

SECTION 05500 – MISCELLANEOUS METALS

PART 1 – GENERAL

1.1 WORK OF THIS SECTION

- A. Contractor shall provide all labor, materials, equipment and incidentals as shown, specified and required to furnish and install all miscellaneous metal fabrications work, including surface preparation and shop priming.
- B. The extent of miscellaneous metal fabrications is shown or scheduled and includes items fabricated from iron, steel and aluminum shapes, plates, bars, castings and extrusions, which are not a part of other metal systems covered by other sections of these Specifications.
- C. The types of miscellaneous metal fabrications work includes, but is not necessarily limited to, the following:
 - 1. Aluminum ladders.
 - 2. Access hatches.
 - 3. Miscellaneous framing and supports.

1.2 Related Sections:

- A. The Work of the following Sections applies to the Work of this Section. Work of other Sections of the Specification, not referenced below, shall also apply to the extent required for proper performance of this Work.
 - 1. Section 01300 - Submittals.
 - 2. Section 03300 - Cast-In-Place Concrete
 - 3. Section 03420 - Precast Reinforced Concrete Vaults
 - 4. Section 09800 - Painting and Coating

1.3 QUALITY ASSURANCE

- A. Reference Standards: Comply with the applicable provisions and recommendations of the following, except as otherwise shown or specified:
 - 1. ASTM A36 – Structural Steel.
 - 2. ASTM A123 – Zinc (Hot-Galvanized) Coatings on Products Fabricated from Rolled, Pressed, and Forged Steel Shapes, Plates, Bars, and Strip.
 - 3. ASTM A153 – Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
 - 4. ASTM A240 – Heat Resisting Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Fusion-welded Unfired Pressure Vessels.
 - 5. ASTM A320 – Alloy Steel Bolting Material for Low Temperature Service.
 - 6. ASTM A386 – Zinc Coating (Hot-Dip) on Assembled Steel Products.
 - 7. ASTM B209 – Aluminum-Alloy Sheet and Plate.

SECTION 05500 – MISCELLANEOUS METALS

8. ASTM B211 – Aluminum-Alloy Bars, Rods and Wire.
 9. ASTM B221 – Aluminum-Alloy Extruded Bars, Rods, Wire, Shapes and Tubes.
 10. ANSI A14.3 – Safety Requirements for Fixed Ladders.
 11. AWS D1.1 – Structural Welding Code.
 12. AISI Standards for Stainless Steel.
- B. Design Criteria: The size and spacing of expansion bolts, anchor bolts, cast-in-place inserts and similar items shown or specified shall be considered the minimum acceptable size. Final selection of these items shall be based upon the actual design load multiplied by a minimum safety factor of four. Where the size and spacing of expansion bolts, anchor bolts, cast-in-place inserts and similar items are not shown or are not specified, Contractor shall provide such items of sufficient size, length, load carrying capacity and spacing required to carry the design load multiplied by a minimum safety factor of four. Provide non-corrosive materials for all such items.
- C. Field Measurements: Take field measurements where required prior to preparation of Shop Drawings and fabrication to ensure proper fitting of the work.
- D. Shop Assembly: Preassemble items in the shop to the greatest extent possible, so as to minimize field splicing and assembly of units at the project site. Disassemble units only to the extent necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation.
- E. Welding: All weld procedures and welder qualification shall be available for review at the request of the AGENCY. All welding shall be inspected by a Contractor-provided inspector qualified in accordance with American Welding Society requirements and approved by the AGENCY.

1.4 SUBMITTALS

- A. Samples: Submit for approval sets of representative samples of materials including nosing, rungs and other finished products as may be requested by AGENCY. Review will be for color, texture, style, and finish only. Compliance with all other requirements is exclusive responsibility of Contractor.
- B. Shop Drawings: Submit for approval the following:
1. Shop drawings for the fabrication and erection of all assemblies of miscellaneous metal fabrications work. Include plans, elevations, and details of sections and connections. Show anchorage and accessory items. Include setting drawing and templates for location and installation of miscellaneous metal fabrications items and anchorage devices.

SECTION 05500 – MISCELLANEOUS METALS

- 2. Copies of manufacturer’s specifications, load tables, dimension diagrams, anchor details, and installation instructions for products to be used in miscellaneous metal fabrications work.

- C. Certification: An alloy certification for all stainless steel shall be provided to show alloy conformance.

PART 2 – MATERIALS

2.1 GENERAL

- A. Materials: Unless otherwise specified or indicated on the drawings, structural and miscellaneous metals shall conform with the standards of the American Society for Testing and Materials, including the following:

<u>Item</u>	<u>ASTM Standard No.</u>	<u>Class, Grade Type or Alloy No.</u>
<u>Cast Iron</u>		
Cast Iron	A48	Class 40B
<u>Steel</u>		
Galvanized sheet iron or steel	A446, A525, A526	Coating G90
Black steel, sheet or strip	A569, A570	
Coil (plate)	A635	
Structural plate, bars, rolled Shapes, and miscellaneous items	A36	
Standard bolts, nuts, and washers	A307	
High strength bolts, nuts and Hardened flat washers	A325, A490	
Eyebolts	A489	Type 1
Tubing, cold-formed	A500	
Tubing, hot-formed	A501	
Steel pipe	A53	Grade B
<u>Stainless Steel</u>		
Plate, sheet and strip		UNS Designation L31653

- B. Stainless steels are designed by type or the Unified Numbering System (UNS).

