



## COMMERCIAL PRODUCTS

### SECTION 05720 ARCHITECTURAL GLASS HANDRAIL AND RAILINGS 3-Line Glass Rail Railing Spec

#### **PART 1 - GENERAL**

##### **1.01 WORK INCLUDED**

- A. Furnish and install [aluminum] railings and components.

##### **1.02 REFERENCE**

- A. American Architectural Manufacturers Association (AAMA)
  - 1. AAMA 2605-98 Specification for Superior Performing Organic Coatings on Architectural Extrusions and Panels.
- B. American National Standards Institute (ANSI)
  - 1. A21.1 Safety Requirements for Floor and Wall Openings, Railings and Toe Boards.
  - 2. A58.1 Minimum Design Loads in Buildings and Other Structures.
  - 3. A117.1 Accessible and Usable Buildings and Facilities.
  - 4. Z97.1 Safety Performance Specifications and Methods of Test for Safety Glazing Materials Used in Buildings.
  - 5. E2358 – Standard Specification for the Performance in Permanent Glass Railings, Guards and Balustrades.
- C. American Society for Testing and Materials (ASTM)
  - 1. E 985 Specifications for Permanent Metal Railing Systems and Rails for Buildings.
- D. Standard Building Code (S.B.C.)
- E. Americans with disabilities act accessibility guidelines (ADA)
- F. National Association of Architectural Metal Manufacturers (NAAMM)
  - 1. Metal Finishes Manual
  - 2. Pipe Railing Manual
  - 3. Stair Manual
- G. American Welding Society D1.2 (AWS)
- H. ASTM C 1048- Standard Specification for Heat Treated Flat Glass—Kind HS, Kind FT Coated and Uncoated Glass; 1997b.



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### 1.03 STRUCTURAL REQUIREMENTS

- A. 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 of Guards: Shall withstand the following loads:
    - a. Concentrated load of 200 lbf (0.89kN) applied at any point and in any direction.
    - b. Uniform load of 50 lbf-ft. (0.07kN-m) applied horizontally and concurrently with uniform load of 100 lbf-ft. (0.14kN-m) applied vertically downward.
    - c. Concentrated and uniform loads above need not be assumed to act concurrently.
  2. Handrails Not Serving As Top Rails: Shall withstand the following loads:
    - a. Concentrated load of 200 lbf (0.89kN) applied at any point and in any direction
    - b. Uniform load of 50 lbf-ft. (0.07kN-m) applied in any direction
    - c. Concentrated and uniform loads above need not be assumed to act concurrently.
  3. Guards Infill Area: Shall withstand the following loads:
    - a. Concentrated horizontal load of 200 lbf (0.89kN) applied to a 1sq. 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.
- B. Thermal Movements: Design handrails and railings to allow for movements resulting from 120 degree F (49 C) changes in ambient and 180 degree F (82 C) surface temperatures. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
- C. Corrosion Resistance: Separate incompatible materials to prevent galvanic corrosion.

### 1.04 SUBMITALS

- A. Shop drawings reflect welding, fabrication and installation of handrails including all plans, typical elevations, sections, details of components, anchor details, and attachment to adjoining units of work. Submittal data shall be in accordance with provisions of applicable specification section.
- B. Samples of manufacturers' standard color chart. For custom colors 2 chips will be submitted for color match and approval by architect or owner.

### 1.05 QUALITY ASSURANCE

- A. Acceptable Manufacturer: Trex Commercial Products Company, 7008 Norhtland Drive North, Suite 150; Minneapolis, MN 55428; Toll Free Tel: 877-215-RAIL(7245); Email: [info@trexcommercial.com](mailto:info@trexcommercial.com).



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- B. Manufacturer Qualifications: All primary products specified in this section will be supplied by a single manufacturer with a minimum of five (5) years of experience.
- C. Railing System:
  - 1. System components: Pre-engineered, designed by licensed Professional Structural Engineer.
  - 2. Attachments to building structure: Designed by Professional Structural Engineer licensed in State in which project is located.
- D. Perform Work in accordance with ASTM E985.

### **1.06 DELIVERY, STORAGE AND HANDLING**

- A. Materials to be delivered to the job site in good condition and adequately protected against damage as handrails are a finished product.
- B. Storage on site in a location and manner to avoid damage. Stacking should be done in a manner that will prevent bending. Store material in a clean, dry location away from uncured concrete and masonry. Any protection on the railings during transportation should remain until installed.
- C. Keep handling on site to a minimum. Exercise caution to avoid damage to finishes of material.

### **1.07 PROJECT CONDITIONS**

- A. Field Measurements: Where handrails and railings are indicated to fit to other construction, check actual dimensions of other construction by accurate field measurements before fabrication. Where field measurements cannot be made without delaying the railing fabrication and delivery, obtain guaranteed dimensions in writing by the contractor or architect and proceed with fabrication of products so as not to delay fabrication, delivery and installation.
- B. Coordinate fabrication and delivery schedule of handrails with construction progression and sequence to avoid delay of railing installation.



