



SECTION 05 52 00
METAL RAILINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. The WORK of this section shall consist of furnishing and erecting steel hand railings on headwalls, wingwalls, or at other locations as shown on the DRAWINGS, in accordance with the designs, dimensions instructions by ENGINEER, and these SPECIFICATIONS.

1.02 REFERENCES

- A. The following is a list of standards which may be referenced in this section:
 - 1. American Institute of Steel Construction, Inc. (AISC).
 - 2. American Welding Society (AWS):
 - a. AWS D1.1/D1.1M, Structural Welding Code – Steel.
 - 3. ASTM International (ASTM):
 - a. ASTM A53/A53M, Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
 - b. ASTM A501, Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing.

1.03 SUBMITTALS

- A. CONTRACTOR shall submit detailed shop drawings based on field measurements to OWNER for review prior to fabrication.
- B. Color Schedule: CONTRACTOR shall provide six (6) copies of the color schedule (if applicable) according to the DRAWINGS and SPECIFICATIONS. Color shall be shown on the DRAWINGS or shall be selected by ENGINEER from color systems of recognized paint companies. If materials of other manufacturers are used, colors shall match those selected.
- C. Paint and Stain Samples: If requested by ENGINEER, prepare and submit paint samples. Remake samples until accepted.
- D. Material List: As part of the submittal, include a letter listing the brand and quality of each different material for use on the PROJECT. Materials listed shall be accepted by ENGINEER before ordering materials.



PART 2 PRODUCTS

2.01 MATERIALS

- A. Steel Railings and Steel Sleeves:
 - 1. Pipe shall be standard weight pipe conforming to ASTM A53/A53M. Steel tubing shall conform to ASTM A501 or as designated on the DRAWINGS.
 - 2. Galvanized pipe and tubing shall be required when designated on the DRAWINGS.
 - 3. Sleeves shall be galvanized on all surfaces.
 - 4. Weathering steel shall be required when designated on the DRAWINGS.
- B. Fasteners:
 - 1. Acceptable expansion bolts are as follows:
 - a. Hilti Corp; Kwik Bolt.
 - b. Wej-it Corp; Standard Wej-its.
 - c. USE; Taper-Bolt.
 - d. Olin Corp; Trubolt.
 - e. Phillips; Red Head Wedge Anchors.
 - 2. Other brands of expansion bolts will be considered upon submission to ENGINEER of data sheets describing capacities and installation procedures of bolts.
 - 3. The bolts, nuts, and washers shall be galvanized.
- C. Miscellaneous: CONTRACTOR shall fabricate plates or structural shapes as indicated on the DRAWINGS. Include welded anchors where detailed and furnish all items to be embedded in concrete or masonry.

2.02 FABRICATION

- A. General: Field measure the headwall, wingwall, or location where the railing is to be installed, compare to the DRAWINGS, and review with ENGINEER prior to fabrication.
- B. Workmanship: Construct all items of sizes, shape, and materials as CONTRACTOR shall indicate and specify. Fabricate structural steel in accordance with AISC Specifications and additional requirements specified hereafter; perform fabrication and assembly in the shop to the greatest extent possible; form materials well, with sharp angles or lines, free from bends, twists, or open joints; shear and punch clean, true lines and surfaces; thickness of metal and details of assembly and supports shall provide ample strength and rigidity.



- C. Welding: CONTRACTOR shall perform welding in the shop with welders qualified under the AWS D1.1/D1.1M welding code for class of work employed; protect adjacent construction and materials against damage; neatly and symmetrically make all welds; fill or grind to a uniform, smooth shape; where required to present uniform appearance, fill space between welds and weld irregularities with suitable metal putty or compound made for this purpose.
- D. Fastenings: CONTRACTOR shall provide concealed fastenings wherever possible; do not use screws or bolts where they can be avoided; where used, heads shall be countersunk, screwed up tight and threads nicked to prevent loosening; and make threaded connections tight so that threads shall be entirely concealed by fittings.
- E. Paint: All products not specified by name shall be “best grade” or “first line” products available by the manufacturer. Railings which are not designated to be painted shall be galvanized or weathering steel according to the DRAWINGS. Shop clean primer on hollow metal WORK immediately before painting to remove grease and dirt film from surfaces.

