

**SECTION 032300**

**ORNAMENTAL STEEL FENCING**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

**\*\*\*\*\* List other specification sections dealing with work directly related to this section such as the following. \*\*\*\*\***

**1.2 SUMMARY**

- A. Section 03 30 00 - Cast-in-Place Concrete: Concrete footings for support of fence posts.
- B. Section 32 31 30 - Gate Operator: Electric operator for ornamental steel gates.
- C. Related Sections:
  - 1. Section 03 30 00 – Cast-in-Place Concrete
  - 2. Section 04 20 00 – Unit Masonry
  - 3. Section 05 50 00 – Metal Fabrications
  - 4. Section 32 31 30 – Gate Operator

**1.3 REFERENCES**

- A. American Society for Testing and Materials (ASTM) Publications:
  - 1. ASTM A1011/A-04, A572, A578 Standard Specification for Steel Sheet and Strip
  - 2. ASTM A36 - Structural Steel.
  - 3. ASTM A121 - Zinc-Coated (Galvanized) Steel Barbed Wire.
  - 4. ASTM A385 – Standard Practice for Providing High-Quality Zinc Coatings (Hot-Dip).
  - 5. ASTM A500 - Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
  - 6. ASTM B117 - Standard Practice for Operating Salt Spray (Fog) Apparatus.
  - 7. ASTM D822 - Tests on Paint and Related Coatings Using Filtered Open-Flame Carbon-Arc Exposure Apparatus.
  - 8. ASTM D1794 - Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact).
  - 9. ASTM D3363 - Test Method for Film Hardness by Pencil Test.

## 1.4 SUBMITTALS

- A. Provide in accordance with section 01 33 00 – Submittal Procedures:
  - 1. Product data for components and accessories
  - 2. Shop drawings showing layout, dimensions, spacing of components and anchorage and installation details.
  - 3. Sample: 12” x 12” minimum size sample of fence panel illustrating design, fabrication workmanship and selected color coating.
  - 4. Copy of warranty specified in Paragraph 1.4 for review by Architect.

## 1.5 WARRANTY

- A. Provide in accordance with section 01 77 00 – Submittal Procedures:
  - 1. 10 year warranty for factory finish against cracking, peeling and blistering under normal use.

## **PART 2 - PRODUCTS**

### 2.1 ACCEPTABLE MANUFACTURERS

- A. OGi Architectural Metal Solutions (800.321.9800) **STEEL FENCE** fabricated fences of required components, or equal as approved by architect.
- B. Requests to use equivalent products of other manufactures shall be submitted in accordance with Section 01 25 13 – Product Substitution Procedures.

### 2.2 MATERIALS

- A. Steel bar stock: ASTM A1011
- B. Steel bar stock: ASTM A36.
- C. Steel tubing: ASTM A500, Grade B.
- D. Grout: Non-shrink type, pre-mixed compound consisting of non-metallic aggregate, cement, and water reducing and plasticizing additives.
- E. Break Metal: ASTM A36 steel sheet.

### 2.3 GENERAL FABRICATION

- A. Form or roll form shapes before finishing.
- B. Fabricate components that, when assembled, have the following characteristics:
  - 1. Profiles which are straight and free from defects or deformations.
  - 2. Accurately fitted joints with minimally visible gaps.
  - 3. Accommodations for thermal and mechanical movements.
  - 4. Fasteners, anchors and connection devices that concealed from view to greatest extent possible.
- C. Fence: Fabricate components for assembly following approved shop drawings and manufacturers standard installation instructions.

- D. After fabrication, clearly mark components to identify their locations in Project according to approved shop drawings.

## 2.4 FENCE CONSTRUCTION

- A. Components: All infills, rails, posts and frame components shall be fabricated in accordance with manufacturer standards for specified system model.
  - 1. Infills: Infills shall be manufactured from manufacturer standard extruded fixed aluminum pressure-locked grilles.
    - a. Size: Manufactured from manufacturer standard mesh profiles of PressLock fence standards:
      - i. Urban 2-3/16" x 5-1/4"
      - ii. Palladium 1-3/4" x 5-1/4"
      - iii. Guardian 2-3/16" x 2-5/8"
      - iv. Perimeter 1-3/4" x 1-3/4"
      - v. Modular 3-15/16" x 3-15/16"
      - vi. SafeGuard 2-3/16" x 5-1/4"
    - b. Type: Manufactured from PressLock thin gauge carbon steel grating.
    - c. Assembly: Infill shall be factory manufactured and ready for field assembly.
  - 2. Rails: Rails shall be roll-formed structural steel profile as shown on architectural drawings.
  - 3. Posts: Posts shall be structural flat bar, steel square or rectangular profile to meet applied loads of gates and wind loads. All steel components to be hot-dipped galvanized to ASTM 123.

