

**SECTION 32 31 19**  
**STEEL BAR FENCE AND GATES**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Decorative steel bar fences and gates.
- B. Decorative steel fences.

**1.02 RELATED REQUIREMENTS**

- A. Section 03 30 00 - Cast-in-Place Concrete.

**1.03 REFERENCE STANDARDS**

- A. ASTM A276/A276M - Standard Specification for Stainless Steel Bars and Shapes; 2016a.
- B. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2015.
- C. ASTM D1654 - Test Method for Evaluation of Painted or Coated Specimens Subjected to Corrosive Environments; 2008.
- D. ASTM D2794 - Test Method for Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact) ; 1993 (Reapproved 2010).
- E. ASTM D3359 - Standard Test Method for Measuring Adhesion by Tape Test; 2009.

**1.04 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Submit manufacturer's data sheets on each product to be used, including:
  - 1. Preparation instructions and recommendations.
  - 2. Storage and handling requirements and recommendations.
  - 3. Installation methods.
- C. Shop Drawings:
  - 1. Indicate plan layout, spacing of components, post foundation dimensions, hardware anchorage, gates, and schedule of components.
- D. Installer's Qualification Statement.
- E. Manufacturer's Warranty.

**1.05 QUALITY ASSURANCE**

- A. Installer Qualifications: Experienced with type of construction involved and materials and techniques specified and approved by fence manufacturer.

**1.06 DELIVERY, STORAGE AND HANDLING**

- A. Store materials in a manner to ensure proper ventilation and drainage. Protect against damage, weather, vandalism and theft.

**1.07 WARRANTY**

- A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.
- B. Finish: 10 years.

**PART 2 PRODUCTS**

**2.01 FENCES**

- A. Fences: Complete factory-fabricated system of posts and panels, accessories, fittings, and fasteners; finished with paint, and having the following performance characteristics: Fences shall be constructed of solid steel bars, posts, rails and braces of the sizes shown on the Drawings. All steel shall conform to ASTM A-36. Prior to fabrication, the Contractor shall make all measurements at the location of the fence installation in order to insure correct fabrication

and installation. New steel bar fence shall be bent to conform to curving curbs and walks in all cases where those curves have a radius of fifteen (15) feet or less.

- B. All rails, posts and pickets shall be **saw cut** square to size. All edges shall be ground smooth. All burrs and sharp edges shall be removed. Rails and pickets shall be formed into panels of the shapes shown on the Drawings. Joints shall be completely welded with welds of proper size and shape. All welds shall be ground smooth to a neat finish. Pickets shall be fully welded to rails on the top side of the rails, eliminating the possibility of water standing at the junction of picket and rail
- C. Paint as per Section 09 91 13
- D. Steel: solid steel bars, posts, rails and braces of the sizes shown on the Drawings. All steel shall conform to ASTM A-36.
- E. Fasteners: as per the Drawings.
- F. Gate hinges and manufacturer shall be as shown on the Drawings. The gate shall be set complete with heavy duty hinges (allowing for opening of 180 degrees), latch, catch, gate keeper, locking device, gate stop, keys, and all other materials necessary for a complete installation. Hinges shall be painted on both sides and be fully welded to the post. Gates shall be locked immediately after installation.
- G. Gate padlocks shall be American Lock Co. #701 DL, telephone (800) 426-0206, or equal, with two and one half inch body diameter, 5 pin tumbler, cadmium plated hardened steel shackles 7/16 inch diameter, one inch clearance. Locks shall be keyed alike. Each lock shall be furnished with two keys, non-removable in an unlocked position.
- H. Cadmium plated or electro-galvanized steel chain shall be made from links that are 5/16" in diameter by 1 3/8" long. The chain shall be 9 inches long and shall be used to fasten the body of the lock to the gate. Contractor shall not weld the chain to the locks on Compactor Area Double Gates.
  - 1. The anchoring compound for fence posts shall be MasterFlow 110AN, as manufactured by BASF Corporation, 880 Valley Park Drive, Shakopee, MN 55379, Phone No. 1-800-433-9517, or equal. The crown grout or sealer shall be SonogROUT 10K, as manufactured by Chemrex, Inc., Phone 1.800.433.9517, or equal.
- I. Deliverables: The Contractor shall supply one (1) extra padlock for every five (5) gates installed. i.e. 1 to 5 gates installed supply 1 extra padlock, 6-10 gates installed supply 2 extra padlocks, etc. Lock keys shall be labeled and left with the Development Superintendent
- J. Steel: ASTM A653/A653M; tensile strength 45,000 psi, minimum.
  - 1. Hot-dip galvanized; ASTM A653/A653M, G60.
  - 2. 62 percent recycled steel, minimum.

## **2.02 MECHANICALLY FASTENED STEEL FENCE**

- A. Provide fence components as shown on the Drawings.
- B. Flexibility: Capable of following variable slope of up to 1:4.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Do not begin installation until substrates have been properly prepared.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

### **3.02 PREPARATION**

- A. Clean surfaces thoroughly prior to installation.

### **3.03 INSTALLATION**

- A. The fence posts and panels shall be installed in the proper size holes in concrete curbs or concrete footings as shown on the Detail Drawings. At the end of any straight fence run, where a resulting panel is less than the standard panel length as shown on the detail drawings, that

panel shall be replaced with two panels equal in length, at the beginning and end of that fence run. The length of those two equal panels shall be determined by adding the length of the shorter panel to the length of the last standard panel and dividing the resultant length in half. Posts and pickets shall in all cases be truly vertical, rails shall be parallel to the finished pavement grade. Panels shall be bolted to posts with cadmium plated bolts. Maximum space between horizontal rails and posts shall be 3/8". After bolts have been tightened they shall be tack welded or peened; bolts shall then be primed and painted. Where new steel bar fence is to be installed in new concrete curb/wall, holes for fence posts shall be cored, holes in footings shall be formed, all in accordance with the Concrete Section of these Specifications.

- B. Set fence posts in accordance with the spacing as indicated on the Drawings.

#### **3.04 ERECTION TOLERANCES**

- A. Maximum Variation From Plumb: 1/4 inch (6.3 mm).
- B. Maximum Offset From Indicated Position: 1 inch. (25.4 mm).
- C. Minimum Distance from Property Line: 6 inches. (152 mm).

#### **3.05 CLEANING**

- A. Clean jobsite of excess materials; scatter excess material from post hole excavations uniformly away from posts. Remove excess material if required.
- B. Clean fence with mild household detergent and clean water rinse well. .
- C. Remove mortar from exposed posts and other fencing material using a 10 percent solution of muriatic acid followed immediately by several rinses with clean water.
- D. Touch up scratched surfaces using materials recommended by manufacturer. Match touchup paint color to fence finish.

#### **3.06 PROTECTION**

- A. Protect installed products until completion of project.
- B. Touch-up, repair, or replace damaged products before Date of Substantial Completion.

**END OF SECTION**