

**SECTION 05 5214****GALVANIZED STEEL PIPE AND TUBE RAILINGS****PART 1 - GENERAL****1.1 SUMMARY**

- A. Includes But Not Limited To:
  - 1. Furnish and install galvanized steel pipe handrails as described in Contract Documents.
- B. Products Furnished But Not Installed Under This Section:
  - 1. Anchoring sleeves in concrete (if used).
- C. Related Requirements:
  - 1. Section 03 3111: 'Normal-Weight Structural Concrete' for installation of anchoring sleeves.
  - 2. Section 05 0503: 'Shop-Applied Metal Coatings' for quality of priming and repair of galvanizing.
  - 3. Finish painting:
    - a. Section 09 9113: 'Exterior Painted Galvanized Metal'.

**1.2 REFERENCES**

- A. Definitions:
  - 1. Galvanized: To coat iron or steel with zinc for protection from rust and corrosion.
  - 2. Non-shrink Grout: Structural grout used for filling voids between elements that is formulated with cement, fine aggregates and admixtures. Admixtures are used to provide expansive properties of the material during curing. This expansion counteracts the natural tendency of cement grouts to shrink during curing.
- B. Reference Standards:
  - 1. ASTM International:
    - a. ASTM A53/A53M-12, 'Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless'.
    - b. ASTM A501-07, 'Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing'.
    - c. ASTM C1107/C1107M-13, 'Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink)'.

**1.3 SUBMITTALS**

- A. Action Submittals:
  - 1. Shop Drawings: Show fabrication and installation of handrails and railings including floor plans, elevations, sections, details of components, and attachments to other elements of The Work.

**1.4 DELIVERY, STORAGE, AND HANDLING**

- A. Storage And Handling Requirements:
  - 1. Store handrails and railing systems in clean, dry location, away from uncured concrete and masonry, and protected against damage.
  - 2. Cover with waterproof paper, tarpaulin, or polyethylene sheeting. Allow for air circulation inside covering.

## PART 2 - PRODUCTS

### 2.1 ASSEMBLIES

#### A. Materials:

1. Handrails, Railings, And Balusters: Galvanized steel pipe meeting requirements of ASTM A53/A53M or galvanized steel tubing meeting requirements of ASTM A501.
2. Sleeves:
  - a. 6 to 9 inches (150 to 225 mm) long with cross-section shape and dimension to allow 1/2 inch (12.7 mm) minimum of grout around perimeter of pipe or tube.
  - b. Provide with fully welded steel plate forming bottom closure.
3. Brackets, Flanges, Fittings, And Anchors:
  - a. Provide standard wall brackets, flanges, miscellaneous fittings, and anchors for connection of handrails and railings to other construction.
  - b. Provide inserts and other anchorage devices for connecting handrails and railing systems to concrete or masonry work.

#### B. Fabrication:

1. Preassemble railing systems in shop to greatest extent possible to minimize field splicing and assembly.
2. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation. Use connections that maintain structural value of joined pieces.
3. Grind smooth welded joints and buff welds to same appearance as remainder of railing. Repair galvanizing and cut pipe ends as specified in Section 05 0503.
4. Form curves by bending pipe in jigs to produce uniform curvature for each configuration required. Maintain cylindrical cross-section of pipe throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces of pipe.
5. Welded Connections:
  - a. Fabricate railing system and handrail connections by welding.
  - b. Weld corners and seams continuously to comply with following:
    - 1) Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
    - 2) At tee and cross intersections, notch ends of intersecting members to fit contour of pipe to which end is joined and weld all around.
    - 3) At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and so contours of welded surfaces match adjacent surfaces.
6. Return pipe ends of wall mounted handrails into wall.
7. Cap pipe ends of floor / ground mounted handrails and exterior handrails.
8. After fabrication, shop prime metal to be painted.
9. .

### 2.2 ACCESSORIES

#### A. Rail Setting Grout:

1. Commercial nonshrink grout conforming to requirements of ASTM C1107/C1107M, Type B or Type C.
2. Type Two Approved Manufacturers:
  - a. Normal Construction Grout A by Bonsal American, Charlotte, NC [www.bonsal.com](http://www.bonsal.com).
  - b. Advantage 1107 Grout by Dayton Superior Specialty Chemicals, Kansas City, KS [www.daytonsuperiorchemical.com](http://www.daytonsuperiorchemical.com).
  - c. NS Grout by Euclid Chemical Co, Cleveland, OH [www.euclidchemical.com](http://www.euclidchemical.com)
  - d. 5 Star Special Grout 110 by Five Star Products Inc, Fairfield, CT [www.fivestarproducts.com](http://www.fivestarproducts.com).
  - e. Duragrout by L&M Construction Chemicals Inc, Omaha, NE [www.lmcc.com](http://www.lmcc.com)
  - f. Sonneborn / BASF Building Systems, Shakopee, MN [www.chemrex.com](http://www.chemrex.com).
  - g. Tamms Grout 621 by TAMMS Industries, Mentor, OH [www.tamms.com](http://www.tamms.com).

- h. U S Spec MP Grout by U S Mix Products Co [www.usspec.com](http://www.usspec.com).
- i. CG-86 Grout by W R Meadows, Hampshire, IL [www.wrmeadows.com](http://www.wrmeadows.com).
- j. Equal as approved by Architect before use. See Section 01 6200.

### **PART 3 - EXECUTION**

#### **3.1 INSTALLATION**

- A. Coring of concrete for installation of balusters is acceptable.
- B. Touch up field welds to match pre-finished material.

**END OF SECTION**