



TECHNICAL SPECIFICATIONS 2017

PRE-ENGINEERED SHADE STRUCTURES

1. DESIGN/PERFORMANCE REQUIREMENTS

- A. Design members to withstand wind loads in accordance with current version of ASCE-7, International Building Code (IBC), and applicable local, state, county, and city codes.
- B. Design structures for winds up to 180 mph with the cover off and 105 mph with the cover on.
- C. Design foundations in accordance with ACI and applicable code and good construction practices for the specific structure and site conditions.
- D. Cooperate with regulatory agency or authority and provide data as requested authority having jurisdiction.
- E. Design covers for easy removal and replacement.
- F. Design covers for a maximum 5 lbs. snow load (where applicable).
- G. Design covers for a maximum 5 lbs. live load as per awnings and canopies.

2. FRAMING MATERIALS

- A. American Institute of Steel Construction (AISC) or American Iron and Steel Institute (AISI) specifications.
- B. Allied Tube and Conduit tubing conforming to ASTM A500, galvanized or treated with Allied's three step Flo-Coat Process.
- C. Structural Steel Cold formed HSS ASTM 500 GRADE C unless otherwise noted.
- D. Structural Steel Pipe: A53 Schedule 40.
- E. Structural Steel Members: Steel Plates ASTM A36, A50 or A572.
- F. ASTM A-123 – Standard Specifications for Zinc (Hot-Dipped Galvanized) Coatings on Iron and Steel Products.
- G. Bolts, Nuts, and Washers: ASTM A325 Galvanized and A316 stainless steel. All Stainless Steel bolts shall comply with ASTM F-593, Alloy Group 1 or 2. All nuts shall comply with ASTM F-594 Alloy Group 1 or 2.

3. REINFORCED CONCRETE

- A. Concrete work shall be executed in accordance with the latest edition of the American Concrete Institute Building Code. Concrete specifications shall be as follows:
 - i. 28 day strength: minimum 2500 psi
 - ii. Slump: 3-5
 - iii. Portland cement shall conform to C-150
 - iv. Aggregate shall conform to ASTM C-33
- B. All reinforcement steel shall conform to ASTM A-615 Grade 60.
- C. All anchor bolts set in new concrete (when applicable) shall comply with ASTM F-1554 Grade 36 or 55 (galvanized).
- D. All non-shrink, non-metallic grout shall have a minimum 28 days compressive strength of 4000 psi, and shall comply with the requirements of ASTM C109 when applicable.

4. FABRICATION

- A. Steel Components: Fabrication of steel components shall be in accordance with guidelines set forth in the AISC steel design manual and the AWS code of structural welding.
- B. Welds: All shop welds shall be executed in accordance with the latest edition of the American Welding Society (AWS) D1.1 specifications. All welds shall be continuous where length is not given. All welds shall develop the full strength of the weaker member. All welds shall be made using E70XX Low Hydrogen.
 - i. All welds shall be in accordance with manufacturers design and performed prior to shipping. No welding shall be performed in the field.
 - ii. Grind all corners and sharp edges.
 - iii. Steel will require abrasive blasting and primer before application of the polyester powder paint finish.
- C. Powder Coating: All steel shall be painted with one shop coat polyester powder painted to a minimum thickness of 3.5 - 4 mils.
 - i. Pencil hardness (ASTM D-3363)
 - ii. Humidity (ASTM D-2247)
 - iii. Solvent Resistance (PCI Test Method)
- D. Frame Colors: Colors as selected from the manufacturer's standard selections.

5. WARRANTY

- A. Apollo Sunguard Systems, Inc. provides a 20-year non-prorated warranty for all steel frame work against all structural failure due to corrosion, deterioration, or workmanship.
- B. Apollo Sunguard Systems, Inc. provides a limited 15-year non-prorated warranty for all polyethylene covers against deterioration, rot, or faulty workmanship including seam failure.

