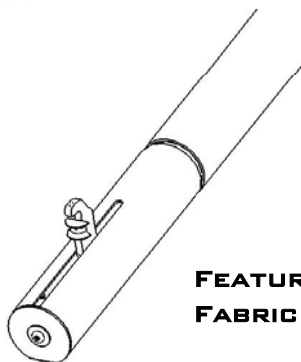
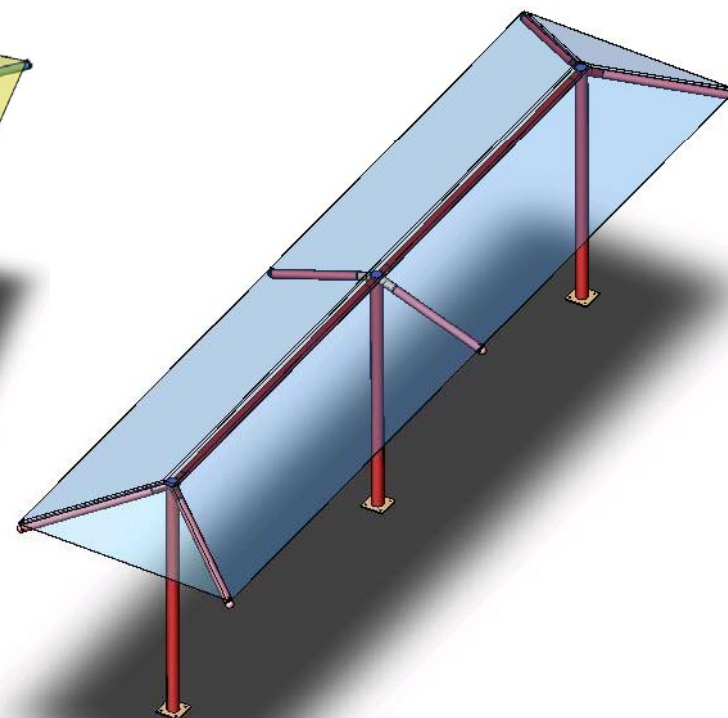
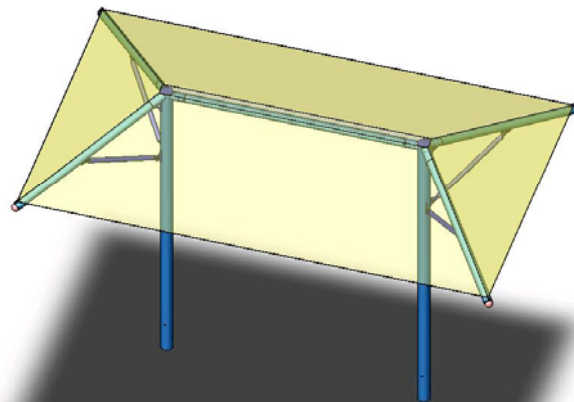
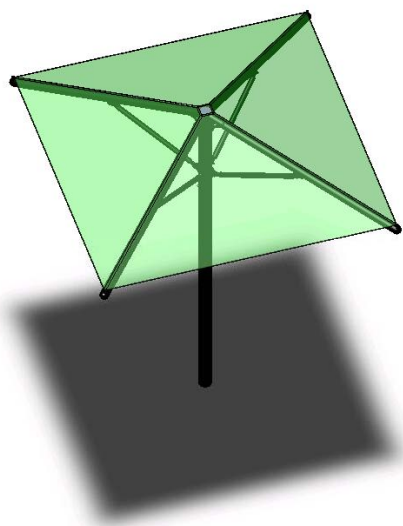


UMBRELLA SHADE DESIGN INSTALLATION

SINGLE, DUAL AND TRIPLE COLUMN MODELS

EMBEDDED AND SURFACE MOUNT



FEATURING THE GLIDE INSERT
FABRIC TENSIONING SYSTEM.

INSTALLATION INTRODUCTION

It is very important that you read this entire manual before beginning the installation process. We are continuously striving to improve our product, and the *Installation Introduction* will Contain the latest up-to-date information.

STORAGE:

When Shade Unit equipment is received at the job site it should be installed as soon as possible (within a few days). We package the equipment components to keep them safe and damage-free during shipment. However, the packaging material is not suited for periods of extended storage in an uncontrolled environments. The combination of moisture in the air mixed with heat generated inside the plastic shrink-wrap may cause damage to the finish of powdercoated frame members.

