
SECTION 05 73 13 – [ILLUME LED LIGHTED RAILING] [LIVERS BRONZE RAILING SYSTEM]

PART 1 -- GENERAL
Section 1.01 SCOPE OF WORK

- A. Fabricate and install metal [railings] in accordance with the requirements set forth in this section.

Section 1.02 ADDITIONAL WORK INCLUDED IN THIS SECTION

- A. Prime painting of galvanized materials

The following items are not to be included in the metal rail contractor's work:

- *Temporary shoring or bracing*
- *Demolition and removal of existing work*
- *Clean up of existing construction prior to installation of stairs*
- *Cleaning out of stair wells*
- *Cutting; preparation of pockets; setting of plates, inserts, carpenter hardware or any other built ins, core drilling*
- *Sleeves*
- *Reinforcing for wall rail brackets at dry wall partitions*
- *Field measuring*
- *Temporary lights and electricity*
- *Temporary safety rails after erection*
- *Field painting*
- *Electrical conduits, wiring from driver to railings and final electrical connections*
- *Final cleaning and protection of railings*

Section 1.03 RELATED WORK SPECIFIED IN OTHER SECTIONS

- A. Section 02 90 00: Landscaping: Installation Location and Coordination
- B. Section 03 30 00: Cast-in-Place Concrete
- C. Section 03 40 00: Precast Concrete
- D. Section 03 62 00: Non-Shrink Grouting
- E. Section 03 63 00: Epoxy Grouting
- F. Section 04 20 00: Unit Masonry
- G. Section 04 40 00: Stone Assemblies
- H. Section 05 52 00: Metal Railings
 - I. Section 05 12 00: Structural Steel Framing
 - J. Section 06 43 00: Wood Stairs and Railings
- K. Section 09 20 00: Plaster and Gypsum Board Assemblies
- L. Section 09 30 00: Tiling
- M. Section 09 65 00: Resilient Flooring
- N. Section 09 68 00: Carpeting
- O. Section 09 90 00: Painting and Coating
- P. Section 26 50 00: Lighting

Section 1.04 STRUCTURAL REQUIREMENTS

The structural adequacy of the metal stair design is the responsibility of the designer or professional of record.

- A. Railing assembly shall withstand a minimum concentrated load of [200] [_____] pounds applied vertically downward or horizontally in any direction, but not simultaneously, at any point on the top rail.

Codes may vary in method of application and magnitude of load. Governing code should be checked for specific requirements. Most codes require a 200 pound minimum concentrated load applied in any direction at any point on the top rail.

- OR -

- A. Railing assembly shall withstand a minimum uniform load of [50] [_____] pounds per foot applied horizontally or vertically downward, but not simultaneously, on the top rail.

Some codes have requirements for uniform loading on the top rails. Most codes require a 50 lb/ft minimum uniform load. Uniform loads are not to be applied concurrently with concentrated loads.

- B. Guard intermediate rails, balusters, panel fillers, or posts shall be designed for a uniform load of not less than [50] [_____] pounds per square foot applied horizontally over the gross area of the guard of which they are part. Reactions due to this loading need not be added to the loading specified for the main supporting members of the guard.

Section 1.05 QUALITY ASSURANCE

- A. Electrician Qualifications: State as required in 1.05.A or state specific qualifications required

- B. Fabricator Qualifications: Furnish references listing projects of similar size and scope

If special or unusual capabilities are required they should be set forth here.

- C. Installer Qualifications

State as required in 1.05.A or state specific qualifications required.

- D. Regulatory Requirements

1. Components and installation are to be in accordance with state and local code authorities
2. Components and installation are to follow current ADA and ICC/ANSI A117.1 guidelines.

Determine code regulations that govern this work. Specify requirements and drawings that are necessary to meet governing codes.

- E. Certifications

1. Furnish certification that all components and fittings are furnished by the same manufacturer or approved by the primary component manufacturer.
2. Furnish certification that components were installed in accordance to the manufacturer's engineering data to meet the specified design loads.

Section 1.06 REFERENCES

Include only reference standards that are to be indicated within the text of this section. Edit the following, adding and deleting as required for project and product selection.

