

METAL FABRICATIONS

1. GENERAL

1.1 Scope

The following statement generally describes the scope of work covered by this Section:

- .1 Provision of:
 - .1 Exterior pipe support system steel
 - .2 Enclosure/cabinets for unloading and transfer system components.
 - .3 Fabrications for dispensing equipment support.

1.2 Related Requirements

- .1 Section 09 87 00 - Coating Systems for Steel Pipes and Miscellaneous Metal Fabrications.

1.3 References

- .1 ASTM International
 - .1 ASTM A 53/A 53M, Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless.
 - .2 ASTM A 269, Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service.
 - .3 ASTM A 307, Standard Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.
- .2 CSA International
 - .1 CSA G40.20/G40.21, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
 - .2 CAN/CSA G164, Hot Dip Galvanizing of Irregularly Shaped Articles.
 - .3 CSA S16, Design of Steel Structures.
 - .4 CSA W48, Filler Metals and Allied Materials for Metal Arc Welding (Developed in cooperation with the Canadian Welding Bureau).
 - .5 CSA W47.1-09 (R2014) - Certification of companies for fusion welding of steel.
 - .6 CSA W59, Welded Steel Construction (Metal Arc Welding).
- .3 Environmental Choice Program
 - .1 CCD-047, Architectural Surface Coatings.

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- .2 CCD-048, Surface Coatings - Recycled Water-borne.
- .4 Green Seal Environmental Standards (GS)
 - .1 GS-11, Paints and Coatings.
- .5 Health Canada / Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS).
- .6 The Master Painters Institute (MPI)
 - .1 Architectural Painting Specification Manual - current edition.

1.4 Action and Informational Submittals

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for sections, plates, pipe, tubing, bolts and include product characteristics, performance criteria, physical size, finish and limitations.
 - .2 Submit two (2) copies of WHMIS MSDS in accordance with Section 01 35 29.06 - Health and Safety Requirements and 01 35 43 - Environmental Procedures.
 - .1 For finishes, coatings, primers, and paints applied on site: indicate VOC concentration in g/L.
- .3 Shop Drawings:
 - .1 Submit drawings stamped and signed by Professional Engineer registered or licensed in Province of Manitoba for any items indicated by the Drawings.
 - .2 Indicate materials, core thicknesses, finishes, connections, joints, method of anchorage, number of anchors, supports, reinforcement, details, and accessories.

1.5 Delivery, Storage and Handling

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
 - .1 Store materials off ground and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Replace defective or damaged materials with new.

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- .4 Packaging Waste Management: remove for reuse or recycling.

2. PRODUCTS

2.1 Materials

- .1 Steel sections and plates: to CSA G40.20/G40.21, Grade 300W or 350W.
- .2 Steel pipe: to ASTM A 53/A 53M standard weight, black or galvanized finish.
- .3 Welding materials: to CSA W59.
- .4 Welding electrodes: to CSA W48 Series.
- .5 Bolts and anchor bolts: to ASTM A 325.
- .6 Aluminum sheet: As indicated on the drawings.
- .7 Grout: non-shrink, non-metallic, flowable, 15 MPa at 24 hours.

2.2 Fabrication

- .1 Fabricate work square, true, straight and accurate to required size, with joints closely fitted and properly secured.
- .2 Use self-tapping shake-proof round or hex headed screws on items requiring assembly by screws or as indicated.
- .3 Where possible, fit and shop assemble work, ready for erection.
- .4 Ensure exposed welds are continuous for length of each joint. File or grind exposed welds smooth and flush.

2.3 Finishes

- .1 Galvanizing: hot dipped galvanizing with zinc coating 600 g/m² to CAN/CSA-G164.
 - .1 Prepare surfaces to be galvanized to
 - .2 Other coatings as per Section 09 87 00 - Coating Systems for Steel Pipes and Miscellaneous Metal Fabrications.

2.4 Isolation Coating

- .1 Isolate aluminum from following components, by means of bituminous paint:
 - .1 Dissimilar metals except stainless steel, zinc, or white bronze of small area.
 - .2 Concrete, mortar and masonry.
 - .3 Wood.

