

**SECTION 32 31 53**

**PERIMETER SECURITY FENCES AND GATES**

**PART 1 - GENERAL**

**1.1 DESCRIPTION**

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

**1.2 RELATED WORK**

- A. Section 01 00 00, GENERAL REQUIREMENTS.
- B. Section 04 20 00, UNIT MASONRY

**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: Fencing, gates and all accessories.
  - 2. Manufacturer's Certificates:
    - a. Zinc-coating complies with specifications.
    - b. Structural characteristics comply with indicated and criteria.
- B. Shop Drawings for fence and gate.

**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: Use the latest edition of all sections listed.
  - ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy (Galvannealed) by the Hot-Dip Process.
  - ASTM F626-08.....Fence Fittings
  - ASTM F1083-10.....Pipe, Steel, Hot-Dipped Zinc-Coated (Galvanized) Welded, for Fence Structures

## **PART 2 - PRODUCTS**

### **2.1 GENERAL**

- A. Materials shall conform to standards referenced above for ferrous metals, zinc-coated; and detailed specifications forming the various parts thereto; and other requirements specified herein. Zinc-coat metal members (including 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 ROOF GARDEN FENCE**

- A. The roof garden fence shall be a metal palisade style fence system. The system shall include all components such as pickets, pale, rails, posts, gates and hardware required.
- B. Material:
1. Steel material requirements for fence framework (ie tubular pickets, rails and posts) shall be galvanized prior to forming in accordance with the requirements of ASTM A653/A653M, with minimum yield strength of 45,000 psi. The steel shall be hot-dip galvanized to meet the requirements of ASTM A653/A653M with a minimum zinc coating weight of 0.90 oz/ft<sup>2</sup>, coating designation G-90.
  2. Pickets shall be 1" square x 14 Ga. Tubing.
  3. Rails shall be 1.75" square x 14 Ga.
  4. Posts shall be 4" x 11 Ga.
- C. Heights:
1. Horizontal members that might be used as foot- or hand-holds shall be spaced at a minimum 8 feet (2400 mm) apart.
- D. Framework:
1. Fence panels shall be capable of supporting a 600 LB. Load applies at midspan without permanent deformation.
- E. Gates:
1. Provide hinged pedestrian gate.
- F. Finishes:
- The manufactured galvanized framework shall be subjected to a thermal stratification coating process (high-temperature, in-line, multi-stage, multi-layer) including, as a minimum, a six-stage pretreatment/wash (with zinc phosphate), an electrostatic spray application of an epoxy base, and a separate electrostatic spray application of a polyester finish. The base coat shall be a

thermosetting epoxy powder coating (gray in color) with a minimum thickness of 2 mils (0.0508mm). The topcoat shall be a "no-mar" TGIC polyester powder coat finish with a minimum thickness of 2 mils (0.0508mm). The color shall be Black.

### **2.3 ACCESSORIES**

Accessories as necessary caps, rail and brace ends, wire ties or clips, braces and tension bands, tension bars, truss rods, and miscellaneous accessories conforming to ASTM as referenced above.

### **2.4 CONCRETE**

Concrete to have a maximum size aggregate of 3/4 inch (19 mm), and have a minimum compressive strength of 3500 psig (25 mPa) at 28 days. Non-shrinking grout shall consist of one part Portland cement to three parts clean, well-graded sand, non-shrinking grout additive and the minimum amount of water to produce a workable mix.

## **PART 3 - EXECUTION**

### **3.1 INSTALLATION**

A. Install fence by properly trained crew, on previously prepared surfaces, to line and grade as shown. Install fence in accordance with the manufacturers printed installation instructions, except as modified herein or as shown. Maintain all equipment, tools, and machinery while on the project in sufficient quantities and capacities for proper installation of posts, pickets, rails, pales, and accessories.

### **3.2 POST CAPS**

Fit all exposed ends of post with caps. Provide caps that fit snugly and are weather tight. Where top rail is used, provide caps to accommodate the top rail. Install post caps as recommended by the manufacturer and as shown.

### **3.3 SUPPORTING ARMS**

Design supporting arms, when required, to be weather tight. Where top rail is used, provide arms to accommodate the top rail. Install supporting arms as recommended by the manufacturer and as shown.

### **3.6 TOP RAILS AND BOTTOM RAIL**

Install rails before installing pickets. Provide suitable means for securing rail ends to terminal and intermediate post. Top rails shall pass through intermediate post supporting arms or caps as shown. The rails shall have expansion couplings (rail sleeves) spaced as

recommended by the manufacturer. Where fence is located on top of a wall, install expansion couplings over expansion joints in wall.

### **3.7 ACCESSORIES**

Supply accessories (post braces, truss rods, and miscellaneous accessories), as required and recommended by the manufacturer, to ensure complete installation.

### **3.8 GATES**

Install gates plumb, level, and secure for full opening without interference. Set keepers, stops and other accessories into concrete as required by the manufacturer and as shown. Test gates, hardware, locking mechanisms and releases for proper operation. Adjust and lubricate as necessary.

### **3.9 REPAIR OF GALVANIZED SURFACES**

Use galvanized repair compound, stick form, or other method, where galvanized surfaces need field or shop repair. Repair surfaces in accordance with the manufacturer's printed directions.

### **3.10 FINAL CLEAN-UP**

Remove all debris, rubbish and excess material from the station.

**END OF SECTION 32 31 53**