DESIGN-MANUFACTURING-BUILD SPECIFICATIONS
TENSIONED FABRIC SHADE STRUCTURES
FRAMED CANOPIES (7/22/20)
CSI MasterFormat 2016 Division 13-31-23

GENERAL QUALITY ASSURANCES

Single-vendor contractual responsibility for all phases of the design-manufacturing-build process (i.e. design, engineering, fabrication, shipping, unloading, foundation construction, structure erection, & warranty servicing).

- Design & Engineering
  - To current, local California building code by Professional Structural Engineer licensed in California.
  - PE designed & engineered hundreds of commercial, cable-tensioned fabric structures.
  - Wind design speed: 110+ MPH 3-second wind gusts with fabrics attached (or higher per code).
- In –Plant Fabrication
  - 20+ years of experience exclusively manufacturing tensioned fabric shade structures.
  - To ensure fit & finish, fabricator does both steel work and sews fabrics.
  - All materials shall be free of sharp edges, corners, & extremely rough surfaces.
  - All materials shall be new and conform to all specifications as herein stated.
- Construction
  - Licensed California contractor with "B" (Gen'l Building) and "C61-D03" (Awnings) license.
  - 15+ years dedicated experience constructing hundreds of cable-tensioned fabric shade structures.
  - 5+ California municipal projects in last 3 years.
  - Registered with California Department of Industrial Relations.
  - Accredited safety training in rigging, forklift, scissor lift, & boom lift operations.
  - Building permit will always be obtained when required.
  - Proof of Insurance minimums:
    - Workers Compensation: $1M Each Accident
    - General Liability: $2M General Aggregate; $1M Each Occurrence
    - Automotive Liability: $1M Each Accident

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1.0 **MATERIALS**

1.1 FABRIC

A. High density polyethylene (HDPE) fabric shall be Alnet Extra Block shade cloth or approved equal
   - Weighs 9.6 ounces per square yard for durability (ASTM 3776)
     - Fabric strength: Monofilament & tape construction
     - Tensile Strength (ASTM D 5034) Warp: 278 lbf/ft.; Weft: 340 lbf/ft.
     - Tear Strength (ASTM D 2261) Warp: 33lb; Weft: 36 lb
     - Elongation at Break: (ASTM D 4595-87) Warp: 71%; Weft: 74%
     - Burst Strength (ASTM 3787 Ball) 363 lb
     - Burst Strength (ASTM 3786 Mullen) 460 psi
   - UV stabilized for protection
   - UVR% blocked: 93-98% (color dependent) UV Protection Factor: 13-33 (color dependent)
   - Shade Factor (visual light): 79-98% (color dependent)
   - Stentored to maintain shape under tension and minimize sag
   - Rachel-knitted to prevent unraveling if cut
   - Temperature stability: -13 to 176 degrees F
   - 10 year warranty

B. Alnet Extra Block fire resistance approvals
   - California State Fire Marshal Section 13115 Registration # F-94501
   - NFPA 701-99 (Test Method 2)
   - ASTM E-84

1.2 THREAD

A. Shall be Gore Tenara high density; high strength and low shrinkage
B. Shall be abrasion resistant and immune to UV radiation
C. Shall be unaffected by non-hydrocarbon based cleaning agents, acid rain, mildew, rot, chlorine, saltwater, and industrial pollution.
D. Shall be warranted for six (6) years

1.3 CARBON STRUCTURAL STEEL

A. All fabricated steel shall conform to approved shop drawings and calculations.
B. All carbon structural steel shall be ASTM A500 or A513 (except steel pipe columns, which shall be ASTM A-53 Grade B, unless otherwise noted). Plate steel shall conform to A36 Grade B.

1.4 TENSIONING CABLE & HARDWARE

A. 7x19 galvanized steel cable shall conform to ASTM A-603.
B. Cable diameter determined by calculated engineering load
   - ¼" diameter for small-to-medium loads ; 3/8" diameter for heavy loads
C. Cable connectors & shackles shall be stainless steel or hot dipped galvanized.
D. Machine bolts shall conform to ASTM A-307 unless otherwise noted.

1.5 ANCHOR BOLTS

A. Anchor bolts set in new concrete shall be A36 threaded rod, ASTM A-325, or A-307.
B. All anchor bolts shall be hot dipped galvanized.

1.6 FOOTING REINFORCEMENT

A. All reinforcement shall conform to ASTM A-615 grade 60.
B. All reinforcing steel shall conform to approved shop drawings and calculations.

2.0 PROCESSES

2.1 WELDING

A. All shop welds shall comply with the latest edition of the American Welding Society Specifications.
B. Welding procedures shall comply with the AWS D1.1-AWS Structural Welding Code-Steel.
C. All welds to be performed by a certified welder.
D. All welds shall be continuous where length is not given, unless otherwise noted on drawings.
E. All welds shall develop the full strength of the weaker member.
F. All welds shall be made using E70xx electrodes; gas metal welds using ER 70S3 wire.
G. Shop connections shall be welded unless noted otherwise.
H. All fillet welds shall be a minimum of 3/16" unless otherwise noted.
I. All steel shall be welded shut at terminations to prevent leakage.
J. Field –welded connections are not acceptable.
K. Field connections shall be indicated on the drawings.

2.2 CORROSION PROTECTION

A. Columns, plates, and pipe framing to be sandblasted, contaminates removed, and coated with zinc-rich primer prior to powder coating with TGIC polyester powder topcoat (min. thickness =2.5 mils).
B. Powder coating shall meet ASTM D2794, B3363, B2247, & B117 standards.

2.3 SEWING

A. On-site sewing of fabric will not be accepted.
B. C orners shall be reinforced with extra non-tear material & strap.
C. P erimeters containing cables shall be double row lock stitched.

2.4 FOOTING CONSTRUCTION

A. Footings shall conform to approved engineering specifications.
B. Reinforcement fabricated & placed to latest ACI manuals ("Detailing" & "Standard Practice").
C. Concrete work shall conform to latest edition of American Concrete Building Code ACI 318.
D. Concrete specifications shall conform to approved engineering specifications.
E. 28 Days Strength F'c = 2500 psi or 3000 psi per approved engineering specifications.
F. Contractor shall not pour concrete when daily ambient temperature is below 55 degrees F.

2.5 STRUCTURE ERECTION

A. Erect structures & hardware in compliance with fabricators' instructions.
B. Securely fasten all parts to be attached.
C. Ensure all parts interact freely & smoothly without binding.
D. Install shade structure in a timely manner & coordinate with the work of other trades.

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3.0 WARRANTY

3.1 The structural integrity of the steel shall be warranted for twenty (20) years.
3.2 The fabric & sewn composite shade covering shall have a pro-rated warranty of ten (10) years.
3.3 When used in its designed capacity, the structure shall be guaranteed for five (5) years from original installation against:
A. Steel frame corroding or deteriorating under normal conditions.
B. Inappropriate design of supporting structure.
C. Fabrics shall be warranted for winds & gusts up to a specified design. The fabric warranty is void if winds or gusts exceed such design.
D. Excessive loss of fabric color under normal exposure conditions (i.e. sunlight, rot, & normal atmospheric chemicals).
E. Wearing or wind blowouts caused by poor installation or design.
3.4 The fabrics should be removed before extreme wind conditions that exceed its design capacity.
3.5 The contractor reserves the right to repair or replace any item covered by the warranty.
3.6 Shade structures located in areas where they may be damaged from other construction shall be protected and or removed from the locations until hazardous conditions cease.