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**SECTION 05 5200  
ALUMINUM RAILING  
PART 1 - GENERAL**

**1.01 SECTION INCLUDES**

- A. Extruded aluminum railing system with cable infill.

**1.02 REFERENCES**

- A. ASTM A 492 - Specification for Stainless Steel Rope Wire.  
B. ASTM B 209 (ASTM B 209M) - Aluminum and Aluminum-Alloy Sheet and Plate.  
C. ASTM B 221 (ASTM B 221 M) - Aluminum-Alloy Extruded Bar, Rod, Wire, Shape and Tube.  
D. ASTM B 429 - Standard Specification for Aluminum-Alloy Extruded Structural Pipe and Tube  
E. AAMA 2604 - Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Pipe.

**1.03 PERFORMANCE REQUIREMENTS**

- A. General: Handrails and railings shall withstand structural loading as determined by allowable design working stresses of materials.
- B. Structural Performance: Provide handrails and railings capable of withstanding the following structural loads without exceeding allowable design working stress of materials for handrails, railings, anchors, and connections.
1. Components and installation shall be in accordance with state and local code authorities.
  2. Components and installation shall follow current ADA and ICC/ANSI A117.1 guidelines.
  3. Top Rail: Shall withstand the following loads.
    - a. Concentrated load of 200 lbf (0.89 kN) applied at any point and in any direction.
    - b. Uniform load of 50 lbf-ft. (0.07 kN-m) applied horizontally and concurrently with uniform load of 100 lbf-ft. (0.14 kN-m) applied vertically downward.
    - c. Concentrated and uniform loads above need not be assumed to act concurrently.
  4. Handrails Not Serving as Top Rails: Shall withstanding the following loads.
    - a. Concentrated load of 200 lbf (0.89 kN) applied at any point and in any direction.
    - b. Uniform load of 50 lbf-ft. (0.07 kN-m) applied in any direction.
    - c. Concentrated and uniform loads above need not be assumed to act concurrently.
  5. Guard Infill Area: Shall withstand the following loads.
    - a. Concentrated horizontal load of 200 lbf (0.89 kN) applied to 1 square foot (0.09 m2) at any point in system, including panels, intermediate rails, balusters, or other elements composing infill area. Loads need not be assumed to act concurrently with loads on top rails in determining stress on guard.
- C. Thermal Movements: Handrails and railings shall allow for movements resulting from 120 deg F (49 deg C) changes in ambient and 180 deg F (82 deg C) surface temperatures. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
- D. Corrosion Resistance: Separate incompatible materials to prevent galvanic corrosion.

**1.04 SUBMITTALS**

- A. Submit under provisions of Section 01 30 00.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
1. Preparation instructions and recommendations.
  2. Storage and handling requirements and recommendations.
  3. Installation methods.
  4. Grout, anchoring cements and paint products.
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- C. Shop Drawings: Submit shop drawings showing fabrication and installation of handrails and railings. Include plans, elevations, sections, details, and attachments to other work.
    - 1. Provide setting diagrams for installation of anchors, location of pockets, weld plates for attachment of rails to structure, and blocking for attachment of wall rail.
    - 2. Indicate all required field measurements to be held.
    - 3. Indicate materials, sizes, styles, fabrication, anchorage and installation details for railing system and infill.
    - 4. Signed and Sealed Shop Drawings to be provided by a Registered Professional Engineer registered in the jurisdiction of the project.
  - D. Manufacturer's Certificates: Certify products meet or exceed specified requirements.
  - E. Closeout Submittals: Provide manufacturer's maintenance instructions that include recommendations for periodic checking and adjustment of cable tension and periodic cleaning and maintenance of all railing and infill components.
  - F. Samples:
    - 1. Post and rail sections, minimum 4 inch (100 mm) long piece of each type.
    - 2. Infill Cable: Minimum 8 inch (200 mm) long piece with end fittings.
    - 3. Verification Samples: For each type of exposed finish required, prepared on components indicated below and of same thickness and metal indicated for the work. If finishes involve normal color and texture variations, include sample sets showing the full range of variations expected.
      - a. 6 inches (152 mm) long sections of each different linear railing member, including handrails and top rails
  - G. Quality Control Submittals:
    - 1. Certificates: Submit certification by the manufacturer that products supplied comply with local regulations controlling use of volatile organic compounds (VOC's).

