



## 100 Series Cable Rail-A1 Top Cap

### PART 1 General

#### 1.1 SECTION INCLUDES

- A. Cable Railing Series with Mushroom Top Cap and Tenseline/Cable pickets.

#### 1.2 RELATED SECTIONS

- A. Section 05510 – Metal Stairs: Metal handrails other than those specified in this section.
- B. Section 05521- Aluminum Handrails and Railings
- C. Section 05710 – Decorative Metal Stairs
- D. Section 05720- Ornamental Handrails and Railings

#### 1.3 REFERENCES

- A. Aluminum Association (AA): AA DAF-45 Designation System for Aluminum Finishes.
- B. ASTM B 26/B 26M – Standard Specification for Aluminum Alloy Sand Castings; 2005
- C. ASTM B 209 –Standard Specification for Aluminum and Aluminum-Alloy Sheet Plate; 2004.
- D. ASTM B 210- Standard Specification for Aluminum and Aluminum Alloy Drawn Seamless Tubes; 2004
- E. ASTM B 221- Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2005
- F. ASTM B 247 – Standard Specification for Aluminum and Aluminum-Alloy Die Forgings, Hand Forgings, and Rolled Ring Forgings; 2000.
- G. ASTM B 429-Standard Specification for Aluminum-Alloy Extruded Structural Pipe and Tube; 2002
- H. ASTM C 1107 – Standard Specification for Packaged Dry, Hydraulic-Cement Grout (non-shrink); 2002
- I. ASTM E 488 – Standard Test Methods for Strength of Anchors in Concrete and Masonry Elements; 1996

#### 1.4 PERFORMANCE REQUIREMENTS

- A. General: Handrails and railings shall withstand structural loading as determined by allowable design working stresses of materials based on the following standards.

1. Aluminum: AA30

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. Top Rail and Supports:

a. Capable of withstanding a concentrated load of 200 pounds (90.6 kg) with a safety factor of x2.5 for a total load of 500lb applied to top rail at any point and in any direction

b. Capable of withstanding a uniform load of 50 pounds per linear foot (74.3 kg), with a safety factor of x2.5 for a total load of 125lb applied to top rail horizontally with a simultaneous load of 100 pounds per linear foot (148.6 kg/m) with a safety factor of x2.5 for a total load of 125lb applied vertically downward.

c. The railing design is not intended for both concentrated and uniform loads to be applied concurrently.

2. Handrails Not Serving as Top Rails:

a. Concentrated load of 50 pounds per foot (0.07kN) with a safety factor of x2.5 for a total load of 125lb applied at any point and in any direction

b. Uniform load of 50-lbf-ft. (0.07kN) with a safety factor of x2.5 for a total load of 125lb applied in any direction

c. Concentrated and uniform loads need not be assumed to act concurrently

3. Guard Infill Area: Shall withstand the following loads:

a. Concentrated horizontal load of 125 lbf (0.55kN) applied to 1 sq. ft. 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.

E. A registered structural engineer, licensed in the location that the project is located, in shall prepare manufacturer's structural calculations.

## 1.5 SUBMITTALS

A. Submit under provisions of Section 01300.

B. Products 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 instructions and methods
4. Description of materials, components, fabrication, and finishes.
5. Structural computations and test reports provided by the manufacturer evidencing compliance with the specifications.

C. Shop Drawings: Submit manufacturer's shop drawings, including plans, elevations, sections, and details, indicating materials components, sizes, dimensions, tolerances, hardware, fasteners, finishes, options, accessories, and installation. Show details of attaching railing system to support.

D. Test and Evaluation Reports

1. Submit test reports prepared by an independent testing laboratory indicating full compliance with specified requirements and ASTM E985.

E. Selection Samples: For each finish product specified, two complete sets of color and finish chips representing manufacturer's full range of available colors and finishes.

F. Verification of Samples: For each finish product specified, two samples, minimum size 6 inches (150 mm) square that represents actual product, color, and patterns.

G. Assembly Samples: Provide assembled samples of railings sections, fabricated from full-size components, including top rail, post, handrail, and infill and showing method of finishing intersections.

H. Manufacturer's Certificates: Certify products meet or exceed specified requirements.

I. Maintenance Instructions: Submit manufacturer's maintenance and cleaning instructions.

## 1.6 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with minimum ten (10) years documented experience.

B. Installer Qualifications: Manufacturer's trained installers or an installer acceptable to the manufacturer.

C. Mock-Up: Provide a mock up for elevation of surface preparation techniques and application workmanship.

1. Finish areas designated by Architect

2. Installer Qualifications: Manufacturer's trained installers or an installer acceptable to the manufacturer.

3. Refinish mock-up area as required to produce acceptable work.
4. Remove mock-up when no longer needed.
5. Mock-up may remain as part of the work.

#### 1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver and store materials to site in manufacturer's original, unopened 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.

#### 1.8 Sequencing

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

#### 1.9 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. 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 show drawings.

C. Coordinate field measurements and fabrication schedule with construction progress to avoid construction delays.

### 1.11 COORDINATION

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

### 2.1 PRODUCTS

A. Acceptable Manufacturer:

Atlantic Aluminum Products Incorporated, which is located at 12144 Sussex Highway; Greenwood, DE 19950; Toll Free: 801-601-1870, Telephone: (302) 349-9091, Fax: (302) 349-0138, Email: aap@atlanticaluminumproducts.com, Web: aaprailing.com.

