



12144 Sussex Highway
Greenwood, DE 19950
(302) 349-9091

Division 32
32-31-00

FENCES AND GATES

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Commercial ornamental aluminum fence system.
- B. Industrial ornamental aluminum fence system.
- C. Pedestrian walk gates.
- D. Commercial / Industrial / Estate Gates.
- E. Cantilever Gates.

1.2 RELATED SECTIONS

- A. Section 02300 - Earthwork.
- B. Section 03300 - Cast-In-Place Concrete.

1.3 REFERENCES

- A. ASTM - American Society for Testing and Materials:
 - 1. ASTM B 221/B 221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Shapes and Tubes.
- B. American Architectural Manufacturers Association (AAMA): AAMA 2604 - Voluntary Specification, Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels.
- C. American Welding Society (AWS):
 - 1. AWS D1.1 - Structural Welding Code - Steel (copyrighted by AWS, ANSI approved).
 - 2. AWS D1.2 - Structural Welding Code - Aluminum (copyrighted by AWS, ANSI approved)

1.4 SUBMITTALS

- A. General: Submit under provisions of Section 01300 - Submittal Procedures.
- B. Product Data: Submit product data showing materials proposed for use. Submit sufficient information to determine compliance with the Drawings and Specifications.
- C. Shop Drawings: Submit shop drawings for each product and accessory required. Include information not fully detailed in manufacturer's standard product data.
- D. Samples:
 - 1. Submit samples for initial color selection. Submit samples of each specified finish. Submit samples in form of manufacturer's color charts showing full range of colors and finishes available. Where finishes involve normal color variations, include samples showing the full, range of variations expected.
 - 2. Submit samples for verification purposes. Additional samples may be required to show fabrication techniques and workmanship. Samples shall be submitted prior to installation.
- E. Closeout Submittals: Submit the following:
 - 1. Maintenance and operation data, including methods for maintaining installed products, and precautions against cleaning materials and methods detrimental to finishes and performance.
 - 2. Warranty documents specified herein.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Manufacturer shall be a firm engaged in the manufacture of ornamental metal fences and gates of types and sizes required and whose products have been in satisfactory use in similar service for a minimum of five years.
- B. Installer Qualifications: Installer shall be a firm that shall have a minimum of two years of successful installation experience with projects utilizing ornamental metal fences and gates similar in type and scope to that required for this project.
- C. Single Source Responsibility: Obtain ornamental metal fences and gates from a single source with resources to produce products of consistent quality in appearance and physical properties without delaying the work.

1.6 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials to the project site in supplier's or manufacturer's original wrappings and containers, labeled with supplier's or manufacturer's name, material or product brand name, if any.
- B. Materials shall be stored in such a manner to ensure proper ventilation and drainage and be protected against damage, weather, vandalism and theft.

1.7 PROJECT CONDITIONS

- A. Field Measurements: Take field measurements prior to fabrication of the work and preparation of shop drawings, to ensure proper fitting of the work. Show recorded measurements on final shop drawings. Notify the Owner and the Architect, in writing, of any dimensions found which are not within specified dimensions and tolerances in the Contract Documents, prior to proceeding with the fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the work.

1.8 WARRANTY

- A. The entire fence and gate system shall have a limited lifetime warranty against defects in workmanship and material. Refer to manufacturer for complete details regarding warranty.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturer: Atlantic Aluminum Products, which is located at
12144 Sussex Hwy, Greenwood, DE 19950
Toll Free Telephone: (888) 388-FENCE
Telephone: (302) 349-9091
Fax: (302) 349-0138
Email: info@aapfence.com
Website: www.aapfence.com
- B. Substitutions: Not permitted.

2.2 MATERIALS

- A. Aluminum Extrusions: 6005-T5 and 6063-T5 alloy in accordance with ASTM B 221/B 221M.
- B. Fasteners: Type 302 stainless steel, self-drilling head screws. Screws shall be painted to match the finish of the fence.
- C. Accessories: Aluminum castings shall be used for post caps, adjustable wall brackets, scrolls, finials and other miscellaneous hardware. Hinges and latches shall be fabricated from aluminum extrusions with stainless steel springs.