#### **1.05 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Minimum five years experience in producing aluminum railing systems.
- B. Mock-Up: Provide a mock-up for evaluation of preparation techniques and application workmanship.
  - 1. Finish one complete railing section with infill in area designated by Architect.
  - 2. Do not proceed with remaining work until workmanship is approved by Architect.
  - 3. Reconstruct mock-up as required to produce acceptable work.
  - 4. Accepted mock-ups shall be comparison standard for remaining Work

#### **1.06 INSTALLATION MEETINGS: CONDUCT MEETINGS INCLUDING CONTRACTOR, ARCHITECT, FABRICATOR, INSTALLER AND OTHER SUBCONTRACTORS WHOSE WORK INVOLVES THE RAILING SYSTEM TO VERIFY PROJECT REQUIREMENTS, FRAMING AND SUPPORT CONDITIONS, MOUNTING SURFACES, AND MANUFACTURER'S INSTALLATION INSTRUCTIONS**

#### **1.07 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver to site and store materials in manufacturer's original containers and packaging, with labels clearly identifying product name and manufacturer.
- B. Store products in clean, dry area indoors until ready for installation. Store materials in accordance with manufacturer's instructions.
- C. Protect materials and finish from damage during handling and installation.

#### **1.08 SEQUENCING**

- A. Ensure that shop drawings and other information required for installation of products of this section are furnished to affected trades in time to prevent interruption of construction progress.
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- B. Ensure that products of this section are supplied to affected trades in time to prevent interruption of construction progress.

### **1.09 PROJECT CONDITIONS**

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.
- B. Verify actual openings by field measurements before fabrication; show recorded measurements on shop drawings.
- C. Coordinate field measurements and fabrication schedule with construction progress to avoid construction delays.

### **1.10 PRE-INSTALLATION MEETING**

- A. Convene a pre-installation meeting approximately two weeks before start of construction of railing frame component mounting surfaces. Require attendance of parties directly affecting work of this section, including Contractor, Architect, fabricator, and installer. Review the following:
  - 1. Specific method of installation of components into mounting surfaces.
  - 2. Installation, adjusting, cleaning, and protection of railing system.
  - 3. Coordination with other work.

### **1.11 COORDINATION**

- A. Coordinate work with other operations and installation of adjacent materials to avoid damage.

### **1.12 WARRANTY**

- A. Warranty:
  - 1. Infill Cables and Connectors: 10 year limited warranty against defects in materials and workmanship.
  - 2. Powder Coat Finish on Aluminum Extrusions and Components: 10 year limited warranty against cracking, flaking, blistering, and peeling.

### **1.13 EXTRA MATERIALS**

- A. See Section 016000 - Product Requirements, for additional provisions.
- B. Provide one, approximately 3 ounce (85 grams) can of touch-up paint per 100 feet (30 m) of each color railing.

## **PART 2 - PRODUCTS**

### **2.01 MANUFACTURERS**

- A. Basis-of-design product: American Metal Specialties (Prism AMS Holdings Inc., cablerailings.com), which is located at: 2511 S. Holgate St.; Tacoma, WA 98402; Tel: 253-272-9344; Fax: 253-627-3843; Email: paul@cablerailings.com; Web: www.cablerailings.com
- B. Requests for substitutions will be considered in accordance with provisions of Section 01 6000.

### **2.02 MATERIALS**

- A. Aluminum: Alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated, and with not less than strength and durability properties of alloy and temper designated below for each aluminum form required.
  - 1. Extruded Bar and Tube: ASTM B 221 (ASTM B 221 M), alloy 6063-T5/T52
  - 2. Extruded Structural Pipe and Tube: ASTM B 429, alloy 6063-T832.
  - 3. Plate and Sheet: ASTM B 209 (ASTM B 209M), alloy 6061-T6.
- B. Cables: 3/16" inch (3.2 mm) diameter, 1 by 19 construction, ASTM A 492, Type 316 stainless steel, polished finish, commercial, dry grade cable with fittings specified below.