PART 3 EXECUTION

3.01 GENERAL

- A. CONTRACTOR shall erect structural steel in accordance with the AISC Specifications with modifications and additional requirements specified hereafter.
- B. Erect all WORK true to lines and planes, with vertical lines plumb and horizontal lines level.
- C. Weld or bolt all permanent connections.

3.02 MISCELLANEOUS ANGLES, LINTELS, PLATES, AND EMBEDDED ITEMS

- A. All welding procedures shall conform to AWS D1.1/D1.1M. All welds shall develop capacity of members being joined, unless specific length or extent is noted on the DRAWINGS.
- B. Finish all cut ends neatly without irregular torch marks or sharp fins. Grind all cut surfaces to a smooth surface. Clean of all loose mill scale, rust, and foreign matter.
- C. Any shop paint on surfaces adjacent to joints to be field welded shall be wire brushed to reduce the paint film to a minimum. Grind down burrs and sharp ridges at all exposed corners and surfaces of welds prior to field painting. After field welding, welded joints to be field primed.
- D. The expansion bolts shall be installed per manufacturer’s recommendations.

3.03 PAINTING

- A. Inspection: Examine surfaces scheduled to receive paint and finishes for conditions that may adversely affect execution, permanence, or quality of WORK and which cannot be put into an acceptable condition through preparatory WORK as included under Paragraph Preparation.



B. Preparation:

1. Sanding: Sand metal surfaces between coats to ensure smoothness and adhesion of subsequent coats. Use extra fine sandpaper to avoid cutting the edges when sanding. Apply putty or spackling compound after surfaces are primed and primer is dry. Bring material flush with adjoining surfaces.
2. Surface Filling: Surfaces shall be perfectly dry, clean, and smooth before starting WORK. Fill cracks, holes, or scratches full and make smooth before finish is applied to surfaces.
3. Ferrous Metal: Remove foreign material from unprimed metal with wire brush and dust clean.
4. Shop Primed Metals: Touch up shop-primed metals with a primer similar to the existing.
5. Zinc-Coated Metal (Galvanized Surfaces): Wash with mineral spirits and prime as specified.
6. Protection: Furnish and lay drop cloths or mask off areas where finishing is being done to protect floors and other work from damage during the execution of WORK. Where it becomes necessary to remove temporary coverings placed by others, replace same in proper manner.
7. Damage to Work of Others: Be responsible for any damage done to the work of other trades, repairing same to the satisfaction of ENGINEER. Replace any materials damaged to such an extent that they cannot be restored to their original condition.

C. Workmanship:

1. Existing Surfaces: If the surfaces are not in proper shape for painting, repair, rebuild, or refinish before proceeding with the WORK. CONTRACTOR is responsible for any poor WORK caused by improper surfaces. The application of the first coat does not relieve CONTRACTOR of the responsibility for failure of the base coat. Do not apply any coats on either damp or wet surfaces and in no case until the preceding coat is dry and hard.
2. General: Apply materials evenly without runs or sagging of materials and according to the manufacturer's requirements. Sand WORK between coats.

3.04 TOUCH-UP PAINTING

- A. CONTRACTOR shall, after erection of steel, apply touch-up paint to field bolt heads and nuts, field welds, and abrasions. When zinc coating has been scratched or removed from surfaces, three (3) coats of zinc rich paint shall be applied over the areas where the coating has been disturbed. Where excessive removal or damage to the zinc coating has occurred, replacement of zinc coating by hot dipping in a zinc bath may be necessary at the direction of ENGINEER.

END OF SECTION