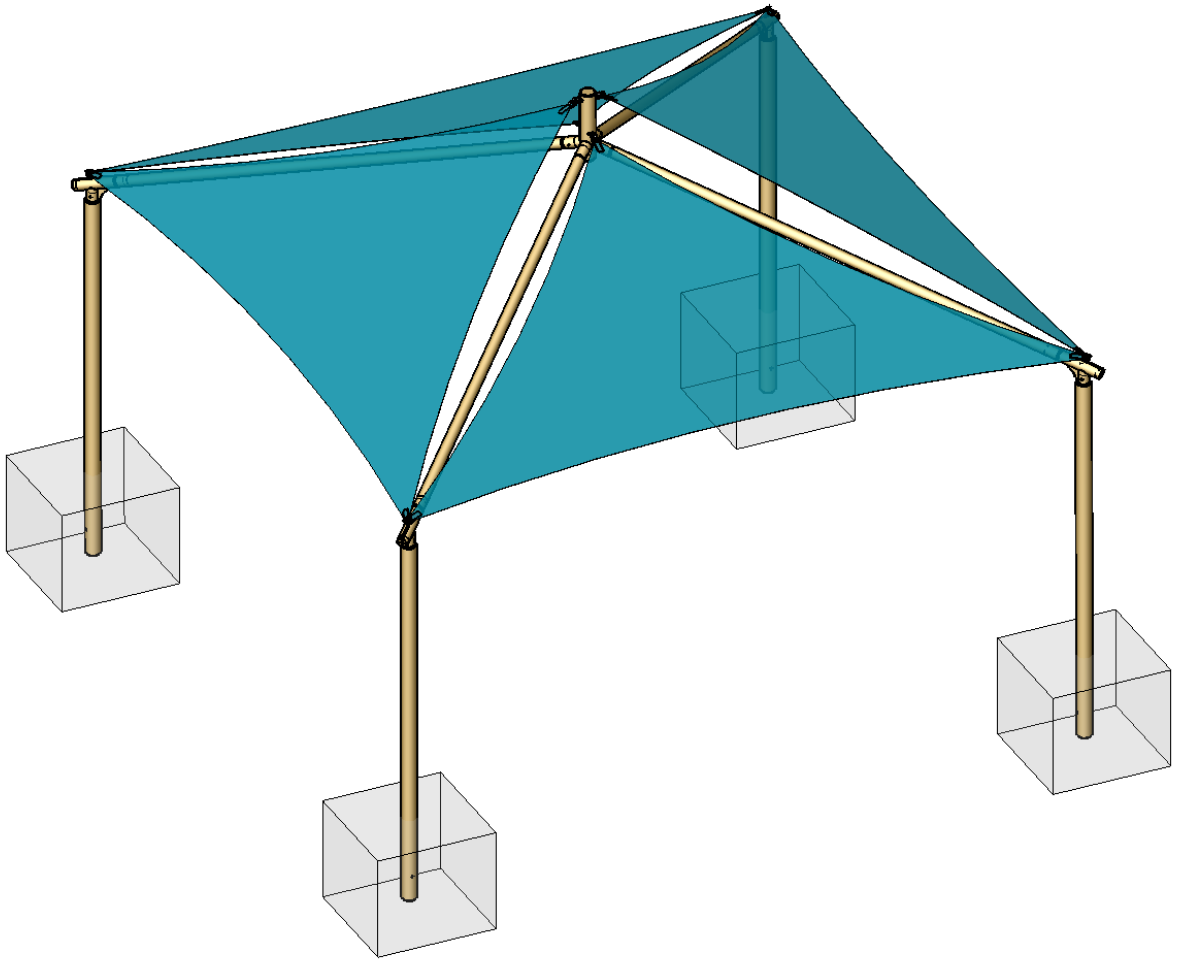
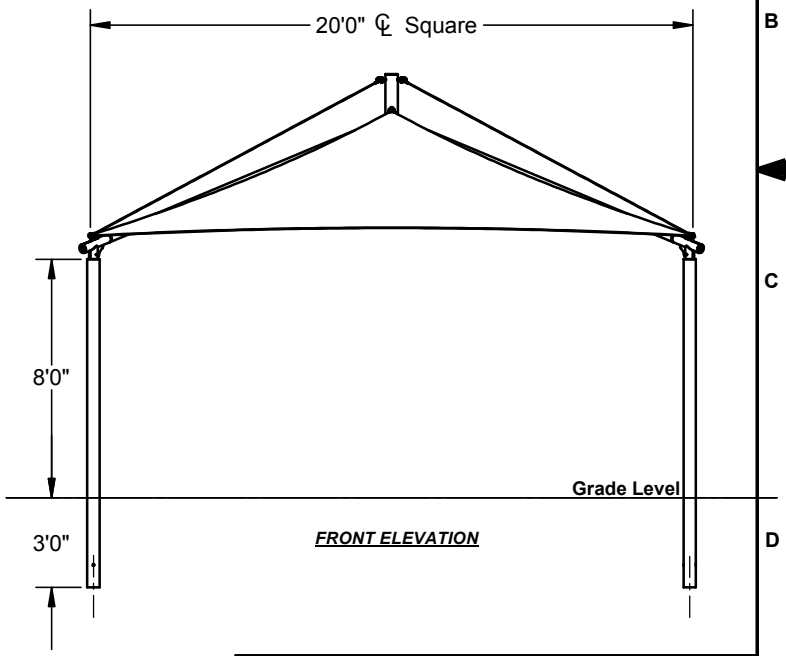
