

CHAIN LINK FENCES AND GATES

1.1 FABRIC

- A. Selvage: Knuckled on both selvages for 2-inch and 2-1/8-inch mesh sizes with heights of 60 inches and less.
- B. Steel Chain-Link Fence Fabric: Fabricated in one-piece widths for fencing 12-feet and less in height to comply with Chain Link Fence Manufacturers Institute (CLFMI) "Product Manual" and with requirements indicated below:
1. Mesh and Wire Size: 2-inch mesh 0.148-inch diameter (9 gage).
 2. Coating: ASTM A 817, Type 2, Class 2, zinc-coated (galvanized).

1.2 FRAMING

- A. Type I Round Posts: Standard weight (schedule 40) galvanized-steel pipe conforming to ASTM F 1083, according to heavy industrial requirements of ASTM F 669, Group IA, with minimum yield strength of 25,000 psi, not less than 1.8 oz. of zinc per sq. ft. Type A coating inside and outside according to ASTM F 1234, as determined by ASTM A 90.
- B. Top Rail: Manufacturer's longest lengths (17 to 21 feet) with swedged-end or expansion-type coupling, approximately 6-inches long for joining. Provide rail ends or other means for attaching top rail securely to each gate corner, pull, and end post.
1. Round Steel: 1.660-inch OD Type I or II steel pipe
- C. Steel Posts for Fabric Heights up to 6-feet:
1. Round Line or Intermediate Posts: 1.90-inch OD Type I or II steel pipe.
 2. Round End, Corner and Pull Posts: 2.375-inch OD Type I or II steel pipe.
- D. Swing Gate and Rolling Gate Posts: Furnish posts to support single gate leaf, and rolling gate, according to ASTM F 900.

1.3 CONCRETE

- A. Concrete: Provide concrete consisting of Portland cement per ASTM C 150, aggregates per ASTM C 33, and potable water. Mix materials to obtain concrete with a minimum 28-day compressive strength of 3,000 psi. Use at least four sacks of cement per cubic yard 1-inch maximum size aggregate, 3-inch maximum slump.

1.4 INSTALLATION

- A. General: Install fence to comply with ASTM F 567. Do not begin installation and erection before final grading is completed.

B. Excavation: Drill or hand-excavate (using post-hole digger) holes for posts to diameters and spacing indicated, in firm, undisturbed or compacted soil.

1. If not indicated on Drawings, excavate holes for each post to minimum diameter recommended by fence manufacturer, but not less than four times the largest cross section of post.

2. Unless otherwise indicated, excavate hole depths approximately 3-inches lower than post bottom, with posts set not less than 36-inches below finished grade surface.

C. Setting Posts: Center and align posts in holes 3-inches above bottom of excavation. Space a maximum of 10-feet on center.

1.4 GATE INSTALLATION

A. Install gates plumb, level, and secure for full opening without interference. Install ground-set items in concrete for anchorage. Adjust hardware for smooth operation and lubricate where necessary. Install gates according to manufacturer's instruction, plumb, level, and secure.

1.5 ADJUSTING

A. Gates: After repeated operation of completed installation equivalent to 3-days' use by normal traffic, re-adjust gates for optimum operating condition and safety. Lubricate operating equipment and clean exposed surfaces.

GREENHOUSE AND RELATED EQUIPMENT

1.1 SUBMITTALS

A. Submit shop drawings, submittals and product data for glazed structure. Include anchoring requirements, complete dimensions and flashing details.

1.2 AVAILABLE MANUFACTURERS

A. Subject to compliance with requirements, manufacturers include but are not limited to the following:

1. International Greenhouse Company – Junior Teaching Package Greenhouse. Design Standard: to be 18-feet by 36-feet by 10-feet 6-inches high double wall clear poly carbonate glazed greenhouse with equipment as listed below.

2. Atlas Greenhouse Systems, Inc.
3. Conley's Greenhouse Manufacturing & Sales
4. Florian Greenhouse, Inc.
5. Four Seasons Solar Products Corp.
6. Nexus Greenhouse Systems
7. Texas Greenhouse Company Inc.
8. Winandy Greenhouse Company Inc.
9. Growers Supply a Division of FarmTek.

1.3 STRUCTURE DETAILS

A. The greenhouse structure shall be clear span steel, hot dip zinc galvanized and aluminum framed, 8 mm double wall polycarbonate. Complete facility to be the product of a single manufacturer. Structure will be standard module of the manufacturer and total area shall not be less than 80-percent of area shown on bid documents.

B. Standard Design Conditions: Design members to carry the following loads:

1. Dead load.
2. Live load, 30 psf on horizontally projected area.
3. Wind load, 70 psf on vertically projected area.

In designing for the above loads, the loads may be considered to act in any of the following combinations.

4. Dead load plus live load.
5. Dead load plus wind load plus one-half live load.

C. Framing Materials

1. Primary supporting posts, trusses and purlins to be steel, hot dip zinc galvanized of 55-60,000 psi yield.

2. Secondary support, glazing receiving members to be structural aluminum alloy of 55051-T6 or 6005-T5 with rating of 35,000 psi yield. All other non-load bearing secondary aluminum extrusion framing members may be 6063-T6 with a rating of 25,000 psi yield.

D. Fasteners: Bolts to be hot dip zinc-galvanized steel. Grade 5 bolts to be furnished in high strength locations. Bolts below ¼-inch in diameter may be aluminum or stainless steel.

E. Glazing Materials: 8-mm double wall greenhouse grade, structural sheet polycarbonate panels with manufacturer's 10-year warranty. Butyl rubber caulking to be furnished for sealing. Clear silicone sealer as manufactured by General Electric, Dow Chemical, or equal to be furnished for the filling and sealing (ATM and Federal Specifications TT-S-00230C/ASTMC-92TT-S-001543A Type II, Class A. All gaskets shall be EPDM foam seals of appropriate size.

F. Doors: Personnel Doors – Two (2) single 4-feet by 7-feet by 1 ¾-inch thick extruded tubular aluminum doors with joints hairline. Doors to be glazed with tempered safety glass and equipped with stainless steel key-in-knob lock set. Provide mechanism to hold doors open.

1.4 ACCESSORIES

A. Rope Cleats: Located on exterior of greenhouse structure to hold down shade cloth.

B. Eye Bolts: Located on interior structure.

C. Irrigation System: Sterling 8-station irrigation system located on interior of greenhouse to provide eight watering zones.

D. Support Rod: Running the length of the greenhouse from front to back 8-feet above the floor capable of supporting a total load of 300 pounds.

E. Shade Cloth: White or silver in color with reinforced grommets.