

Part 1 General

1.1 RELATED SECTIONS

- .1 n/a

1.2 REFERENCES

The contractor to adhere to the latest version of the following publications and any version referred to in this specification.

- .1 American Society for Testing and Materials (ASTM)
- .1 ASTM A36/A 36M, Specification for Structural Steel.
 - .2 ASTM A193/A193M, Specification for Alloy-Steel and Stainless Steel Bolting Materials for High-Temperature Service.
 - .3 ASTM A307, Specification for Carbon Steel Bolts and Studs, 60,000 psi Tensile.
 - .4 ASTM A325, Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength.
 - .5 ASTM A325M, Specification for High-Strength Bolts for Structural Steel Joints Metric.
 - .6 ASTM A490, Specification for Heat Treated, Steel Structural Bolts, 150 ksi (1035 MPa) Tensile Strength.
 - .7 ASTM A490M, Specification for High-Strength Steel Bolts, Classes 10.9 and, for Structural Steel Joints Metric.
- .2 Canadian General Standards Board (CGSB)
- .1 CAN/CGSB-1.40, Primer Structural Steel, Oil Alkyd Type.
 - .2 CGSB 85-GP-14M, Painting Steel Surfaces Exposed to Normally Dry Weather.
 - .3 CAN/CGSB-85.100, Painting.
- .3 Canadian Institute of Steel Construction/Canadian Paint Manufacturer's Association (CISC/CPMA).
- .1 CISC/CPMA 1, Quick-Drying, One-Coat Paint for Use on Structural Steel.
 - .2 CISC/CPMA 2, Quick-Drying, Primer for use on Structural Steel.
- .4 Canadian Standards Association (CSA)
- .1 CAN/CSA-G40.20, General Requirements for Rolled or Welded Structural Quality Steel.
 - .2 CAN/CSA-G40.21, Structural Quality Steels.
 - .3 CAN/CSA-G164, Hot Dip Galvanizing of Irregularly Shaped Articles.
 - .4 CAN/CSA-S16.1, Limit States Design of Steel Structures.
 - .5 CAN/CSA-S136, Cold Formed Steel Structural Members.
 - .6 CSA W47.1, Certification of Companies for Fusion Welding of Steel Structures.
 - .7 CSA W48 Series, Electrodes.
 - .8 CSA W55.3, Resistance Welding Qualification Code for Fabricators of Structural Members Used in Buildings.
 - .9 CSA W59, Welded Steel Construction (Metal Arc Welding) Metric.
- .5 The Society for Protective Coatings (SSPC)
- .1 SSPC SP-6/NACE No. 3, Commercial Blast Cleaning

1.3 SHOP DRAWINGS

- .1 Submit shop drawings including fabrication and erection documents and materials list in accordance with Section 013300 - Submittal Procedures.

- .2 On erection drawings, indicate all details and information necessary for assembly and erection purposes such as, description of methods, sequence of erection, type of equipment used in erection and temporary bracings.
- .3 Ensure Fabricator designed assemblies, components and connections, and drawings are stamped and signed by qualified professional engineer licensed in the province of Manitoba, Canada.

1.4 SAMPLES

- .1 Submit samples in accordance with Section 013300 - Submittal Procedures.

1.5 DESIGN OF DETAILS AND CONNECTIONS

- .1 Design details and connections in accordance with requirements of CAN/CSA-S16.1 and CAN/CSA-S136 with CSA S136.1 to resist forces, moments, shears and allow for movements indicated.
- .2 If connection for shear only (standard connection) is required:
 - .1 Select framed beam shear connections from an industry accepted publication such as "Handbook of the Canadian Institute of Steel Construction".
 - .2 If shears are not indicated, select or design connections to support reaction from maximum uniformly distributed load that can be safely supported by beam in bending, provided no point loads act on beam.
- .3 For non-standard connections, submit sketches and design calculations stamped and signed by qualified professional engineer licensed in Province of Manitoba, Canada.

1.6 QUALITY ASSURANCE

- .1 Submit 4 copies of mill test reports showing chemical and physical properties and other details of steel to be incorporated into work at least 4 weeks prior to fabrication of structural steel. Mill test reports shall be certified by metallurgists qualified to practice in province of Manitoba, Canada.
- .2 Ensure Fabricator of structural steel, in addition, provides an affidavit stating that materials and products used in fabrication conform to applicable material and products standards called for by design drawings and specifications.

Part 2 Products

2.1 MATERIALS

- .1 Structural steel: to CAN/CSA-G40.21 Grade 350W and as indicated on structural drawings and CAN/CSA-S136.
- .2 Anchor bolts: to CAN/CSA-G40.21, Grade 300W.
- .3 Bolts, nuts and washers: to ASTM A325M.
- .4 Welding materials: to CSA W59 and certified by Canadian Welding Bureau.
- .5 Shop paint primer:
 - .1 Where steel is not to be field painted: CISC/CPMA 1.
 - .2 Where steel is to be field painted: Use same primer specified in Section 099100 – Painting for finishing formulae for steel surfaces.
- .6 Hot dip galvanizing: galvanize steel, where indicated, to CAN/CSA-G164, minimum zinc coating of 600 g/m².

