



For Home, For Life.®
www.rdirail.com



SECTION 05 73 00

ORNAMENTAL STEEL RAILINGS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Ornamental steel railings.
- B. Related Sections:
 - 1. Section 05 52 00
 - 2. Section 05 52 13

1.2 DEFINITIONS

- A. Railings: Guards, handrails, and similar devices used for protection of occupants at open-sided floor areas and for pedestrian guidance and support, visual separation, or wall protection.

1.3 REFERENCES

- A. American Society for Testing and Materials (ASTM)
 - 1. ASTM A123/A123M-13 Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
 - 2. ASTM A 307-14 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rods 60,000 psi Tensile Strength.
 - 3. ASTM A500/A500m-13 - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
 - 4. ASTM A751-14a Standard Test Methods, Practices, and Terminology for Chemical Analysis of Steel Products.
 - 5. ASTM B117-11 Standard Practice for Operating Salt Spray (Fog) Apparatus
 - 6. ASTM E8/8M-13a Standard Test Methods for Tension Testing of Metallic Materials.
 - 7. ASTM E488/E488M-10 Standard Test Method for Strength of Anchors in Concrete Elements.
 - 8. ASTM E894-88 (2010) Standard Test Method for Anchorage of Permanent Metal Railing Systems and Rails for Buildings.
 - 9. ASTM E935-13e1 Standard Test Methods for Performance of Permanent Metal Railing Systems and Rails for Buildings.
 - 10. ASTM E1481-00a(2014)e1 - Standard Terminology of Railing Systems and Rails for Buildings
 - 11. ASTM E2349-12 Standard Practice for Safety Requirements in Metal Casting Operations and Sand Preparation; Molding and Core Making; Melting and Pouring; and Cleaning and Finishing.
 - 12. ASTM F593-13a Standard Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs

13. ASTM F606/F606M-14a Standard Test Methods for Determining the Mechanical Properties of Externally and Internally Threaded Fasteners, Washers, Direct Tension Indicators and Rivets
14. ASTM F879-12 Standard Specification for Stainless Steel Socket Button and Flat Countersunk head Cap Screws

B. International Code Council (ICC):

1. International Building Code (IBC)
2. International Residential Code (IRC)

C. International Conference of Building Officials (ICBO):

1. ICBO UBC - Uniform Building Code.

1.4 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1.5 DELEGATED DESIGN REQUIREMENTS

- A. Delegated Engineering Responsibility: Require ornamental metal railings installer to employ a professional engineer, licensed in the state where the project is located, to provide an engineering design for connections of the railings to adjacent building construction required to meet concept expressed in the Contract Documents that includes the following:

1. Comprehensive engineering analysis indicating location, type, magnitude, and direction of loads imposed on building construction.
2. Preparation of engineering calculations, shop drawings, and other submittals with professional seal affixed according to respective jurisdictional licensing regulation.

1.6 PERFORMANCE REQUIREMENTS

A. Structural Requirements:

1. Excalibur® steel rail systems performance meets or exceeds design loading specified in Chapter 16 of the IBC, Section R301 of IRC, and UBC Chapter 16.

- B. Structural Performance: Comply with performance requirements specified, as determined by testing of manufacturer's standard ornamental aluminum railings representing those indicated for this Project without failure due to defective manufacture, fabrication, installation, or other defects in construction.

- C. Structural Requirements: Engineer ornamental metal railings to withstand live and dead loads according to authorities having jurisdiction, applicable local building codes, and information indicated within limits and under conditions indicated, without material failure or permanent deformation of structural members.

1. Handrails and Top Rails of Guards:

- a. Uniform Load: 50 lbf/lin ft applied in any direction.
- b. Concentrated Load: 200 lbf applied in any direction.

