

1. GENERAL

1.1 Work Included

- .1 Pipe supports, platforms, walkways, and monorail beams.
- .2 Grating, stairs and ladders.
- .3 Baseplates, bearing plates, anchor bolts, vertical and horizontal bracing.
- .4 Welds, bolts, washers and nuts, screws, plates, and brackets.
- .5 Prime items to be finished painted as indicated on the Drawings.
- .6 Galvanizing items as indicated on the Drawings.
- .7 Field touch up of primed, finish painted and galvanized surfaces including field welding.

1.2 Design Standards, Code Requirements

- .1 Conform to requirements of CAN/CSA-S16-01, CSA-S136-01, the Canadian Institute of Steel Construction (CISC) "Code of Standard Practice for Buildings", and the Provincial Construction Safety Act.
- .2 Use loads, load combinations and stress levels in accordance with the National Building Code of Canada and as shown on drawings.
- .3 For non-standard connections, submit sketches and design calculations stamped and signed by a Professional Engineer registered in the Province of Manitoba.
- .4 Perform all welding in accordance with requirements of CSA-W59-M1989.

1.3 Qualifications

- .1 All work is to be performed by a firm certified by the Canadian Welding Bureau to the requirements of CSA-W47.1, in Division 1 or Division 2.1.
- .2 All welders employed for erection are to possess valid "S" Classification Class "O" certificates issued by the Canadian Welding Bureau. For hollow structural sections, welders are to possess valid "T" Classification, Class "D" certificates.

1.4 Inspection and Testing

- .1 Shop and field inspection and testing is to be performed by an Inspection and Testing Firm appointed and paid by the City.
- .2 Provide free access to all portions of work in the shop and in the field and cooperate with appointed firm.

- .3 Pay all additional costs for inspection and re-inspection due to defective workmanship or materials.
- .4 If requested by the Contract Administrator, submit four (4) copies of mill test reports, properly correlated to materials actually used.
- .5 Radiographic and magnetic particle inspection of welds is to be performed by the Inspection and Testing Firm, in accordance with CSA-W59 and ASTM E109, when required by the Contract Administrator.
- .6 Welds are to be considered defective if they fail to meet quality requirements of CSA-W59.
- .7 Additionally, all welds are to be visually inspected.
- .8 High Tensile bolted connections are to be inspected and tested in accordance with Clause 22.7, CAN/CSA-S16.

1.5 Shop Drawings, Submittals

- .1 Provide a fabrication and erection schedule to the Contract Administrator prior to commencement of shop fabrication and field erection, in ample time to allow proper scheduling of inspection and testing.
- .2 Submit details of typical connections and special connections for review prior to preparation of shop drawings.
- .3 Shop drawings and design briefs are to bear the seal of a Professional Engineer, registered in the Province of Manitoba. Design all connections for loads shown.
- .4 Submit shop drawings for review in accordance with Section 01300.
- .5 Clearly indicate profiles, sizes, spacing and locations of structural members, connections, attachments, reinforcing, anchorage, framed openings, size and type of fasteners, cambers and loads, accessories, column anchor bolt locations, setting details.
- .6 Include erection drawings, elevations and details.
- .7 Indicate welded connections using welding symbols in compliance with CISC Welding Standards. Clearly indicate net weld lengths.

2. PRODUCTS

2.1 Materials

- .1 All materials are to be new.
- .2 Structural Steel: conforming to CSA-G40.21, Type W, with minimum yield strength of 300 MPa for channels, angles, plate and miscellaneous steel, and minimum 350 MPa for wide

flange beams and hollow structural sections, including guardrailing. All steel to be shop primed or galvanized as indicated.

- .3 Steel Pipe: conforming to ASTM A53 grade 240 standard wall thickness.
- .4 Bolts, Nuts and Washers: conforming to ASTM A325, finished to match members to which they attach.
- .5 Anchor Bolts: fabricated from material conforming to CSA-G40.21, Type W, with yield strength 300 MPa; nuts and washers to be of equal or greater strength than bolts.
- .6 Welding Materials: conforming to CSA-W59.
- .7 Concrete Anchors: Hot dip galvanized or stainless steel 304 as applicable, with adhesive epoxy or epoxy acrylate.
- .8 Galvanizing: conforming to CSA-G164.
- .9 Primer: for surfaces to be finish painted to conform to CISC/CMPA 2-75.
- .10 Finish Paint: Section 09900. Colour as selected by Contract Administrator.

