

## **PART 1        GENERAL**

### **1.1            RELATED SECTIONS**

- .1        Section 05 50 00 – Metal Fabrications.
- .2        Section 05 51 00 – Metal Stairs and Ladders.

### **1.2            REFERENCES**

- .1        American Society for Testing and Materials International (ASTM),
  - .1        ASTM A36/A36M-14, Standard Specification for Carbon Structural Steel.
  - .2        ASTM F3125/F3125M-15a, Specification for High-Strength Structural Bolts, Steel and Alloy Steel, Heat Treated, 120 ksi (830 MPa) and 150 ksi (1040 MPa) Minimum Tensile Strength, Inch and Metric Dimensions.
- .2        Canadian General Standards Board (CGSB)
  - .1        CAN/CGSB-85.10, Protective Coatings for Metals.
- .3        Canadian Institute of Steel Construction (CISC)/Canadian Paint Manufacturers Association (CPMA).
  - .1        Handbook 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/G40.21-13, 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-S16-14, Limit States Design of Steel Structures.
  - .4        CAN/CSA-S136-12, Cold Formed Steel Structural Members.
  - .5        CSA W47.1-09 (R2014), Certification of Companies for Fusion Welding of Steel.
  - .6        CSA W48-14, Filler Metals and Allied Materials for Metal Arc Welding.
  - .7        CSA W55.3-08 (R2013), Resistance Welding Qualification Code for Fabricators of Structural Members Used in Buildings.
  - .8        CSA W59-13, Welded Steel Construction (Metal Arc Welding) – Metric.
- .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.

### **1.3 ACTION AND INFORMATION 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 the province of Newfoundland and Labrador, 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.
    - .5 Show detail of all non-standard connections such as bracing connections, moment connections, slotted connections, and hanger assemblies as requested by the Departmental Representative.
- .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 Newfoundland and Labrador, Canada.
- .5 As-Built/Record Drawings:
  - .1 Provide as-built drawings of structural steel to the Departmental Representative for records.
- .6 Source Quality Control Submittals:
  - .1 Submit mill test reports 4 weeks prior to fabrication of structural steel.
    - .1 Mill test reports to show chemical and physical properties and other details of steel to be incorporated in project.
    - .2 Provide mill test reports certified by metallurgists qualified to practice in Province of Newfoundland and Labrador, Canada.
- .7 Fabricator Reports:
  - .1 Provide structural steel fabricator's affidavit stating that materials and products used in fabrication conform to applicable material and products standards specified and indicated.

### **1.4 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.

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## **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.
- .3        Moment connections:
  - .1        Design moment connections for factored moment values provided on Structural drawings.
  - .2        If moment values are not indicated, provide connection for full moment capacity of controlling member and indicate value on shop drawings.
- .4        Submit sketches and design calculations stamped and signed by qualified professional engineer licensed in Province of Newfoundland and Labrador.

### **2.2            MATERIALS**

- .1        Structural steel: to CSA-G40.20/G40.21 Grade 350W and/or CAN/CSA-S136.
- .2        Anchor bolts: to CSA-G40.20/G40.21, Grade 300W.
- .3        Bolts, nuts and washers: to ASTM A325M.
- .4        Welding materials: to CSA W48 Series, CSA W59 and certified by Canadian Welding Bureau.
- .5        Shop paint primer: to CISC/CPMA2-75 solvent reducible alkyd, grey.
- .6        Hot dip galvanizing: galvanize steel, where indicated, to CAN/CSA-G164, minimum zinc coating of 600 g/m<sup>2</sup>.

### **2.3            FABRICATION**

- .1        Fabricate structural steel in accordance with CAN/CSA-S16 and in accordance with reviewed shop drawings.
- .2        Continuously seal members by continuous welds where indicated.

## **2.4 SHOP PAINTING**

- .1 Clean, prepare surfaces and shop prime structural steel in accordance with CAN/CSA-S16 except where members to be encased in concrete.
- .2 Clean members, remove loose mill scale, rust, oil, dirt and foreign matter. Prepare surface according to NACE No.3/SSPC SP-6.
- .3 Apply one coat of primer in shop to all exposed steel surfaces.
- .4 Apply paint under cover, on dry surfaces when surface and air temperatures are above 5 degrees C.
- .5 Maintain dry condition and 5 degrees 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 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-S16
- .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.

### **3.3 CONNECTION TO EXISTING WORK**

- .1 Verify dimensions and condition of existing work, report discrepancies and potential problem areas to Departmental Representative 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 bearing assemblies and splices for fit and match.

### **3.5 ERECTION**

- .1 Erect structural steel, as indicated and in accordance with CAN/CSA-S16 and in accordance with reviewed erection drawings.
- .2 Field cutting or altering structural members: to approval of Departmental Representative.
- .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 Inspection and testing of materials and workmanship will be carried out by testing laboratory designated by Departmental Representative.
- .2 The Inspection and Testing Company will carry out vertical and horizontal alignment checks, torque testing and inspection of representative connection welds.
- .3 Provide safe access and working areas for testing on site, as required by testing agency and as authorized by Departmental Representative.
- .4 Submit test reports to Departmental Representative within two weeks of completion of inspection.
- .5 Departmental Representative will pay costs of tests as specified in Section 01 45 00 – Quality Control.
- .6 Prior to inspection & testing by the Inspection and Testing company the structural steel erection Contractor will carry out an inspection of Work and make the inspection results available to Departmental Representative and Inspection and Testing company. The inspection report will identify the areas of Work inspected, deficiencies identified and measures taken to correct Submit copies of test reports and inspections to Departmental Representative.

### **3.7 FIELD PAINTING**

- .1 Paint in accordance with Section 09 91 99 - Painting.
- .2 Touch up damaged surfaces and surfaces without shop coat with primer to NACE No.3/SSPC-SP-6 except as specified otherwise. Apply in accordance: MPI Architectural Painting Specification Manual.

### **3.8 CLEANING**

- .1 Clean in accordance with Section 01 74 11 - Cleaning.

**END OF SECTION**