



COMMERCIAL PRODUCTS

SECTION 05720

ARCHITECTURAL GLASS HANDRAIL AND RAILINGS

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)



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- 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.

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 (0.899kN) 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 to be assumed to act concurrently.

 - 2. Handrails Nor 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 to be assumed to act concurrently, with loads on top rails in determining stress on guard.



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- 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 SUBMITTALS

- A. Submit under provisions of Section 01300.
- B. [Product Data]: Manufacturer to submit approval drawings to include the following:
 - 1. Section details.
 - 2. Mounting methods.
 - 3. Typical Elevations.
 - 4. Key plan layouts
- C. Shop Drawings: Drawings showing fabrication and installation of handrails including plans, elevations, sections, details of components, anchor details, and attachment to adjoining units of work.

1.05 QUALITY ASSURANCE

- A. Acceptable Manufacturer: Trex Commercial Products, 7008 Northland Drive North, Suite 150; Minneapolis, MN 55428; Toll Free Tel: 877-215-7245; Email: info@trexcommercial.com
- B. Manufacturer Qualifications: All primary productions specified in this section will be supplied by a single manufacturer with a minimum of five (5) years of experience.
- C. Railing System:
 - a. System components: Pre-engineered, designed by licensed Professional Structural Engineer.
 - b. Attachments to building structure: Designed by Professional Structural Engineer licensed in State in which project is located.
- D. Perform Work in accordance with ASTM #985.



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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. Store 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.
- B. Where field measurements cannot be made without delaying the railing fabrication and delivery, obtain guaranteed dimensions in writing by the Contractor and proceed with fabrication of products to not delay fabrication, delivery and installation.
- C. Coordinate fabrication and delivery schedule of handrails with construction progress and sequence to avoid delay of railing installation.



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PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Acceptable Manufacturer: Trex Commercial Products, 7008 Northland Drive North, Suite 150; Minneapolis, MN 55428; Toll Free Tel; 877-215-7245; Email; info@trexcommercial.com.
MATERIALS AND FINISHES.

2.02 MATERIALS AND FINISHES

MATERIALS

- A. All Stainless Steel tubing to be 304 or 316.
- B. Extruded Bars, Shapes and Mouldings: Alloy 6063-T52 or Alloy 6063-T6 meeting ASTM B 221
- C. Castings: Almag 35 meeting ASTM B 26
- D. All components shall be as detailed be as detailed on the architectural drawings
- E. All components shall be factory welded one to another by AWS certified welders, except where splices are required.
- F. Finish (refer to NAAMM Metal Finishes Manual).
- G. Grout and anchoring cement are to be Bonsal Anchor Cement.

FINISHES:

- A. 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.
- B. Interior Exit Stair rails use a standard white or black powder coat finish.
- C. Railing System:



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- a. Two-Line rail Glass rail system using a 3-inch round top cap; 2 inch square post with $\frac{1}{4}$ " wall thickness; 2" x 1.5" bottom glass channel. Glass will be $\frac{3}{8}$ " tempered with polished vertical edges.

2.03 FASTENERS

- A. All mechanical fasteners used shall be manufactured from stainless steel.

2.04 FABRICATION

- A. All mitered and welded corners shall be ground smooth to match finish.
- B. Make exposed joints butt tight and flush.
- C. Interior sleeves shall be used for typical splices.
- D. Fasteners are allowed at splice connection.
- E. Verify dimensions on site prior to shop fabrication.



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PART 3 EXECUTION

3.01 PREPARATION

- A. Coordinate post setting drawings, diagrams, templates, instructions, and directions for installation of anchorages. These include items such as sleeves, concrete inserts, anchor bolts, and miscellaneous items having integral anchors that are to be embedded in concrete and masonry construction.
 - 1. Coordinate delivery of anchorages to project site.
 - 2. Coordinate that blocking is in place for all mounting fasteners.
- B. Clean debris and dust from surfaces and embed holes thoroughly prior to installation.
- C. Prepare surfaces using the methods recommended by the manufacturer for achieving proper results given the substrate and project conditions.

3.02 INSTALLATION

- A. Install in accordance with manufacturer's drawings and direction.
- B. Fit exposed connections accurately together to form tight joints except as necessary for expansion.
- C. Perform cutting, drilling, and fitting required for installation of handrails. Accurately set handrails in location, alignment, and elevation, measured from established lines and levels.
- D. Set posts plumb within a tolerance of 1/8 inch (3 mm).
- E. When fastening to in-place construction, provide anchorage devices and fittings to properly secure rail to in-place construction. Examples of such devices include threaded fittings (for concrete inserts), toggle bolts and through-bolts. Separate dissimilar materials with bushings, grommets or washers to prevent electrolytic corrosion.

3.02 PROTECTION

- A. Upon delivery railing may have protective wrapping. At completion of railing installation, immediately remove any protective wrapping and clean all work for inspection and approval.
- B. After installation, General Contractor or Owner shall be responsible for protection of railings during the balance of construction.
- C. When cleaning stainless steel surfaces use plain water containing a mild soap or detergent. No abrasive agents or harsh chemicals shall be used.

END OF SECTION