If an immediate installation is not possible, certain steps should be taken to minimize the risk of damage to the components. If Shade components must be stored, ideally they should be kept in a controlled warehouse or storage container environment away from heat and moisture. If this is not possible, the packaging material should be removed. Care is recommended when using cutting blades to remove packaging. Keep blades away from powdercoated surfaces to avoid damage to surface.

INVENTORY:

It is very important that you inventory all Shade equipment received using the Packing List that shipped with your unit. Review all items for proper quantities and check for any damaged components. Notify the company immediately if any components are missing or damaged at (866) 319--8916

We are not responsible for items discovered missing after 72-Hours from time of delivery.

IF YOU NEED TO REPLACE DAMAGED PARTS OR HAVE INSTALLATION
QUESTIONS, PLEASE CALL OUR CUSTOMER SERVICE REPRESENTATIVES AT

866-511-5642

SHADE UNIT SITE PREPARATION

Using the provided plan view drawing of your unit, locate the position of all four support columns.

All loose asphalt, concrete and debris must be removed from the entire site prior to installation.

Site must be graded as close to level as possible to aid in unit construction. Special installation considerations must be implemented for sites that are not level.

The customer is responsible for checking local soil and drainage conditions within the site area. Proper drainage around the unit and the support columns is important. Inquire with local contractors in your area for drainage recommendations.

Site must be surveyed for underground hazards such as Electrical Cables, Phone Lines and Gas or Water Pipes. Serious injury or death could result if these hazards are not first located and marked within the site.

Never leave the job site unattended without making sure that all open holes are covered with material such as plywood. Rope off all unfinished construction to keep children away from site until job is complete.



REQUIRED TOOLS

- (A) Safety Glasses
- (B) String Level, Magnetic Level
- (C) Rubber Mallet
- (D) Shovel / Post Hole Digger / Auger
- (E) Tape measure
- (F) Rechargeable Drill / Drill Bit Set
- (G) Socket Set (SAE)
- (H) Adjustable Wrench
- (I) Center Punch
- (J) Two Ladders (10' recommended)
- (K) Duct Tape
- (L) One 2" x 8" x 16" Wood Length
- (M) Multiple Scrap 2" x 4" x 8' Lengths
- (N) 1/2" x 4' x 4' Plywood Sheet
- (O) Wheelbarrow / Loader





WARNING:

Cables must exit through holes under webbing to ensure spacing for the FOUR cable clamps.

STEP #1:

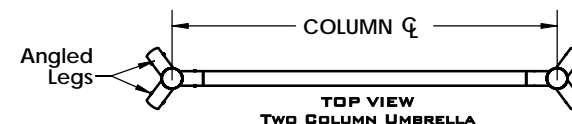
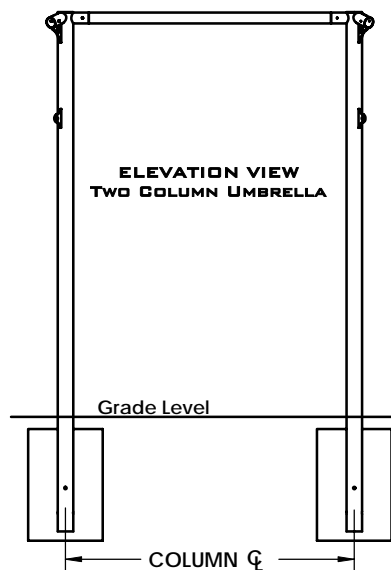
For two and three column Umbrellas locate and mark the positions of the upright columns. Refer to the specific dimension information for your Shade unit provided in this packet.

EMBEDDED COLUMNS:

- Excavate footings in accordance with the dimensions specified for your Shade unit.
- Refer to the specific dimensions provided for your unit within in this packet.
- Place a 3" block in the bottom of each hole.
- Place a column into each hole on top of each block.
- Block and brace each column into position making sure that they are plumb and remain on centers. The distance between the columns at the top between centers must be correct.
- Pour concrete around columns until it is three inches below grade level. **Allow concrete to harden for 48-hours before proceeding to next step.**

