

**SECTION 32 31 21**

**ALUMINUM LOUVER FENCES AND GATES**

**\*\*\*\*\* Ametco® Manufacturing Corporation manufactures fixed louver fencing from three different metals - galvanized steel, aluminum, and stainless steel. Galvanized steel has excellent strength and corrosion resistance, but can have rough areas resulting from the galvanizing process. In contrast, aluminum fencing has a very smooth finish. It is also lightweight and hence suited for roof-mounted screens. Stainless steel fencing has the greatest strength, best corrosion resistance, and does not have rough areas typical of galvanized steel. Refer to Ametco® product literature for additional information to assist in selecting type of material for fixed louver fencing.**

**This guide specification can be used to specify Eclipse®, Total Eclipse®, and Venetian®, and Phoenix® Aluminum Fixed Louver Fencing manufactured by Ametco® Manufacturing Corporation. Galvanized louver fencing can be specified with SECTION 32 31 20 - ORNAMENTAL STEEL FENCES AND GATES and stainless steel fixed louver fencing can be specified with SECTION 32 31 22 - STAINLESS STEEL LOUVER FENCES AND GATES.**

**The specifier will need to edit this guide specification for a specific project to reflect the options and applications being used. The guide section has been written so that most editing can be accomplished by deleting unnecessary requirements. Options are indicated by [ ]. Notes to assist the specifier in selecting options and editing the guide specification are printed in bold and indicated with \*\*\*\*\*. For final editing, all brackets and notes will need to be deleted from the guide.**

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**PART 1 - GENERAL**

**1.1 SUMMARY**

A. Section includes: Ornamental fixed louver modular fencing panels fabricated with extruded aluminum louvers and flat aluminum bars, including extruded aluminum fence posts and aluminum louver 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 11 - Gate Operators: Electric operator for ornamental aluminum louver gates.

## **1.2 REFERENCES**

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

A. ASTM International (ASTM):

1. ASTM B117 - Operating Salt Spray (Fog) Apparatus.
2. ASTM B209 - Aluminum and Aluminum-Alloy Sheet and Plate.
3. ASTM B221 - Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
1. ASTM D822 - Filtered Open-Flame Carbon-Arc Exposures of Paint and Related Coatings.
2. ASTM D2794 - Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact).
3. 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] [203 by 254 mm] 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.

## **1.4 WARRANTY**

A. Provide in accordance with Section 01 77 00 - Closeout Procedures:

1. 10-year warranty for factory finish against cracking, peeling, and blistering under normal use.

**PART 2 - PRODUCTS****2.1 ACCEPTABLE MANUFACTURERS**

- A. Ametco Manufacturing Corporation, 4326 Hamann Parkway, P.O. Box 1210, Willoughby, Ohio 44096; 800-362-1360.
- B. Requests to use equivalent products of other manufacturers shall be submitted in accordance with Section 01 25 13 - Product Substitution Procedures.

**2.2 MATERIALS**

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

**2.3 FENCE SYSTEM**

**\*\*\*\*\* Ametco® Manufacturing provides four types of aluminum louver fencing.**

**Eclipse®: Inclined, flanged louver blade providing 80 percent visual blocking.**

**Total Eclipse®: Inclined, flanged louver blade providing 100 percent visual blocking.**

**Venetian®: V-shaped louver blade providing 100 percent visual blocking.**

**Phoenix®: Extruded tubular aluminum blades providing either 80 or 100 percent visual blocking.**

**Louver panels can be installed with the louvers in either a vertical or a horizontal position. Edit the following paragraph to reflect type of louver fence required. \*\*\*\*\***

- A. Type: Ornamental fencing system consisting of [vertical] [horizontal], fixed louver, modular fence panels fabricated with extruded aluminum framing bars and supported by extruded aluminum fence posts; [Eclipse] [Total Eclipse] [Venetian] [Phoenix] Aluminum Fixed Louver Fencing as manufactured by Ametco Manufacturing Corporation.

