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## **Part 1 General**

### **1.1 RELATED SECTIONS**

- .1 Section 03 20 00 - Concrete Reinforcing
- .2 Section 03 30 00 - Cast-in-Place Concrete

### **1.2 REFERENCES**

- .1 Canadian Standards Association (CSA International)
  - .1 CAN/CSA-S16.1-94 (R2000), Limit States Design of Steel Structures.
  - .2 CSA-S136-94, Cold Formed Steel Structural Members.
  - .3 CSA W47.1-92, Certification of Companies for Fusion Welding of Steel Structures.
  - .4 CSA W55.3-1965, Resistance Welding Qualification Code for Fabricators of Structural Members Used in Buildings.
  - .5 CSA W59-M1989, Welded Steel Construction, (Metal Arc Welding) Metric.

All Standards mentioned above shall be of latest Edition.

### **1.3 MEASUREMENT FOR PAYMENT**

- .1 Steel deck will be measured in square meters incorporated in this work and will include supply, delivery, storage and erection, including all fasteners and metal end closures.

### **1.4 DESIGN REQUIREMENTS**

- .1 Galvanized steel decking has been designed as formwork to carry concrete loads while curing. Once concrete has cured, the concrete deck is structurally independent.

### **1.5 SHOP DRAWINGS**

- .1 Submit shop drawings in accordance with Section 01 33 00 – Submittal Procedures.

## **Part 2 Products**

### **2.1 MATERIALS**

- .1 Steel Deck: Galvanized composite, hi bond, structural quality grade 230 MPa, 1.52 mm minimum base steel thickness (16 gauge) with 76 mm deep flutes spaced at 152 mm center to center.
- .2 Galvanized coating shall conform to ASTM A.Z275 (G90).
- .3 Metal end closures to match deck.

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### **Part 3 Execution**

#### **3.1 GENERAL**

- .1 Structural steel work: in accordance with CAN/CSA-S136 and CSSBI 10M and CSSBI 12M.
- .2 Deck shall be connected to each pile caps and edge beams all around at 300 mm center to center in lower flutes with 16 mm diameter x 300 mm long galvanized steel lag bolts. Lag bolts shall be 150 mm into pile caps and 150 mm into concrete topping.
- .3 Fasten all deck laps with #10 screws (4.8 mm diameter) galvanized at 300 center to center.

#### **3.2 INSTALLATION**

- .1 Install steel deck in accordance with manufacturer's instructions.
- .2 Prior to concrete placement, steel deck to be free of soil, debris, standing water, loose mil scale and other foreign matter.
- .3 Place and support reinforcing steel as indicated.

#### **3.3 CLOSURES**

- .1 Install closures in accordance with approved details at all exposed edges.

**END OF SECTION**

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## **Part 1 Metal Fabrications**

### **1.1 RELATED SECTIONS**

- .1 Section 01 33 00 - Submittal Procedures
- .2 Section 01 74 21 - Construction/Demolition Waste Management And Disposal.
- .3 Section 06 10 10 – Rough Carpentry

### **1.2 REFERENCES**

- .1 CAN/CSA-G40.20/G40.21, General Requirements for Rolled or Welded Structural Quality Steel.
- .2 CAN/CSA-G164- Hot Dip Galvanizing of Irregularly Shaped Articles.
- .3 CAN/CSA-S16.1- Limit States Design of Steel Structures.
- .4 CSA W48- Filler Metals and Allied Materials for Metal Arc Welding (Developed in co-operation with the Canadian Welding Bureau).
- .5 CSA W59-Welded Steel Construction (Metal Arc Welding).
- .6 CSA W47-1 Arc Welding

All Standards used shall be of latest edition.

### **1.3 DESCRIPTION**

- .1 This section specifies requirements for the supply fabrication, delivery and installation of the following:
  - .1 Galvanized Steel connectors and misc. steel as shown on drawings etc. to complete the work.
  - .2 Ladder rungs, hold fasts and mooring cleats etc.