- .7 Shear studs: to CSA W59, Appendix H.

2.2 FABRICATION

- .1 Fabricate structural steel in accordance with CAN/CSA-S16.1, CAN/CSA S136 and in accordance with reviewed shop drawings.
- .2 Install shear studs in accordance with CSA W59.
- .3 Continuously seal members by continuous welds. Grind smooth.
- .4 Provide holes in top and bottom flanges or weld threaded studs to top and bottom flanges for attachment of wood nailers.
- .5 Provide holes for grouting as required.

2.3 SHOP PAINTING

- .1 Clean, prepare surfaces and shop prime structural steel in accordance with CAN/CSA-S16.1, CAN/CSA-S136, and CAN/CGSB-85.100 except where members to be encased in concrete.
- .2 Clean all members. Remove loose mill scale, rust, oil, dirt and other foreign matter. Prepare surface according to SSPC No SP6.
- .3 Apply one coat of primer in shop to all steel surfaces to achieve minimum dry film thickness of 0.04 to 0.065 mils, except:
 - .1 Surfaces to be encased in concrete.
 - .2 Surfaces to receive field installed stud shear connections.
 - .3 Surfaces and edges to be field welded.
 - .4 Faying surfaces of friction-type connections.
 - .5 Below grade surfaces in contact with soil.
 - .6 Hot dipped galvanized finishes.
- .4 Apply paint under cover, on dry surfaces when surface and air temperatures are above 5°C.
- .5 Maintain dry condition and 5°C minimum temperature until paint is thoroughly dry.
- .6 Strip paint from bolts, nuts, sharp edges and corners before prime coat is dry.

Part 3 Products

3.1 GENERAL

- .1 Structural steel work: in accordance with CAN/CSA-S16.1 and CAN/CSA-S136.
- .2 Welding: in accordance with CSA W59.
- .3 Companies to be certified under Division 1 or 2.1 of CSA W47.1 for fusion welding of steel structures and/or CSA W55.3 for resistance welding of structural components.

3.2 CONNECTION TO EXISTING WORK

- .1 Verify dimensions and condition of existing work, report any discrepancy and potential problem areas to Contract Administrator for direction before commencing fabrication.

3.3 MARKING

- .1 Mark materials in accordance with CAN/CSA-G40.20. Do not use die stamping. If steel is to be left in unpainted condition, place marking at locations not visible from exterior after erection.
- .2 Match marking: shop mark bearing assemblies and splices for fit and match.

3.4 ERECTION

- .1 Erect structural steel, as indicated and in accordance with CAN/CSA S16.1, CAN/CSA-S136 and in accordance with reviewed erection drawings.
- .2 Field cutting or altering structural members: to approval of Contract Administrator.
- .3 Clean with mechanical brush and touch up shop primer to bolts, rivets, welds and burned or scratched surfaces at completion of erection.
- .4 Continuously seal members by continuous welds where indicated. Grind smooth.

3.5 FIELD QUALITY CONTROL

- .1 Inspection and testing of materials and workmanship will be carried out by testing laboratory designated by City of Winnipeg.
- .2 Provide safe access and working areas for testing on site, as required by testing agency and as authorized by Contract Administrator.
- .3 Submit test reports to Contract Administrator within 1 weeks of completion of inspection.
- .4 Costs of tests will be paid by Cash Allowance.
- .5 Test shear studs in accordance with CSA W59.

3.6 FIELD PAINTING

- .1 Paint in accordance with Section 099100 - Painting.
- .2 Touch up all damaged surfaces and surfaces without shop coat with primer to CAN/CGSB-1.40 except as specified otherwise. Apply in accordance with CGSB 85-GP-14M.

Part 1 General

1.1 DESCRIPTION

- .1 This section specifies requirements for the design, supply, fabrication and installation of miscellaneous metals including gratings, ladders, stairs, handrails and hatches.
- .2 The miscellaneous metal fabricator is responsible for the design of all miscellaneous metal, grating, ladders, stairs, handrails and hatches in accordance with the Nation Building Code of Canada, latest edition.

1.2 RELATED WORK

- .1 Concrete Reinforcement - Section 03 20 00
- .2 Cast in Place Concrete - Section 03 30 00
- .3 Interior Painting - Section 09 91 00
- .4 Exterior Painting – Section 09 97 19

1.3 REFERENCE STANDARDS

- .1 Materials shall be in accordance with CSA, CGSB and ASTM Standards.
- .2 Submit certificates for the materials supplied, as requested by the Contract Administrator.

