

Part 1 General

1.1 REFERENCES

- .1 ASTM International Inc.
 - .1 ASTM A36/A36M [08], Standard Specification for Carbon Structural Steel.
 - .2 ASTM A193/A193M [08], Standard Specification for Alloy Steel and Stainless Steel Bolting Materials for High Temperature or High-Pressure Service and Other Special Purpose Applications.
 - .3 ASTM A307 [07b], Standard Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.
 - .4 ASTM A325 [07a], Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength.
 - .5 ASTM A325M [08], Standard Specification for Structural Bolts, Steel, Heat Treated 830 MPa Minimum Tensile Strength[Metric].
 - .6 ASTM A490M [04ae], Standard Specification for High Strength Steel Structural Bolts, Classes 10.9 and 10.9.3, for Structural Steel Joints [Metric].
- .2 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB 85.10 [99], Protective Coatings for Metals.
- .3 Canadian Institute of Steel Construction (CISC)/Canadian Paint Manufacturers Association (CPMA).
 - .1 Handbook of the Canadian Institute of Steel Construction.
 - .2 CISC/CPMA Standard 2 75, Quick Drying Primer for use on Structural Steel.
- .4 Canadian Standards Association (CSA International)
 - .1 CSA G40.20/G40.21 [04], General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
 - .2 CAN/CSA G164 [M92(R2003)], Hot Dip Galvanizing of Irregularly Shaped Articles.
 - .3 CAN/CSA S16 [01(R2007)], Limit States Design of Steel Structures.
 - .4 CAN/CSA S136 [07], North American Specifications for the Design of Cold Formed Steel Structural Members.
 - .5 CSA W47.1 [03], Certification of Companies for Fusion Welding of Steel.
 - .6 CSA W48 [06], Filler Metals and Allied Materials for Metal Arc Welding.
 - .7 CSA W55.3 [1965(R2003)], Resistance Welding Qualification Code for Fabricators of Structural Members Used in Buildings.

- .8 CSA W59 [03], Welded Steel Construction (Metal Arc Welding).
- .5 Master Painters Institute
 - .1 MPI INT 5.1 [08], Structural Steel and Metal Fabrications.
 - .2 MPI EXT 5.1 [08], Structural Steel and Metal Fabrications.
- .6 The Society for Protective Coatings (SSPC) and National Association of Corrosion Engineers (NACE) International
 - .1 NACE No. 3/SSPC SP 6 [06], Commercial Blast Cleaning.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 Submittal Procedures.
- .2 Shop Drawings:
 - .1 Provide drawings stamped and signed by professional engineer registered or licensed in Province of Manitoba, Canada.
- .3 Erection drawings:
 - .1 Submit erection drawings indicating details and information necessary for assembly and erection purposes including:
 - .1 Description of methods.
 - .2 Sequence of erection.
 - .3 Type of equipment used in erection.
 - .4 Temporary bracings.
- .4 Fabrication drawings:
 - .1 Submit fabrication drawings showing designed assemblies, components and connections are stamped and signed by qualified professional engineer licensed in the Province of Manitoba, Canada.

1.3 DELIVERY, STORAGE, AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements.
- .2 Deliver materials in manufacturer's original, undamaged containers with identification labels intact.

Part 2 Products

2.1 DESIGN REQUIREMENTS

- .1 Design details and connections in accordance with requirements of CAN/CSA S16 and CAN/CSA S136 with CSA S136.1 to resist forces, moments, shears and allow for movements indicated.

- .2 Shear connections:
 - .1 Select framed beam shear connections from an industry accepted publication such as "Handbook of the Canadian Institute of Steel Construction" when connection for shear only (standard connection) is required.
 - .2 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, when shears are not indicated.

2.2 MATERIALS

- .1 The Contractor shall verify dimensions of structural steel provided and notify Contract Administrator of any discrepancies from dimensions provided in Section 05 12 23 2.2.1.
- .2 Steel sections and plates: CAN/CSA-G40.20/G40.21, Grade 300W
- .3 Anchor bolts: to CSA G40.20/G40.21, Grade 300W. For wide flanges and HSS sections.
- .4 High strength anchor bolts: to ASTM A193/A193M.
- .5 Bolts, nuts and washers: to ASTM A325M.
- .6 Welding materials: to CSA W59 and certified by Canadian Welding Bureau.
- .7 Hot dip galvanizing: galvanize steel, Only where indicated, to CAN/CSA G164, minimum zinc coating of 600 g/m².
- .8 Shear studs: to CSA W59, Appendix H.

2.3 FABRICATION

- .1 Fabricate structural steel in accordance with CAN/CSA S136 and in accordance with approved shop drawings.
- .2 Continuously seal members by continuous welds. Grind smooth.