2.3 ORNAMENTAL FENCING

- A. Commercial Style Fence System:
 - 1. Product: "Commercial" as manufactured by Atlantic Aluminum Products.
 - 2. Panel Width:
 - a. 6 foot (1829 mm) panels. Notch to notch measurement 69".
 - b. 8 foot (2438 mm) panels. Notch to notch measurement 93".
 - 3. Pickets: 0.750 inch (19.05 mm) by 0.750 inch (19.05 mm) by 0.050 inch (1.27 mm).
 - 4. Rails: 1.5 inch (38.1mm) by 1.25 inch (31.75 mm) by 1.5 inch (38.1 mm).
 - a. Side Wall: 0.075 inch (1.905 mm).
 - b. Top Wall: 0.062 inch (1.57 mm).
 - 5. Posts: 2 inches (51 mm) by 2 inches (51 mm) by 0.062 inch (1.57 mm) wall.
 - 6. Gate Posts: 2 inches (51 mm) by 2 inches (51 mm) by 0.125 inch (3.18 mm) wall.
 - 7. Picket Spacing:
 - a. Commercial 6' Panels: 3.90 inches (99.06 mm).
 - b. Commercial 8' Panels: 3.9375 inches (100.0125 mm).
 - 8. Height: 36 inches (914 mm).
 - 9. Height: 42 inches (1067 mm).
 - 10. Height: 48 inches (1219 mm).
 - 11. Height: 54 inches (1371mm).
 - 12. Height: 60 inches (1524 mm).
 - 13. Height: 72 inches (1829 mm).
 - 14. Height: 84 inches (2134 mm).

15. Alloy: 6005-T5 and 6063-T5
 16. Optional Post: 2.5 inches (64 mm) by 2.5 inches (64 mm) by 0.075 inch (1.91 mm) wall.
 - a. Fence Design:
 - 1) Jamestown
 - 2) Roanoke
 - 3) Charleston
 - 4) Plymouth
 17. Posts:
 - a. Size: 2 inches (51 mm) by 2 inches (51 mm) by 0.062 inch (1.57 mm) wall w/ standard post cap.
 - b. Size: 2.5 inches (64 mm) by 2.5 inches (64 mm) by 0.075 inch (1.91 mm) wall w/standard post cap.
 - c. Size: 3 inches (76.2 mm) by 3 inches (76.2 mm) by 0.100 inch (2.54 mm) wall w/standard post cap.
 18. Accessories: Aluminum castings.
 - a. Post Cap: Ball Cap.
 - b. Rings.
- B. Industrial Style Fence System:
1. Product: "Industrial," as manufactured by Atlantic Aluminum Products.
 2. Panel Width:
 - a. 6 foot (1829 mm) panels. Notch to notch measurement 68".
 - b. 8 foot (2438 mm) panels. Notch to notch measurement 92-1/2".
 3. Pickets: 1 inch (25.4 mm) by 1 inch (25.4 mm) by 0.060 inch (1.524 mm).
 4. Rails: 1.625 inch (41.28 mm) by 1.625 inch (41.28 mm) by 1.625 inch (41.28 mm).
 - a. Side Wall: 0.100 inch (2.54 mm).
 - b. Top Wall: 0.070 inch (1.778 mm).
 5. Posts: 2.5 inches (64 mm) by 2.5 inches (64 mm) by 0.075 inch (1.91 mm) wall.
 6. Gate Posts: 2.5 inches (64 mm) by 2.5 inches (64 mm) by 0.125 inch (3.18 mm) wall.
 7. Picket Spacing:
 - a. Industrial 6' Panels: 3.929 inches (99.7966 mm).
 - b. Industrial 8' Panels: 3.92 inches (99.568 mm).
 8. Height: 42 inches (1067 mm).
 9. Height: 48 inches (1219 mm).
 10. Height: 54 inches (1371mm).
 11. Height: 60 inches (1524 mm).
 12. Height: 72 inches (1829 mm).
 13. Height: 84 inches (2133 mm).
 14. Height: 96 inches (2438 mm).
 15. Alloy: 6005-T5 and 6063-T5
 16. Optional Post: 3 inches (76.2 mm) by 3 inches (76.2 mm) by 0.100 inch (2.54 mm) wall.
 17. Fence Design:
 - a. Jamestown
 - b. Roanoke
 - c. Charleston
 - d. Plymouth
 18. Posts: Size:
 - a. 2.5 inches (64 mm) by 2.5 inches (64 mm) by 0.075 inch (1.91 mm) wall w/ standard post cap.
 - b. Size: 3 inches (64 mm) by 3 inches (64 mm) by 0.100 inch (2.54 mm) wall w/standard post cap.
 19. Accessories: Aluminum castings.

- a. Post Cap: Ball Cap.
- b. Rings

2.4 GATES

- A. Pedestrian walk gate: As manufactured by Atlantic Aluminum Products match style and grade of fencing system. Provide a punch-thru design with heavy-walled aluminum gate frame.
 - 1. Gate Style: Standard as indicated on the Drawings.
 - 2. Gate Style: Custom as indicated on the Drawings.
 - 3. Gate Style: As selected by the Architect from manufacturer's standards.
- B. Commercial / Industrial Estate Gates: As manufactured by Atlantic Aluminum Products provide estate gates as indicated on the drawings, available to match fence style or custom Atlantic Aluminum Products design. Provide heavy-walled all-welded aluminum construction. Gates shall have standard Atlantic Aluminum barrel hinges.
- C. Cantilever Gates:
 - 1. Top Track Cantilever: As manufactured by Atlantic Aluminum Products provide cantilevered gates as indicated on the Drawings. Gates shall have standard four-wheel truck rollers, factory-lubricated sealed bearings and lower roller guides to eliminate lateral movement. Provide heavy-walled all-welded aluminum construction with welded gussets and stainless steel aircraft cable bracing based on opening size. Counter balance will be 1/2 of the opening size.

