

SECTION 2
DIVISION 05
METALS

DIVISION 5 - METALS

Note: This is a guide for Designers only. Contents shall not be used in lieu of specifications as part of the Designer's Contract Documents.

GENERAL DESIGN:

1.1 GENERAL REQUIREMENTS

- A. Structures shall be designed in accordance with the North Carolina Building Code.
- B. Take expansion and contraction into account in the design and detailing. Handrails and long members are noted in particular, especially when they span over an expansion joint in other materials.
- C. Try to design column base plates for ease of installation; i.e. use anchor bolts with double nuts and 1 ½" space to grout after leveling.
- D. Specify that work be temporarily braced during construction until the structural system is adequate to brace itself.

1.2 GENERAL TESTING

Structural tests on welds, bolts, shear studs, etc. shall be performed by a qualified independent laboratory (conforming to American Society for Testing and Methods standards) selected and paid for by the Owner in accordance with the NC Construction Manual. The University solicits proposals for the testing laboratory shortly after the receipt of construction bids. The Designer should contact the University prior to this time and provide the scope of work for testing and any other unique requirements for the proposal request. The Designer should contact Engineering and Construction Management during the design phase of the project to discuss testing frequency to be included in the specifications.

SECTION 05 5000 – METAL FABRICATIONS

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Steel:
 - 1. Steel Plates, Shapes, and Bars: ASTM A 36, pickled when exposed to view.
 - 2. Cold-Formed Steel Tubing: ASTM A 500, Grade B.
 - 3. Hot-Formed Steel Tubing: ASTM A 501.
 - 4. Hot-Rolled Carbon Steel Bars: ASTM A 575, Grade as selected by fabricator.
 - 5. Steel Plates to be Vent or Cold-Formed: ASTM A 283, Grade C.
 - 6. Hot-Rolled Carbon Steel Sheets & Strips: ASTM A 568 & A 569, pickled and oiled.
 - 7. Galvanized Carbon Steel Sheets: ASTM A 526, with ASTM A 525, G90 zinc-coating.
 - 8. Malleable Iron Castings: ASTM A 47, Grade as selected.
 - 9. Steel Pipe: ASTM A 53, type as selected, Grade A, black finish unless galvanizing is required; standard weight (Schedule 40), unless otherwise shown or specified.
 - 10. Steel Wire Rope: ASTM A 475, plastic covered zinc-coated steel wire strand, size and number wires shown. Proved "Common" grade with Class B zinc-coating unless otherwise shown or specified.
 - 11. Cold-Finished Steel Bars: ASTM A 108, Grade as selected by fabricator.

University of North Carolina at Charlotte Design and Construction Manual
Section 2, Division 05 – Metals

2.2 FASTENERS

- A. Provide zinc-coated fasteners, with galvanizing complying with ASTM A 153. Select fasteners for the type, grade and class required for the installation of miscellaneous metal items.
- B. Standard Bolts and Nuts: ASTM A 325, Grade A, regular hexagon head.
- C. Lag Bolts: FS FF-B-561, square head type.
- D. Machine Screws: FS FF-S-92, cadmium plated steel.
- E. Plain Washers: FS FF-W-92, round, general assembly grade carbon steel.
- F. Lock Washers: FS FF-W-84, helical spring type carbon steel.

2.3 MISCELLANEOUS MATERIALS

- A. Steel Primer Paint: Tnemec 10-99G, Green, modified alkyd rust inhibitive primer exceeding the performance requirements of FS TT-P-86d, Types I and II or equal.
- B. Galvanizing Repair Paint: High zinc-dust content paint for re-galvanizing welds in galvanized steel, complying with Military Specifications Mil-P-21035 (ships).
- C. Anti-Slip Surfacing: 3M Company "Safety-Walk," Black color with adhesive recommended by manufacturer for substrates indicated.

2.4 FABRICATION

For the fabrication of miscellaneous metal work which will be exposed to view, use only materials which are smooth and free of surface blemishes including pitting, seam marks, roller marks, rolled trade names, and roughness. Remove such blemishes by grinding or welding and grinding prior to cleaning, treating, and application of surface finishes and including zinc coatings.

