

SECTION 32 31 40
HIGH SECURITY FENCES AND GATES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. High security fences, gates and accessories.

1.2 RELATED REQUIREMENTS

- A. Temporary Construction Fence: Section 01 00 00, GENERAL REQUIREMENTS.
- B. Concrete Footings: Section 03 30 00, CAST-IN-PLACE CONCRETE.

1.3 APPLICABLE PUBLICATIONS

- A. Comply with references to extent specified in this section.
- B. ASTM International (ASTM):
 - 1. A653/A653M-15e1 - Steel Sheet, Zinc-Coated (Galvanized) or Zinc Alloy-Coated (Galvannealed) by Hot-Dip Process.
 - 2. A924/A924M-14e1 - General Requirements for Steel Sheet, Metallic Coated by the Hot-dip Process.
 - 3. D2794-93(2010) - Test Method for Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact).
 - 4. F2408-16 - Ornamental Fences Employing Galvanized Steel Tubular Pickets.
- C. Master Painters Institute (MPI):
 - 1. No. 18 - Primer, Zinc Rich, Organic.

1.4 SUBMITTALS

- A. Submittal Procedures: Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- B. Submittal Drawings:
 - 1. The Contractor shall provide a complete design for installation of gates/fence including concrete footings, concrete pads and the supporting structure for complete operation of the gates from recommendations from the manufacturer.
 - 2. Show size, configuration, and fabrication and installation details.
 - 3. The Contractor shall employ the services of a registered engineer who shall aid in the design of the gate supporting structure and provide sealed drawings for the work. Provide professionally prepared calculations and certifications for the work.
- C. Manufacturer's Literature and Data:

1. Description of each product.
- D. Certificates: Certify each product complies with specifications.
 1. Fence alignment.
 2. Zinc-coating complies with specifications.
 3. Structural characteristics comply with indicated and criteria on Drawings.
 4. Connections comply with requirements indicated on Drawings.
- E. Qualifications: Substantiate qualifications comply with specifications.
 1. Manufacturer with project experience list
 2. Installer with project experience list
 3. Welders and welding procedures.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications:
 1. Regularly manufactures specified products.
 2. Manufactured specified products with satisfactory service on five similar installations for minimum five years.
 - a. Project Experience List: Provide contact names and addresses for completed projects.
- B. Installer Qualifications: Manufacturer authorized installer.
 1. Regularly installs specified products.
 2. Installed specified products with satisfactory service on five similar installations for minimum five years.
 - a. Project Experience List: Provide contact names and addresses for completed projects.
- C. Welders and Welding Procedures Qualifications: AWS D1.1/D1.1M.
AWS D1.3/D1.3M.

1.6 DELIVERY

- A. Deliver products in manufacturer's original sealed packaging.
- B. Mark packaging, legibly. Indicate manufacturer's name or brand, type, color, production run number, and manufacture date.
- C. Before installation, return or dispose of products within distorted, damaged, or opened packaging.

1.7 STORAGE AND HANDLING

- A. Store products indoor in dry, weathertight facility.
- B. Protect products from damage during handling and construction operations.

1.8 FIELD CONDITIONS

- A. Field Measurements: Verify field conditions affecting high security fence fabrication and installation. Show field measurements on Submittal Drawings.
 - 1. Coordinate field measurement and fabrication schedule to avoid delay.

1.9 WARRANTY

- A. Construction Warranty: FAR clause 52.246-21, "Warranty of Construction."

PART 2 - PRODUCTS

2.1 SYSTEM PERFORMANCE

- A. To provide superior structural integrity, major vertical members shall be spaced at intervals less than the gate frame height and each vertical member, including pickets, shall be welded in place.
- B. Provide a means for locking the gates which shall include PIV authorized access or provisions to support other typical separate locking devices used by the owner.
- C. System components includes pickets, pales, mesh, fabric, rails, posts, gates and hardware required with following performance requirements:
 - 1. Steel Yield Strength: ASTM A924, minimum 344 MPa (50,000 psi)
 - 2. Impact Resistance: ASTM D2794, over 6.8 Nm (60 in-lb.) when using 0.625 ball forward impact.
- D. Gates: Design to meet same forced entry and anti-climb characteristics as other portions of fence.