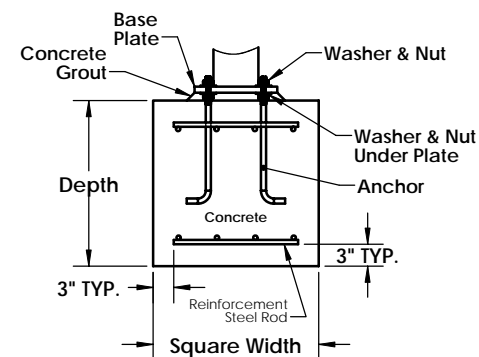
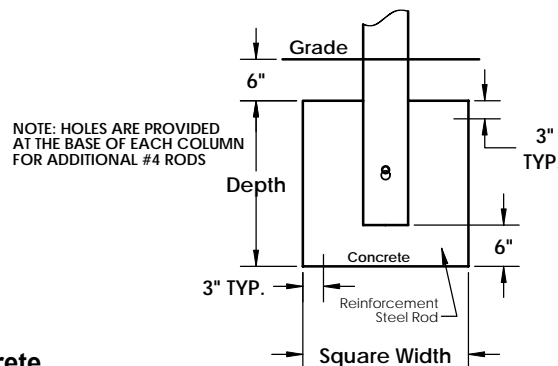
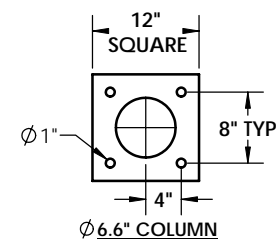
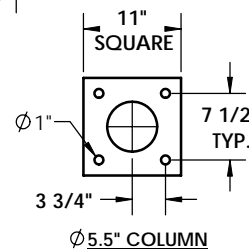
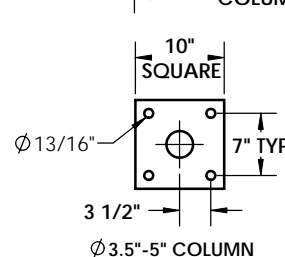
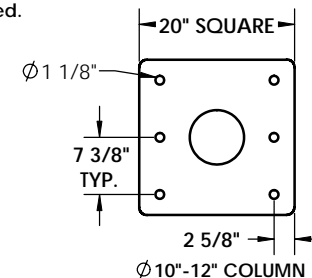
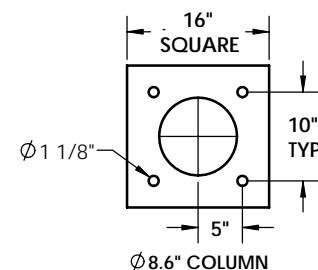
BASE PLATE COLUMNS:

- Excavate footings for concrete pads in accordance with the dimensions specified for your shade structure. Refer to the specific dimensions provided in this packet.
- Cut the plywood sheet into four squares 2" larger than your base plates. Working from the center, mark off the hole pattern that applies to your base plate. Mark the center point of the column as well.
- Drill four holes through the plywood at the outer marks. Make the holes slightly larger than the anchor diameter.
- Insert the four anchors through the holes. Thread a nut completely over each anchor on top of the plywood. The four anchors should hang from the plywood.
- Fill the footer holes with concrete to 4" below grade.
- Place one Plywood sheet with anchors over each footer submersing the anchors into the concrete. Make sure the the center marks are on your column centers.
- After the concrete has started to harden you must remove the hardware and plywood from each footer.
- Let concrete harden for 48-hours.
- Re-thread a nut over each anchor down to the concrete. Place a washer over each anchor followed by each column base plate. Adjust the nuts under the base plates to plumb each column. Insert a washer and thread a nut over each anchor tight against base plate.
- Apply concrete Grout base between base plates and concrete.

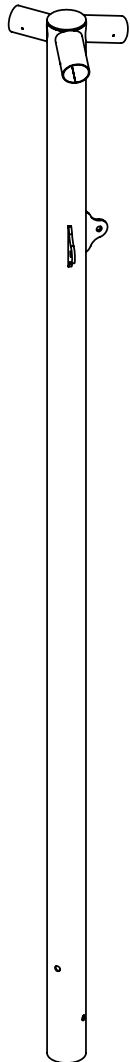


IMPORTANT NOTE:

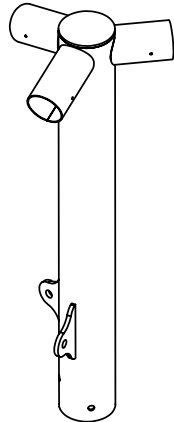
Some $\varnothing 5"$ And Larger Columns Are One Part And Do Not Have A separate Crown. Ridge Pole Must Be Positioned Between Columns Before Concrete Is Poured.