1. Fittings:
  - a. Cable Terminals: per design. terminals attached to end fitting.
  - b. Include washers, nuts, end caps and any accessory items as recommended by manufacturer for installation conditions shown on Drawings.

### **2.03 COMPONENTS**

- A. Posts: 2-3/8 inch (61 mm) square by 3/32 inch (2.4 mm) thick extruded aluminum tube.
  1. Surface mount as shown on Drawings.
- B. Base Plate: 5" x 5" x 3/8" thick aluminum plate.
- C. Cap Rail:
  1. Series 200: 3-1/2 inch by 1-1/4 inch (89 by 32 mm) by 3/32 inch (2.4 mm) thick extruded aluminum rectangular profile.
- D. Cap Infill Channel: Extruded aluminum profile configured to secure specified infill.
- E. Foot Rail Extruded aluminum profile configured to secure specified infill.
- F. Infill:
  1. Horizontal Cable
- G. Fasteners for Interconnecting Railing Components: Stainless steel screws of type and size recommended by railing manufacturer.
- H. Fasteners for Connecting Components to Other Construction: Type and size as shown on Drawings.
- I. Aluminum end caps for exposed open ends of rails, tubes, and profiles.

### **2.04 ACCESSORIES**

- A. Grab Rail: 1-1/2 (38.1 mm) to 1-5/8 inch (41 mm) diameter extruded aluminum tube. Provide where shown on Drawings.
- B. Brackets: Cut from extruded aluminum profile

### **2.05 2.05 FINISH**

- A. Shop Finish: Powder coat.
- B. Color: Black

### **2.06 FABRICATION**

- A. Fabricate members and assemblies in accordance with approved shop drawings.
- B. Assemble items to largest extent practical to minimize field splicing. Disassemble as required for shipping. Clearly identify each unit for installation
- C. Conceal fasteners and welds as much as design will allow.
- D. Connect non-welded members using manufacturer's standard concealed fasteners and fittings unless otherwise indicated.
- E. Close exposed ends of railing members with manufacturer's standard end fittings.
- F. Provide manufacturer's standard brackets, fittings, flanges, and anchors for connection to other work unless otherwise indicated on the approved shop drawings.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Do not begin installation until substrates have been properly prepared.
- B. Verify mounting conditions are in accordance with manufacturer's recommendations.

### **3.02 PREPARATION**

- A. Clean surfaces thoroughly prior to installation.

- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

### **3.03 INSTALLATION**

- A. Install in accordance with manufacturer's instructions.
- B. Provide anchorage devices and fittings to secure railings to in-place construction, including threaded fittings for concrete inserts, toggle bolts and through-bolts.
- C. Install railing system plumb, level, square, and rigid.
- D. Separate dissimilar materials with bushings, gaskets, grommets, washers or coatings where required to prevent electrolytic corrosion.
- E. Use manufacturer's supplied cable and hardware.
- F. Terminate and tension cables in accordance with manufacturer's instructions.
- G. Ensure cables are clean, parallel to each other, and without kinks.
- H. ADJUSTING
- I. Adjust cable tension with connecting hardware in accordance with manufacturer's instructions.

### **3.04 CLEANING**

- A. Remove temporary coverings and protection of adjacent work areas. Clean installed products in accordance with manufacturer's instructions before owner's acceptance.
- B. Remove from project site and legally dispose of construction debris associated with this work

### **3.05 PROTECTION**

- A. Protect installed products until completion of project.
- B. Replace defective or damaged components as directed by Architect.
- C. Touch-up, repair or replace damaged products before Substantial Completion.

### **3.06 SCHEDULES**

- A. :
- B. :

**END OF SECTION 05 5200**