### **1.4 SUBMITTALS**

- .1 Shop Drawings:
  - .1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.
  - .2 Indicate materials, core thicknesses, finishes, connections, joints, method of anchorage, number of anchors, supports, reinforcement, details, and accessories.
  - .3 Submit certificate of welders employed in field for review before commencing the work. All welders shall have CWB Ticket for all position welding.

### **1.5 QUALITY ASSURANCE**

- .1 Test Reports: Certified test reports showing compliance with specified performance characteristics and physical properties.
- .2 Certificates: Product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

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## **1.6 MEASUREMENT FOR PAYMENT**

- .1 Payment for items under this section shall be as follows:
  - .1 The installation of all steel connectors as shown on drawing shall be paid as Lump Sum.
  - .2 The supply and installation of mooring cleats will be measured by the unit acceptably incorporated in the work.
  - .3 The supply and installation (including welding, cutting, drilling and galvanizing as required) of miscellaneous metals including connectors to complete the work will be paid as Lump Sum.
  - .4 Measurement for payment of all washers, bolts, anchor rods and hardware will be incidental to the item that the hardware is associated with.
  - .5 Ladders shall be measured on a per unit basis. This item will include supply and placing of all ladders, angles, holdfast and all other items to complete the work.

## **1.7 WASTE MANAGEMENT AND DISPOSAL**

- .1 Separate and recycle waste materials in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
- .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 Departmental Representative.

## **Part 2 Products**

### **2.1 MATERIALS**

- .1 Steel sections and plates: to CAN/CSA-G40.20/G40.21, Grade 350W.
- .2 Welding materials: to CSA W59.
- .3 Welding electrodes to CSA W 48
- .4 Bolts and anchor bolts: to ASTM A307. hot dipped Galvanized G- 90
- .5 Grout: non-shrink, non-metallic, flow able, 15 MPa at 24 hours.
- .6 Galvanizing 900 gm/m<sup>2</sup> Z 275 – G90
- .7 Mooring cleats – minimum mass for cleats shall be 13 kg.

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## **2.2 FABRICATION**

- .1 All fabrication of steel shall be by the company certified by CWB .
- .2 Fabricate work square, true, straight and accurate to required size, with joints
- .3 closely fitted and properly secured.
- .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 Machine bolts will have standard heads, nuts and when in position will be of sufficient length to permit a full nut and two washers. Thread shall be coarse threads series as specified in latest ANS/B1-1 having a Class 2A tolerances.
- .7 Standard cast iron washers suitable for the bolt specified will be placed under the nuts of all machine bolts bearing on timber surfaces unless noted otherwise on the drawings.

## **2.3 FINISHES**

- .1 Galvanizing: hot dipped galvanizing with zinc coating 900g/m2 to CAN/CSA-G164. for all bolts, washers and connectors
- .2 Zinc primer: zinc rich, ready mix to CAN/CGSB-1.181.

## **Part 3 Execution**

### **3.1 ERECTION**

- .1 Does welding work in accordance with CSA W59 unless specified otherwise.
- .2 Erect metal work square, plumb, straight, and true, accurately fitted, with tight joints and intersections.
- .3 Provide suitable means of anchorage acceptable to Departmental Representative 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 Make field connections with bolts to CAN/CSA-S16.1, or weld.
- .6 Touch-up rivets, field welds, bolts and burnt or scratched surfaces after completion of erection with zinc primer.
- .7 Take necessary care in the handling of all galvanized steel parts to prevent damage to the coatings. Evidence of damage shall be cause for rejection. Touch-up galvanized surfaces with zinc rich primer where burned by field welding or damaged. As per the approval from Departmental Representative.
- .8 Welders employed in field shall be certified by CWB for all position welding.

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**3.2 CLEATS**

- .1 Secure cleats with anchor bolts with nuts and washers as shown on drawings.
- .2 If required, grout under base of cleat using a non-shrink, no metallic type of grout to obtain a smooth level surface.
- .3 After cleat installation is complete, bolt holes in cleats shall be filled with approved waterproof exterior grade sealant.

**END OF SECTION**