

**PART 1 - GENERAL**

1.1 RELATED  
REQUIREMENTS

- .1 Section 01 33 00 - Submittal Procedures.
- .2 Section 01 74 21 - Construction/Demolition Waste Management and Disposal (short form).

1.2 REFERENCES

- .1 American Society for Testing and Materials international, (ASTM)
  - .1 ASTM A 36/A36M-01, Specification for Structural Steel.
  - .2 ASTM A 193/A193M-01b, Specification for Alloy-Steel and Stainless Steel Bolting Materials for High-Temperature Service.
  - .3 ASTM A 307-00, Specification for Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength.
  - .4 ASTM A 325-02, Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength.
  - .5 ASTM A 325M-00, Specification for High Strength Bolts, for Structural Steel Joints Metric.
  - .6 ASTM A 490M-00, Specification for High-Strength Steel 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 CISC/CPMA 1-73b, Quick-Drying, One-Coat Paint for Use on Structural Steel.
  - .2 CISC/CPMA 2-75, Quick-Drying, Primer for use on Structural Steel.

- .4 Canadian Standards Association (CSA International)
  - .1 CAN/CSA G40.20/G40.21-98, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
  - .2 CAN/CSA-G164-M92(R1998), Hot Dip Galvanizing of Irregularly Shaped Articles.
  - .3 CAN/CSA-S16-01, Limit States Design of Steel Structures.
  - .4 CAN/CSA-S136-94 (R2001), Cold Formed Steel Structural Members.
  - .5 CSA S136.1-95 (R2001), Commentary on CSA Standard S136.
  - .6 CSA W47.1-92 (R2001), Certification of Companies for Fusion Welding of Steel Structures.
  - .7 CSA W48-01, Filler Metals and Allied Materials for Metal Arc Welding.
  - .8 CSA W55.3-1965 (R1998), Resistance Welding Qualification Code for Fabricators of Structural Members Used in Buildings.
  - .9 CSA W59-M1989(R2001), Welded Steel Construction (Metal Arc Welding) (Metric).
- .5 The Society for Protective Coatings (SSPC)
  - .1 SSPC SP-6/NACE No. 3-00, Commercial Blast Cleaning.

### 1.3 SHOP DRAWINGS

- .1 Submit shop drawings including fabrication and erection documents and materials list in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Erection drawings: indicate 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.

- .3 Ensure Fabricator drawings showing designed assemblies, components and connections are stamped and signed by qualified professional engineer licensed in the Province of Prince Edward Island, Canada.

#### 1.4 SAMPLES

- .1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.

#### 1.5 QUALITY ASSURANCE

- .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 Province of Prince Edward Island, Canada.
- .2 Provide structural steel Fabricator's Affidavit stating that materials and products used in fabrication conform to applicable material and products standards specified and indicated.

#### 1.6 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate and recycle waste materials in accordance with Section 01 74 21 - Construction and Demolition Waste Management and Disposal (short form).
- .2 Remove from site and dispose of packaging materials at appropriate recycling facilities.
- .3 Collect and separate for disposal paper, plastic, polystyrene, corrugated cardboard, packaging material in appropriate on-site for recycling in accordance with Waste Management Plan.

- .4 Divert unused metal materials from landfill to metal recycling facility approved by the departmental representative.
- .5 Divert unused paint material from landfill to official hazardous material collections site approved by the departmental representative.
- .6 Do not dispose of unused paint materials into sewer systems, into lakes, streams, onto ground or in other location where it will pose health or environmental hazard.

1.7 Measurement for Payment

- .1 Structural Steel will be measured in accordance with Section 01 10 10.
- .2 The unit price for this item shall include all labour, equipment and materials to fabricate and install structural steel items (other than H-piles and tie rods) as described by the project drawings including but not limited to panel hanger straps and seat angles, tie rod connection to H-piles, channel beam cap at the top of precast wall units.
- .3 Steel tie rods will be measured in accordance with Section 01 10 10.
- .4 The unit price for steel tie rods item shall include all equipment, labour, and materials to supply and install the steel tie rods, bearing plates, heavy hex nuts and pipe sleeves.

**PART 2- PRODUCTS**

2.1 Materials

- .1 Structural Steel to: CAN/CSA G40.21, Grade 350 W.

- .2 Tie rods: to ASTM A615, Grade 517 MPa. Continuously threaded bar with single corrosion protection. Pre-assemble, mark and test tie rod assemblies in shop. Heavy hex nuts to have full capacity of the tie rod.
- .3 Nuts and bolts: hexagon nuts, bolts and washers: to ASTM A 307.
- .4 Maximum tie rod diameter = 43 mm.
- .5 Bearing plates to sizes indicated.
- .6 Hot dip galvanize items indicated to CAN/CSA G-164, minimum zinc coating of 610 g/square meter.