2. Concentrated Load at Infill of Guards: 50 lbf applied horizontally on an area not to exceed 1 sq ft.

3. Load Assumption: Loads need not be assumed to act concurrently.

1.7 SUBMITTALS

- A. Product Data: Manufacturer's technical literature for each product specified.
 - 1. Include preparation instructions and recommendations.
 - 2. Include storage and handling requirements and recommendations.
 - 3. Include manufacturer's installation instructions
- B. Shop Drawings: Include plans, elevations, sections, and attachment details.
- C. Samples for Initial Selection: For products involving selection of color, texture, or design, including mechanical finishes.
- D. Samples for Verification: For each type of exposed finish required.
 - 1. 8" samples of top and bottom rails.
 - 2. 4" samples of infill/balusters.

1.8 QUALITY ASSURANCE

- A. Installer Qualifications: All products listed in this section should be installed by a single installer with a minimum of five years demonstrated experience in installing products of the same type and scope as specified.

PART 2 - PRODUCTS

2.1 MANUFACTURER

- A. Acceptable Manufacturer: Excalibur® steel railing manufactured by RDI; Address: 545 Tilton Road, Egg Harbor City, New Jersey 08215. Phone: (877) 420-7245. Fax: 866-277-5160. Web: www.rdirail.com.

2.2 MATERIALS

- A. Steel Components:
 - 1. General: Provide steel free from pitting, seam marks, roller marks, stains, discolorations, and other imperfections where exposed to view on finished units.
 - 2. Pre-welded steel panels and posts:
 - a. Rails and Pickets: Grade A cold rolled steel formed and welded tubing conforming to ASTM A500/A500M-13 with G-60 zinc coating (0.60 oz/ft² or 0.27 kf/M²) on both inside and outside surfaces in accordance with ASTM A123/A123M-13 hot dipped electroplating process
 - b. Posts: square formed and welded galvanized steel tubing with welded base and powder-coated factory finish.
- B. Physical Parameters of Railings:
 - 1. Height: [36"][42"].
 - 2. Length: [72"][96"][120"][As indicated on the Drawings].
 - 3. Top Rail: 1" x 1" galvanized steel

4. Bottom Rail: 1" x 1" galvanized steel
5. Vertical Balusters: 5/8" square.
6. Posts: Vertical structural post inserts constructed of 2²/₃" steel tube with a 3.8" x 3.8" x 1/4" thick steel plate welded to steel post. Base plate to have four 7/16" diameter holes for passage of fasteners to attach to mounting surface. Steel tube and plate to have hot dip galvanized finish.
 - a. Posts: [2" x 2" posts for use as blank, line, corner and end post application.[3" x 3" posts for post to post rail systems, in which rails will terminate at posts.]

B. Fasteners: Systems include stainless steel fasteners, all to be concealed upon installation.

2.3 FINISHES

A. 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.

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

1. Individual parts and welded assemblies shall be made from G60 pre-galvanized material
2. Galvanized steel railing components shall be cleaned with a non-petroleum solvent followed by the application of a sealing zinc phosphate coating.
3. Electro coating of parts and welded assemblies shall be a two-component cathodic electrodeposition primer with high corrosion protection followed by a sealing and drying process.
4. Immediately after sealing, a two-step powder finish coating shall be applied by the electrophoresis and electrostatic spray process coating, 3 mil average film thickness.
5. Colors: [Satin black][Bronze].

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Install railings in locations shown in compliance with manufacturer's written instructions. During installation, steel components shall be carefully handled and stored to avoid contact with abrasive surfaces. Install components in sequence as recommended by railing manufacturer.

3.2 CLEANING

A. Remove all traces of dirt and soiled areas

B. Clean by washing thoroughly with clean water and soap, rinsing with clean water, and wiping dry.

3.3 PROTECTION

- A. Protect railings from damage during construction period with temporary protective coverings approved by railing manufacturer. Remove protective coverings at time of Substantial Completion.
- B. Restore finishes damaged during installation and construction period so no evidence remains of correction work. Return items that cannot be refinished in the field.

END OF SECTION