

**SECTION 032300**

**ORNAMENTAL ALUMINUM 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 B209 - Aluminum and Aluminum-Alloy Sheet and Plate.
  - 2. ASTM B221 - Aluminum-Alloy Extruded Bar, Rod, Wire, Shape, and Tube.
  - 3. ASTM B117 - Standard Practice for Operating Salt Spray (Fog) Apparatus.
  - 4. ASTM D822 - Tests on Paint and Related Coatings Using Filtered Open-Flame Carbon-Arc Exposure Apparatus.
  - 5. ASTM D1794 - Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact).
  - 6. 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 WARRANT**

- 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) **ALUMINUM 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. Aluminum Extrusions: Alloy and temper recommended by sunshade manufacturer for strength, corrosion resistance, and application of required finish and not less than 0.08" wall thickness at any location for the main frame and complying with ASTM b211: 6063-T6, 6105-T5 or 6061-T6 alloy and temper.
- B. Structural aluminum: ASTM B221, Alloy 6061 T-6.
- C. Sheet aluminum: ASTM B209 6063, Temper T-6.
- D. Steel tubing: ASTM A500, Grade B
- E. Grout: Non-shrink type, pre-mixed compound consisting of non-metallic aggregate, cement, and water reducing and plasticizing additives.

### **2.3 GENERAL FABRICATION**

- A. Form or extrude aluminum 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 blades, infills, rails, posts and frame components shall be fabricated in accordance with manufacturer standards for specified system model.
1. Blades: Blade assemblies shall be mechanically fastened or welded from manufacturer standard products based on the available standard series FH2D, FH4D, FH24D, FV2D, FV4D, FH2C2, FV2C2.
    - a. Size: Manufactured from 2" or 4" extruded aluminum D or C series design blades oriented vertically ['V'] or horizontally ['H'] and spaced as shown in the architectural drawings.
    - b. Type: Manufactured from D or C series blades from extruded aluminum design. Rotated as shown in architectural drawings.
    - c. Assembly: Blades shall be factory assembled to provide 100%, 80%, 75% or alternate percent direct visual block and attached to rails using stainless steel thread cutting screws through internal screw bosses in blades or welded.
  2. Infills: Infills shall be manufactured from manufacturer standard extruded fixed aluminum pressure-locked grilles.
    - a. Size: Manufactured from 1-3/4" [LGLi] or 2-1/2" [LG] depth extruded aluminum louver blades
    - b. Type: Manufactured from LG or LGLi extruded aluminum louver blades and pressure-locked to standard sq. cross bars at 4" O.C.
    - c. Assembly: LG or LGLi extruded aluminum louver blades shall be factory manufactured to provide 100%, 80% or 60% direct visual block and assembled to the rails using stainless steel thread cutting screws or welded.
  3. Rails: Rails shall be extruded aluminum profile as shown on architectural drawings.
  4. Posts: Posts shall be extruded aluminum or structural 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 aluminum/steel tubing with miter cut corners and the open grille aluminum 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

- 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 extruded aluminum 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 PVDF or 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. \*\*\*\***

- A. Fluorocarbon Coating: Inhibitive thermo-cured primer, 0.2 mil minimum dry film thickness, and thermo-cured fluorocarbon coating.
- B. 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**