

1. GENERAL

1.1 RELATED SECTIONS

.1 Not Applicable

1.2 REFERENCES

.1 Canadian Standards Association (CSA):

- .1 CAN/CSA-G164, Hot Dip Galvanizing of Irregularly Shaped Articles.
- .2 CAN/CSA-S157, Strength Design in Aluminum.
- .3 CSA W47.2, Certification of Companies for Fusion Welding of Aluminum.
- .4 CSA W59.2, Welded Aluminum Construction.
- .5 CSA W55.3 - Resistance Welding Qualification Code for Fabricators of Structural Members Used in Buildings

.2 Canadian General Standards Board (CGSB):

- .1 CAN/CGSB-1.108, Bituminous Solvent Type Paint.

.3 American Society for Testing and Materials (ASTM):

- .1 ASTM A 307, Standard Specification for Carbon Steel Bolts and Studs, 60 000 PSI Tensile Strength.
- .2 ASTM A668M Standard Specification for Steel Forgings, Carbon and Alloy, for General Industrial Use.
- .3 ASTM A 490, Specification for Heat Treated, Steel Structural Bolts, 150 ksi (1035 Mpa) Tensile Strength.
- .4 ASTM A 490M, Specification for High-Strength Steel Bolts, Classes 10.9 and 10.9.3 for Structural Steel Joints Metric.
- .5 ASTM B 209M, Specification for Aluminum and Aluminum-Alloy Sheet and Plate Metric.
- .6 ASTM B 210M, Specification for Aluminum-Alloy Drawn Seamless Tubes Metric.
- .7 ASTM B 211M, Specification for Aluminum and Aluminum-Alloy Bar, Rod and Wire Metric.
- .8 ASTM B 316M Standard Specification for Aluminum and Aluminum-Alloy Rivet and Cold-Heading Wire and Rods Metric

- .4 Aluminum Association, Inc. (AA):
 - .1 Designation System for Aluminum Finishes.
- .5 American Welding Society (AWS):
 - .1 AWS A5.10, Specification for Bare Aluminum and Aluminum-Alloy Welding Electrodes and Rods.

1.3 SHOP DRAWINGS

- .1 Shop Drawings:
 - .1 Submit shop drawings including fabrication and erection documents consisting of connection and design details, shop details, erection diagrams, erection procedures and material lists in accordance with Section 01330 – Submittals.
 - .2 Indicate cuts, copes, connections, holes, threaded fasteners, rivets, welds and other items. Indicate welds using welding symbols as shown in Appendix A of CSA W59.2.
 - .3 Submit description of methods, sequence of erection and type of equipment to be used in erecting structural aluminum.

1.4 SAMPLES

- .1 Not Applicable.

1.5 MEASUREMENT AND PAYMENT

- .1 The work described herein will be paid for under the Contract Lump Sum Price for “Miscellaneous Metals, Metal Fabrications, Metal Repairs” and “Hatches, Grating, Stairs, Ladders, Rails, Bollards”. Said price shall be payment in full for supplying all materials and performing all operations herein described and all other items incidental to the Work included in this specification, accepted by the Contract Administrator.
 - 1.1.1 A maximum of ninety-five percent (95%) may be submitted for progress payments prior to the total completion of the associated services, including the provision of As-Built Drawing mark-ups and O&M Manuals.

2. PRODUCTS

2.1 MATERIALS

- .1 Aluminum bar, rod, and wire: to ASTM B 211M.
- .2 Aluminum and Aluminum-Alloy Extruded Bar, Rods, Wire, Shapes, and Tubes: to ASTM B 221M.
- .3 Aluminum sheet or plate: to ASTM B 209M.
- .4 Aluminum drawn tubes: to ASTM B 210M.

