

PART 1 - GENERAL

- 1.1 Work Included
- .1 This section specifies the requirements for furnishing all materials, labour, tools and equipment, and performing all operations necessary to complete all miscellaneous metal and fabricated items, as shown on the Project Drawings and specified in this section.
 - .2 The work generally includes the following categories and all related items of miscellaneous metal shown on the Drawings except where noted otherwise:
 - .1 Lugs, support straps, tie rod modifications, etc.
 - .2 Ladders.
 - .3 Miscellaneous steel.
- 1.2 Related Sections
- .1 Cast-In-Place Concrete: Section 03 30 00
- 1.3 Reference Standards
- .1 ASTM A53/A53M-12, Pipe, Steel, Black and Hot-Dipped, Zinc-coated Welded and Seamless.
 - .2 ASTM A123/A123M-15, Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
 - .3 ASTM A307-14, Carbon Steel Bolts, Studs, and Threaded Rod 60000 psi Tensile Strength.
 - .4 ASTM A325M-14, Structural Bolts, Steel, Heat Treated 830 MPa Minimum Tensile Strength (Metric).
 - .5 ASTM A480/A480M-15, General Requirements for Flat-Rolled Stainless and Heat-Resisting Steel Plate, Sheet, and Strip.
 - .6 ASTM A484/A484M-15, General Requirements for Stainless Steel Bars, Billets, and Forgings.

- .7 ASTM B209-14, Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate
- .8 ASTM B221-14, Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes
- .9 CSA-G40.20/G40.21-13, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
- .10 CAN/CSA-S16.1-14, Limit States Design of Steel Structures.
- .11 CSA-W59-13, Welded Steel Construction (Metal-arc Welding).
- .12 CAN/CGSB-85.10-99, Protective Coatings for Metals.
- 1.4 Shop Drawings
 - .1 Submit shop drawings in accordance with Section 01 33 00.
 - .2 Shop Drawings:
 - .1 Clearly indicate the following items:
 - .1 General arrangements, dimensions, clearance locations and directions of assemblies as installed on structures.
 - .2 Locations, sizes and installation tolerances of anchor bolts, eye bolts and embedded parts.
 - .3 Types of materials used, finishes and core thickness.
 - .4 All other pertinent details and accessories.
 - .3 Test results: provide test results for any galvanized items.

PART 2 - PRODUCTS

- 2.1 Materials
 - .1 Steel Sections: to CAN G40.21, Grade 350W.

- .2 Steel rod, plate channels and angles: to CSA G40.21, Grade 300W.
- .3 Welding materials: to CSA W59.
- .4 Bolts and anchor bolts: to ASTM A307.
- .5 Galvanizing: hot dipped galvanizing with zinc coating 600 g/m² to ASTM A123/A123M.
- .6 Zinc primer: zinc rich, ready mix to CGSB 1-GP-181.
- .7 Do not use items manufactured or fabricated from scrap steel of unknown chemical composition or physical properties.
- .8 For adhesive anchors see Cast-in-Place Concrete, Section 03 30 00.
 - .1 Acceptable product as noted on Project Drawings, or approved equivalent.
 - .2 Embedment as indicated on the Project Drawing or minimum embedment equal to the manufacturer's standard recommendations.
- .9 Ladders: galvanized to ASTM A123.

2.2 Fabrication

- .1 Workmanship and finish must be equal to the best practice of modern shops for each item of work.
 - .2 Build work square, true, straight and accurate to required size, with joints closely fitted and properly secured.
 - .3 Provide exposed surfaces with a smooth finish and sharp, well defined lines and arises. Form sections to shape and size shown with sharp lines and angles.
 - .4 Confirm castings have sharp corners and edges, and are clean, smooth and true to pattern.
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- .5 Make exposed welds continuous for length of each joint. File or grind exposed welds smooth and flush.
 - .6 Where possible, fit and shop assemble work, ready for installation.
 - .7 Fabricate miscellaneous steel in accordance with CAN/CSA-S16 and in accordance with reviewed shop Drawings.
- 2.3 Miscellaneous Metal Work Items
- .1 Anchors, adhesive anchors, bolts and inserts:
 - .1 Provide as required to fasten miscellaneous metal items to concrete or masonry.
 - .2 Where sizes, kinds and spacing of anchors are not indicated or specified, provide as necessary for the purpose as approved by the Departmental Representative.
 - .3 Hot-dip galvanize all anchors, bolts and inserts.
 - .2 Miscellaneous Steel:
 - .1 Provide miscellaneous steel as required for equipment supports, angles, and steel framing to shape, size and details required.
 - .2 Galvanize miscellaneous steel items after fabrication.

PART 3 - EXECUTION

- 3.1 Installation
- .1 Install miscellaneous metal items in the locations shown on the Drawings.
 - .2 Install metalwork square, plumb and true using welded connections wherever possible to provide rigid structures. Provide anchor bolts, bolts and plates as necessary for connecting to structure of types acceptable

to the Departmental Representative.

- .3 Hand over items for casting into concrete to appropriate trades together with setting templates.
- .4 Exposed fastening devices to match finish, and to be compatible with material thorough which they pass.
- .5 Touch-up field welds, bolts, and burnt or scratched surfaces with primer after installation.
- .6 Touch-up galvanized surfaces with zinc-rich primer.