

**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 perimeter security 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 08 71 00, DOOR HARDWARE.
- B. Section 26 05 26, GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS.
- C. Section 31 20 00, EARTHWORK.
- D. Section 32 90 00, PLANTING.
- E. Section 28 13 00, PHYSICAL ACCESS CONTROL SYSTEMS.
- G. Section 32 31 53, PERIMETER SECURITY FENCES AND GATES.

**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.
    - c. Connections comply with requirements indicated.
- B. Shop Drawings for healing garden fence.
- C. Certification that fence alignment meets requirements of contract documents.

**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 A853-04(R2010).....Steel Wire, Carbon, for General Use  
ASTM C94/C94M-11.....Ready-Mixed Concrete  
ASTM F626-08.....Fence Fittings  
ASTM F1083-10.....Pipe, Steel, Hot-Dipped Zinc-Coated  
(Galvanized) Welded, for Fence Structures  
ASTM A853-04.....Steel Wire, Carbon for General Use

**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 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 PERIMETER SECURITY FENCE**

A. The perimeter security fence shall be a metal palisade style fence system. The system shall include all components such as pickets, pales, mesh, fabric, rails, posts, gates and hardware required.

1. Metal palisade style fence system.

B. Material:

1. Strength requirements for posts shall be steel material with a minimum yield strength of 45,000 PSI (310 mPa).

a. 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> (276 g/m<sup>2</sup>).

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.

2. Extend fence posts 3 FEET (900 mm) below grade.

D. Framework:

1. Framework strength shall provide 4,000 lb. of structural members or other fence framework.

2. Fence panels shall be capable of supporting a 400 LB. (882 KG) LOAD APPLIED AT MIDSPAN.

E. Gates:

1. Gates shall be designed to meet the same forced entry and anti-climb characteristics as the other portions of the fence.

2. Provide hinged pedestrian gates with card reader.

### **2.3 ACCESSORIES**

- A. 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**

- A. 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.
- B. Engage the services of a Registered Professional Land Surveyor as specified in Section 01 00 00, GENERAL REQUIREMENTS, to stake out and certify that the fence alignment meets the requirements shown on the plans and confirm the fence is totally on the Owner's property.

### **3.2 EXCAVATION**

- A. Excavation for concrete-embedded items shall be of the dimensions shown, except in bedrock. If bedrock is encountered before reaching the required depth, continue the excavation to the depth shown or 18 inches (450 mm) into the bedrock, whichever is less, and provide a minimum of 2 inches (50 mm) larger diameter than the outside diameter of the post. Clear loose material from post holes. Grade area around finished concrete footings as shown and dispose of excess earth as directed by the COR.

### **3.3 POST SETTING**

- A. Install posts plumb and in alignment. Set post in concrete footings of dimensions as shown, except in bedrock. Thoroughly compact concrete so as it to be free of voids and finished in a slope or dome to divert water running down the post away from the footing. Install posts in

bedrock with a minimum of one inch (25 mm) of non-shrinking grout around each post. Thoroughly work non-shrinking grout into the hole so as to be free of voids and finished in a slope or dome. Cure concrete and grout a minimum of 72 hours before any further work is done on the posts.

#### **3.4 POST CAPS**

- A. 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.

#### **3.5 SUPPORTING ARMS**

- A. 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 RAILS**

- A. 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**

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

#### **3.8 GATES**

- A. 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**

- A. 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**

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

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