- .5 Aluminum bolts and rivets: to ASTM B 316M
- .6 Aluminum welding wire: to AWS A5.10.
- .7 Stainless steel bolts: to AISI Steel Products Manual No. 13.
- .8 Steel bolts: to ASTM A 668M.
- .9 Bituminous paint: to CAN/CGSB-1.108, type 1, 2, without thinner.
- .10 Galvanizing hot dip galvanize steel bolts to CAN/CSA-G164, minimum zinc coating of 600g/m².
- .11 Grating:
 - .1 Aluminum Grating to be Type 30-102M.
 - .2 Bearing Bars: 6063T6
 - .3 Cross Bars: 6063T5
 - .4 Maximum allowable fibre stress: 82.82 Mpa
 - .5 Grating to have smooth top edge.
 - .6 Fasteners to be Type A fixing clip c/w stainless steel screw, nut, and washer.
 - .7 Size: 51 x 4.8 unless noted otherwise on drawings
 - .8 Hinges, fasteners and all hardware to be stainless steel
- .12 Ladders:
 - .1 Construct to PIP STE05501
 - .2 Applicable Equipment:
 - .1 Location:
 - .1 As shown on Drawings
 - .2 Specified Equipment: **Dry Well Ladders**
 - .1 Ladders: 6061 Aluminum
 - .2 Fasteners/Anchors: 304 Stainless Steel
 - .3 Exclude cage
 - .3 Specified Equipment: **Wet Well Ladders**
 - .1 NMS 055000 Metal Fabrication
- .13 Stairs
 - .1 Stairs sizes and framings as indicated on Drawings.
 - .2 Shop Drawings
 - .1 Submit shop Drawings in accordance with NMS 01300 Submittals
 - .2 Shop drawings shall be stamped by a professional engineer registered in the Province of Manitoba

- .3 Materials
 - .1 Aluminum Extruded Shapes: 6061 Alloy
 - .2 Fasteners: 304 Stainless Steel
- .4 Installation
 - .1 Install as indicated on Drawings.
 - .2 Bolt sections together in field.
- .14 Access Hatches:
 - .1 Install hatches where indicated on drawings.
 - .2 Applicable Equipment:
 - .1 Location:
 - .1 As shown on Drawings
 - .2 Specified Equipment: **AH-1**
 - .1 Manufacturer: MSU Mississauga Ltd. or approved equivalent.
 - .2 Model: M – Drainage Frame cast into concrete.
 - .3 Capacity: 12.0kPa minimum live load.
 - .4 Opening Size: **1200 mm x 800 mm** (confirm with engineer)
 - .5 Doors: 2 (overlap, seal joint)
 - .6 Lid thickness: 6.4mm minimum
 - .7 Finish: Factory Finish Aluminum
 - .8 Body: Aluminum: to ASTM B 221M or B 209M, Alloy 6351-T6.
 - .9 Tread Plate: Aluminum: ASTM B 221M or B 209M, Alloy 6061-T6.
 - .10 Miscellaneous: Fasteners, gas spring, and hold open arm in 316 stainless steel; hinges and slam lock in 304 stainless steel.
 - .11 Accessories:
 - .1 Padlock: Complete with master padlock and key. All hatches to be keyed alike
 - .12 Drain Outlet
 - .1 Outlet frame drain ~~through curb~~ to exterior.
 - .3 Specified Equipment: **AH-2**
 - .1 Manufacturer: MSU Mississauga Ltd. or approved equivalent.
 - .2 Model: BD – Bolt down
 - .3 Capacity: 7.5kPa minimum live load.
 - .4 Opening Size: 950 mm x 1130 mm (site confirm opening)
 - .5 Doors: 2 (overlap, seal joint)
 - .6 Lid thickness: 6.4mm minimum
 - .7 Finish: Factory Finish Aluminum
 - .8 Body: Aluminum: to ASTM B 221M or B 209M, Alloy 6351-T6.
 - .9 Tread Plate: Aluminum: ASTM B 221M or B 209M, Alloy 6061-T6.
 - .10 Miscellaneous: Fasteners, gas spring, and hold open arm in 316 stainless steel; hinges and slam lock in 304 stainless steel.

- .11 Accessories:
 - .1 Padlock: n/a
- .12 Drain Outlet
 - .1 n/a

2.2 FABRICATION

- .1 Fabricate in accordance with CAN/CSA-S157 and in accordance with shop drawings.

2.3 FINISHES

- .1 Plain mill finish, unless otherwise indicated.

3. EXECUTION

3.1 GENERAL

- .1 Structural aluminum work: in accordance with CAN/CSA-S157.
- .2 Welding: in accordance with CSA W59.2.
- .3 Companies to be certified under Division 1 or 2.1 of CSA W47.2 for fusion welding of aluminum and/or CSA W55.3 for resistance welding of structural components.
- .4 Paint aluminum surfaces in contact with concrete with two (2) coats of alkali resistant bituminous paint.

3.2 ERECTION

- .1 Erect structural aluminum as indicated and in accordance with CAN/CSA-S157 and approved erection drawings.
- .2 Field cutting or altering structural members: to approval of the Engineer.

3.3 FIELD QUALITY CONTROL

- .1 Inspection and testing of materials and workmanship may be carried out by testing laboratory designated by Engineer.
- .2 Provide safe access and working areas for testing on site, as required by testing agency and as authorized by Engineer.

END OF SECTION