

SECTION 032300**ORNAMENTAL ALUMINUM FENCING**

******* OGi Architectural Metal Solutions manufactures several basic construction materials including steel, stainless steel and aluminum bar gratings, safety gratings, stair treads, and fiberglass gratings. OGi Architectural Metal Solutions also manufactures several types of ornamental aluminum fencing.**

This guide can be used to specify various aluminum bar gratings. These can be used for platforms, stairs treads and handrails, trench covers, sunscreens, fences and many other applications. Aluminum bar gratings can be specified as a separate section or as part of another building element. For the later, paragraphs from this guide would be inserted into the section specifying the element constructed with aluminum gratings. *****

The specifier will need to edit this product specification to reflect the options and applications being used. Most editing can be accomplished by deleting unnecessary requirements.

PART 1 - GENERAL**1.1 SUMMARY**

- A. Section includes: Ornamental aluminum fencing panels fabricated with aluminum extrusions pressure locked into, modular, open grille fencing panels including steel/aluminum fence posts and gates.
- B. Related sections:

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

1. Section 03 30 00 - Cast-in-Place Concrete: Concrete footings for support of fence posts.
2. Section 32 31 30 - Gate Operator: Electric operator for ornamental steel gates.

1.2 REFERENCES

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

1.3 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, [interface with electric gate operator,] and anchorage and installation details.
 3. Sample: 8 by 10 inches minimum size sample of fence panel illustrating design, fabrication workmanship, and selected color coating.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. OGi Architectural Metal Solutions (800.321.9800) custom fabrication of required components, or equal as approved by architect.
- B. Manufacturers of equivalent products submitted and approved in accordance with Section 01 63 00 - Product Substitution Procedures.

2.2 MATERIALS

- A. Extruded aluminum: ASTM B221, Alloy [6063 T-6] [6105 T-5].
- B. Structural aluminum: ASTM B221, Alloy 6061 T-6.
- C. Sheet aluminum: ASTM B209 Alloy 6063, Temper T-6.
- D. Grout: Non-shrink type, pre-mixed compound consisting of non-metallic aggregate, cement, and water reducing and plasticizing additives.

2.3 FENCE SYSTEM

- A. Type: Ornamental aluminum fencing system consisting of modular open grille fencing panels fabricated by pressure locking aluminum extrusions, supported by aluminum/steel posts and gates and gate hardware; OGi aluminum fence systems as manufactured by OGi Architectural Metal Solutions.

******* OGi Architectural Metal Solutions provides 4 types of aluminum fences. Refer to OGi product literature for illustrations of various patterns. *******

- B. Fence panels: Fabricated from extrusions pressure locked to form an open grille pattern; [[VisiBlock](#)] [[VisiShield](#)] [[VisiScreen](#)] [[SGFence](#)] as manufactured by OGi Architectural Metal Solutions.

OGi-AMS VisiBlock (LG100) 100% view-blocking louver. 1/8" thickness, tapered to 1/16" tip, extruded aluminum louvers (may be positioned horizontally, vertically or inverted in horizontal position to effectively block sight lines from below). Louvers positioned and held in place by 5/16" square crossbars at 4" centers. Custom engineered panel system banding/framing/mounting clips per fabrication detail.]

OGi-AMS VisiShield (LG75) 75% view-blocking louver. 1/8" thickness, tapered to 1/16" tip, extruded aluminum louvers (may be positioned horizontally, vertically or inverted in horizontal position to effectively block sight lines from below). Louvers positioned and held in place by 5/16" square crossbars at 4" centers. Custom engineered panel system banding/framing/mounting clips per fabrication detail.]

OGi-AMS VisiScreen (LG60) 60% view-blocking louver. 1/8" thickness, tapered to 1/16" tip, extruded aluminum louvers (may be positioned horizontally, vertically or inverted in horizontal position to effectively block sight lines from below). Louvers positioned and held in place by 5/16" square crossbars at 4" centers. Custom engineered panel system banding/framing/mounting clips per fabrication detail.]

OGi-AMS SGFence (19SGF4) 1/8" thickness extruded aluminum rectangular bars (may be positioned horizontally or vertically based on 100#/SF uniform loading). Bars positioned and held in place by 1/4" square crossbars with extruded tail at 4" centers mechanically pressure locked. Custom engineered panel system, banding, framing, mounting per fabrication details.]

******* Fence panels are provided in standard heights and widths. Available sizes vary with fence pattern. Refer to OGi product literature for available sizes. Custom sizes can also be obtained as a special order. *******

******* Include the following section for all fence panels height up to 120 inches. *******

1. Panel height: [_____] inches. [As indicated on Drawings.]

******* Fence posts for OGi Aluminum Fence System can be square aluminum/steel tubing. Post length will be determined by fence height and foundation design. *******

- C. Posts: [Structural Aluminum] [Galvanized Steel] [flat steel bars] [square steel tubes].