SECTION 05500 – MISCELLANEOUS METALS

- C. Aluminum:
 - 1. Alloy and Temper: Provide alloy and temper as shown or specified, or as otherwise recommended by the aluminum producer or finisher.
 - 2. Extruded Shapes and Tubes: ASTM B221.
 - 3. Plate and Sheet: ASTM B209.
 - 4. Bars, Rods and Wire: ASTM B211.
 - 5. Finish: Provide Architectural Class I anodized finish AA-M32C22A41 Clear as specified in the NAAMM Manual.
- D. Stainless Steel Fasteners and Fittings: ASTM A320.
- E. Zinc Coated Hardware: ASTM A153.

2.2 ACCESS HATCHES

- A. All hatches shall be fabricated from Aluminum 6061 T6 unless otherwise indicated. All hatch hardware shall be Type 316 stainless steel. Hatches shall be gutter-type, or as shown.
- B. Hatch opening sizes, number and direction of swing of door leaves, and locations, shall be as indicated. Sizes given shall be for the clear opening. Unless indicated otherwise, hinges shall be located on the longer dimension side. Unless indicated otherwise, ladder hatches shall be a minimum of 30 inches wide by 36 inches long, with the ladder centered on the shorter dimension, and the door hinge opposite the ladder.
- D. Door leaves shall be a minimum of ¼ inch checkered pattern plate. Channel frames shall be a minimum of ¼ inch material with an anchor flange around the perimeter. Hatches shall be provided with an automatic hold-open arm with release handle. Hatches shall be designed for easy opening from both inside and outside.
- E. Hatches shall be designed to be water-tight and shall be equipped with a joint gutter and moat-type edge drain. The Contractor shall field verify hatch installation conditions via shop drawings.
- F. Hatches shall include a recessed hasp for a padlock that is covered by a hinged lid flush with the surface and shall accommodate an openable lock from the inside
- G. Hatch cover shall be equipped with a hold-open arm with separate grip handle, which automatically locks the cover in the open position. Hatches without separate grip handles shall not be permitted.
- H. Hatches shall be designed for AASHTO H-20 loading.

SECTION 05500 – MISCELLANEOUS METALS

- I. Installation shall be in accordance with manufacturer's instructions. Manufacturer shall guarantee against defects in material or workmanship for a period of five years.
- J. Access hatches shall be manufactured by Bilco, Type JD-AL (double door). No substitution is allowed.

2.3 LADDERS (NEED TO DETERMINED IF USED IN STANDARD DWGS)

2.4 FALL PREVENTION SYSTEMS (NOT USED)

2.5 SURFACE PREPARATION AND SHOP PAINTING

- A. Surface preparation and shop painting is required for all ferrous metal, equipment and accessories. Stainless steel shall not be painted.
- B. All ferrous metal surfaces shall be cleaned and provided with two coats of priming paint in accordance with the applicable requirements of the standard specifications. All prime coat materials shall be compatible with the finish coat materials to be furnished under the standard specifications. All ferrous metal surfaces may be given two coats of the manufacturer's standard paint system in lieu of the priming paint, provided that the total mil thickness of paint is equal to that specified for the priming paint.
- C. Minimum acceptable surface preparation for any equipment furnished with manufacturer's standard paint system shall include cleaning with a Commercial Sandblast (SSOC-SP6).
- D. Surface treatment shall be required on all stainless steel. After rolling, only stainless steel tools shall be used. An acid wash shall be applied after rolling.

PART 3 – EXECUTION

3.1 INSTALLATION

- A. Set miscellaneous metal fabrications accurately in location, alignment and elevation, plumb, level, true and free of rack, measured from established lines and levels. Brace temporarily or anchor temporarily in formwork where fabrications are to be built into concrete, masonry or similar construction.
- B. Anchor securely as shown or as required for the intended use, using concealed anchors wherever possible.
- C. Stairs and ladders shall be fitted accurately and field measured where necessary.
- D. Fit exposed connections accurately together to form tight hairline joints. Weld steel connections which are not to be left as exposed joints, but cannot be shop

SECTION 05500 – MISCELLANEOUS METALS

welded because of shipping size limitations. Grind steel joints smooth and touch up shop paint coat. Do not weld, cut or abrade the surfaces of exterior units which have been hot-dip galvanized after fabrication, and are intended for bolted or screwed field connections.

- E. Protection of Aluminum from Dissimilar Materials: Using approved washers, strips or sheets of felt, and coating specified in the standard specifications, protect all surfaces of aluminum from contact with dissimilar materials such as concrete, masonry, steel, nonferrous metals, etc.
- F. Galvanizing: All structural steel plates, shapes, bars, and fabricated assemblies required to be galvanized shall, after the steel has been thoroughly cleaned of rust and scale, be galvanized in accordance with the requirements of ASTM A123. Any galvanized part that becomes warped during the galvanizing operation shall be straightened. Field repairs to galvanizing shall be made using "Galvinox," "Galvo-Weld," or approved equal.
- G. Welding: All welding shall be by the metal-arc method or gas-shielded arc method as described in the American Welding Society's "Welding Handbook" as supplemented by other pertinent standards of the American Welding Society. Qualifications of welders shall be in accordance with the American Welding Society Standards governing same. All sharp corners of material to be painted or coated shall be ground to a minimum of 1/32-inch on the flat. All exposed aluminum welds shall be ground smooth and flush and shall be polished and anodized. Discoloration of exposed aluminum surfaces, whether or not due to welding, shall constitute a basis for rejection of the entire assembly.

****END OF SECTION****