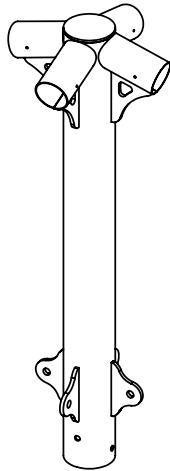
UMBRELLA SHADE COMPONENT INVENTORY



SINGLE COLUMN



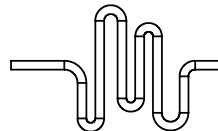
TWO & THREE COLUMN CROWN



SINGLE COLUMN CROWN



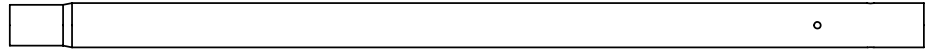
DRIVER TOOL



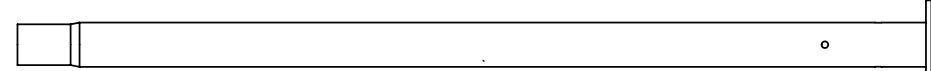
CABLE LENGTH
Cable Will Be Installed Within Fabric If Shade Has Glide Equiped Rafter



ANCHOR ROD WASHERS



EMBEDDED COLUMN



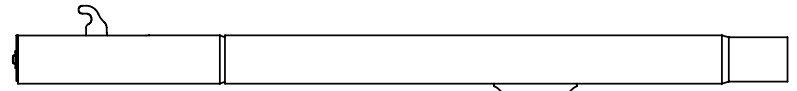
SURFACE MOUNT COLUMN



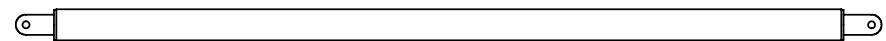
RIDGE POLE
Two & Three Column Umbrellas



STANDARD RAFTER WITH CAPPED END & HOOK



RAFTER WITH GLIDE INSERT



RIGID STRUT



HEX HEAD BOLTS



NYLOCK HEX NUTS



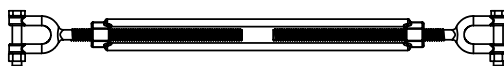
WASHERS



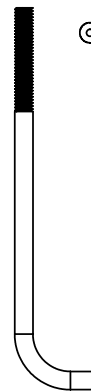
SELF TAPPING SCREWS



CABLE CLAMPS
Supplied With Umbrellas Using Turnbuckle



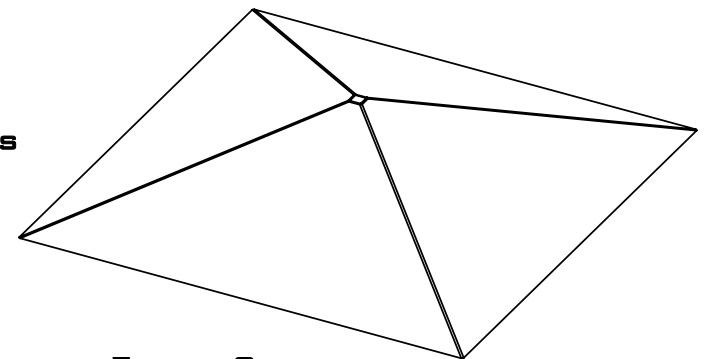
TURNBUCKLE
Turnbuckle Is Supplied When Unit Has Standard Rafter



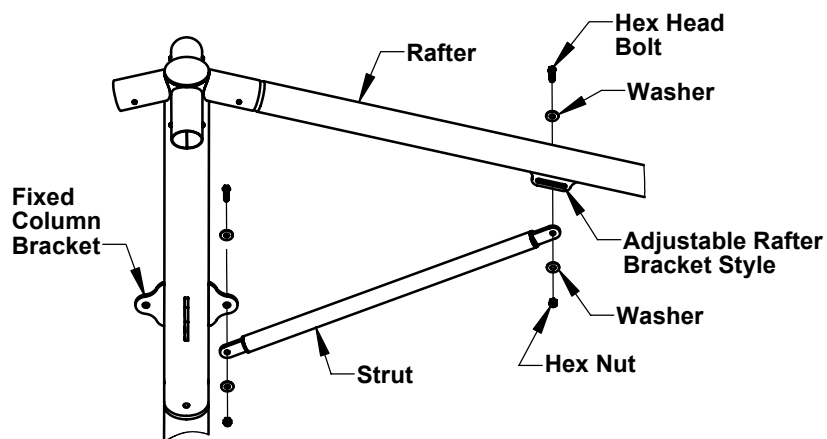
ANCHOR RODS
Supplied With 12" x 12" Or Larger Base Plate Columns.