- A. American National Standards Institute (ANSI)

1. ANSI A21.1 Safety Requirements for Floor and Wall Openings, Railings and Toe Boards.
2. ANSI A58.1 Minimum Design Loads in Buildings and Other Structures.
3. ICC/ANSI A117.1 Accessible and Usable Buildings and Facilities.
4. ANSI A97.1 Safety Performance Specifications and Methods of Test for Safety Glazing Material used in Buildings.
5. ANSI/NAAMM MBG 531 Metal Bar Grating Manual.

- B. American Society for Testing and Materials (ASTM)

1. A 269 Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service.
2. A 554 Welded Stainless Steel Mechanical Tubing
3. B 43 Specification for Standard Sizes of Seamless Red Brass Pipe.
4. E 894 Standard Test Methods for Anchorage of Permanent Metal Railing Systems and Rails for Buildings.
5. E 935 Standard Test Methods for Performance of Permanent Metal Railing Systems and Rails for Buildings.
6. E 985 Specification for Permanent Metal Railing Systems and Rails for Buildings.

- C. American Welding Society (AWS)

1. Specifications for Welding Rods and Bare Electrodes.

- D. Americans With Disabilities Act Accessibility Guidelines (ADAAG)

- E. Copper Development Association (CDA)

1. Standards Handbook, Wrought Copper and Copper Alloy Mill Products, Part 2 - Alloy Data.
2. Standards Handbook, Cast Copper and Copper Alloy Products, Part 7 - Alloy Data.
3. Copper, Brass and Bronze Design Handbook for Architectural Applications.

- F. International Code Council (ICC)
 - 1. International Building Code (IBC)
 - 2. International Residential Code (IRC)
- G. National Association of Architectural Metal Manufacturers (NAAMM) and National Ornamental and Miscellaneous Metals Association (NOMMA)
 - 1. Metal Finishes Manual
- H. National Association of Architectural Metal Manufacturers (NAAMM)
 - 1. Metal Stair Manual
- I. National Fire Protection Association (NFPA)
 - 1. 101 Life Safety Code
- J. U.S. Green Building Council
 - 1. The Leadership in Energy and Environmental Design (LEED) Green Building Rating System™

Section 1.07 SUBMITTALS

- A. Submit shop drawings and product data
 - 1. Show sections and plans of stairs, dimensions and assembly of components.
 - a. Railings
 - b. Handrail
 - c. Brackets
 - d. Reinforcements
 - e. Anchors
 - f. Welded and bolted connections
 - 2. Show all field connections
 - 3. Indicate all required field measurements.
- B. Indicate component details, materials, finishes, connection and joining methods, and the relationship to adjoining work.
- C. Shop drawings shall be manufacturers installation instructions.
- D. Samples:
 - 1. Submit duplicate samples of railing showing style and finish. One approved sample will be returned to contractor.
This is only specified if appearance sample is required. Applies to pipe, tubing. LED samples are not furnished unless specified to be part of a mockup.
 - 2. Submit sample(s) of _____
 - 3. Certificates:
 - a. Furnish manufacturer's certification that materials meet specification requirements.

– OR –

 - a. Furnish [certification] [and] [or] [calculations] by an engineer registered in the state where the project is located showing that safety requirements are met.
This requirement should be included only if called for by contract documents.
- E. Substitutions:
 - 1. Any changes in specified material must meet requirements of the General Conditions "or equal" clause.
 - 2. Changes in architectural details to fabricator's standard procedures will be allowed when appearance and strength are not affected.

Section 1.08 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials to the job site in good condition and properly protected against damage to finished surfaces.
- B. Storage on site:
 - 1. Store material in a location and in a manner to avoid damage. Stacking shall be done in a way, which will prevent bending.
 - 2. Store material in a clean, dry location away from uncured concrete and masonry. Cover with waterproof paper, tarpaulin, or polyethylene sheeting in a manner that will permit circulation of air inside the covering.
 - 3. Keep handling on site to a minimum. Exercise particular care to avoid damage to finishes of material.