**B. Fence panel:**

**\*\*\*\*\* Include the following to specify Eclipse® with 80 percent direct vision screening. \*\*\*\*\***

1. Fixed louver bars: Extruded aluminum louver bars, [1-31/32 inches] [50 mm] wide, spaced at [2-1/16 inches] [52 mm]. Extend louver flange to allow 80 percent direct visual screening.
2. Cross bars: [1/2 by 1/8 inch] [13 by 3 mm] flat bars welded perpendicular to back side of louver bars and spaced at [18 inches] [457 mm].

**\*\*\*\*\* Include the following to specify Total Eclipse® with 100 percent direct vision screening. \*\*\*\*\***

1. Fixed louver bars: Extruded aluminum louver bars, [1-31/32 inches] [50 mm] wide, spaced at [1-13/16 inches] [46 mm]. Extend louver flange to allow 100 percent direct visual screening.
2. Cross bars: [1/2 by 1/8 inch] [13 by 3 mm] flat bars welded perpendicular to back side of louver bars and spaced at [18 inches] [457 mm].

**\*\*\*\*\* Include the following to specify Venetian® with 100 percent direct vision screening. \*\*\*\*\***

1. Fixed louver bars: V-shaped extruded aluminum louver bars, [1-3/4 inches] [44 mm] wide by [2-1/2 inches] [64 mm] high, spaced at [2-5/8 inches] [67 mm] and providing 100 percent direct visual screening.
2. Framing bars: Extruded aluminum flat bars welded to ends of louvers.

**\*\*\*\*\* Include the following to specify Phoenix® with either 80 or 100 percent direct vision screening. \*\*\*\*\***

1. Fixed louver blades: Extruded tubular aluminum louver blades, inclined at 45 degrees, and [spaced at [2.83 inches] [72 mm] and to provide 100 percent direct visual screening.] [spaced at [3.4 inches] [86 mm] to provide 80 percent direct visual screening.]
  - a. Size: [1/2 by 4 inches] [13 by 102 mm].
  - b. Material thickness: [0.09 inch] [2 mm].
2. Framing bars: Extruded aluminum flat bars welded to ends of louvers.

**\*\*\*\*\* Fence panels are provided in standard heights and widths. Refer to Ametco® product literature for available sizes. Custom sizes can also be obtained as a special order. \*\*\*\*\***

3. Panel height: [[36] [48] [60] [62-3/8] [\_\_\_\_\_] inches.] [[889] [1219] [1524] [\_\_\_\_\_] [1584] mm.] [As indicated on Drawings.]

**\*\*\*\*\* As the strongest louver panel provided by Ametco® Manufacturing Corporation, Phoenix® can span 72 inches (1828 mm) horizontally. Standard width for Eclipse®, Total Eclipse®, and Venetian® is 64-21/32 inches (1642 mm). \*\*\*\*\***

4. Panel width: [[64-21/32] [96] [\_\_\_\_\_] inches.] [[1642] [2438] [\_\_\_\_\_] mm.] [As indicated on Drawings.]

**\*\*\*\*\* Fence posts for aluminum louver fencing are either extruded aluminum solid shapes or square tubular sections. \*\*\*\*\***

C. Posts:

1. Type: 3 x 3 inch [76 by 76 mm] extruded tubular aluminum sections with solid aluminum caps.
2. Length: [\_\_\_\_\_] [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.

**\*\*\*\*\* Ametco® Manufacturing Corporation provides single and double hinged swinging gates, V-wheeled rolling gates, and cantilevered horizontal sliding gates for aluminum louver fences. Gates can be operated with various types of electric operators specified in other sections. Refer to Ametco® 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 extruded aluminum tubing used to fabricate swinging gate frames will depend on gate size. Refer to Ametco® product literature for recommended sizes. \*\*\*\*\***

1. Construction: Welded frame fabricated from [\_\_\_\_\_] by [\_\_\_\_\_] [inches] [mm] extruded aluminum tubing with aluminum fixed louver panels to match fencing material.
2. Nominal size: [\_\_\_\_\_] wide by [\_\_\_\_\_] high.

