

PART 1 - GENERAL

- 1.1 WORK INCLUDED .1 This section specifies 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 Drawings and specified herein.
- .2 Work generally includes the following categories and all related items of miscellaneous metal shown on the Drawings.
- .1 Anchor bolts, inserts and fasteners
 - .2 Miscellaneous steel
 - .3 Pipe bollards
- 1.2 RELATED WORK .1 Cast-in-Place Concrete: Section 03 30 00
- 1.3 REFERENCES .1 ASTM A53-2012, Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
- .2 ASTM A123-2012, Standard for Zinc-Dipped (Hot-Dipped Galvanized) Coatings on Iron and Steel Products.
- .3 ASTM A307-07b, Carbon Steel Bolts and Studs, 60 000 PSI Tensile Strength.
- .4 CSA G40.20-04/G40.21-04 (R2009), Rolled or Welded Structural Quality Steel/Structural Quality Steel.
- .5 CSA W59-03 (R2008), Welded Steel Construction (Metal Arc Welding).
- .6 CSA W59.2-03 (R2008), Welded Aluminum Construction,.
- 1.4 SHOP DRAWINGS .1 Submit shop drawings for all metal fabrications in accordance with Section 01 33 00.
- .2 Clearly indicate materials, core thickness, finishes, connections, joints, method of attachment, number of anchors, support, reinforcement, details and accessories.
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<u>1.5 PRODUCT DELIVERY, STORAGE AND HANDLING</u>	.1	Label, tag or otherwise mark items supplied for installation by other sections to indicate its function, location, and shop drawing designation.
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<u>1.6 JOB CONDITIONS</u>	.1	Protection: .1 Maintain protection of Work of this Section from time of installation until final finishes are applied. .2 Protect galvanized surfaces from damage. .3 Protect exposed surfaces of prefinished metal work which does not receive site finishing with protective coatings or wrappings. Use materials recommended by finishers or manufacturers of metals to ensure that method is sufficiently protective, easily removed, and harmless to the finish.
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PART 2 - PRODUCTS

<u>2.1 MATERIALS</u>	.1	Steel sections and plates: to CSA-G40.21M, 260W.
	.2	Steel pipe: to ASTM A53, standard weight, galvanized finish.
	.3	Welding materials: to W59 for steel and CSA W59.2.
	.4	Stainless steel: to ASTM A240, 316L
	.5	Welding materials: to ASTM A312 for stainless steel.
	.6	Bolts and anchor bolts: to ASTM A307.
	.7	Galvanizing: hot-dip method with minimum zinc coating of 600g/m ² conforming to ASTM A123.
	.8	Galvanized primer: zinc-rich, ready mix conforming to CAN/CGSB-1.181.

<u>2.2 FABRICATION</u>	.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	Exposed surfaces to have smooth finish and sharp, well defined lines and arises. Sections to be well formed to shape and size with sharp lines and angles.

- 2.2 FABRICATION
(Cont'd)
- .4 Castings to have sharp corners and edges and be clean, smooth and true to pattern.
 - .5 Exposed welds to be continuous for length of each joint. File or grind exposed welds smooth and flush.
- 2.3 MISCELLANEOUS
METALWORK ITEMS
- .1 Anchors, bolts and inserts, furnished as necessary to fasten miscellaneous metal items to concrete. Where sizes, kinds and spacing of anchors are not indicated or specified, provide as necessary for the purpose as approved by Departmental Representative. All anchors, bolts and inserts to be galvanized or stainless steel.
 - .2 Miscellaneous steel: fabricate angles, equipment supports, plates and steel framing from steel conforming to CSA G40.21M, galvanized to ASTM A123 where indicated.
 - .3 Pipe bollards:
 - .1 Fabricate bollards of 150 mm diameter steel pipe, to ASTM A53, galvanized. Fabricate bollards to lengths indicated, fill with concrete and set in concrete foundation.
 - .2 Provide fitted bollard caps to suit.

PART 3 - EXECUTION

- 3.1 FIELD
MEASUREMENTS
- .1 Verify dimensions and perform field measurements required to assure that items function properly when installed.
 - .2 Details of proposed departures due to field conditions or other causes to be submitted to the Departmental Representative for approval.
- 3.2 INSTALLATION
- .1 Install miscellaneous metal items in the locations shown on the Drawings.
 - .2 Install 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 Departmental Representative.
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3.2 INSTALLATION
(Cont'd)

- .3 Install bollards where indicated, paint exposed portion with one (1) coat zinc-rich primer and two (2) coats yellow.
- .4 Hand over items for casting into concrete to appropriate trades together with setting templates. Coordinate inserts with supplier of precast concrete structures.
- .5 Exposed fastening devices to match finish, and to be compatible with material thorough which they pass.
- .6 Touch-up field welds, bolts, and burnt or scratched surfaces with primer after installation.
- .7 Touch-up galvanized surfaces with zinc-rich primer.