6. SHADE FABRIC MATERIALS

- A. Apollo SUNGUARD SHADE CLOTH®: High density polyethylene fabric with ultraviolet blocking additives.
- B. Fabric is knitted providing stability and fraying resistance when cut. Fabric is fabricated with monofilament and tape construction for additional stability.
- C. Apollo SUNGUARD SHADE CLOTH® - Z25 :
 - i. Fabric Mass: 200 gsm
 - ii. Tear Strength
 - i. Warp 100 kg 220 lbs
 - ii. Weft 210 kg 462lbs
 - iii. Bursting Pressure 2600 kPa
 - iv. Bursting Force 1200 N
- D. Apollo SUNGUARD SHADE CLOTH® - C95 :
 - i. Fabric Mass: 340 gsm
 - ii. Tear Strength
 - a. Warp 635 N/50mm
 - b. Weft 2494 N/50mm
 - c. Bursting Pressure 3500 kPa
 - d. Bursting Force 2146 N
- E. Apollo SUNGUARD SHADE CLOTH® - EX32 :
 - i. Fabric Mass: 310 gsm
 - ii. Tear Strength
 - a. Warp 450 N
 - b. Weft 1721 N
 - c. Bursting Pressure 3400 kPa
 - d. Bursting Force 1970N
- F. Apollo SUNGUARD SHADE CLOTH® - MONO:
 - i. Fabric Mass: 370 gsm
 - ii. Tear Strength
 - a. Warp 1433 N/50mm
 - b. Weft 2210 N/50mm
 - c. Bursting Pressure 4750 kPa
 - d. Bursting Force 3011 N
- G. Apollo SUNGUARD SHADE CLOTH® - DRI-Z:
 - i. Fabric Mass: 280 gsm
 - ii. Tear Strength
 - a. Warp 616 N
 - b. Weft 1143 N
 - c. Bursting Pressure 2400 kPa
 - d. Bursting Force 1200 N
- H. Fabric Corners & Hemmed Edges: Fabric cover fabricated with PTFE coated UV resistant thread.

Fabric connection points & cable exit points to be triple reinforced and heat sealed with vinyl interfacing inserted and sewn between layers of reinforcement. Fabric shall be pre-stressed prior to fabrication.

- i. W. L. Gore Tenara
- ii. Solar Fix

I. Fire Rating:

- i. ASTM E 84: Class 1, Flame Spread 15, Smoke Developed 15
- ii. NFPA 701 Test Method 2 test
- iii. FFPC Florida Fire Prevention Code
- iv. Specific fabric type meets California State Fire Marshall Requirements, Section 13115 of California Health & Safety Code. Limited fabrics available. Inquire for available selection.

J. Shade Percentage: 60 percent to 95 percent (varies by fabric color).

K. UVB Block: 83 percent to 96 percent (varies by fabric color).

L. Colors: Color as selected from the manufacturer's standard selections.

7. CABLE FASTENING AND TENSIONING MATERIALS

A. Fastening and Tensioning System: Quick & Easy Turnbuckle Tensioning System on all PlayTower & cantilever style system shade.

B. QRS - Quick Release System™ Our innovative shade structures are uniquely designed with the QRS - Quick Release System™ to remove the fabric covers easily. No special tools are required. You just loosen the turnbuckles with a standard wrench and you're done! This is the easiest and most practical release system in the shade structure industry.

- i. Turnbuckles: Premium Closed Body & open body
- ii. Wire Rope shall conform to AISI Steel Cable Manual requirements with a Class A galvanized coating or approved substitute. ASTM A603. Cable shall be IWRC improved plow steel. Aircraft Grade 7x19 core wire rope.
- iii. Normal diameters used : $\emptyset 1/4"$, $\emptyset 3/16"$, $\emptyset 3/8"$ & $\emptyset 5/16"$ $\emptyset 1/2"$
- iv. Construction: 7X19
- v. Surface: galvanized
- vi. Core: JWS
- vii. Stainless steel when specified.