Part 3 Execution

3.1 APPLICATION

- .1 Manufacturer's Instructions: comply with manufacturer's written recommendations, including product technical bulletins, handling, storage and installation instructions, and datasheets.

3.2 GENERAL

- .1 Structural steel work: in accordance with 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.
- .4 This specification to be read in conjunction with structural on-sheet specifications found on L001 General Notes – Structural Notes. Report any discrepancies to Contract Administrator prior to proceeding with Work.

3.3 CONNECTION TO EXISTING WORK

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

3.4 MARKING

- .1 Mark materials in accordance with CSA G40.20/G40.21. Do not use die stamping. When steel is to be left in unpainted condition, place marking at locations not visible from exterior after erection.
- .2 Match marking: shop mark for fit and match.

3.5 ERECTION

- .1 Erect structural steel, as indicated and in accordance with CAN/CSA S136 and in accordance with approved erection drawings.
- .2 Field cutting or altering structural members: to approval of Contract Administrator and material supplier
- .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.

3.6 FIELD QUALITY CONTROL

- .1 Provide safe access and working areas for testing on site, as required Contract Administrator.

END OF SECTION

Part 1 General

1.1 REFERENCES

- .1 ASTM A53/A53M-07 - Pipe, Steel, Black and Hot-Dipped Zinc Coated, Welded and Seamless.
- .2 ASTM A153/A153-09 - Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
- .3 ASTM A307-07b - Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.
- .4 ASTM A500/A500M-09 - Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
- .5 ASTM A501-07 - Hot-Formed Welded and Seamless Carbon Steel Structural Tubing.
- .6 ASTM B177- 01(2006)e1 - Engineering Chromium Electroplating.
- .7 CAN/CGSB-1.40-97 - Anti-corrosive Structural Steel Alkyd Primer.
- .8 CAN/CGSB-1.181-99 - Ready-Mixed, Organic Zinc-Rich Coating.
- .9 CAN/CSA-G40.20-04/G40.21-04 (R2009) - General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
- .10 CSA S16-09 - Design of steel structures.
- .11 CSA-W47.1-09 - Certification of Companies for Fusion Welding of Steel Structures.
- .12 CSA-W48-06 - Filler Metals and Allied Materials for Metal Arc Welding
- .13 CSA-W59-03 (R2008) - Welded Steel Construction (Metal Arc Welding).

1.2 SUBMITTALS

- .1 Section 01 33 00: Submission procedures.
- .2 Shop Drawings:
 - .1 Indicate materials, core thicknesses, finishes, connections, joints, method of anchorage, number of anchors, supports, reinforcement, details, and accessories of all metal work sealed by Engineer in the Province of Manitoba.
- .3 Samples:
 - .1 Provide samples of bar grating material showing finish and fastener assembly.

1.3 QUALITY ASSURANCE

- .1 Welders' Certificates: Submit to Section 01 33 00 requirements, certifying welders employed on the Work, verifying qualification within the previous twelve (12) months to CSA-W47.1
- .2 Welded Steel Construction: CSA-W59.
- .3 Design of steel structures: CSA S16.
- .4 Prepare Shop Drawings under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed at the place where the Project is located.
- .5 Comply with requirements of the Building Code in place of work, and local authority having jurisdiction. It is the responsibility of this subcontractor to design and fabricate handrails in accordance with barrier free requirements.

1.4 DELIVERY, STORAGE, AND HANDLING

- .1 Packing, Shipping, Handling and Unloading: Deliver, store, handle and protect materials in accordance with Section 01 61 00 Common Product Requirements.

Part 2 Products

2.1 MATERIALS

- .1 Steel Sections and Plates: CAN/CSA-G40.20/G40.21, Grade 300W. 350W for wide flange and HSS Sections.
- .2 Steel Pipe: ASTM A53/A53M, Standard weight,
- .3 Bolts, Nuts, and Washers: ASTM A307.
- .4 Wire: cold drawn steel.
- .5 Hot Rolled Sheet Steel: to ASTM A1011, hot rolled mild steel, commercial quality, thicknesses indicated.
- .6 Exposed fastenings: same material, colour, finish as fastened metal, as indicated.
- .7 Welding Materials: Type required for materials being welded.
- .8 Welding Filler Material: CSA-W48.
- .9 Galvanizing: to CSA G164 M92, hot dipped galvanizing, minimum zinc coating 600g/m² (2 oz/sq.ft). Only where indicated on drawings.
- .10 Grout: non-shrink, non-metallic, flowable, 15 MPa at 24 hours.