### 2.3 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 other foreign matter. Prepare surface according to SSPC-SP-6.
- .3 Apply one coat of primer in shop to steel surfaces.
- .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 - EXECUTION**

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|----------------------------------|--|
| <u>3.1 GENERAL</u>               | <ul style="list-style-type: none"><li>.1 Structural steel work: in accordance with CAN/CSA-S16, CAN/CSA-S136.</li><li>.2 Welding: in accordance with CSA W59.</li><li>.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.</li></ul>   |
| <u>3.2 MARKING</u>               | <ul style="list-style-type: none"><li>.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.</li><li>.2 Match marking: shop mark bearing assemblies and splices for fit and match.</li></ul>   |
| <u>3.3 ERECTION</u>              | <ul style="list-style-type: none"><li>.1 Erect structural steel, as indicated and in accordance with CAN/CSA-S16 and in accordance with approved erection drawings.</li><li>.2 Field cutting or altering structural members: to approval of the departmental representative.</li><li>.3 Clean with mechanical brush and touch up shop primer to bolts, rivets, welds and burned or scratched surfaces at completion of erection.</li></ul> |
| <u>3.4 FIELD QUALITY CONTROL</u> | <ul style="list-style-type: none"><li>.1 Inspection and testing of materials and workmanship will be carried out by testing</li></ul>  |

laboratory designated by the Departmental Representative.

- .2 Provide safe access and working areas for testing on site, as required by testing agency and as authorized by the Departmental Representative.
- .3 Submit test reports to the Departmental Representative within 2 weeks of completion of inspection.
- .4 The Departmental Representative will pay costs of tests as specified in Section 01 45 00.

### 3.5 FIELD PAINTING

- .1 Touch up damaged surfaces and surfaces without shop coat with primer to SSPC-SP-6 except as specified otherwise. Apply in accordance with CAN/CGSB 85.10.

**PART 1 - GENERAL**

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|------------------------------------|----|--|
| <u>1.1 RELATED WORK</u>            | .1 | Rough Carpentry: Section 06 10 00  |
| <u>1.2 DESCRIPTION OF WORK</u>     | .1 | The work of this Section comprises the furnishing of all labour, materials and equipment necessary for the supply and installation of items of work specifically listed under Part 2 - PRODUCTS of this Section, as specified in this Section and shown on the Drawings. |
| <u>1.3 MEASUREMENT FOR PAYMENT</u> | .1 | Measurement of Payment for mooring cleats will be in units of each, and shall include all labour, materials, and equipment to supply and install the mooring cleat.  |
|                                    | .2 | Measurement of Payment for structural steel shall be in units of tonnes and shall include all labour, materials and equipment to supply and install the structural steel.  |
|                                    | .3 | Measurement of Payment of all other items (metal connectors and fasteners) indicated shall be considered incidental to the work.   |

**PART 2 - PRODUCTS**

- |                                |    |   |
|--------------------------------|----|---|
| <u>2.1 MOORING CLEATS</u>      | .1 | Cast steel mooring cleat, located as indicated on the drawings and sized to the Harbour Authority's requirements. |
| <u>2.2 MISCELLANEOUS METAL</u> | .1 | Steel sections and plates: to CAN/CSA G40.21, Grade 350W except where specified otherwise.                        |
|                                | .2 | Ladder rungs: to CSA C-40.21 round bars to size as indicated.   |

.3 Welding materials: to CSA W59.

.4 Bolts and anchor bolts: to ASTM A307.

### 2.3 GALVANIZING

.1 Hot dip galvanize bolts, nuts, washers, and ladder assemblies and unless otherwise specified, staples, cable clamps, pipe sleeves, spikes and nails to CAN/CSA-G164. All steel materials shall be hot dipped galvanized (min. 700gr/m3) suitable for marine environment.

## **PART 3 - EXECUTION**

### 3.1 CLEATS / LADDERS

.1 Install at locations indicated on drawings.

### 3.2 MISCELLANEOUS METALS

.1 Do miscellaneous steel work in accordance with CAN/CSA S16.1.

.2 Welding in accordance with CSA W59. Install miscellaneous site items as indicated on drawings.

### 3.3 FABRICATION GENERAL

.1 Fabricate steel, as indicated, in accordance with CAN/CSA-S16.1 and in accordance with reviewed shop drawings.

.2 Fabricate work square, true, straight and accurate to required size, with joints closely fitted and properly secured.

.3 Use welded connections for both interior and exterior metal work

unless otherwise indicated or approved  
by Departmental Representative.

- .4 Where possible, fit and shop assemble  
work, ready for erection.
- .5 Ensure exposed welds are continuous  
for length of each joint. File or  
grind exposed welds smooth and flush.
- .6 Grind and polish all exposed edges and  
corners to leave smooth surface free  
from burrs or other sharp protrusions.
- .7 All holes shall be punched or drilled.  
Burning holes in any steel member is  
NOT permitted.
- .8 Galvanize all steel materials.

3.4 CONNECTION TO  
EXISTING WORK

- .1 Verify dimensions, alignment,  
elevations and condition of existing  
work before commencing fabrication and  
report any discrepancies and potential  
problem areas to a Departmental  
Representative and await instructions.