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2.5 Weather Proof Pumping System Enclosures (Cabinets)

- .1 Mild steel welded and bolted construction.
- .2 Any penetrations shall be in walls. Roof or base penetrations not permitted.
- .3 Provide structural steel base members to elevate bottom of enclosure a minimum of 100 mm above concrete slab and to provide structural support for the enclosure as required.
- .4 Minimum steel wall thicknesses:
 - .1 2.6 mm (12 gauge) plate/sheet.
 - .2 4.8 mm (3/16 inch) structural members
- .5 Floor:
 - .1 25,000 kL Diesel enclosure:
 - .1 sealed, leak proof floor pan to 50 mm above bottom of enclosure.
 - .2 Combined Gasoline and Diesel enclosure:
 - .1 Provide structural members only as required to support components, so as to create a minimum 50 % open area, and to prevent collection or pooling of any gasoline on the bottom members of the enclosure.
- .6 Front access Doors:
 - .1 Full width opening, less any framing members.
 - .2 Maximum single door width 900 mm.
 - .3 Maximum single door weight: 25 kg.
 - .4 Folded or reinforced edges all around.
 - .5 Welded on, lift off pin type hinges, two (2) per door:
 - .1 Steel body, steel pin with bronze pivot bushing.
 - .2 Minimum pin diameter: 8 mm.
 - .6 Surface mounted D-type handle, minimum inside opening 37 mm x 100 mm.
 - .7 For double doors, one of the doors shall include a top mounted, vertically oriented heavy duty 8 mm diameter barrel bolt, or equivalent system to keep the door closed independently of the padlock hasp.
 - .8 Padlock hasp, with minimum 19 mm hole.
- .7 Side panels

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- .1 Removable, threaded fastener connected to main enclosure.
- .8 Fixed rear panel
- .9 Roof panel
 - .1 Removable, threaded fastener connected to main enclosure
 - .2 Minimum slope 1 in 12 away from any adjacent tank.
- .10 Load Capacity:
 - .1 The enclosure shall have a minimum capacity of 2.3 kPa (50 lbs./sq.ft.) plus 100 kg (220 lb) central concentrated load in middle of roof, with maximum roof deflection of L/180.
- .11 Natural ventilation:
 - .1 Upper level: Minimum of 0.10 square meters effective open area on each of two opposite sides within 300 mm of the roof.
 - .2 Lower level: Minimum of 0.10 square meters effective open area on each of two opposite sides, within 300 mm of the floor.
 - .3 Acceptable openings:
 - .1 Roof to wall soffit type openings,
 - .2 Sidewall rain shedding stamped louvers, or louver panels on two opposite walls – Louver spacing not to exceed 25 mm.
 - .3 13 mm opening galvanized or aluminum mesh.
- .12 Minimum clearances around internal components:
 - .1 As per manufacturer's recommendations, or generally accepted trade practice, but not less than 100 mm, unless otherwise indicated on the drawings.
- .13 Interior Lighting:
 - .1 LED fixture on manual switch within enclosure, adjacent to one pump access door.
 - .2 110 volt / 1 phase / 60 hz.
 - .3 Rated for installed location – Hazardous location as determined by installation.
 - .4 Coordinate with Mechanical and Electrical.
- .14 Finish:
 - .1 As per Section 09 87 00 - Coating Systems for Steel Pipes and Miscellaneous Metal Fabrications.

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- .2 Colour: white, to be confirmed from samples.
- .15 Coordinate all dimensions and layout with Mechanical and Electrical disciplines.
- .16 Submit Conceptual drawings for initial review.
- .17 Submit Shop drawings stamped by Professional Engineer registered with APEGM prior to fabrication.

2.6 Shop Painting

- .1 Coating applied as per Section 09 87 00 - Coating Systems for Steel Pipes and Miscellaneous Metal Fabrications.
- .2 Clean surfaces to be field welded; do not paint until final assembly is complete.

2.7 Angle Lintels

- .1 Steel angles: galvanized, sizes indicated for openings. Provide 150 mm minimum bearing at ends.
- .2 Weld or bolt back-to-back angles to profiles as indicated.

2.8 Bollards

- .1 Fabricate and finish pipe bollards as indicated on the drawings.

3. EXECUTION

3.1 Examination

- .1 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts are acceptable for metal fabrications installation in accordance with manufacturer's written instructions.
 - .1 Visually inspect substrate.
 - .2 Inform Contract Administrator of unacceptable conditions immediately upon discovery.
 - .3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Contract Administrator.

3.2 Erection

- .1 Do welding work in accordance with CSA W59 unless specified otherwise.
- .2 Erect metalwork square, plumb, straight, and true, accurately fitted, with tight joints and intersections.
- .3 Exposed fastening devices to match finish and be compatible with material through which they pass.

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- .4 Supply components for work by other trades in accordance with shop drawings and schedule.
- .5 Deliver items over for casting into concrete together with setting templates to appropriate location and construction personnel.
- .6 Touch-up painted scratched surfaces:

3.3 Trench Covers

- .1 Install trench covers in locations as indicated.

3.4 Channel Frames

- .1 Install steel channel frames to openings as indicated.

3.5 Cleaning

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
 - .1 Leave Work area clean at end of each day.
 - .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.
 - .3 Waste Management: separate waste materials for reuse and recycling.
 - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

3.6 Protection

- .1 Protect installed products and components from damage during construction.
- .2 Repair damage to adjacent materials caused by metal fabrications installation.

END OF SECTION