

PART 1 - GENERAL

- 1.1 Related Requirements
- .1 Section 03 30 00 - Cast-in-Place Concrete: installation of embedded parts.
 - .2 Section 09 91 23 - Painting.
- 1.2 Definitions
- .1 Miscellaneous metal items: all metal items shown on the following drawings: Civil (C - Series), Concrete (S - Series), and Architectural (A - Series).
- 1.3 References
- .1 ASTM International (ASTM).
 - .1 ASTM A36/A36M-14, Standard Specification for Carbon Structural Steel.
 - .2 ASTM A53/A53M-18, Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
 - .3 ASTM A123/A123M-17, Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
 - .4 ASTM A307-14e1, Specification for Carbon Steel Bolts and Studs, 60 000 psi Tensile Strength.
 - .5 ASTM A325M-13, Standard Specification for Structural Bolts, Steel, Heat Treated 830 MPa Minimum Tensile Strength Metric.
 - .6 ASTM A500/A500M-18, Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
 - .7 ASTM A563-15, Specification for Carbon and Alloy Steel Nuts.
 - .8 ASTM F436/F436M-18a, Standard Specification for Hardened Steel Washers
 - .2 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB 1.40-97, Anticorrosive Structural Steel Alkyd Primer.

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- .3 Canadian Standards Association (CSA)
 - .1 CSA G40.20-13/G40.21-13 (R2018), General Requirements for Rolled or Welded Structural Quality Steel / Structural Quality Steel.
 - .2 CSA W47.1-09 (R2014), Certification of Companies for Fusion Welding of Steel.
 - .3 CSA W59-18, Welded Steel Construction (Metal Arc Welding).

 - .4 The Master Painters Institute (MPI).
 - .1 MPI #18, Primer, Zinc Rich, Organic.
 - .2 MPI #79, Primer, Alkyd, Anti-Corrosive for Metal.
- 1.4 Codes and Standards
- .1 Do welding in accordance with CSA W59, by companies certified by, and welders qualified in accordance with CSA W47.1, Division 1 or 2.1.

 - .2 Submit written documentation within two weeks after award of contract from the Canadian Welding Bureau certifying that the steel subcontractor is qualified to requirements of CSA W47.1, Division 1 or 2.1.

 - .3 National Building Code of Canada 2015.
- 1.5 Shop Drawings
- .1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.

 - .2 Show sections and plans; dimensions and assembly of components, anchors, welded and bolted connections.

 - .3 Submit shop drawing for review before any fabrication begins.
- 1.6 Delivery, Storage and Handling
- .1 Deliver, store, handle and protect materials in a safe manner and in accordance with Section 01 61 00 - Common Product Requirements.

- .2 Deliver the products to the site in the largest practical sections. Tag or mark all items for identification.
- .3 Schedule delivery of products and arrange storage area with Contractor.

PART 2 - PRODUCTS

2.1 Materials

- .1 Steel plates and rods:
CSA G40.20/G40.21, 300W.
- .2 Rolled structural steel section
material: to CSA G40.20/G40.21, 350W.
- .3 Hollow structural steel (HSS) section
material: to CSA G40.20/G40.21, 350W
Class C, or ASTM A500 Grade C.
- .4 Steel pipe: to ASTM A53/A53M, standard
weight, black; galvanized or heavy
weight where indicated.
- .5 Screws:
 - .1 Tamper-resistant: self-tapping,
round or pan head, fabricated of
18-8 stainless steel; one-way or
other tamper-resistant style
approved by Departmental
Representative.
 - .2 Self-drilling, self-tapping.
- .6 Nuts and bolts:
 - .1 High-strength bolts: to ASTM
A325M.
 - .2 Ordinary bolts: to ASTM A307.
 - .3 Anchor bolts: to ASTM A36/A36M
complete with ASTM A563 nuts and
ASTM F436 circular washers.
 - .4 Shear (Nelson) studs.
- .7 Anchors:
 - .1 Adhesive anchors: HVA or HY150 by
Hilti or Epcon System by ITW
Readhead.
- .8 Prime coat of paint: to CAN/CGSB 1.40.
- .9 Zinc-rich touch-up paint: to CAN/CGSB-
1.181 or MP I#18.