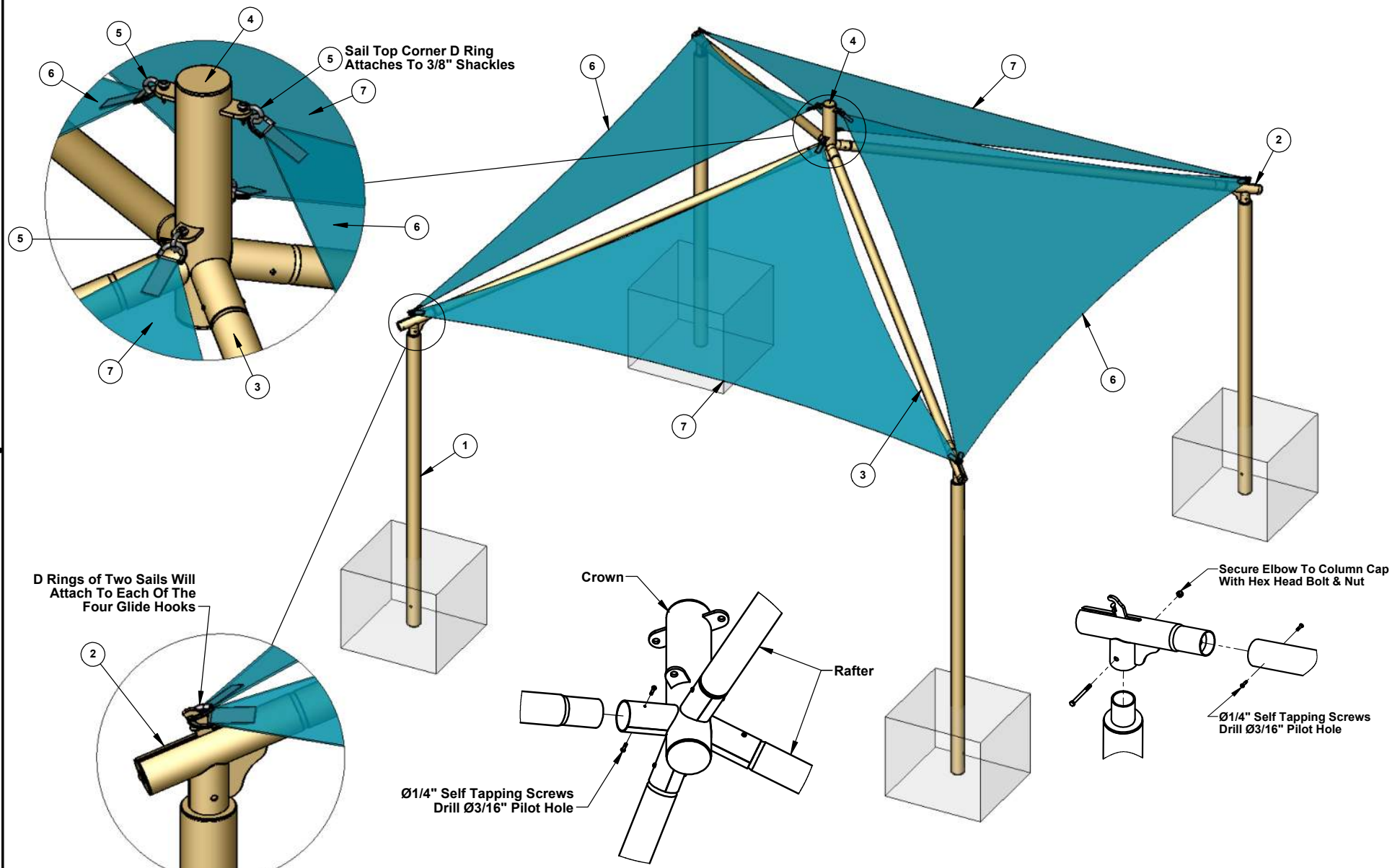


