

**SECTION 32 31 13**  
**CHAIN LINK FENCES AND GATES**

**PART 1 - GENERAL****1.1 DESCRIPTION**

This work consists of all labor, materials, and equipment necessary for furnishing and installing chain link fence, gates and accessories in conformance with the lines, grades, and details as shown.

**1.2 RELATED WORK**

- A. Grounding: Section 26 05 26, GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS.
- B. Temporary Construction Fence: Section 01 00 00, GENERAL REQUIREMENTS.
- C. Rough Grading: Section 31 20 00, EARTH MOVING.

**1.3 MANUFACTURER'S QUALIFICATIONS**

Fence, gates, and accessories shall be products of manufacturers regularly engaged in manufacturing items of type specified.

**1.4 SUBMITTALS**

- A. In accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA AND SAMPLES, furnish the following:
  - 1. Manufacturer's Literature and Data: Chain link fencing, gates and all accessories.
  - 2. Manufacturer's Certificates: Zinc-coating complies with complies with specifications.

**1.5 APPLICABLE PUBLICATIONS**

- A. The publications listed below form a part of this specification to the extent referenced. The publications are referenced in the text by the basic designation only.
- B. American Society for Testing and Materials (ASTM):
  - A392-07.....Zinc-Coated Steel Chain-Link Fence Fabric
  - A817-07.....Metal-Coated Steel Wire for Chain-Link Fence  
Fabric and Marcellled Tension Wire
  - C94-12.....Ready-Mixed Concrete
  - F567-11a.....Installation of Chain-Link Fence
  - F626-08.....Fence Fittings

- F668-11.....Polyvinyl Chloride (PVC) and Other Organic  
Polymer-Coated Steel Chain Link Fence Material
- F1664-08.....Polyvinyl Chloride (PVC) and Other Conforming  
Organic Polymer Coated Steel Tension Wire used  
with Chain Link Fence
- F1665-08.....Polyvinyl Chloride (PVC) and Other Conforming  
Organic Polymer Coated Steel Barbed Wire used  
with Chain Link Fence
- F1043-11a.....Strength and Protective Coatings on Metal  
Industrial Chain-Link Fence Framework
- F1083-10.....Pipe, Steel, Hot-Dipped Zinc-Coated  
(Galvanized) Welded, for Fence Structures.
- C. Federal Specifications (Fed. Spec.):
- FF-P-110J.....Padlock, Changeable Combination

## **PART 2 - PRODUCTS**

### **2.1 GENERAL**

Materials shall conform to the above referenced publications for ferrous metals, zinc-coated; and detailed specifications forming the various parts thereto; and other requirements specified herein. Zinc-coat metal members (including fabric, gates, posts, rails, hardware and other ferrous metal items) after fabrication shall be reasonably free of excessive roughness, blisters and sal-ammoniac spots.

### **2.2 CHAIN-LINK FABRIC**

- A. Steel Chain Link Fabric: 2 in. mesh, 11 gauge 8'-0" high.
1. Zinc-Coated Steel Fabric: hot dipped galvanized before or after weaving.
    - a. Class 1 - 1.2 oz/ft<sup>2</sup> (366 g/m<sup>2</sup>)

### **2.3 STEEL FENCE FRAMEWORK**

- A. Round steel pipe and rail: Group IA Heavy Industrial Fence Framework, schedule 40 galvanized pipe. Exterior zinc coating Type A, interior zinc coating Type A. Regular Grade.
1. Line post: 2"
  2. End, Corner, Pull post: 3"
  3. Brace rails, top, bottom, and intermediate rails, 1.660 in. (42.2 mm) OD, 2.27 lb/ft

**2.4 TENSION WIRE**

A. Metallic Coated Steel Marcellled Tension Wire: 7 gauge (0.177 in.) (4.50 mm) marcellled wire

1. Type II Zinc-Coated Class 4 - 1.2 oz/ft<sup>2</sup> (366 g/m<sup>2</sup>)

**2.6 FITTINGS**

A. Tension and Brace Bands: Galvanized pressed steel, minimum steel thickness of 12 gauge (0.105 in.) (2.67 mm), minimum width of 3/4 in. (19 mm) and minimum zinc coating of 1.20 oz/ft<sup>2</sup> (366 g/m<sup>2</sup>). Bands supplied with 5/16 in. (7.94 mm) or 3/8 in. (9.53 mm) galvanized steel carriage bolts.

B. Terminal Post Caps, Line Post Loop Tops, Rail and Brace Ends, Boulevard Clamps, Rail Sleeves: Pressed steel galvanized after fabrication having a minimum zinc coating of 1.20 oz/ft<sup>2</sup> (366 g/m<sup>2</sup>).

C. Truss Rod Assembly: 3/8 in. (9.53 mm) diameter steel truss rod with a pressed steel tightener, minimum zinc coating of 1.2 oz/ft<sup>2</sup> (366 g/m<sup>2</sup>), assembly capable of withstanding a tension of 2,000 lbs. (970 kg).

D. Tension Bars: Galvanized steel one-piece length 2 in. (50 mm) less than the fabric height. Minimum zinc coating 1.2 oz. /ft<sup>2</sup> (366 g/m<sup>2</sup>).

1. Bars for 2 in. (50 mm) and 1 3/4 in. (44 mm) mesh shall have a minimum cross section of 3/16 in. (4.8 mm) by 3/4 in. (19 mm).