1. Size: [2 by 2] [2 by 4] [2 by 6] [4 by 4] [4 by 6] [6 by 6] inches.
2. Length: [_____] [As indicated on Drawings.]
3. Weld flat aluminum/steel bar top caps to tubular posts.

******* Fence posts for VisiBlock, VisiShield, VisiScreen, and SGFence Aluminum Fence Systems can be spaced up to 120 inches. *******

4. Spacing: [_____] inches. [As indicated on Drawings.]

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.

******* OGi Architectural Metal Solutions provides single and double hinged swinging gates for ornamental aluminum fences. Gates can be operated with various types of electric operators specified in other sections. Refer to OGi product literature for available sizes and types of gates. *******

***** Include the following paragraphs if hinged swinging gates are required. *****

- B. Type: Hinged swinging [single] [double] gate.

***** Size of steel tubing used to fabricate swinging gate frames will depend on gate size. Refer to OGi product literature for recommended sizes. *****

1. Construction: Welded frame fabricated from [] by [] inches aluminum/steel tubing with open grille aluminum panels to match fencing material.
2. Nominal size: [] wide by [] high. (Up to 9'-6" Wide by 10'-0". Consult with manufacturer for additional sizes.)
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.

***** Include the following paragraph if gates are to be operated with electric gate operator. *****

- 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.

***** Include the following paragraph if ornamental steel fencing is erected in high-security area and anti-intruder bolts are required. *****

- 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

***** Except for large gate panels, factory applied finish for aluminum fencing is a polyester powder coating. Large gate panels will receive a factory applied durable polyurethane coating. Contact OGi Architectural Metal Solutions for gate size limitations. *****

- A. Aluminum fence panels and posts shall receive polyester powder coating. [Large gate panels shall be coated with 2-part polyurethane coating.]
- B. Polyester powder coating: Electrostatically applied colored polyester powder coating heat cured to chemically bond finish to metal substrate.

1. Minimum hardness measured in accordance with ASTM D3363: 2H.
2. Direct impact resistance tested in accordance with ASTM D2794. Withstand 160 inch-pounds.
3. Salt spray resistance tested in accordance with ASTM B117: No undercutting, rusting, or blistering after 500 hours in 5 percent salt spray at 95 degrees F and 95 percent relative humidity and after 1000 hours less than [3/16 inch] [5 mm] undercutting.
4. Weatherability tested in accordance with ASTM D822: No film failure and 88 percent gloss retention after 1 year exposure in South Florida with test panels tilted at 45 degrees.

******* Include the following paragraphs if a polyurethane coating is required for large gate panels. *******

C. Polyurethane coating: 1.0 mil dry film thickness of coating cured 30 minutes at 180 degree F and aged 14 days shall resist the following test conditions without failure:

1. 5 percent salt spray for 500 hours.
2. 100 percent relative humidity for 1000 hours.
3. Water immersion for 100 hours.
4. 20 double rubs with cloth saturated with either lacquer thinner, acetone, MEK, gasoline, xylene.
5. Exposure to lubricating oils, hydraulic fluids, and cutting oils.
6. 16 cycles of 24 hours at 100 percent humidity, 24 hours at 10 degrees F, and 24 hours at 77 degrees F.
7. Hardness: H to 2H.
8. Flexibility: 1/8 inch conical mandrel.

******* OGi Architectural Metal Solutions provides 10 standard paint colors and 7 standard anodized options. Custom colors are available for minimum size orders. Contact OGi for information on custom colors. *******

D. Color:

MESA TAN	9810-1049
SAFETY YELLOW	9810-1268
RUBY RED	9810-3042
OCEAN BLUE	9910-5054
IVY GREEN	9810-6046
SONNY ORANGE II	9810-2113
ELECTRIC GRAY	9810-7042
JET BLACK	9900-9000
SKY WHITE II	9910-9897
DARK SIENNA	9910-8036

Selected by Architect from manufacturer's standard color range
 Custom color as selected by Architect

ANODIZED	CLEAR – CLASS I
ANODIZED	CLEAR – CLASS II
ANODIZED	LIGHT BRONZE
ANODIZED	MEDIUM BRONZE
ANODIZED	DARK BRONZE
ANODIZED	BLACK
ANODIZED	COPPER
MILL	N/A

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.

******* Size of concrete fence footings will depend on fence height, post spacing, and other project conditions. Footing dimensions may be indicated on Drawings or in this section but not both locations in order to eliminate potential conflicts. Edit the following paragraphs to reflect specific project conditions. *******

- 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.]

***** Include the following paragraph if extension arm posts are installed. *****

- E. Extension arm posts: Erect arms sloped [inward] [outward] and attach 3 strands of barbed wire. Tension wire and secure to arms.

***** Include the following paragraph if canted fence panel extensions are required. *****

- 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