REF.#	PART DESCRIPTION	QTY.
1	Column - EMB Ø5" With 3" Cap	4
2	Elbow - Ø3 1/2" Glide	4
3	Rafter - Swaged Ø3 1/2"	4
4	Crown - Ø5" Four Socket Quad	1
5	Shackle - 3/8"	4
6	Upper Sail With Cable Insert	2
7	Lower Sail With Cable Insert	2
8	Frame Hardware Kit	4

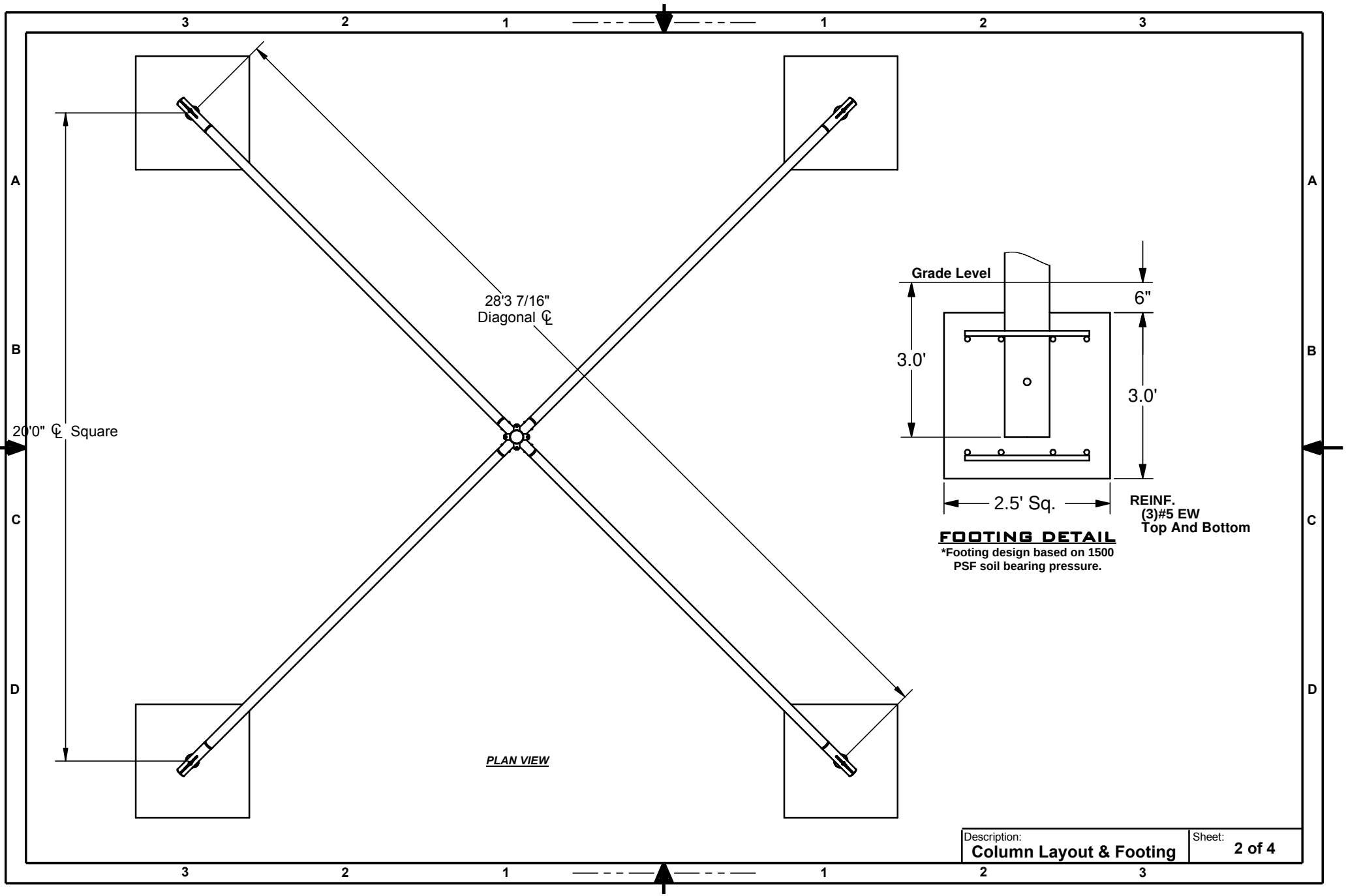


FRONT ELEVATION

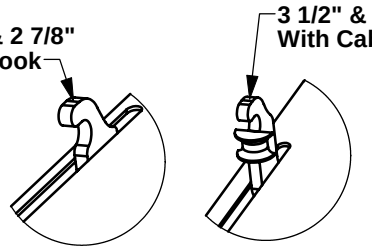
Description: **20' x 20' x 8' Standard Suspended Quad Sail**		
Scale: **Varies**	Shade Style:	Sheet: **1 of 4**
Date:	Units: Inches / Feet	Proposal No:



Description:	Sheet:
Frame Details	**3 of 4**

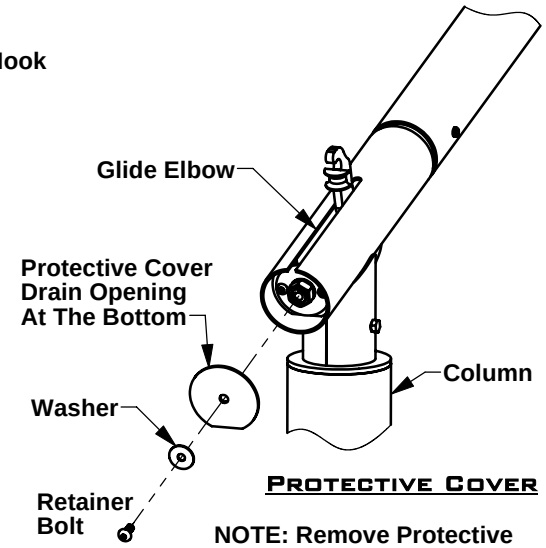


Description:	Sheet:
Column Layout & Footing	**2 of 4**



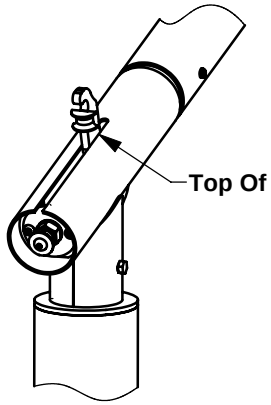
Hook Styles

NOTE: Larger Framework Will Have Glide Hooks With A Seperate Position For The Cable. For Standard Glide Elbows Both The Cable And Fabric Are Positioned Over Hook.