2.2 METAL HAND RAILINGS AND GUARDRAILS

- .1 Bar grating for railing and guardrail infill panel:

- .1 3/16"x3/4" GW75 welded bar grate, raw finish by McNichols (<http://www.mcnichols.com>) or similar approved. Install per manufacturer's written instructions and/or specifications.
- .2 For all steel type and sizing associated with the fabrication and construction of metal hand railings and guardrails, refer to drawings.

2.3 METAL STAIRS AND FLOOR SURFACE GRATING

- .1 Bar grating for stair treads and floor surface:
 - .1 3/16"x1 1/2" 11-W-4 steel bar grate, galvanized finish, 1/2" bar spacing by McNichols (<http://www.mcnichols.com>) or approved equal in accordance with B7. Install per Manufacturer's written instructions and/or specifications.
- .2 For all steel type and sizing associated with the fabrication or construction of metal stairs or floor surface grating, refer to drawings.

2.4 PIVOT DOORS

- .1 Pivot doors, supplied and installed by VUTA (fabrication and installation, Contractor to coordinate): 204-889-7995, shaun@vuta.net. Or approved equal in accordance with B7. VUTA or approved equal in accordance with B7 to provide shop drawings sealed by Engineer in the Province of Manitoba.
- .1 For all material type and sizing associated with the fabrication and construction of Pivot Doors, feature wall and roof, refer to drawings.

2.5 FEATURE WALL & ROOF

- .1 Feature wall and lookout roof supplied and install by VUTA (Contractor to coordinate): 204-889-7995, shaun@vuta.net. Or approved equal in accordance with B7. VUTA to provide shop drawings sealed by Engineer in the Province of Manitoba.

2.6 FABRICATION

- .1 Fit and shop assemble items in largest practical sections, for delivery to Site.
- .2 Fabricate items with joints tightly fitted and secured.
- .3 Continuously seal joined members by continuous welds.
- .4 Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.
- .5 Exposed Mechanical Fastenings: Flush countersunk screws or bolts; unobtrusively located; consistent with design of component, except where specifically noted otherwise.

- .6 Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.
- .7 Use self-tapping shake-proof screws on items required to be assembled by screws or as indicated. Use screws for interior metal work, except where noted otherwise. Use welded connections for exterior metal work, unless otherwise approved by Contract Administrator.
- .8 Where possible, work to be fitted and shop assembled, ready for erection.
- .9 Ensure exposed welds are continuous for length of each joint. File or grind exposed welds smooth and flush.
- .10 All exposed fastenings shall be of the same material, colour, and finish as the metal to which applied unless specifically shown or listed otherwise.
- .11 All items supplied by this section shall be complete with all fastenings.
- .12 Drill for countersunk screws and anchor bolts.
- .13 All metal fabrications accessible to the public shall have burrs, sharp filings, or dangerous protrusions removed and ground smooth. Contractor shall correct any dangerous installation as direct by the Contract Administrator.
- .14 Site confirm field dimensions prior to fabrication.

2.7 FABRICATION TOLERANCES

- .1 Squareness: 3 mm (1/8 inch) maximum difference in diagonal measurements.
- .2 Maximum Offset Between Faces: 1.6 mm (1/16 inch).
- .3 Maximum Misalignment of Adjacent Members: 1.6 mm (1/16 inch).
- .4 Maximum Bow: 3 mm in 1.2 m (1/8 inch in 4 ft).
- .5 Maximum Deviation From Plane: 1.6 mm in 1.2 m (1/16 inch in 4 ft).

2.8 FINISHES

- .1 Galvanized bar grating galvanizing: hot dipped galvanizing with zinc coating 600 g/m² to CAN/CSA G164. Only where indicated on drawings. Only bar grating floor surfaces.
- .2 Exposed Mild Steel: All structural steel members, handrail and guardrail, pivot doors, feature wall and roof steel to be sandblasted to remove all rust and to achieve a consistent finish. Absolutely no, isolation coating, alkali resistant bituminous paint or shop primer required.

Part 3 Execution

3.1 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 Provide suitable means of anchorage acceptable to Contract Administrator such as dowels, anchor clips, bar anchors, expansion bolts and shields, and toggles.
- .4 Exposed fastening devices to match finish and be compatible with material through which they pass.
- .5 Provide components for building by other sections in accordance with shop drawings and schedule.
- .6 Make field connections with bolts to CAN/CSA-S16.1, or weld.
- .7 Hand items over for casting into concrete or building into masonry to appropriate trades together with setting templates.

3.2 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 – Cleaning.
- .2 Leave Work area clean at end of each day
- .3 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning

3.3 PROTECTION

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

END OF SECTION