PART 2 -- PRODUCTS

Section 2.01 ACCEPTABLE MANUFACTURER

- A. LED Railing shall be ILLUME (Linear or Puck) as manufactured or supplied by Livers Bronze Co.. Phone: 816-300-2828. Fax: 816-300-0864. Web site: www.liversbronze.com. E-mail: railings@liversbronze.com.

Section 2.02 MATERIALS AND FINISHES

- A. Stainless Steel: Type [304] [316]
 - 1. Bar: ASTM A 167
 - 2. Pipe and Tubing: ASTM [A 269] [A 312]
 - 3. Finish: [Ornamental Grade, AISI No. 4] [AISI No. ____].
- B. Copper Alloys:
 - 1. Drawn Pipe: C23000 (Red Brass), ASTM B 43
 - 2. Drawn Tube: C27000
 - 3. Extruded Tube: C38500 (Architectural Bronze)
 - 4. Sheet: C28000 (Muntz Metal)
 - 5. Extrusions: C38500 (Architectural Bronze)
 - 6. Finish:
 - Mechanical: Straight grain medium satin finish or polished finish.
 - Chemical conversion coatings – antiqued bronze, color as selected by the architect.
 - Coating to be clear organic lacquer

Section 2.02 RAILING SYSTEM

- A. Material shall conform to 2.02 and be finished in accordance with 2.02
- B. Rails/Posts: Fabricate rails [bronze] [stainless steel]
- C. ILLUME LED Lighted Railing:
 - 1. Select ILLUME Linear lighting or ILLUME Puck lighting
 - a. Source: LED product from product data sheet
 - b. Life (L70/ 70% brightness): 50,000 hours
 - c. Light Output: ILLUME Standard Output, [3000K] Other temperatures available see product data sheet
 - d. Listings: Listed for wet or dry locations.
 - e. Length: See product data sheet or manufacturers shop drawings for final layout of LED
 - f. Power Requirement: 24V
 - g. Power Supply: 24V/100W
 - h. Input Voltage to Power Supply: [120-277]
 - i. Temperature Range: -40° C through +60° C
 - j. Product Rating: Interior and Exterior Applications, ETL, Class 2 circuit.

Section 2.04 FASTENERS

- A. All mechanical fasteners used in the assembly of stainless steel shall be manufactured from stainless steel.
- B. Exposed mechanical fasteners for use with bronze materials shall be manufactured from yellow brass or stainless steel depending on the location and structural requirements
- C. Cement: Hydraulic, ASTM C 595, factory prepared with accelerator.

Section 2.05 HANDRAIL BRACKETS

- A. Standard bracket assemblies as used for the product selected.

Section 2.06 FABRICATION

- A. Form rail-to-end post connections and all changes in rail direction by miters or radius bends
- B. Cut material square and remove burrs from all exposed edges, with no chamfer.
- C. Make exposed joints butt tight and flush.
- D. Close exposed ends of handrail by welding and finishing to match adjacent surfaces.
- E. Locate intermediate posts between top rail and finished floor as required for project conditions.
- F. Verify dimensions on site prior to shop fabrication.

PART 3 -- EXECUTION

Section 3.01 INSTALLATION

- A. Install in accordance with shop drawings [and manufacturer's instructions] at locations indicated on the drawings.
- B. Erect work [square and level,] [horizontal or parallel to rake of steps or ramp,] rigid, [and] free from distortion or defects detrimental to appearance or performance.

Section 3.02 PROTECTION

- A. Protect railing system and finish from damage during construction.

Section 3.03 CLEANING

- A. As installation is completed, wash thoroughly using clean water and soap; rinse with clean water.
- B. Do not use acid solution, steel wool or other harsh abrasives.
- C. If stain remains after washing, remove finish and restore in accordance with *NAAMM/NOMMA Metal Finishes Manual*.

Section 3.04 REPAIR OF DEFECTIVE WORK

- A. Remove stained or otherwise defective work and replace with material that meets specification requirements.
- B. Repair damaged finish as directed by Architect
- C. Replace defective or damaged components as directed by Architect.