2.2 MATERIALS

- A. Zinc-Coated Steel: ASTM A653, G90 coating designation
- B. Tubular Steel: ASTM F2408.
- C. Concrete: As specified in Section 03 30 00, Cast-in-Place Concrete.

2.3 PRODUCTS - GENERAL

- A. Provide fence components from one manufacturer.
 - 1. Steel Recycled Content: 30 percent total recycled content, minimum.

2.4 HIGH SECURITY FENCE

- A. Vertical Members:
 - 1. Ornamental Picket (Internal and External): The vertical members at the ends of the opening portion of the frame shall be 2" x 2" (51mm x

51mm) in the cross section weighing not less than 1.1 lb/lf (1.6kg/m). The major vertical members separating each bay shall be 1" x 2" (25mm x 51mm) in cross section weighing not less than .82 lb/lf (1.2kg/m).

- B. Ornamental Picket: Picket sizes shall be 1" square. Pickets may extend through only the clear opening portion or through the entire length of the gate as required.
- C. Posts: Support posts shall be sized in accordance with fence and gate dimensions, as specified by the manufacturer. Posts shall be galvanized or coated and supported in concrete footings as specified by the engineer.
- D. Finish: Gate to be color coated with polyester powder as specified. Powder coated gate and all accessories shall be pretreated chemically by sand blasting or other acceptable method to ensure proper coating adherence.
- E. Pickets: Hot-dip galvanized steel, nominal 68.75 mm (2 3/4 inches) by 18.75 mm (3/4 inch) by 1.98 mm (0.078 inch) thick.
- F. Rails: Hot-dip galvanized steel, nominal 50 mm (2 inch) square.
- G. Gate Posts: Tubular steel, nominal 100 mm (4 inch) square.
 - 1. Provide manually operated for pedestrian access.
 - 2. Provide hinged pedestrian gates with electric strike and card reader both sides.

2.5 FABRICATION

- A. Fabricate fence and gate to profile and dimensions indicated on Drawings.
- B. Fabricate components with joints tightly fitted and secured.

2.6 FINISHES

- A. Steel Paint Finish:
 - 1. Powder-Coat Finish: Manufacturer's standard two-coat finish system as follows:
 - a. One coat primer.
 - b. One coat thermosetting topcoat.
 - c. Dry-film Thickness: 0.05 mm (2 mils) minimum.
 - d. Color: As selected by Architect from manufacturer's standard range.
- B. Finish exposed surfaces after fabrication.

2.7 ACCESSORIES

- A. Accessories: Manufacturer's required accessories for complete installation.
- B. Barrier Coating: ASTM D1187/D1187M.
- C. Welding Materials: AWS D1.1/D1.1M, type to suit application.
- D. Fasteners: Fasteners as recommended by manufacturer.
- E. Gate Hardware: Fence manufacturers standard hardware for manually operated PIV access gates. Access control to be provided on both sides of the gate, along with a weatherized exit device, connected to the fire-alarm system.
- F. Galvanizing Repair Paint: MPI No. 18.
- G. Touch-Up Paint: Match shop finish.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Examine and verify substrate suitability for product installation.
- B. Protect existing construction and completed work from damage.

3.2 INSTALLATION - GENERAL

- A. Install products according to manufacturer's instructions and approved submittal drawings.
 - 1. When manufacturer's instructions deviate from specifications, submit proposed resolution for Contracting Officer's Representative consideration.
- B. Excavate for concrete-embedded items.
- C. Set posts in concrete foundation with a minimum depth of 914 mm (36 inches).
- D. All concrete footing equipment pads and other supports for the gates shall be as recommended by the manufacturer. Complete details of the concrete support structures shall be submitted for approval. Refer to submittal requirements for further detail.
- E. Attach fence panel to the line and end posts with manufacturer's standard fasteners.
- F. Install gate to gate posts spaced as indicated on Drawings. Install required hardware and adjust for smooth operation.
- G. Touch up damaged factory finishes.
 - 1. Repair galvanized surfaces with galvanized repair paint.
 - 2. Repair painted surfaces with touch up primer.

3.3 CLEANING

- A. Clean exposed high security fence and gate surfaces. Remove contaminants and stains.

3.4 PROTECTION

- A. Protect high security fences and gates from traffic and construction operations.
- B. Remove protective materials immediately before acceptance.
- C. Repair damage.

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