**2.7 TIE WIRE AND HOG RINGS**

Tie Wire and Hog Rings: Galvanized minimum zinc coating 1.20 oz/ft<sup>2</sup> (366 g/m<sup>2</sup>) 9 gauge (0.148) (3.76 mm) steel wire. Polymer coated; match the coating, class and color to that of the chain link fabric.

**2.8 SWING GATES**

A. Swing Gates: single opening 3'-6" by 8'-0" high. Galvanized steel welded fabrication. Gate frame members 1.900 in. OD (48.3 mm) Group IA F1083 schedule 40 pipe Frame members spaced no greater than 8 ft. (2440 mm) apart vertically and horizontally. Welded joints protected by applying zinc-rich paint. Positive locking gate latch fabricated of 5/16 in. (7.9 mm) thick by 1 3/4" (44.45 mm) pressed steel galvanized after fabrication. Galvanized malleable iron or heavy gauge pressed steel post and frame hinges. Match gate fabric to that of the fence system. Gateposts 3" OD.

**2.10 CONCRETE**

Concrete for post footings shall have a 28-day compressive strength of 3,000 psi (25.8 MPa).

**PART 3 EXECUTION****3.1 CLEARING FENCE LINE**

Clearing: Surveying, clearing, grubbing, grading and removal of debris for the fence line or any required clear areas adjacent to the fence. Surveying, clearing, grubbing, grading and removal of debris for the fence line or any required clear areas adjacent to the fence is included in the earthwork contractor's contract. The contract drawings indicate the extent of the area to be cleared and grubbed.

**3.2 FRAMEWORK INSTALLATION**

- A. Posts: Posts shall be set plumb in concrete footings. Minimum footing depth, 24 in. (609.6 mm). Minimum footing diameter four times the largest cross section of the post up to 4.00" (101.6mm) O.D. and three times the largest cross section of post greater than 4.00" (101.6mm). O.D. Gate posts require larger footings. Top of post concrete footing to be at grade and crowned to shed water away from the post. Line posts installed at intervals not exceeding 10 ft. (3.05 m) on center.
- B. Top rail: When specified, install 21 ft. (6.4 m) lengths of rail continuous thru the line post or barb arm loop top. Splice rail using top rail sleeves minimum 6 in. (152 mm) long. The rail shall be secured to the terminal post by a brace band and rail end. Bottom rail or intermediate rail shall be field cut and secured to the line posts using boulevard bands or rail ends and brace bands. Fences 12 feet (3.66 m) high or higher require mid rail.
- C. Terminal posts: End, corner, pull and gate posts shall be braced and trussed for fence 6 ft. (1.8 m) and higher and for fences 5 ft. (1.5 m) in height not having a top rail.
- D. Tension wire: Shall be installed 4 in. (102 mm) up from the bottom of the fabric. Fences without top rail shall have a tension wire installed 4 in. (102 mm) down from the top of the fabric. Tension wire to be stretched taut, independently and prior to the fabric, between the terminal posts and secured to the terminal post using a brace band. Secure the tension wire to the chain link fabric with a 9 gauge hog rings 18 in. (457 mm) on center and to each line post with a tie wire.

**3.3 CHAIN LINK FABRIC INSTALLATION**

- A. Chain Link Fabric: Install fabric to outside of the framework. Attach fabric to the terminal post by threading the tension bar through the fabric; secure the tension bar to the terminal post with tension bands and 5/16 in. (8 mm) carriage bolts spaced no greater than 12 inches

(305 mm) on center. Small mesh fabric less than 1 in. (25 mm), attach to terminal post by sandwiching the mesh between the post and a vertical 2 in. wide (50 mm) by 3/16 in. (5 mm) steel bar using carriage bolts, thru bolted thru the bar, mesh and post spaced 15 in. (381 mm) on center. Chain link fabric to be stretched taut free of sag. Fabric to be secured to the line post with tie wires spaced no greater than 12 inches (305 mm) on center and to rail spaced no greater than 18 inches (457 mm) on center. Secure fabric to the tension wire with hog rings spaced no greater than 18 inches (457 mm) apart.

- B. Tie wire shall be wrapped 360 degrees (6.28 rad) around the post or rail and the two ends twisted together three full turns. Excess wire shall be cut off and bent over to prevent injury. The installed fabric shall have a ground clearance on no more than 2 inches (50 mm).

### **3.5 GATE INSTALLATION**

- A. Swing Gates: Installation of swing gates and gateposts in compliance with ASTM F567. Direction of swing shall be outward. Gates shall be plumb in the closed position having a bottom clearance of 3 in. (76 mm) grade permitting. Hinge and latch offset opening space from the gate frame to the post shall be no greater than 3 in. (76 mm) in the closed position. Double gate drop bar receivers shall be set in a concrete footing minimum 6 in. (152 mm) diameter 24 in. (610 mm) deep. Gate leaf holdbacks shall be installed for all double gates. Electrically operated gates and accessories must be manufactured and installed in compliance with manufacturer's recommendations.

### **3.6 NUTS AND BOLTS**

Bolts: Carriage bolts used for fittings shall be installed with the head on the secure side of the fence. All bolts shall be peened over to prevent removal of the nut.

### **3.7 ELECTRICAL GROUNDING**

Grounding: Grounding, when required, shall be specified and included in Contract Section 33 79 00. A licensed electrical contractor shall install grounding.

### **3.8 CLEAN UP**

Clean Up: The area of the fence line shall be left neat and free of any debris caused by the installation of the fence.

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