2.5 ROUGH HARDWARE

Furnish custom fabricated bolts, plates, anchors, hangers, dowels, and other miscellaneous steel and iron shapes for framing and supporting and anchoring Project Work, unless specified to be provided under other Sections of the Specifications. Provide with hot-dipped galvanized finish unless otherwise noted.

2.6 MISCELLANEOUS STEEL TRIM

Provide shapes and sizes as required for the profiles shown. Except as otherwise noted, fabricate units from structural steel shapes and plates and steel bars with continuously welded joints and smooth exposed edges. Use concealed field splices wherever possible. Provide cut outs, fittings, and anchorages as required for coordination of assembly and installation with other work.

2.7 GRATINGS

- A. Provide grating platforms, platform frames, hangers, connections, and fasteners as indicated and required. Provide all hangers, structural connections, and fasteners required for platforms and to supporting structure as indicated. Provide one shop coat PMS 349 modified alkyd rust-inhibitive primer as specified after fabrication.
- B. Provide banded metal bar grating as shown on the Drawings, complying with the NAAMM "Metal Bar Grating Manual" and as specified herein.

University of North Carolina at Charlotte Design and Construction Manual
Section 2, Division 05 – Metals

- C. Grating shall be provided complete with angle frames where indicated on the Drawings. Frames and fastening devices shall be of same material and finish as grating being fastened.
- D. Notching of bearing bars at supports to maintain elevations will not be permitted.
- E. Provide miscellaneous structural steel framing and supports as required to complete the work.

2.8 STEEL AND IRON FINISHES

- A. All exterior ferrous metals shall be aluminum or hot-dip galvanized after fabrication. Field welds shall be ground and have cold galvanizing applied.
- B. Clearly define limits and type of paint for metal elements including primers. Shop painting is preferred. Preparation methods prior to applications of primers and paints shall be described in the specifications.
 - 1. Shop Painting: Shop paint miscellaneous metal work, except those members or portions of members to be embedded in concrete or masonry, surfaces and edges to be field welded, and galvanized surfaces, unless otherwise specified.
 - 2. Remove scale, rust and other deleterious materials before the shop coat of paint is applied. Clean off heavy rust and loose mill scale in accordance with SSPC SP-2 "Hand Tool Cleaning." Remove oil, grease and similar contaminants in accordance with SSPC SP-1 "Solvent Cleaning."
 - 3. Apply one shop coat of metal primer paint to fabricated metal items, except apply two coats of paint to surfaces which are inaccessible after assembly or erection. Change color of second coat.
 - 4. Brush or spray on metal primer paint at a rate to produce a uniform dry film thickness of 2.0 mils for each coat. Provide full coverage of joints, corners, edges, and all exposed surfaces.
 - 5. Touch-up Painting: Cleaning and touch-up painting of field welds, bolted connections, and abraded areas of the shop paint on miscellaneous metal.

University of North Carolina at Charlotte Design and Construction Manual
Section 2, Division 05 – Metals

SECTION 05 7300 – ORNAMENTAL RAILINGS

PART 1 - GENERAL

1.1 CODES

All guardrails and handrails must be in compliance with the ADA Accessibility Guidelines and all governing codes.

1.2 STORAGE AND HANDLING

Store structural steel in a manner that will prevent damage from falling objects, etc. and soiling from mud, concrete and debris. Make proper repairs if damaged or replace items where damage is extensive. .

PART 2 - PRODUCTS

2.1 HANDRAIL POCKETS, SLEEVES, OR ANCHOR PLATES

Shall be designed to shed water and prevent corrosion. Provide drawing details for installation and/or describe fabrication methods if critical to the finished product.

2.2 EXTERIOR METAL RAILINGS AND GRILLWORK:

- A. Exterior railings at steps and ramps will comply with Campus standard details (Section 3, Annex F).
- B. Railings which are an integral part of the architecture should be similar to Campus standard details (Section 3, Annex F).
- C. All railings and grillwork of painted metal will dark green, Campus standard.