

**SECTION 32 31 40
HIGH SECURITY FENCES AND GATES**

SPEC WRITER NOTE:

1. Delete text between // _____ // not applicable to project. Edit remaining text to suit project.
2. Use this specification in specifying high security fence. Specify temporary fencing, such as Construction Fence in Division 01.
3. See VA Physical Security Design Guides for security requirements.

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. High security fences, gates and accessories.

1.2 RELATED REQUIREMENTS

SPEC WRITER NOTE: Update and retain references only when specified elsewhere in this section.

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

SPEC WRITER NOTE: Update applicable publications to current issue at time of project specifications preparation.

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.

SPEC WRITER NOTE: The requirements for shop drawings shall be included for special items, such as sliding gates. See TECHNICAL NOTES.

- B. Submittal Drawings:
 - 1. Show size, configuration, and fabrication and installation details.
- C. Manufacturer's Literature and Data:
 - 1. Description of each product.
- D. Certificates: Certify // each product complies // products comply // with specifications.

SPEC WRITER NOTE: Fence alignment certification requirement is for property line fencing or similar purpose requiring accurate alignment.

- 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 // conditioned // 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

SPEC WRITER NOTE: Always retain construction warranty. FAR includes Contractor's one year labor and material warranty.

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

PART 2 - PRODUCTS

2.1 SYSTEM PERFORMANCE

- A. System components includes pickets, pales, mesh, fabric, rails, posts, gates and hardware required with following performance requirements:
 - 1. Steel Yield Strength: ASTM A924, minimum // 310 MPa (45,000 psi) // 344 MPa (50,000 psi) //.
 - 2. Impact Resistance: ASTM D2794, over 6.8 Nm (60 in-lb.) when using 0.625 ball forward impact.

- B. Gates: Design to meet same forced entry and anti-climb characteristics as other portions of fence.

2.2 MATERIALS

SPEC WRITER NOTE: Specify option when galvanized before forming.

- A. Zinc-Coated Steel: ASTM A653, G90 coating designation // ASTM A924 //.
- 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.

SPEC WRITER NOTE:

1. Specify products containing greatest recycled content practicable to maximize material recovery. See EPA Comprehensive Procurement Guidelines (CPG) for guidance about individual products and available recycled content. Section 01 81 13 sets overall project recycled content requirements.

2. Steel recycled content depends upon furnace type. AISC reports industry wide 32 percent for basic oxygen furnace and 93 percent for electric arc furnace.

- 1. Steel Recycled Content: 30 percent total recycled content, minimum.

2.4 HIGH SECURITY FENCE

- A. 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.
- B. Rails: Hot-dip galvanized steel, nominal 50 mm (2 inch) square.
- C. Gate Posts: Tubular steel, nominal 100 mm (4 inch) square.
 - 1. Provide // motorized // manually operated // sliding gates for vehicle access.
 - 2. Provide hinged pedestrian gates with // electric strike // and // card reader //.

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.
- B. Finish exposed surfaces after fabrication.

2.7 ACCESSORIES

- A. Accessories: Manufacturer's required accessories for complete installation.

SPEC WRITER NOTE: Retain barrier coating to separate dissimilar metals and to separate metals from cementitious materials.

- 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 // motorized // manually operated // sliding // gates.
- 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.
- C. Remove existing // fence panels // gates // to permit new installation.
 - 1. Retain existing // fence panels // gates // for reuse.
 - 2. Dispose of // other // removed materials.

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. Attached fence panel to the line and end posts with manufacturer's standard fasteners.
- E. Install gate to gate posts spaced as indicated on Drawings. Install required hardware and adjust for smooth operation.
- F. 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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