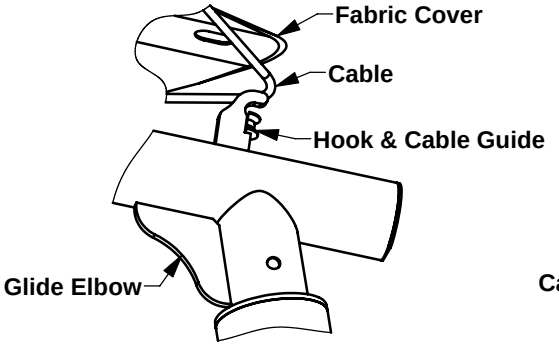
Protective Cover

NOTE: Remove Protective Cover From End Of Glide Elbows.



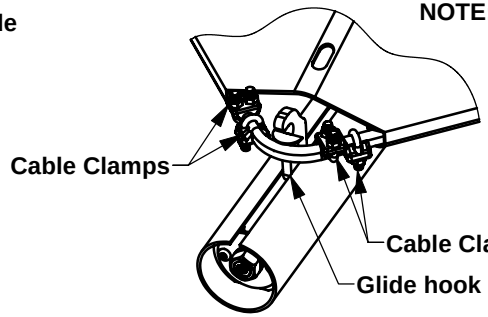
Glide Adjustment

NOTE: Rotate Hex Nut With Hand Tool To Adjust All Glide Hooks To The Top Of Slots Before Installing Fabric.



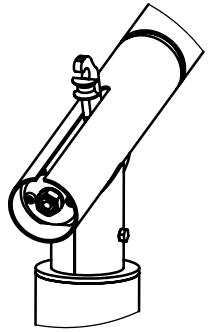
Fabric Installation

NOTE: Pull Cable Over Hook Into Cable Guide. Pull Hole In Fabric Corner Over Hook. This Applies To Three Of Four fabric Corners.



NOTE: Cross Cable Ends Within Cable Guide. Pull Cables Tight To Remove Any Slack. Secure With Two Cable Clamps On Either Side Of Guide. Pull Strap On Fabric Corner Over Hook Followed By The Hole In Fabric. Tuck Loose cable Ends Back Into Fabric Hems.

Secure Cable Ends



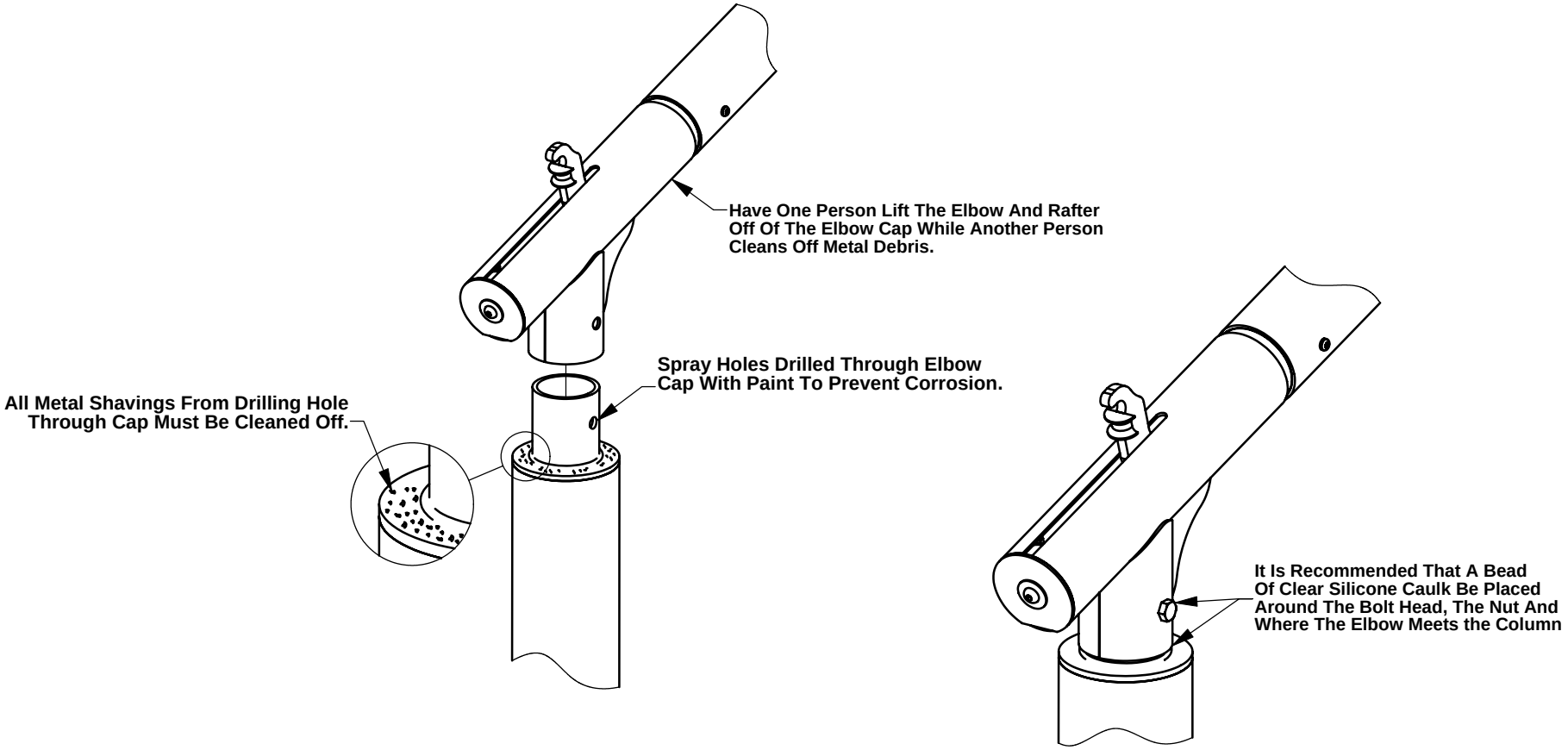
Fabric Tension

NOTE: Rotate Glide Hex Nuts Equally With Hand Tool To Adjust Cable And Fabric Tension.