## 2.4 GATES

- A. Provide gates of type and size indicated on Drawings. Equip gates with manufacturer's standard hardware as required for complete functional operation.
- B. Type: Hinged swinging single or double gate.
  - 1. Construction: Welded frame fabricated from 2 by 2 inches steel tubing with open grille panels to match fencing material.
  - 2. Nominal size: As indicated on drawings.
  - 3. Hardware:
    - a. Hinges: Size and type as determined by manufacturer. Provide 2 hinges for each leaf up to 6 feet high and 1 additional hinge for each additional 24 inches in height or fraction thereof.
    - b. Latch: 3/4 inch diameter slide bolt to accommodate padlock.
    - c. For double gates provide padlockable, 5/8 inch diameter center cane bolt assembly and strike.
- C. Coordinate provision of gate with electric operator specified in Section 32 31 30 - Gate Operator to ensure size, weight, and design of gate is compatible with operator.

## 2.5 ACCESSORIES

Rev-F.1

- A. Fasteners: Stainless steel bolts of type, size, and spacing as recommended by fence manufacturer for specific condition.
- B. End caps: Provide aluminum caps for exposed open steel sections and for attachment of components to posts.
- C. For exposed locations, provide anti-intruder bolts consisting of cup head bolt and nut with clamping hexagon such that tightening shears hexagon and render bolt impossible to release.

**2.6 FACTORY FINISH**

- A. General: Comply with NAAMM 'Metal Finishes Manual' for finish designations and application recommendations, except as otherwise indicated. Apply finishes in factory after products assembly. Protect finishes on exposed surfaces prior to shipment. Remove scratches and blemishes from exposed surfaces which will be visible after completing finishing process.

Provide color as indicated or, if not otherwise indicated, as selected by architect from standard color range of super-durable polyester powder coatings from selected vendor.

**\*\*\*\* List by number and full title reference standards referred to in remainder of specification section. Delete non-applicable references. \*\*\*\***

- B. Hot-Dipped Galvanized Finish: ASTM A385 standards
- C. Sandblast: Lightly blast hot-dipped galvanized surface to preparation of powder coat finish, not more than 24 hours prior to coating.
- D. Super-durable Polyester Powder Coating: Electro-static applied and thermo-cured, 2-3 mil dry film thickness polyester powder coating.

**PART 3 - EXECUTION**

**3.1 PREPARATION**

- A. Prior to fabrication, field verify required dimensions.

**\*\*\*\* Include the following paragraph if electric gate operators are required. \*\*\*\***

- B. Coordinate fence and gate installation with provision of gate operator specified in Section 32 31 30 - Gate Operator to ensure proper power supply and that conduit and wiring are concealed.
- C. Cast concrete footings in accordance with Section 03 30 00 - Cast-in-Place Concrete as detailed on Drawings and approved shop drawings.
  - 1. Minimum footing diameter:
    - a. Terminal and gate posts: 12 inches.
    - b. Intermediate line posts: 10 inches.
  - 2. Allow [8 inches] [ ] minimum embedment of posts.

3. Allow [6 inches] [\_\_\_\_\_] minimum concrete beneath post bottom.
- D. [Provide setting holes for embedment of fence posts.] [Core drill existing concrete footings for embedment of fence posts.] Hole shall be 2 inches minimum greater than post width.

### 3.2 INSTALLATION

- A. Install fencing in accordance with manufacturer's installation instructions and approved shop drawings.
- B. Install fence posts plumb and level [by setting post in hole [cast] [drilled] in concrete and grouting solid.] [by embedding post directly in concrete footing.] 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] [stainless steel anti-intruder bolts] to fence posts [prior to setting posts in footings.] [after posts have been set in footings.]
- E. Extension arm posts: Erect arms sloped [inward] [outward] and attach 3 strands of barbed wire. Tension wire and secure to arms.
- F. Canted fence panel extension: Slope panels [inward] [outward] at 45 degrees angle and rigidly bolt to vertical fence panels.
- G. Gates:
  1. Install gates and adjust hardware for smooth operation.
  2. [Provide concrete center foundation depth and drop rod retainers at center of double swinging gate openings.]
  3. [Provide concrete surface for length of operation of V-wheeled rolling gate. Anchor track to concrete with countersunk fasteners.]
  4. After installation, test gate [and operator]. Open and close a minimum of five times. Correct deficiencies and adjust.
- H. Touch-up damaged finish with paint supplied by manufacturer and matching original coating.

**END OF SECTION**