**3. Hardware:**

- a. Hinges: Size and type as determined by manufacturer. Provide 2 hinges for each leaf up to [6 feet] [1829 mm] high and 1 additional hinge for each additional [24 inches] [610 mm] in height or fraction thereof.
- b. Latch: [3/4 inch] [19 mm] diameter slide bolt to accommodate padlock.
- c. For double gates provide padlockable, [5/8 inch] [16 mm] diameter center cane bolt assembly and strike.

**\*\*\*\*\* Include the following paragraphs if hinged V-wheeled rolling gates are required. Refer to Ametco® product literature for recommended aluminum tubing sizes used to fabricate gate frame and wheel diameters to accommodate different gate weights and sizes. \*\*\*\*\***

**C. Type: V-wheeled rolling gates.**

1. Construction: Welded frame fabricated from [\_\_\_\_\_] by [\_\_\_\_\_] [inches] [mm] extruded aluminum tubing with aluminum fixed louver panels to match fencing material. Frame configuration shall be as indicated on Drawings and approved shop drawings.
2. Nominal size:
  - a. Gate opening: [\_\_\_\_\_].
  - b. Gate: [\_\_\_\_\_] wide by [\_\_\_\_\_] high.
  - c. Gate travel distance: [\_\_\_\_\_].
3. Support posts: Pair of [\_\_\_\_\_] diameter tubular aluminum posts with solid cap.
4. Rolling mechanism: Steel wheels with V-shaped edge groove and [[4] [6] inches] [[102] [152] mm] diameter, mounted to gate frame and riding on ground set V-track. Assembly braced at top by adjustable guide wheels mounted with brackets to support posts.

**\*\*\*\*\* Include the following paragraphs if cantilevered horizontal sliding gates are required. \*\*\*\*\***

**D. Type: Cantilevered horizontal sliding gate.**

**\*\*\*\*\* Size of aluminum tubing used to fabricate cantilevered gate frame will depend on gate size. Refer to Ametco® product literature for recommended sizes. \*\*\*\*\***

1. Construction: Welded frame fabricated from [ ] by [ ] [inches] [mm] extruded aluminum tubing with aluminum fixed louver panels to match fencing material. Frame configuration shall be as indicated on Drawings and approved shop drawings.
2. Nominal size:
  - a. Gate opening: [ ] wide by [ ] high.
  - b. Gate: [ ] wide by [ ] high.
  - c. Overhang distance: [ ].
3. Support posts: Pair of [ ] diameter tubular aluminum posts with solid cap.
4. Cantilever mechanism: Aluminum top track and wheeled carriers and bottom roller guides supported by brackets attached to support posts.

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

- E. Coordinate provision of gate with electric operator specified in Section 32 31 11 - Gate Operators 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.

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

- B. 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 Ametco® Manufacturing Corporation for 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 of test panel cured 30 minutes at 180 degrees 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, or 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] [3 mm] conical mandrel.

**\*\*\*\*\* Ametco® Manufacturing Company provides 15 standard colors. Custom colors are available for minimum size orders. Contact Ametco® Manufacturing Company for information on custom colors. \*\*\*\*\***

- D. Color: [[Red Baron] [Black Velvet] [Blue Streak] [Bronze Mat] [Cal Gray] [Charlie Brown] [Cream] [Light Blue] [Light Ivory] [Moss Green] [Pale Green] [Safety Orange] [Safety Yellow] [Silver with weather-resistant clear coating] [White] as manufactured by Ametco Manufacturing Company.] [Selected by Architect from manufacturer's standard range.] [Custom color as selected by Architect.]

### **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 11 - Gate Operators 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.] [305 mm.]
    - b. Intermediate line posts: [10 inches.] [254 mm.]
  2. Allow [8 inches] [203 mm] [\_\_\_\_\_] minimum embedment of posts.
  3. Allow [6 inches] [152 mm] [\_\_\_\_\_] 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] [51 mm] 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. 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.
- F. Touch-up damaged finish with paint supplied by manufacturer and matching original coating.

**END OF SECTION**