Description:	Sheet:
Glide Elbow Details	4 of 4

ATTENTION!

Metal Shavings Must Be Removed To Prevent Corrosive Staining.



SHADE STRUCTURE MATERIAL SPECIFICATIONS

Rev. 10/8/2012

1.01 FABRIC SPECIFICATIONS

A. UV shade fabric is made of UV stabilized cloth manufactured by ALNET, or approved equal.

B. The high density polyethylene material shall be manufactured with tensioned fabric structures in mind.

C. The fabric knit is to be made using monofilament and tape filler which has a weight of 9.38 to 10.32 oz. sq. yd. Material to be Rachel-knitted to ensure material will not unravel if cut.

D. Burst strength of 828 lbf (ASTM 3786).

E. Cloth meets fire resistance tests as follows:

Alnet Extra Block:	California State Fire Marshall Reg. #F-93501
Others:	NFPA 701-99 (Test Method 2)
	ASTM E-84

F. Fabric Properties:

STRETCH	**STENTORED**
Tear Tests (lbs/ft)	WARP 44.8 WEFT 44
Burst Tests (lbs ft)	828
Fabric Weight (oz/sqFT) avg	1.02 to 1.07
Fabric Width	9’-10”
Roll Length	150’
Roll Size	63” x 16.5”
Weight	120 lbs.
Life Expectancy	10 years
Fading Note	Minimum fading after 6 years. 3 years for Red and Yellow.
Temperature	- 77 degrees
Maximum Temperature	+167 degrees

1.02 THREAD

A. Shall be 100% expanded PTFE fiber which carries a 10 year warranty that is high strength and low shrinkage.

B. Shall have a wide temperature and humidity range.

C. Abrasion resistant and UV radiation immunity.

D. Shall be unaffected by non-hydrocarbon based cleaning agents, acid rain, mildew, rot, chlorine, saltwater, and pollution.

E. Lockstitch thread – 1200 Denier or equal.

F. Chain stitch thread – 2400 Denier or equal.

1.03 STEEL TUBING

A. All fabricated steel must be in accordance with approved shop drawings and calculations.

B. All steel is cleaned, degreased or etched to ensure proper adhesion of powder-coat in accordance with manufacturer's specifications.

C. All Steel used on this project needs to be new and accompanied by the mill certificates if requested. Structural steel tubing up to 5"-7 Gage shall be galvanized per Allied Steel FLO-COAT specifications. Schedule 40 black pipe fabrications shall be sandblasted and primed as described below.

D. All non-hollow structural shapes comply with ASTM A-36, unless otherwise noted.

E. All hollow structural steel shapes shall be cold formed HSS ASTM A-53 grade C, unless otherwise noted.

F. Plate products shall comply with ASTM A-36.

1.04 POWDER COATING & PRIMING

A. All non-galvanized steel shall be sandblasted and primed prior to powder coating using brown fused aluminum oxide grit and the following primer.

B. All non-galvanized steel must be coated with rust inhibiting primer prior to applying the powder coat. Primer shall be Marine Grade Cardinal Industrial Finishes Corp. E396 – GR1372 epoxy powder coating semi-gloss smooth zinc rich primer.

C. Welds shall be primed with rust inhibiting primer prior to applying the powder coat. Primer shall be Marine Grade Cardinal Industrial Finishes Corp E396-GR1372 epoxy powder coating semi-gloss smooth zinc rich primer.

D. All steel parts shall be coated for rust protection and finished with a minimum 3.5 mil thick UV-inhibited weather resistant powder coating.

E. Characteristics: Powder used in the powder-coat process shall have the following characteristics:

N.3.1	Specific gravity	1.68+/-0.05
N.3.2	Theoretical coverage	114+/- 4 ft 2/lb/mil
N.3.3	Mass loss during cure	< 1%
N.3.4	Maximum storage temperature	75 degrees F

F. Powder-coating shall meet the following tests:

ASTM	Gloss at 60 degree	85-95
HOI TM 10.219	PCI Powder smoothness	7
ASTM D2454-91	Over-bake resistance time	200%
ASTM D3363-92A	Pencil hardness	H-2H
ASTM D2794-93	Dir/Rev Impact, Gardner	140/140 in/lbs
ASTM D3359-95B	Adhesion, cross hatch	5B Pass
ASTM D522-93A	Flexibility Mandrel	¼" dia. No fracture
ASTM B117-95	Salt Spray	1,000 hours
UL DtOV2	Organic coating steel enclosures, elect eq.	Recognized

G. Application Criteria:

N.5.1	Electrostatic spray cold	Substrate:0.032 in. CRS
N.5.2	Cure Schedule	10 minutes at 400 degrees F
N.5.3	Pretreatment	Bonderite 1000
N.5.4	Film Thickness	3.5 Mils

1.05 WELDING

A. All shop welds shall be executed in accordance with the latest edition of the American Welding Society Specifications.