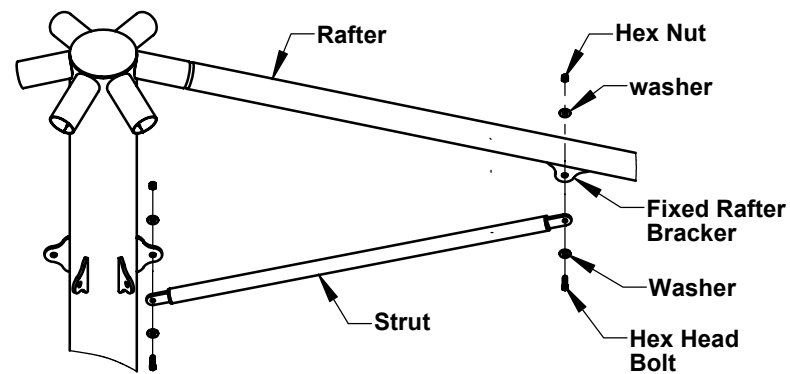
ANCHOR ROD NUTS



FABRIC COVER



TWO PIECE SINGLE COLUMN UMBRELLA



ONE PIECE SINGLE COLUMN UMBRELLA

STEP #4:

Attach one strut to each rafter using short hex head bolts at both the column and rafter brackets.

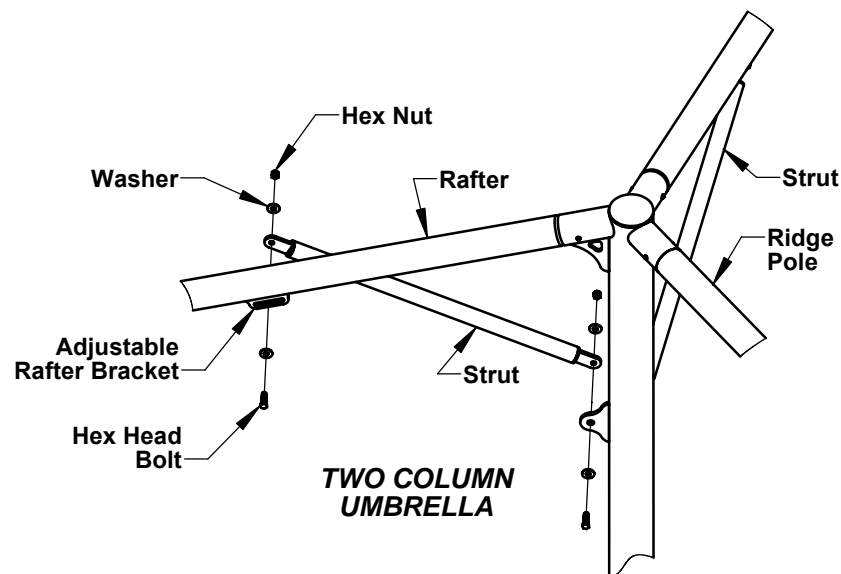
Starting with the rafters, insert a bolt through a washer and the rafter bracket. Hang the strut by inserting it over the bolt end.

Secure the strut by placing a second washer over the bolt against the rafter bracket. Hand tighten a nut against the washer.

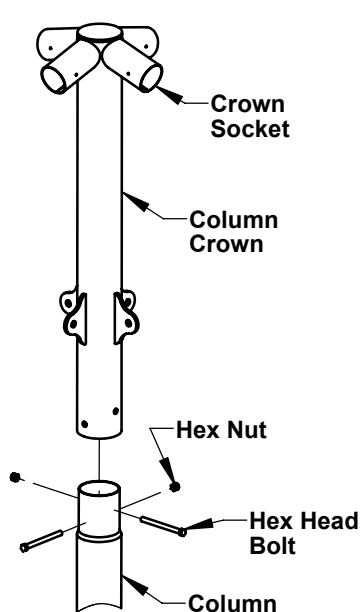
Swing the strut bottoms into position aligning the end hole with the hole in the column bracket. Be sure that the strut end is on the same bracket side as the one at the top rafter position.

Secure the bottom end of strut into position against the column using the same hardware procedure used for the top.