2.5 FINISH

- A. AAP Advanced Finish: The fence and gate system shall have a finish that meets or exceeds industry standard 2604 tests.
 - 1. Coating Process:
 - a. Pretreatment: Before the finish is applied, a six-stage pretreatment must be applied to assure maximum adhesion and corrosion resistance.
 - b. Stage 1: Alkaline Wash
 - c. Stage 2: Pure Water Rinse
 - d. Stage 3: Chromium Dip Pre-treatment
 - e. Stage 4: Deionized Water Rinse
 - f. Stage 5: Set in Dry Oven
 - g. Stage 6: Triple Coating Finish
 - h. Stage 7: Primer Coat Applied
 - i. Stage 8: Top Coat Applied
 - j. Stage 9: Final Top Coat Applied
 - k. Stage 10: Final Finish in Curing Oven
 - 2. Coating Performance Requirements: Coating meets or exceeds the following.
 - a. Minimum Initial Dry Film Thickness: > 30 microns (1.2 mil) for 80% of measurements, > 25 microns (0.68 mil) or 85% of film thickness specified. Minimum primer > 7.75 microns (0.4 mil)
 - b. Outdoor Weathering Exposure Time: The coating shall maintain its film integrity and at a minimum meet the following color retention, chalk resistance, gloss retention and erosion resistance properties. The architect, owner or contractor should request data relative to the long-term durability of the color(s) selected. Exposure panels must be made available to the architect and/or owner upon request.
 - c. Chalking Resistance (After Weather Exposure) (ASTM D 4214, Met. A): 5 years: Chalk < 8 rating
 - d. Color Retention (After Weather Exposure): 5 year fade: delta E < 5

- e. Gloss Retention (After Weathering): 5 years > 30% retention
- f. Erosion Resistance (After Weathering): 5 years < 10% loss
- g. Humidity Resistance (per ASTM D 2247 or D4585) - no visually apparent change and "few" blisters < size 8 per ASTM D 968)
- h. Resistance to Erosion: < 10%
- i. Abrasion Resistance (per ASTM D 968): Abrasion Coefficient > 20
- j. Salt Spray Corrosion Resistance: 3000 hr < 8 blisters, > 7 scribe
- k. Boiling Water Film Adhesion: No loss of adhesion after 20 minutes in 212OF water

2.6 FABRICATION

- A. Horizontal Rails: Rails shall be "U" channels. Pickets shall pass through holes punched in the top rail. The number of rails shall vary with the style, height and strength of the fence system according to manufacturer's specifications.
- B. Pickets: Pickets shall be fastened to the rails using stainless steel tek screws painted to match the color of the fence. Screws shall be used on only one side of the rail leaving the other side with a clean appearance.
- C. Posts: Posts shall be pre-punched to allow the Horizontal rails to slide in and be attached with stainless steel tek screws. Cast aluminum post caps shall be affixed to all posts. Post size and wall thickness shall be based on manufacturer's recommendations. A gate requires a gate post on both sides.
- D. Gates: Swing gates shall be fabricated to manufacturer's standard methods based on application. Standard hardware should be used.

PART 3 EXECUTION

3.1 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.

3.2 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare the grade and remove surface irregularities, if any, which may cause interference with the installation of fencing.
- C. If preparation and condition is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.3 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Use of non-Atlantic Aluminum Products parts/components will negate manufacturer's warranty.
- C. Fence posts shall be set in accordance with the manufacturer recommended spacing.
- D. Insert fence horizontal rail end into pre-punched posts and fasten with Tek screws.

- E. Center and align posts, place concrete around posts and vibrate or tamp for consolidation. Recheck vertical and top alignment of posts and make necessary corrections.
- F. Install gates plumb, level and secure for full opening without interference. For double gates, install drop rod. Adjust hardware for smooth operation.
- G. Division 2 and Division 3 Sections shall govern post base material requirements.
- H. Gate posts shall be spaced according to the manufacturer's gate drawings, dependent on standard out-to-out gate leaf dimensions and gate hardware selected.
 - 1. Type and quantity of gate hinges shall be based on the application; weight, height and number of gate cycles.
 - 2. The manufacturer's gate drawings shall identify the necessary gate hardware required for the application.
 - 3. Gate hardware shall be provided by the manufacture of the gate and shall be installed per manufacturer's recommendations.

3.4 CLEANING

- A. Leave immediate work area neat at end of each work day.
- B. Clean jobsite of excess materials; scatter excess material from post hole excavations uniformly away from posts. Remove excess material if required.
- C. Clean fence with mild household detergent and clean water rinse well. Mortar should be removed from exposed posts and other fencing material using a 10% 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.

3.5 PROTECTION

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

END OF SECTION