B. Requests for substitutions will be considered in accordance with provisions of Section 01600.

### 2.2 CABLE RAIL MATERIALS

A. Extrusion Alloy: Aluminum 6063-T5, 6063-T-6, 6061-T6, or 6005A-T61.

B. Screws and anchors: All screws and anchors are made of corrosion resistant material.

C. Tensiline: Stainless steel cable railing system designed and constructed using stainless steel cables and a selection of stainless steel fittings and turnbuckles.

1. Series: Square Tube
2. Frame Material Aluminum
  - a. enamel
  - b. kynar
3. Cable Diameter: 3/16 inch (4.5mm)
4. Guardrail Height: 42 inches (1067mm)

D. Top Rail: Mushroom Cap

1. Top Rail Profile: 2-1/2 inches (63.5mm) wide by 1-5/8 inches (41.148 mm) high

E. Post

1. Post Dimension: 1-3/4 inches square (44.45mm) square

F. Colors and Finishes

A. Colors:

White: Duracron White UC -107616

Duranar White: UC-96818

Black: Duracron S600 L/G Black UC- 61204  
Bronze: Duranar XL Bronze UC-96808  
Duracron Bronze: UC-66721  
Clay: UC 100603

B. Finishes:

1. Electrostatic Paint: Acrylic coating which conforms to specification outlined in AAMA 2603.
2. Kynar: Two part coat system (primer and paint). Conforms to specification outlined in AAMA 2605 to offset the corrosive effects of weathering and to protect color pigments from chalking and fading.
3. Kynar-XL: Three part coat system (primer, paint, XL). Conforms to specification outlined in AAMA 2605 to achieve the highest possible corrosion defense and protects color pigments from chalking and fading.

## 2.3 FASTENERS

A. Handrail Anchors: Select fasteners of type, grade and class required to produce connections suitable for anchoring handrails and railings to other types of construction indicated and capable of withstanding design loads.

B. Handrail and Railing Component Anchors: Use fasteners fabricated from same basic metal, unless otherwise indicated. Do not use metals that are corrosive or incompatible with materials joined.

1. Provide concealed fasteners for connecting railing components and for attaching them to other work, unless exposed fasteners are unavoidable or are a standard fastening method for handrail and railing indicated.

## 2.4 GROUT AND ANCHORING CEMENT

A. Non-shrink, nonmetallic grout: Premixed, factory-packaged, non-staining, non-corrosive, non-gaseous grout complying with ASTM C 1107. Provide grout specifically recommended by manufacturer for interior and exterior applications.

B. Interior Anchoring Cement: Factory-packaged, non-shrink, non-staining, hydraulic-controlled expansion cement formulation for mixing with water at project site to create pourable anchoring, patching and grouting compound. Use for interior application only.

## 2.5 Fabrication

A. Assemble handrails and railings in shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations.

Clearly mark units for reassembly and coordinated installation. Use connections that maintain structural value of joined pieces.

B. Form changes in direction of railing members as shown in the Contract Drawings.

C. Mechanical Connections: Fabricate handrails and railings by connecting members with railing manufacturer's standard concealed mechanical fasteners and fittings, unless otherwise indicated. Fabricate members and fittings to produce flush, smooth, rigid, hairline joints.

D. Brackets, Flanges, Fittings, and Anchors: Provide the manufacturer's standard wall brackets, flanges, miscellaneous fittings to connect the handrail and railing members to other construction.

E. Shear and punch metals cleanly and accurately. Remove burrs from exposed cut edges.

F. Shear and punch metals cleanly and accurately. Remove burrs from exposed cut edges.

G. Cut, reinforce, drill and tap components as indicated on drawings to receive finish hardware, screws, and similar items.

H. Close exposed ends of railing members with prefabricated end fittings.

I. Provide mounted handrails walls returns at wall ends unless otherwise indicated. Close ends of returns, unless clearance between end railing and wall is ¼ inch (6mm) or less.

## 2.6 FINISHES

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for applying and designating finishes.

B. Appearance of Finished Work:

1. Variations in appearance of abutting or adjacent units are acceptable if they are within one-half of the range of approved samples. Noticeable variations in the same unit are not acceptable.

2. Variations in appearance of other components are acceptable if they are within the range of approved samples and are assembled or installed to minimize contrast.

C. Finish Coating: Prepare, pre-treat, and apply coating to exposed metal surfaces to comply with manufacturer's written instructions.

## PART 3 EXECUTION

### 3.1 EXAMINATION

A. Do not begin installation until substrates have been properly prepared.

B. Verify field measurements are acceptable to suit railing assembly tolerances.

C. Verify Supports and anchors are correctly positioned.

- D. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

### 3.2 PREPARATION

- A. Supply items required to be cast into concrete or embedded in masonry with setting templates to appropriate areas.
- B. Take field measurements after permanent end transitions are in place and prior to preparation of shop drawings and fabrication, to ensure fitting of work.
- C. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

### 3.3 INSTALLATION

- A. Install railing system in accordance with the approved shop drawings and manufacturer's instructions.
- B. Install railing system plumb, level, square, true to line, and rigid.
- C. Attached railing system securely in place using fasteners approved by manufacturer and indicated on the approved shop drawings.
- D. Use supplied plastic insulator plates or use a coat of bituminous paint to conceal surfaces of aluminum that will be in contact with grout, concrete, masonry, wood, or dissimilar metals.
- E. Repair minor damages to finish in accordance with manufacturer's instructions and as approved by Architect.
- F. Remove and replace defective or damaged components that can not be successfully repaired as determined by Architect.

### 3.4 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 project completion.