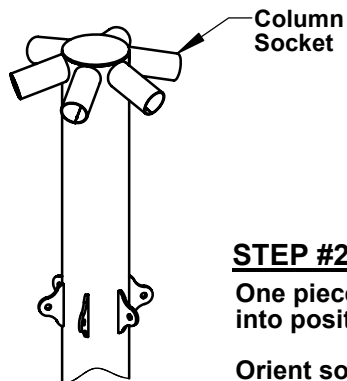
Fully tighten all strut attachment hardware.



TWO COLUMN UMBRELLA



TWO PIECE COLUMN



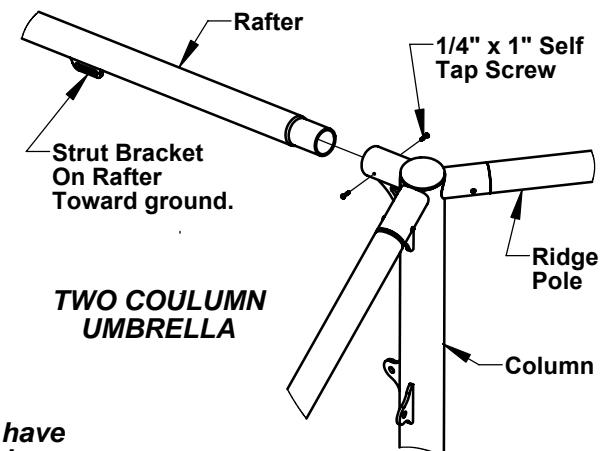
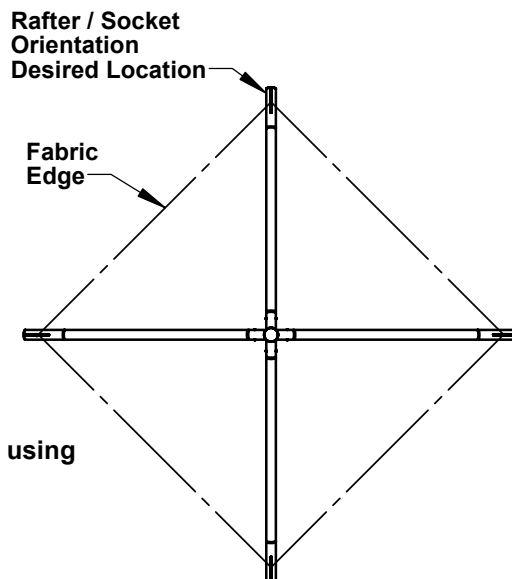
ONE PIECE COLUMN

STEP #2: Single Column

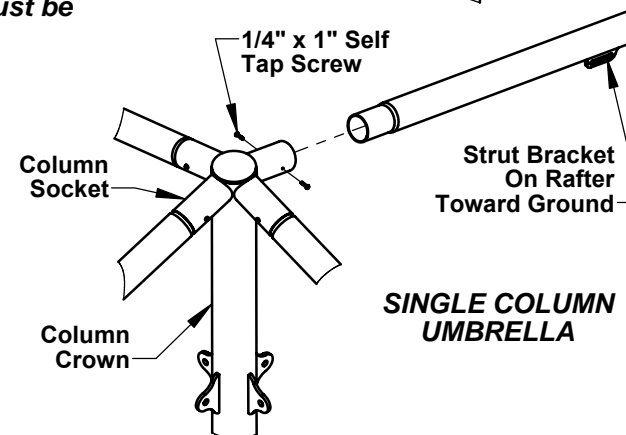
One piece columns must be rotated into position while concrete is still wet.

Orient sockets toward the desired fabric corner locations.

NOTE: With Two Column Umbrellas that have one piece columns, the Ridge Pole must be fitted before concrete is poured.



TWO COLUMN UMBRELLA



SINGLE COLUMN UMBRELLA

STEP #2: Crowned Columns

Smaller single column Umbrellas will have a separate Crown that will need to be placed over the swaged end of column after the concrete has hardened.

Orient the crown so that the sockets point toward the desired Fabric corner locations.

Field drill $\phi 9/16$ " through both walls of column using holes in crown as template (Two Locations).

Secure with two 1/2" hex head bolts and nuts.

