SECTION 32 31 20
ORNAMENTAL STEEL FENCES AND GATES

PART 1 – GENERAL

1.1 DESCRIPTION

Section includes: Ornamental welded steel fencing panels fabricated with galvanized flat bars and round rods welded into modular, open grille fencing panels, including steel fence posts and gates.

1.2 RELATED WORK

A. Temporary Construction Fence: Section 01 00 00, GENERAL REQUIREMENTS.

B. Anchors into Concrete: Section 05 50 00, METAL FABRICATIONS.

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.

B. Shop Drawings: For each type of fence and gate assembly.

1. Include plans, elevations, sections, details, and attachments to other work.

C. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for the following:
   a. Fence and gate posts, rails, and fittings.
   b. Chain-link fabric, reinforcements, and attachments.
   c. Gates and hardware.

1.5 FIELD CONDITIONS

A. Field Measurements: Verify layout information for chain-link fences and gates shown on Drawings in relation to property survey and existing structures. Verify dimensions by field measurements.

1.6 WARRANTY

A. Special Warranty: Installer agrees to repair or replace components of chain-link fences and gates that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Deterioration of metals, metal finishes, and other materials beyond normal weathering.

2. Warranty Period: Five years from date of Substantial Completion.

1.7 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 Marcelled 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

F1184-05.....Industrial and Commercial Horizontal Slide Gates

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

F2200-11b.....Automated Vehicular Gate Construction F900-11 Industrial and Commercial Swing Gates

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.

A36.....Carbon Structural Steel

A121.....Metallic-Coated Carbon Steel Barbed Wire.

A123.....Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.

A500.....Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.

B117.....Operating Salt Spray (Fog) Apparatus.

D822.....Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact).
D3363.....Test Method for Film Hardness by Pencil Test.

PART 2 - PRODUCTS

2.1 GENERAL

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

2.2 BASIS OF DESIGN

A. METRO Product Line by Ametco Manufacturing Corporation, 4326 Hamann Parkway, P.O. Box 1210, Willoughby, Ohio 44096; 800-362-1360. http://www.ametco.com/products/grilles-screens/architectural-security-grilles/

B. Manufacturers of equivalent products submitted and approved in accordance with Section 01 25 13 - Product Substitution Procedures.

2.3 MATERIAL

A. Steel bar stock: ASTM A36.

B. Steel tubing: ASTM A500, Grade B.

C. Grout: Non-shrink type, pre-mixed compound consisting of non-metallic aggregate, cement, and water-reducing and plasticizing additives.

2.4 FENCE SYSTEM

A. Type: Ornamental steel fencing system consisting of modular open grille fencing panels fabricated by welding flat steel bars and rods, supported by steel posts and gates and gate hardware; Ametco Fence System as manufactured by Ametco Manufacturing Corporation. Or Approved Equal.

B. Fence panels: Fabricated from galvanized steel rods, flat bars, welded to form an open grille pattern; **Metro** as manufactured by Ametco Manufacturing Corporation. Or Approved Equal

2.5 FENCE PANELS

A. Vertical main bars: 1 by 1/8 inch flat bars spaced at 2-7/16 inches.

B. Horizontal cross rods: 3/16 inch diameter rods spaced at 5-3/16 inches.

C. Top and bottom perimeter bars: 1 by 1/8 inch flat bars.

D. Panel height: 96 inches.

E. Panel width: 78-7/16 inches and as indicated on drawings.

F. Posts: Galvanized square steel tubes.

1. Size: 4 by 4 inches.

2. Weld flat steel bar top caps to tubular posts.

2.7 FACTORY FINISH

A. Color: Black.

B. Steel fence panels and posts shall be hot-dip galvanized to 1.25 ounces per square foot minimum zinc coating in accordance with ASTM A123. Standard size components shall receive polyester powder coating. Large gate panels shall be coated with 2-part polyurethane coating.

C. Polyester powder coating: Electrostatically applied colored polyester powder coating heat cured to chemically bond finish to metal substrate.

1. Minimum hardness measured in accordance with ASTM D3363: 2H.

2. Direct impact resistance tested in accordance with ASTM D2794: Withstand 160 inch-pounds.

3. Salt spray resistance tested in accordance with ASTM B117: No undercutting, rusting, or blistering after 500 hours in 5 percent salt spray at 95 degrees F and 95 percent relative humidity and after 1000 hours less than [3/16 inch] [5 mm] undercutting.

4. Weatherability tested in accordance with ASTM D822: No film failure and 88 percent gloss retention after 1 year exposure in South Florida with test panels tilted at 45 degrees.

D. Polyurethane coating: 1.0 mil dry film thickness of coating of steel test panel cured 30 minutes at 180 degrees F and aged 14 days shall resist the following test conditions without failure:

1. 5 percent salt spray for 500 hours.

2. 100 percent relative humidity for 1000 hours.

3. Water immersion for 100 hours.

4. Weatherability tested in accordance with ASTM D822: No film failure and 88 percent gloss retention after 1 year exposure in South Florida with test panels tilted at 45 degrees.

5. Exposure to lubricating oils, hydraulic fluids, and cutting oils.

6. 16 cycles of 24 hours at 100 percent humidity, 24 hours at 10 degrees F, and 24 hours at 77 degrees F.

7. Hardness: H to 2H.

8. Flexibility: 1/8 inch conical mandrel.

2.8 CONCRETE

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

PART 3 - INSTALLATION

3.1 PREPERATION

A. Prior to fabrication, field verify required dimensions.

3.2 INSTALLATION

A. Install fencing in accordance with manufacturer's installation instructions and approved shop drawings.
B. Install fence posts plumb and level drilled in concrete and grouting solid. Temporarily brace fence posts with 2 by 4 wood supports until concrete, grout is set.
C. Do not install bent, bowed, or otherwise damaged panels. Remove damaged components from site and replace.
D. Secure fence panels with standard stainless steel bolts to fence posts prior to setting posts in concrete.

- - - E N D - - -

THIS PAGE IS INTENTIONALLY LEFT BLANK