2.2 Fabrication

- .1 Fabricate steel members in accordance with CAN/CSA-S16 and CAN/CSA-S136.
- .2 Verify all Drawing and on-site dimensions prior to commencing fabrication.
- .3 Design and detail all connections for loads shown.
- .4 Fabricate items of sizes and profiles detailed on Drawings, with joints neatly fitted and properly secured.
- .5 Fit and shop assemble in largest practical sections, for delivery to site.
- .6 Supply all components required for proper anchorage of steel items. Fabricate anchorage and related components of same material and finish as steel fabrications, unless otherwise specified or shown.
- .7 Shop weld connections where possible, otherwise bolt connections. Cut off bolts flush with nuts.
- .8 Accurately cut and mill column ends and bearing plates to assure full contact of bearing surfaces prior to welding.
- .9 Accurately form all connections and joints with exposed faces flush, mitres and joints tight.
- .10 Close and weatherproof all gaps, butt joints and connections exposed to exterior steel items. All exposed welds are to be flush with surface of welded members; grind smooth where required.

- .11 Provide lugs, clips, brackets, hangers and struts as required for attaching miscellaneous metal items securely to building structure.
- .12 Design and detail connections for structural steel so that corrosion potential is minimized. Cap and seal weld all exposed ends of HSS sections.

2.3 Shop Painting

- .1 Prepare surfaces according to SSPC SP 7.
- .2 Apply one coat of prime paint in the shop to all steel surfaces, except:
 - Surfaces to be encased in concrete.
 - Surfaces and edges to be field welded.
 - Faying surfaces of friction-type connections.
 - Elements to be galvanized.
- .3 Apply paint under cover, on dry surfaces only and when surface and air temperatures are above 5°C.
- .4 Maintain dry condition and 5°C minimum temperature until paint is thoroughly dry.
- .5 Patch paint bolts, nuts, sharp edges and corners one coat before full prime coat is applied.
- .6 Apply paint by brush or spray to a dry film thickness of 0.05 mm minimum.

3. EXECUTION

3.1 Examination

- .1 Before starting erection, take field measurements and examine other work may affect this work.
- .2 Notify the Contract Administrator of any conditions which would prejudice proper installation of this work.
- .3 Commencement of this work implies acceptance of existing conditions.

3.2 Damaged Members

- .1 Repair or replace members damaged during transit or erection, before securing in position.

3.3 Erection

- .1 Erect steel in accordance with CAN/CSA-S16 and Drawings.
- .2 Field connections are to be bolted or as shown on Drawings.
- .3 Do not field weld wet surfaces or during rain unless under cover.

STEEL FABRICATIONS

- .4 Do not weld at temperature below 5°C except with express permission of the Contract Administrator.
- .5 Conform to requirements of CSA-W59 for minimum preheat and interpass temperatures.
- .6 Make adequate provision for all erection loads, and for sufficient temporary bracing to maintain structure safe, plumb and in true alignment until completion of erection and installation of necessary permanent bracing.
- .7 Set column bases and other vertical members to design elevations on levelling nuts or steel wedges. Do not use wood wedges.
- .8 Erection error is not to exceed requirements of CAN/CSA-S16. Obtain Contract Administrator's written permission prior to field cutting or altering steel members.
- .9 Install items plumb, square and level, fit accurately, and maintain free from distortion or defects detrimental to appearance and performance.
- .10 After erection field prime welds, nuts, bolts, washers and touch up abrasions and damage to shop primed surfaces.
- .11 Perform necessary cutting and altering for the installation of work of other sections, and as indicated on Drawings. No additional cutting is to be done without the acceptance of the Contract Administrator.
- .12 Perform all field assembly bolting and welding to match standard of shop bolting and welding. Bolts and screws are to be concealed whenever possible.
- .13 After installation, touch-up field bolts, nuts, welds, and scratched and damaged primed surfaces. Field touch-up primer to be same as shop primer.
- .14 Supply, to appropriate Sections, items required to be cast into or drilled into, or cored into concrete, complete with necessary setting templates.

END OF SECTION