

## 1 GENERAL

### 1.01 REFERENCES

- .1 ASTM International Inc.
  - .1 ASTM A 36/A 36M- 08, Standard Specification for Carbon Structural Steel.
  - .2 ASTM A 193/A 193M- 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 A 307- 07b, Standard Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.
  - .4 ASTM A 325- 07a, Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength.
  - .5 ASTM A 325M- 08, Standard Specification for Structural Bolts, Steel, Heat Treated 830 MPa Minimum Tensile Strength Metric.
  - .6 ASTM A 490M- 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.

## **1.02 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 the Province of Prince Edward Island, 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 Prince Edward Island, Canada.
- .5 Samples:
  - .1 Prepare sample of typical exposed structural connections in accordance with AISC Specifications of Architecturally exposed structural steel for approval of Departmental Representative. Samples to be judged upon alignment of surfaces, uniform contact between surfaces, smoothness and uniformity of finished welds. When approved, sample units will serve as a standard for workmanship, appearance and material acceptable for entire project.
- .6 Source Quality Control Submittals:
  - .1 Submit 2 copies of 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 the Province of Prince Edward Island, 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.

### **1.03 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.

## **2 PRODUCTS**

### **2.01 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 For composite construction select or design minimum end connection to resist reaction resulting from factored movement resistance as tabulated in the "Handbook of the Canadian Institute of Steel Construction" assuming 100% shear connection with depth of steel deck and/or slab shown on drawings.
- .4 Submit sketches and design calculations stamped and signed by qualified professional engineer licensed in the Province of Prince Edward Island, Canada for non-standard connections.

### **2.02 MATERIALS**

- .1 Structural steel: to CAN/CSA-S136.
- .2 Anchor bolts: to CSA-G40.20/G40.21, Grade 300W ASTM A 36/A 36M.
- .3 High strength anchor bolts: to ASTM A 193/A 193M.
- .4 Bolts, nuts and washers: to ASTM A 307.
- .5 Welding materials: to CSA W48 Series and certified by Canadian Welding Bureau.
- .6 Shop paint primer: to CISC/CPMA 2-75 solvent reducible alkyd, grey.

- .7 Hot dip galvanizing: galvanize steel, where indicated, to CAN/CSA-G164, minimum zinc coating of 600 g/m.
- .8 Shear studs: to CSA W59, Appendix H.

### **2.03 FABRICATION**

- .1 Fabricate structural steel in accordance with CAN/CSA-S16 and in accordance with approved shop drawings.
- .2 Install shear studs in accordance with CSA W59.
- .3 Continuously seal members by continuous welds where indicated. Grind smooth.

### **2.04 SHOP PAINTING**

- .1 Clean, prepare surfaces and shop prime structural steel in accordance with CAN/CSA-S16.
- .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 steel surfaces, 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 slip-critical connections.
  - .5 Below grade surfaces in contact with soil.
- .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.

## **3 EXECUTION**

### **3.01 APPLICATION**

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

### **3.02 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.

### **3.03 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.

### **3.04 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.

### **3.05 ERECTION**

- .1 Erect structural steel, as indicated and in accordance with CAN/CSA-S16.
- .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.

### **3.06 FIELD QUALITY CONTROL**

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

**3.07    FIELD PAINTING**

- .1        Paint in accordance with Section 09 91 23 - Interior Painting.
  - .1        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.

**3.08    CLEANING**

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

**END OF SECTION**