



Southern Shading Structure Specifications

SCOPE

- I.** Structural design, engineering, and fabrication of the entire Shade Structure utilizing structural steel selections.
- II.** Fasteners, anchors, and related reinforcement of the framing system as required to resist design loads.
- III.** Up to 98% Ultraviolet protected high-density polyethylene knitted shade cloth.

PERFORMANCE CRITERIA

- I.** Framing system shall be designed to support design loads as prescribed by the governing building code for Negative Wind Load, Positive Wind Load, and Concentrated Load.
- II.** Framing system shall be designed to withstand a thermal load of +/- 60 degrees F from ambient temperature without causing buckling, failure, or undue stress on structural elements, reduction of performance, or other detrimental effects.
- III.** The maximum allowable deflection of any framing member normal to the plane of the structure shall not exceed L/175. For spans 20'-0" or greater the maximum allowable deflection shall not exceed L/240.

SUBMITTALS

I. Product Data: Submit manufacturer's product data, installation instructions, use limitations and recommendations for the entire structure, including both published data and specified data prepared for this project.

II. Shop Drawings: Submit shop drawings for approval prior to fabrication. Include detailed plans, elevations, and details of framing members, connections, fasteners, and anchoring systems. Indicate the relationship of adjacent materials.

III. Samples

Submit the following:

A. Powder Coated Paint Finish: Submit manufacturer's standard Ultraviolet resistant color chart or any range of custom colors for color selection.

B. Shade Cloth: Submit complete set of 5" x 7" samples with all possible color choices and specifications per individual color selection.

IV. Submit Manufacturer's written certification that the Shade Structure is warranted.

WARRANTY

The Vendor Shall:

I. Warrant the steel frames and steel cables for a period of Twenty years against failure due to corrosion or faulty workmanship. Frames are guaranteed not to fail due to corrosion or rust on the frame, fittings, or cable.

II. Warrant the powder coated finish for a period of one year against deterioration and faulty workmanship.

III. Warrant the Shade Cloth against failure due to ultraviolet deterioration, rot, mildew, fading, and faulty workmanship for a period of Ten years.

IV. Shade structures warrant for a period of Twenty years not to fail due to wind speeds as specified per this selection.

V. Guarantee the installation for a period of Twenty years when installation is performed by a Vendor trained installer.

QUALITY ASSURANCE

I. Work of this section, including design, engineering, fabrication, finishing, preparation at the site, and installation shall be responsibility of the Vendor.

PRODUCTS

I. Framing Systems

A. Utilized per manufacturer's specifications.

B. Rolled steel plates, shapes, and bars shall be structural quality carbon steel complying with ASTM A-36, except where engineer drawings specify otherwise.

C. Structural steel tubular products shall be cold-formed structural quality carbon steel, welded or seamless, complying with ASTM A-500, Grade B, except where engineer drawings specify otherwise.

- D.** Pipe columns shall conform to the requirements of ASTM A-53B (Type E or S).
- E.** Reinforcement steel as required or designed per detailed specifications.
- F.** All structural steel shall be fabricated and erected in accordance by and as recommended by the AISC Manual of Steel Construction.
- G.** Steel finish shall be determined per selections of section 2.02 of this specification.

II. Steel Finish

A. Powder Coated Finish

- 1.** Structural Steel treated with de-greaser to remove any unwanted substances.
- 2.** Treated with an acid bath to prepare the surface for maximum adhesion of chosen powder coating color.
- 3.** Pre-heated to remove any welding gas impurities and moisture.
- 4.** Powder coated in the approved color by electro statically applying and baking at 400 degrees Fahrenheit to a thickness between 3.0 – 3.5 mil for a consistent glossy finish.

B. Galvanized Steel

- 1.** Corrosion resistance obtained by using patented Flo-Coat™ process.
- 2.** Steel treated with a molten zinc bath to remove unwanted substances and prepare steel for maximum adhesion.

3. Steel with chromate application to further prime and seal for adhesion and resistance.

4. Final Polymer coating applied to seal and protect.

III. Shade Cloth

A. High-density polyethylene woven architectural fabric, 98% Ultraviolet resistant meeting the requirements of ASTM E-84.