B. Welding procedures shall comply in accordance with the AWS D1.1-AWS Structural Welding Code-Steel.

C. All welds to be performed by a certified welder. All welds shall be continuous where length is not given, unless otherwise shown or noted on drawings.

D. All welds shall develop the full strength of the weaker member. All welds shall be made using E70xx.035 wire.

E. Shop connections shall be welded unless noted otherwise. Field connections shall be indicated on the drawings. Field –welded connections are not acceptable.

F. All fillet welds shall be a minimum of ¼" unless otherwise noted.

G. All steel shall be welded shut at terminations to prevent internal leakage.

H. Internal weld sleeving is not acceptable.

I. On-site welding of any component is not acceptable.

1.06 SEWING

A. On-site sewing of a fabric will not be accepted.

B. All corners shall be reinforced with extra non-tear cloth and strap to distribute the load.

C. The perimeters that contain the cables shall be double lock stitched.

1.07 INSTALLATION HARDWARE

A. Bolt and fastening hardware shall be determined based on calculated engineering loads.

B. All bolts shall comply with SAE-J429 (Grade 8) or ASTM A325 (Grade BD). All nuts shall comply with ASTM F-594, alloy Group 1 or 2.

C. Upon request, Stainless Steel hardware shall comply with ASTM A-304.

D. 1/4" galvanized wire rope shall be 7x19 strand with a breaking strength of 7,000 lbs. for shades generally under 575 sq. ft. unless requested larger by the customer. For shades over 575 sq. ft., cable shall be 5/16" with a breaking strength of 9,800 lbs. Upon request, 1/4" Stainless Steel wire rope shall be 7x19 strand with a breaking strength of 6,400 lbs. 5/16" Stainless Steel wire rope shall be 7/19 strand with a breaking strength of 9,000 lbs.

E. All fittings required for proper securing of the cable are hot dipped galvanized.

1.08 CONCRETE

A. Concrete work shall be executed in accordance with the latest edition of American Concrete Building Code ACI 318 unless specified by the governing municipality.

B. Concrete specifications shall comply in accordance with, and detailed as per plans as follows:

1. 28 Days Strength F'c = 2500 psi
2. Aggregate: HR
3. Slump: 3-5
4. Portland Cement shall conform to C-150
5. Aggregate shall conform to ASTM C-33

C. All reinforcement shall conform to ASTM A-615 grade 60.

D. Reinforcing steel shall be detailed, fabricated and placed in accordance with the latest ACI Detailing Manual and manual of Standard Practice

E. Whenever daily ambient temperatures are below 80 degrees Fahrenheit, the contractor may have mix accelerators and hot water added at the batch plant (See Table 1).

F. The contractor shall not pour any concrete when daily ambient temperature is below 55 degrees Fahrenheit.

Temperature Range	**% Accelerator**	**Type Accelerator**
75-80 degrees	1%	High Early (non calcium)
70-75 degrees	2%	High Early (non calcium)
Below 70 degrees	3%	High Early (non calcium)

1.09 FOOTINGS

A. All anchor bolts set in new concrete shall be ASTM A-307, or ASTM F-1554 if specified by engineer.

B. All anchor bolts shall be zinc plated unless specified otherwise.

C. Footing shall be placed in accordance with and conform to engineered specifications and drawings.

WARRANTY

Including Appendix A, **"PROPER CARE, MAINTENANCE AND SAFE REMOVAL OF THE SHADE CANOPY"**

General Conditions:

- The warranty set forth shall be the purchaser's sole and exclusive warranty.
- All warranties below are effective from the date of delivery by the company, its subsidiaries or agents.
- Labor for the removal, installation and/or freight will be covered in full for a period of 12 months from the date of delivery for warranty claims; following that, labor for the removal, installation and/or freight will be at the customers' expense and the warranty will only be applicable to the repair or replacement of the defective materials.
- Superior Shade reserves the right to repair or replace any item covered by this warranty.
- This warranty will be void if the structures are not paid for in full.
- The warranty is void if the structures are not installed in strict compliance with the manufacturer specifications.
- Purchaser shall notify the company or its agent in writing detailing any defect for which a warranty claim is being made.
- The company shall not in any event be liable for indirect, special, consequential or liquidated damages.
- The company specifically denies the implied warranties of fitness for a particular purpose and merchantability.
- The warranty is void if any changes, modifications, additions or attachments are made to the structures or fabric without the written consent of the manufacturer.
- No signs, objects, ornaments, fans, lights, fixtures or decorations may be hung from the top part of the structure, unless specifically designed and engineered by the manufacturer. These items may interfere with the fabric causing the warranty to be voided.

Thread:

- Shall be 100% expanded PTFE fiber that is high strength and low shrinkage which carries a 10 year warranty.
- This warranties that the sewing thread will be free from defects in material and workmanship and will not be damaged by exposure to sunlight, weather and water.
- All other warranties are disclaimed.