1.4 QUALITY ASSURANCE

- .1 Employ tradesmen skilled in this trade and proficient in the use of various materials specified.
- .2 Perform work in accordance with material manufacturer's instructions.
- .3 Refer to Section 01 45 00 - Quality Control.

1.5 SUBMITTALS

- .1 Submit detailed shop drawings for all miscellaneous metals, showing fabrication and erection details. Design of all connections to be carried out and stamped by a Professional Contract Administrator registered in the Province of Manitoba.
- .2 Submit examples of aluminum grating, handrail and ladders for review by the Contract Administrator as requested.
- .3 Submit details and shop drawings for review by the Contract Administrator, at least 10 days in advance of fabrication.

1.6 PRODUCT DELIVERY, STORAGE, HANDLING

- .1 Deliver items on site in a safe manner.
- .2 Deliver items in sufficient quantity to allow continuity of work.

- .3 Deliver products to the site in the largest practical sections. Tag and mark items for identification.
- .4 Deliver items to be built in adjoining construction at proper time.
- .5 Store items on site under cover in positions to ensure that no bending, warping or marring takes place.
- .6 Prevent staining by concrete, mortar, plaster, oil, grease or other foreign substances.
- .7 Do not paint or place crayon or other markings on exposed surfaces.

1.7 JOB CONDITIONS

- .1 Give timely and accurate instructions to other trades for locations, levels, holes, connections of anchors, sleeves and frames.
- .2 Examine site conditions and take site measurements to ensure accurate and proper fitting, clear of obstructions.

Part 2 Products

2.1 MATERIALS

- .1 Steel hollow structural section – conform to CSA G40.21 grade 350 W.
- .2 Steel - conform to CSA-G40.21, Grade 300W. (For members exposed to cold weather conform to CSA-G40.21-300WT)
- .3 Steel pipe - conform to ASTM-A53 - Grade B.
- .4 Aluminum - alloy 6063-T6; 6351-T6 and 6061-T6 as specified herein.
- .5 Galvanizing - conform to CSA-G164.
- .6 Stainless Steel - ASTM A167 and A276 or Type 316 as shown on the drawings.

2.2 FASTENINGS AND ANCHOR BOLTS

- .1 Nuts, bolts, washers, rivets and screws to ASTM-A325M.
- .2 Anchor bolts to ASTM-A307, unless specified otherwise.
- .3 For fastenings in stainless steel use stainless steel Type 316 ELC ASTM-A167.
- .4 For structural steel use high strength bolts to ASTM-A325M.
- .5 All fasteners submerged in water - Stainless Steel Type 316 ELC ASTM A167-86.
- .6 For anchors or fastening required to fix equipment after concrete has been poured, use anchorage in accordance with the equipment manufacturers recommendations.
- .7 Provide angles, brackets, inserts, bolts, frames and all other items required to fasten metalwork to concrete, to metal framing or other parts of the structure.

2.3 CORROSION PROTECTION

- .1 Conform to Section 09 91 00 - Painting, for shop priming.
- .2 Use stainless steel for all bolts.
- .3 Hot dip galvanize all ferrous metal fixings and miscellaneous parts, including hangers, bolts, nuts and washers. Galvanize in accordance with CSA-G164.

2.4 GROUT

- .1 Use pre-mixed non shrink, non-metallic grout.

2.5 STAINLESS STEEL LADDERS

- .1 Stainless steel access ladders and cases welded construction to CSA-S157, Alloy 6351-T6 and shall be as detailed on the drawings.

2.6 ALL OTHER MISCELLANEOUS

- .1 All other miscellaneous items as shown on the drawings shall be stainless steel unless otherwise specified or shown on the drawings.

Part 3 Execution

3.1 INSPECTION

- .1 Notify the Contract Administrator to allow inspection of fit, welding, bolting and other items.
- .2 Take field measurements as necessary to ensure proper fit of miscellaneous metal items into structures.

3.2 FABRICATION

- .1 Perform steel welding according to CSA-W59.
- .2 Perform Aluminum welding according to CSA-S244.
- .3 Trim and bevel ends and other items to enable satisfactory welding.
- .4 Keep painting back from areas requiring welding after fabrication.

3.3 FINISHING

- .1 Apply touch up paint for galvanized metal.
- .2 Clean and touch up shop primer after installation.
- .3 Refer to Section 09 91 00 – Interior Painting and 09 97 19 Exterior Painting for finishing details.

3.4 FASTENING, ANCHORING

- .1 Cast anchor bolts in concrete as shown on the drawings.

- .2 Do not use self-drilling anchors where cast-in anchor bolts are specified.

3.5 INSTALLATION

- .1 Access Ladders
 - .1 Position access ladders as shown on the drawings.
 - .2 Access ladders to be in accordance National Building Code of Canada.

END OF SECTION