

Tender No. []

1.0 GENERAL

1.1 REFERENCES

- .1 Provide metal fabrications in accordance with the following standards (latest revision) except where specified otherwise.
- .2 American Society for Testing and Materials (ASTM)
 - .1 ASTM A53 Specification for Pipe, Steel, Black, and Hot-Dipped, Zinc-Coated Welded and Seamless.
 - .2 ASTM A108 Specification for Steel Bars, Carbon, Cold Finished, Standard Quality.
 - .3 ASTM A276 Specification for Stainless Steel Bars and Shapes.
 - .4 ASTM A307 Specification for Carbon Steel Bolts and Studs, 60,000 psi Tensile.
 - .5 ASTM A320 Specification for Alloys, Steel Bolting Materials for Low-Temperature Service.
 - .6 ASTM A325M Specification for High-Strength Bolts for Structural Steel Joints (Metric).
- .3 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-1.181 Ready-Mixed Organic Zinc-Rich Coating.
- .4 Canadian Standards Association (CSA)
 - .1 CSA-G40.21 Structural Quality Steel.
 - .2 CAN/CSA-G164 Hot-Dip Galvanizing of Irregularly Shaped Articles.
 - .3 CAN/CSA-S16 Limit States Design of Steel Structures.
 - .4 CSA-W47.1 Certification of Companies for Fusion Welding of Steel Structures.
 - .5 CSA-W48 Filler Metals and Allied Materials for Metal Arc Welding.
 - .6 CSA-W59M Welded Steel Construction (Metal Arc Welding) (Metric Version).

1.2 SUBMITTALS

- .1 Provide the following submittals.
- .2 Shop drawings at least 20 days prior to fabrication. Indicate material specifications, dimensions, weights, finishes, welds, and other details.

Tender No. []

- .3 Details of CSA welding certification of the fabricator at least 30 days prior to fabrication.

1.3 DELIVERY, STORAGE, AND HANDLING

- .1 Inspect each shipment of material and timely replace any damaged materials.
- .2 Unload, handle, and store materials in accordance with the manufacturer's written instructions. Do not damage the metal fabrications or shop-applied coatings. Do not store metal fabrications in direct contact with the ground.

2.0 PRODUCTS

2.1 MATERIALS

- .1 Provide materials in accordance with the following.
- .2 Steel:
 - .1 Steel sections and plates: In accordance with CSA-G40.21, Grade 300W.
 - .2 Hollow structural sections: In accordance with CSA-G40.21, Grade 350W.
 - .3 Steel pipe: In accordance with ASTM A53, [] weight [weight as specified in the Contract Documents].
 - .4 Welding materials: In accordance with CSA-W59. Welding electrodes: In accordance with CSA-W48. Welding electrodes for structural steel: E480XX.
 - .5 High strength steel bolts: In accordance with ASTM A325M, [galvanized finish.]
 - .6 Steel anchor bolts: In accordance with ASTM A307, [galvanized finish.]
 - .7 Stainless steel anchor bolts: In accordance with ASTM A276 Type 304.
 - .8 Stainless steel fasteners: In accordance with ASTM A320, Grade B8 Class 2 AISI 304, minimum yield strength 690 MPa, 321 HB hardness.
 - .9 Steel grating: Type 30–102 standard mesh galvanized grating. Size of [serrated] bearing bars [] [as specified in the Contract Documents].
 - .10 Steel studs: Nelson Studs in accordance with ASTM A108, minimum yield strength of 345 MPa.
- .3 Aluminium:
 - .1 Ladders: [MSU Model 1105 access ladders complete with Model 3104 double rail access handles as manufactured by MSU Mississauga Ltd.]
 - .2 Access hatches: [MSU Type M access hatches with padlock recess as manufactured by MSU Mississauga Ltd.]
- .4 [].

2.2 SHOP FABRICATION OF STEEL COMPONENTS

- .1 Employ a fabricator certified by the Canadian Welding Bureau in accordance with CSA-W47.1, Division 3, unless specified otherwise.
- .2 Fabricate in accordance with CAN/CSA-S16. Perform welding in accordance with CSA-W59 using welding electrodes in accordance with CSA-W48. Control and minimize distortion, and include stress relief measures to minimize residual stresses.
- .3 Do not conduct welding operations when the ambient temperature is below 0°C, or when the base metal temperature is below 0°C. Preheat and maintain the base metal at a minimum temperature of 25°C during welding.
- .4 Accurately fabricate metal fabrications true to line and free from warps, twists, bends, and open joints. Reject metal fabrications that have sharp kinks or bends.
- .5 Use approved dies or bending rolls for bends. When heating is required, avoid overheating the metal and use cooling methods that do not alter the original properties of the metal.
- .6 Do not carry out metal fabrications with welds other than those specified in the Contract Documents unless authorized by the Minister.
- .7 Structural steel may be gas-cut in accordance with the applicable portions of CAN/CSA-S16. Do not flame-cut any material without the authorization of the Minister.
- .8 Provide bolted connections in accordance with the applicable clauses of CAN/CSA-S16.
- .9 Provide holes for fasteners that are not more than 2 mm larger than the nominal diameter of bolts unless otherwise specified in the Contract Documents. Where the thickness of the material is greater than the nominal diameter of the bolt, sub-punch and ream or sub-drill and ream, or drill the holes for the fasteners. Poor matching of holes will be cause for rejection of the item of work.
- .10 Hot-dip galvanize metal fabrications, except stainless steel and aluminium items and steel items completely encased in concrete, in accordance with CAN/CSA-G164. Employ measures to minimize distortions due to galvanizing. Locate vent holes so they are not readily visible after the item is installed. Galvanize all items after fabrication, except parts that are bolted together are to be galvanized before final assembly. Galvanize to provide a zinc coating of not less than 610 g/m².

3.0 EXECUTION

3.1 GENERAL INSTALLATION

- .1 Do not tack weld to aid fabrication or installation without authorization from the Minister
- .2 Perform repairs to welds or base metal by grinding or arc-air gouging followed by grinding. Do not use flame gouging or oxygen gouging.

Tender No. []

- .3 Shop assemble matching parts of metal fabrications to verify the correctness of fabrication and matching of component parts. If required by the Minister, assemble the component parts at the Site prior to installation.
- .4 Accurately align and install metalwork true to the lines, grades, slopes, and elevations specified in the Contract Documents, and obtain proper matching of adjacent surfaces.
- .5 Install anchors and anchor bolts such that, after placement of the concrete, their position is within 3 mm of their specified location, and within 2 mm of their specified location with respect to other anchors and anchor bolts, which are to be subsequently connected to the same piece of metalwork. Provide templates for proper location of anchor bolts for equipment.
- .6 Install grounding as specified in Section [] – [].

3.2 REPAIR OF DAMAGED GALVANIZED COATING

- .1 Repair damaged galvanized surfaces with a zinc-rich paint that is in accordance with CAN/CGSB-1.181.
- .2 Power tool clean surfaces to be repaired to a bright metal surface. Apply multiple coats of zinc-rich paint in accordance with the manufacturer's written instructions to obtain a minimum dry film thickness of 50 microns or greater where required by the paint manufacturer.

END OF SECTION