B. Sewn with Tanara™ Ultraviolet Rated Bonded Polyester thread utilizing the lockstick sewing method.

C. Water runoff:

Runoff	Roof Angle
70%	10°
90%	40°

D. Provides an average of 85% or greater shade to covered area.

E. Temperature stability maximum +176° / -13° minimum.

F. Utilized in accordance to manufacturer's shade cloth specifications product data, installation instructions use limitations and recommendations for the entire structure, including both published data and specified data prepared for this project.

G. Grade A Fire Rating as a result of ASTM E-84 test.

IV. Welding

- A.** Welding performed in accordance with the latest edition of the American Welding Society Structural Welding Code ASW D1.1.
- B.** Steel shall be welded as to develop the maximum strength at connections.
- C.** According to selection, Engineer drawings shall specify particular sizes and types of welds.
- D.** Welds shall be visually inspected for soundness, smooth, even contour and freedom from undercutting and arc strikes.
- E.** Minimum fillet welds 3/16" unless other wise noted. Welds shall be continuously sealed.
- F.** Standard practice welding performed using E-70 electrodes or gas-metal arc welding utilizing ER 70-S6.

V. Foundations

- A.** The foundation design shall be based on previous knowledge of soil conditions in the vicinity or existing surfaces and building codes and structural load requirements in accordance with American Concrete Institute, ACI 318-95.
- B.** Existing foundation conditions shall be examined and surveyed to assure support for the structure.
- C. Concrete Piers**
 - 1.** Concrete work shall be performed when outdoor temperatures are above 32° and conditions are relatively dry.

- 2.** Utilizing a minimum concrete strength of 3000-psi high strength Ready Mix concrete with an approximate finished weight of 183 Lbs. per cubic foot.
- 3.** Concrete shall be formed as to direct drainage from the site to prevent corrosion or rust in the embedded post.
- 4.** Concrete shall be left to set up a minimum of 24 twenty-four hours before any load-bearing members shall be attached on site.
- 5.** All concrete work shall be performed in accordance with the American Concrete Institute, ACI 318-95.

D. Base Plate / Anchors

- 1.** Steel plates shall be continually welded at the base of the post and bolted to the foundation.
- 2.** All Steel plates, nuts, bolts, anchor bolts, lags, lock washers, cable locks and threaded rod shall be stainless steel or corrosion resistant as specified by engineer drawings per application.
- 3.** Installation, design, and structural specifications shall be in accordance with ASTM Structural Specifications for Bolted Connections. Utilizing ASTM A-325 or ASTM A-440 Bolts.

4. Anchoring methods shall be in conjunction with all relations selections of this specification.

VI. Fasteners

A. Bolted Connections

1. All nuts, bolts, anchor bolts, lags, lock washers, cable locks, and threaded rods shall be medium carbon steel, stainless steel, or galvanized corrosion resistant: size and type to suit applications and meet requirements.

2. Carbon steel connections shall conform to ASTM A-325 steel.

3. Bolted connections shall be in conjunction with all relating selections of this specification.

4. All bolted connections shall be installed in accordance with Structural Specifications for Bolted Connections ASTM A-325 or ASTM A-440 anchor bolts and tie rods.

B. Steel Cable

1. Standard ¼" Steel cable shall be utilized with a minimum tensile strength of 9,000 Lbs. unless specified in detail in this section.

2. Tension as required to square shade cloth on framing structure.

3. Cable connections shall be installed in conjunction with all relating aspects of this specification.

ROOF PITCH & RISE

- I.** Type and design of roof style as determined by designer and engineer based on project requirements.
Standard Minimum Rise: 1'6" and greater

INSTALLATION

- I.** Strictly comply with engineer and manufacturer's instruction and recommendations.
- II.** Match profiles, sizes and spacing as indicated on approved shop drawings.
- III.** Ensure structure is plumb and level according to survey and specifications.
- IV.** All materials shall be delivered, stored and covered to protect finish from construction conditions.
- V.** Structural materials shall be packaged in foam wrap to prevent damage during shipping and handling.
- VI.** Installation shall coordinate with the construction schedule to avoid any delay in the scheduled workflow.