Fabric:

- The company fabrics carry a ten-year limited manufacturers warranty from the date of delivery against failure from significant fading*, deterioration, breakdown, mildew, outdoor heat, cold or discoloration. Should the fabric need to be replaced under the warranty, the company will manufacture and ship a new fabric at no charge for the first six years, thereafter pro-rated at 18% per annum over the last four years. *The colors Red and Yellow are warranted against significant fading for only two years.
- If the corners of the fabric are equipped with both holes in the fabric corner PLUS reinforcing straps, BOTH the strap and fabric hole must be placed over each corner hook or the fabric warranty is void.

- Fabric curtains, valences or flat vertical panels are not covered under the warranty.
- Fabric is not warranted where it is installed on a structure that is not engineered and built by the company or its agents.
- This warranty shall be void if damage to or failure to the shade structure is caused by contact with chemicals, chlorine, bleaching agents, hydrocarbons or hydrocarbon containing solvents, misuse, vandalism or any act of God, including but not limited to wind in excess of the wind limitations set forth below.
- All fabric tops are warranted for sustained winds up to 76mph (hurricane force 1) and for gusts of up to 3 seconds duration up to 90mph. Removal of the shade fabric is required if damaging winds are called for. Damage due to snow and/or ice accumulation is not covered by this warranty. Canopies should be removed during the "off season".
- The structures have been designed to eliminate any friction between the rafters and the fabric. The warranty will, therefore, be voided if any modification (temporary or permanent) is made to the rafter, cross pieces or ridge beams.
- The company reserves the right, in cases where certain fabric colors have been discontinued, to offer the customer a choice of available colors to replace the warranted fabric of the discontinued color. The company does not warranty that any particular color will be available for any period of time and reserves the right to discontinue any color for any reason it may determine, without recourse by the owner of the discontinued fabric color.

Steel Structure:

- The structural steel frames are covered for a period of twenty years against failure due to rust-through corrosion under normal environmental conditions.
- Workmanship is warranted for a period of five years.
- Structures are warranted for winds up to 150mph only if shade canopies have been removed as per requirement set forth above in the **Fabric** paragraph. Removal and reinstallation must be performed by a qualified person or authorized dealer following the instructions in APPENDIX A below.
- This steel warranty shall be void if damage to the steel frame is caused by the installer, or from physical damage, damage by salt spray, or sprinkler systems, contact with chemicals, chlorine, pollution, misuse, vandalism, or any act of God.

Powder Coat Finish:

- The factory applied powder coat finish is warranted for a period of ten years under normal environmental conditions. This warranty does not cover cosmetic issues such as fading, discoloration, or weathering.
- This finish warranty shall be void if damage to the powder coat is caused by the installer, or from physical damage, damage by salt spray or sprinkler systems, contact with chemicals, chlorine, thinners, degreasers, hydrocarbon containing solvents, pollution, misuse, vandalism or any act of God, including but not limited to, ice, snow or wind in excess of the applicable building code parameters. The owner must report any defects in the powder coat at the time the installation is completed.

Acts of Nature:

- This warranty does not cover natural disasters, such as earthquakes, shifts of terrain or tornados. If the structure is installed in an area exposed to hurricanes, removal of the shade fabric is required when a hurricane warning is issued.

APPENDIX A

PROPER CARE, MAINTENANCE AND SAFE REMOVAL OF THE SHADE CANOPY

THINGS TO AVOID

SNOW, ICE and HIGH WINDS: Remove the canopy in winter conditions, ice and snow load are not covered by the warranty. The same goes for winds in excess of hurricane force 1.
SHARP OBJECTS: Always avoid dragging the fabric across surfaces, etc. Roll or fold the fabric and carry it. Avoid sharp objects, bolts, snags, and other protrusions including mounting hardware.
OBSTRUCTIONS: Keep foliage, such as tree limbs, shrubbery, bushes, etc. trimmed back and away from fabric at least three to four feet.
SOURCES OF HEAT: Also avoid contact with heat sources such as hot lights, torches, and avoid using grilles, etc. under the fabric.

CLEANING THE FABRIC

The fabric itself is generally maintenance free with the exception of necessary removal due to weather or seasonal requirements. The fabric does not harbor mildew or mold, but residues may. Residues such as tree sap, leaves, bird droppings, dust & dirt, etc. may need to be removed. To clean the fabric, use water and mild soap. A soft mop or soft broom may also be used. Cleaners that do not contain hydrocarbons, solvents, bleach or ammonia may be used. Use of solvents, hydrocarbons, bleach, and ammonia type cleaners will void the fabric warranty. A pressure washer may be used if necessary using a wide-spray nozzle.

CABLES AND HARDWARE

It is recommended that the cables be replaced if corrosion is visible, or every 3 to 4 years whichever comes first. The cable ends must be wrapped with tape to secure any wires thus preventing the wires from tearing the fabric. Taping must be done when removing old cable as well as when installing new cable. Clamps should be replaced when the cable is replaced.

If the cable appears slack on a still day (no wind), immediately have the cable and clamps retightened by a qualified person. The cable should not be slack.

GLIDE ELBOWS

Lubricate glide elbows annually, and before operating. A waterproof grease is recommended such as a lithium based grease or anti-seize thread lubricant.

STORAGE

Fabric must be stored in clean dry place free from snags, sharp edges, etc. The storage area must be rodent-free. Wrap all hardware fittings with rags, etc. as they can damage the fabric.