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### PART 2 – PRODUCTS

#### 2.01 MANUFACTURERS

- A. Acceptable Manufacturer: Trex Commercial Products Company, 7008 Norhtland Drive North, Suite 150; Minneapolis, MN 55428; Toll Free Tel: 877-215-RAIL(7245); Email: [info@trexcommercial.com](mailto:info@trexcommercial.com).

#### 2.02 MATERIALS AND FINISHES (Choose from applicable material specification below)

A. Aluminum:

1. Extrusions: Alloy 6063-T6, 6036-T5, 6005-T5or 6061-T6 meeting ASTM B 221
2. Extruded Bars, Shapes and Mouldings: Alloy 6063-T52 or Alloy 6063-T6 meeting ASTM B 221
3. Castings: Almag 35 meeting ASTM B 26
4. All components shall be as detailed be as detailed on the architectural drawings.
5. All components shall be factory welded one to another by AWS certified welders, except where splices are required.
6. Finish (refer to NAAMM Metal Finishes Manual).
7. Grout and anchoring cement are to be Bonsal Anchor Cement.

B. Finishes:

1. Painted finish shall be Kynar 500 2-coat standard factory color and shall meet the requirements of AAMA 2605-98 specification for high performance organic coatings. Finish Designations prefixed by "AA" conform to the system established by The Aluminum Association for designating aluminum finishes. Chemical Pretreatment (AA-C12C42R1x): Aluminum shall be cleaned with inhibited chemicals and the surface chemically converted to amorphous chromium phosphate to conform to ASTM 1730, Type B, Method 5, prior to coating. High Performance Organic Coating: Apply manufacturer's standard [2-coat thermo-cured system composed of specially formulated inhibited primer, a fluoropolymer color coat containing not less than 70% polyvinylidene fluoride resin by weight. Provide coating which has been field tested under normal range of weathering conditions for a minimum of 10 years without significant peel, flake, chip, crack, or check in the finish, and without chalking in excess of 8 (ASTM D 659) and without fading in excess of 5 NBS units.
2. Interior Exit Stair rails use a standard white or black powder coat finish.

C. Railing System:



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1. 3-Line rail Glass rail system using a 3 inch round top cap; 2 inch square post; 2" x 1" intermediate and bottom glass channels. 3/8" tempered glass with polished vertical edges. Top cap will be curved as required with segmented channel and glass sections.

### **2.03 FASTENERS**

1. All mechanical fasteners used shall be manufactured from stainless steel.

### **2.04 FABRICATION**

1. All mitered and welded corners shall be ground down smooth before finishing unless otherwise noted.
2. Make exposed joints butt tight and flush.
3. Interior sleeves shall be of used for typical splices.
4. Fasteners are allowed at splice connection.
5. Verify dimensions on site prior to shop fabrication.
6. Horizontal Channels shall be punched to receive pickets and welds in this application shall be concealed from view.
7. Provide weep holes when necessary to drain closed sections from pretreatment immersion and finishes. Provide weep holes when necessary for moisture from condensation to escape.



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### **PART 3 – EXECUTION**

#### **3.01 PREPERATION**

- A. Coordinate post setting drawings, diagrams, templates, instructions, and directions for installation of anchorages, such as sleeves, concrete inserts, anchor bolts, and miscellaneous items having integral anchors that are to be embedded in concrete as masonry construction. Coordinate delivery of such items to project site. Should railings require wall mounting, wood blocking will be provided by the contractor to secure to.

#### **3.02 INSTALLATION**

- A. Fit exposed connections accurately together to form tight joints, except as necessary for expansion.
- B. Perform cutting, drilling, and fitting required for installation of handrails. Set handrails and accurately in location, alignment, and elevation, measured from established lines and levels.
- C. Leave anchoring material down approximately 1/2" allowing for final topping with a waterproof material matching the surrounding areas by others.
- D. Set posts plumb within a tolerance of 1/8".
- E. Fastening to In-Place Construction: Provide anchorage devices and fasteners where necessary for securing handrails and railings to in-place construction.

#### **3.03 ANCHORING POSTS**

- A. Anchor post in concrete by means of preset sleeves into concrete. After posts have been inserted into sleeves, fill space between post and sleeve solid with Bonsal Anchor Cement, CGM Anchoring Cement or Sonnaborn anchoring cement.
- B. Anchor posts in concrete by core drilling holes not less than 3" deep and 1" greater than outside diameter of post. Clean holes of all loose material, insert posts, and fill space between post and concrete with Bonsal Anchor Cement.

#### **3.04 CLEANING AND PROTECTION**



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- A. Upon delivery railing will have protective wrapping over cap only. Immediately upon completion of installation of railing installer shall remove cap cover and clean all work for inspection and approval.
- B. After installation the General Contractor or Owner shall be responsible for protecting the railings during the balance of construction.
- C. When cleaning painted aluminum surfaces use plain water containing a mild soap or detergent. No abrasive agents or harsh chemicals are to be used.

**END OF SPECIFICATION**



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