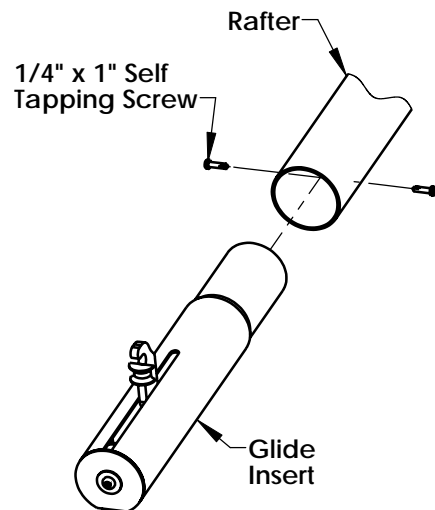
STEP #3:

Insert swaged end of Rafters into column sockets.

Orient rafter strut brackets to point down toward ground.

Drill two $\phi 3/16$ " pilot holes through each rafter using the holes in the socket as a template.

Secure with two 1/4" self tapping screws



STEP #6

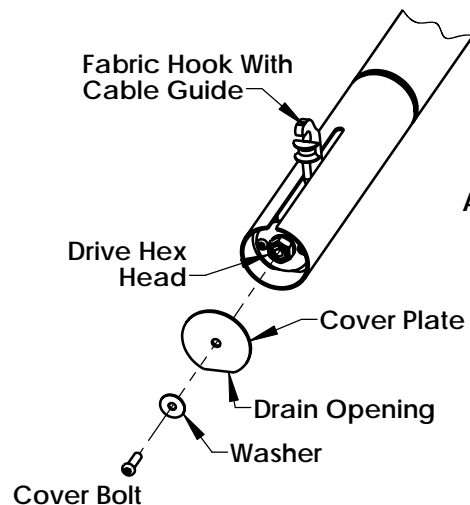
Locate the glide mechanisms that will go on the end of each rafter.

With the fabric hook oriented up away from the ground, insert the tapered end of the glide into the end of the rafter.

Using a $\phi 3/16$ " drill bit, drill a hole through both the rafter and glide from opposite sides.

Secure the glide to the rafter using two 1/4" x 1" self tapping screws and the tool provided.

Repeat this procedure at each rafter location.

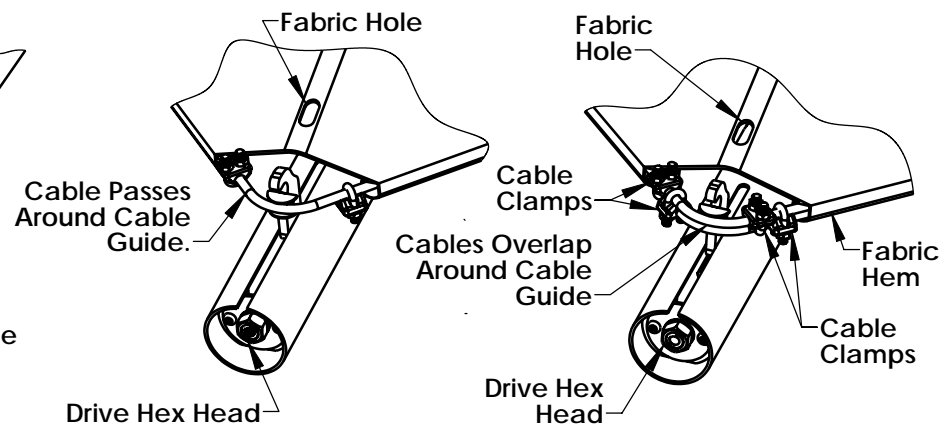


STEP #7

Remove the screw and washer that hold the protective cover on each glide end.

With the hem side down, gently lift the fabric up over the framework. Orient each fabric corner over a glide insert.

With a ratchet and socket, rotate the drive hex head at each location until the fabric hook moves up the rafter as far as it will go.



STEP #8

Start at one of the fabric corners with the cable running completely through.

Pull the cable over the hook and into the 180° cable guide. Push the hole in the fabric corner down over the hook portion.

Move to the next corner with the cable running completely through. Repeat the procedure.

NOTE: You will have to pull hard and stretch the fabric over the hooks, this is normal and ensures a tight fit.

At the final corner you will attach the loose cable ends by crossing them over each other and securing them with two cable clamps on each side of hook. Pull to remove any slack in cables before tightening clamps. Insert fabric corner over hook.

Tuck the loose cable ends back into the adjacent fabric hem.

Rotate the hex drive head on each glide the same number of turns until fabric is completely tight over frame.

Replace protective covers on glide ends making sure that the drain opening is oriented at the bottom.

STEP #5

Unroll the umbrella fabric on a smooth flat surface with the hem side up.

Starting at one corner, insert the steel cable into the hem that runs along the fabric edge.