UNINSTALLING THE SHADE CANOPY

NECESSARY CARE

It is important to take **necessary care** when handling the fabric during removal and installation to prevent damage to the fabric as well as **SAFE** control of the fabric in a breeze or wind. The fabric is tough and engineered for use as a shade, but it can tear or cut when or if pulled over a snag or sharp item; it can puncture from bolts or other protruding objects; and it can melt from things like cigarettes, matches, hot torch tips, sparks and the like. In addition, care must be exercised to avoid the fabric hooks after the fabric is unhooked from the elbow corners and sides of the structure where there are intermediate supports. It is best to wrap any connected mounting hardware to prevent it from harming the fabric.

PROPER AND SAFE
Based on the size of the canopy, several persons may be needed to **properly and safely handle** the fabric during the uninstalling process. You will need several commercial ladders or other means to work safely at heights such as scissor lifts, etc. It is advised that you pad the post side of the ladder and tie the ladder to the post. The pad is to protect the post finish. Also keep in mind that every 100 square feet of fabric (10' X 10') weighs approximately five pounds; a large canopy can get heavy fast. For proper control of the fabric, read below. It is best to remove the fabric on a still day. **Do not attempt to remove the canopy in strong or gusty winds.**

INSTALLATION IN REVERSE
Refer to the **Installation Instructions pages 7 and 8 (enclosed)**. Determine which style elbows (corners) are installed on your structure. Begin on page 8, at either Step 11 or Step 9 - depending on which style elbow is on your structure. In general, uninstalling the canopy means following these pages in reverse. **Do not attempt to remove the canopy in strong or gusty winds.**

1. For shade structures with Standard Elbows, loosen the turnbuckle several turns in order to put enough slack in the cable to allow the fabric and cables to unhook from all the elbow hooks. **Attach 3/8" or larger ropes** to each corner of the fabric and cable before unhooking to secure and properly control the fabric from ground level. If uninstalling in breezy conditions, choose the windy side of the fabric and tie these corners to the posts with the ropes with enough slack to allow for unhooking the fabric from the structure. These ropes are to prevent the shade from flying away in the breeze and to help prevent injury to ground personnel. Once the corners have been secured to the posts, unhook the fabric and cables from each corner.

On the side away from the wind, release the corners of the fabric and cable and have a person hold on to each rope. It may help to wrap the rope around a column to help hold it from getting caught in the wind. Fold the fabric back away from the hooks.

Now it will be necessary to remove the cable clamps to allow the cable to be free from the structure and the turnbuckle. If the cable ends are frayed, wrap them with tape. NOTE: It is usually not necessary nor is it recommended that the cable be removed from the canopy.

With a person on each rope, starting at the windy side, gently pull the canopy down in between the framework of the structure. The side away from the wind can be guided with the ropes toward the persons pulling the canopy down.

IMPORTANT HINT: It is important when reinstalling the canopy, that it is put back in its original orientation to the structure. Starting at the turnbuckle corner, the fabric and cable corners should be returned to their original positions.

2. For shade structures with Glide Elbows, remove the protective covers from the ends of the glide elbows. Then, using the proper wrench, turn the hex nuts on the end of the Glide Elbow to run the glide hooks to their top most position. Do not loosen the cable clamps, leave the cable intact. **Attach 3/8" ropes** to each corner of the fabric and cable before unhooking to secure and properly control the fabric from ground level. If uninstalling in breezy conditions, choose the windy side of the fabric and tie these corners to the posts with the ropes with enough slack to allow for unhooking the fabric from the structure. These ropes are to prevent the shade from flying away in the wind and to help prevent injury to ground personnel. Once the corners have been secured to the posts, unhook the fabric and cables.

On the side away from the wind, release the corners of the fabric and cable and have a person hold on to each rope. Fold the fabric back away from the hooks.

It is a good idea to put the Glide Elbow protective covers back in place. NOTE: With Glide Elbow installations it is not necessary to loosen or remove the cable clamps nor to remove the cable from the canopy. If the cable ends are frayed, wrap them with tape.

IMPORTANT HINT: When uninstalling the canopy, mark or identify the corner of origin in such a way that when reinstalling the canopy, it is put back in its original orientation to the structure. The fabric and cable corners should be returned to their original positions when reinstalling the canopy. The cable and fabric should tighten properly when the glide elbows are adjusted down into their tension positions.

3. For shade sails equipped with fans, loosen the adjustable threaded rod several turns in order to put enough slack in the cable to allow the shackle pin to be removed (do not remove the pins until the fabric corners have been secured with ropes). **Attach 3/8" or larger ropes** to each corner of the fabric and fan before unhooking to secure and properly control the fabric from ground level. If uninstalling in breezy conditions, choose the windy side of the fabric and tie these corners to the posts with the ropes with enough slack to allow for unhooking the shackle from the structure. These ropes are to prevent the shade from flying away in the breeze and to help prevent injury to ground personnel. Once the corners have been secured to the posts, unhook the shackles and lower the fabric and cables to the ground.

REINSTALLING HINTS

Using the same rope technique, install from the windy side (if it is breezy) making sure to secure these ropes to the posts. Then, throw the remaining corner ropes over the structure and gently pull the canopy into position. The cables and fabric corners can now be hooked on the hooks (and cable guides if so equipped). Next reinstall the clamps if applicable and tightened the cable with the turnbuckle or the Glide Elbows. **Do not attempt to install the canopy in strong or gusty winds.**

For help call Treetop Products at 1-866-319-8916

See Install instructions pages 7 & 8 attached