2.2 Workmanship and
Fabrication

- .1 Fabricate miscellaneous metal work with structural qualities to withstand strain and stresses to which the item will be subjected.
- .2 Fit and shop-fabricate the various items of work in sections as large and complete as possible. Make inconspicuous connections, and clearly mark matching surfaces to ensure correct reassembly on the site. Do not use paint or grease markers for identifying steel work sections.
- .3 Fabricate the work true to dimensions, free from distortion and defects detrimental to the appearance and performance. Accurately fit joints and intersecting members with adequate fastening.
- .4 Weld connections where possible; otherwise, bolt connections. Ensure bolts are free of burrs, deformations, discolorations, or other blemishes and of the same material, texture, colour and finish as the base material on which they occur, unless required for structural or safety reasons.
- .5 Drill or punch holes in base and template plates.
- .6 Provide all miscellaneous clips, anchors and necessary accessories.
- .7 Separate dissimilar metals to prevent galvanic corrosion using fibrated paint.
- .8 Grind exposed welds and steel sections smooth.

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- 2.3 Shop Painting .1 Thoroughly clean steel work to receive primer in accordance with manufacturer's instructions, and apply one coat, unadulterated, to items with exception of stainless steel, aluminum and galvanized items; surfaces to be embedded in concrete, and machined surfaces.
- .2 Clean surfaces to be field-welded; do not paint.
- 2.4 Galvanizing .1 Prepare irregular shaped items for hot-dipped galvanizing after fabrication as follows:
- .1 Clip or drill holes at corners, closed ends of pipe and other areas where air may accumulate and prevent acid bath from completely cleaning surfaces.
- .2 Make provisions in surface that will be hidden from view after installation. If all surfaces to be exposed to view, then obtain
- .3 approval for location from Departmental Representative.
- .4 Plug small holes after galvanizing with pear shaped lead, filed off smooth.
- .5 Provisions for galvanizing shall not be detrimental to strength of item being galvanized.
- .2 Hot-dip galvanize items in accordance with ASTM A123/A123M; where possible, galvanize after fabrication.
- 2.5 Miscellaneous Metal Items .1 Contractor is responsible for all miscellaneous metal items shown and specified.
- .2 Refer to drawings for location, layout and details of all miscellaneous items. Work that is existing or supplied by Others is indicated on the drawings.
- .3 Fabricate items from steel unless noted otherwise.

- .4 Miscellaneous metal items consist of, but are not limited to the following:
 - .1 Bollards; galvanized finish.
 - .1 Flexible plastic cap with dome top and reflective tape.

PART 3 - EXECUTION

3.1 General

- .1 Take necessary field dimensions where required before fabrication.
- .2 Repair items with errors in fabrication, or where damaged during installation, to satisfaction of Departmental Representative. If items are beyond repair, replace with new at no increase in Contract Price. Departmental Representative's decision as to repair or replacement is final.
- .3 Hand items over for casting into concrete or building into masonry.

3.2 Installation

- .1 Install the work of this section using skilled craftsmen in accordance with the best practice and according to manufacturer's recommendations where applicable.
- .2 Install the work plumb, level and structurally free from defects detrimental to the finished appearance. Install work rigidly and securely.
- .3 Insulate where necessary to prevent electrolysis due to metal-to-metal contact or contact between metal and masonry or concrete. Use bituminous paint, butyl tape, building paper or other suitable and approved means.
- .4 Provide all drilling of concrete, masonry or other materials for fastening of work specified in this section.
- .5 Touch up bolts, field welds and burned or scratched surfaces with primer; touch up galvanized surfaces with zinc-rich primer.

END OF SECTION