Feed the cable through the entire length of the hem until approximately 24" is left at the starting corner.

Re-insert cable into the adjacent hem at the second corner.

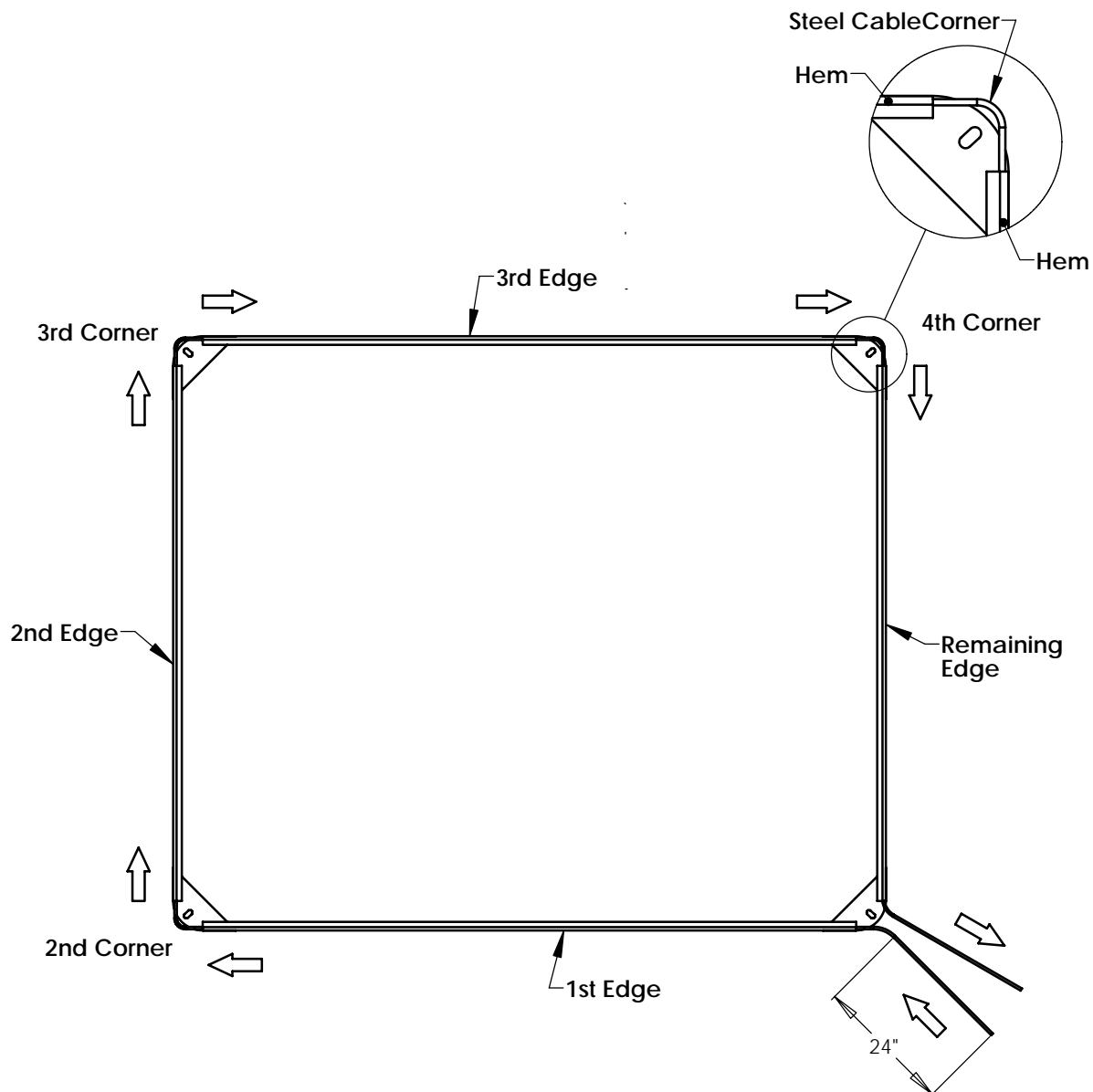
Feed the cable through the entire length of the second edge until only a small corner slightly larger than the fabric corners remains.

Re-insert the cable into the adjacent hem at the third corner.

Feed the cable through the entire length of the third edge until a small cable corner is formed at the third corner.

Repeat this procedure at the fourth corner feeding the cable through the remaining edge.

At this point you will have two loose ends at the starting corner.



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	1/4" 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.