

PART 1 - GENERAL

1.1 RELATED SECTIONS

- .1 Section 01 33 00 - Submittal Procedures.
- .2 Section 01 74 19 - Construction/Demolition Waste Management And Disposal.
- .3 Section 31 62 16.19 - Steel Pipe Piles.
- .4 Section 35 51 24 - Float Installation.

1.2 DESCRIPTION

- .1 The work under this section will include:
 - .1 The fabrication, supply and installation of anchor bolts, machine bolts, lagscrews, and all other miscellaneous bolts, nuts, washers, plates and metal parts required for the completion of the work.

1.3 MEASUREMENT PROCEDURES

- .1 No separate payment shall be made for spikes, anchor bolts, machine bolts, lagscrews, nuts and washers, inserts, holdfasts, mooring rings, angles, channels, plates, any other metal required to complete the work, will be considered incidental to the contract and no separate payment will be made for these items.

1.4 REFERENCES

- .1 American Society for Testing and Materials International, (ASTM)
 - .1 ASTM A 53/A53M-02, Specification for Steel, Black and Hot-Dipped, Zinc-Coated Welded and Steamless.
 - .2 ASTM B928/B928-07, Standard Specification for High Magnesium Aluminum-Alloy Sheet and Plate for Marine Service and Similar Environment.
 - .3 ASTM D 2000 Standard Classification System for Rubber Products in Automotive Applications
- .2 Canadian Standards Association (CSA International)
 - .1 CAN/CSA-G40.20/G40.21-98, General Requirements for Rolled or Welded Structural Quality Steel.
 - .2 CAN/CSA-G164-M92(R1998), Hot Dip Galvanizing of Irregularly Shaped Articles.
- .3 The Environmental Choice Program
 - .1 CCD-047a-98, Paints, Surface Coatings.
 - .2 CCD-048-98, Surface Coatings - Recycled Water-borne.
- .4 CSA HA Series-M1980, CSA Standards for Aluminum and Aluminum Alloys.

- .5 CAN3-S157-M83, Strength Design in Aluminum.
- .6 CSA W59.2-M1991, Welded Aluminum Construction.
- .7 CSA W57.2-M1987, Certification of Companies for Fusion Welding of Aluminum.
- .8 CAN3-S157, Surface preparation of aluminum in contact with dissimilar materials.
- .9 ASTM B928/B928-07 Standard Specification for High Magnesium Aluminum-Alloy Sheet and Plate for Marine Service and Similar Environment.
- .10 CSA CAN3-S16.1-M78, Steel Structures for Building-Limit States Design.
- .11 Do welding work to CSA W59-M1989 unless specified otherwise. Submit welder's certificate for review by Departmental Representative.
- .12 ASTM D 2000 Standard Classification System for Rubber Products in Automotive Applications.

1.5 Source Quality Assurance

- .1 Prior to commencing of work, submit certified copy of mill reports covering chemical and physical properties of aluminum used in this work.

1.6 SUBMITTALS

- .1 Product Data:
 - .1 Submit manufacturer's printed product literature, specifications and data sheet in accordance with Section 01 33 00 - Submittal Procedures.
 - .2 Submit two copies of WHMIS MSDS - Material Safety Data Sheets in accordance with Section 01 33 00 - Submittal Procedures. Indicate:
 - .1 For finishes, coatings, primers and paints.
- .2 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. Indicate welds using CWB Welding Symbols.
 - .3 All submissions shall bear the stamp of qualified Professional Engineer registered in the Province of New Brunswick.

1.7 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.

1.8 DELIVERY, STORAGE, AND HANDLING

- .1 Packing, Shipping, Handling and Unloading:
 - .1 Deliver, store, handle and protect materials in accordance with Section 01 61 00 - Common Product Requirements.
- .2 Storage and Protection:
 - .1 Cover exposed stainless steel surfaces with pressure sensitive heavy protection paper or apply strippable plastic coating, before shipping to job site.
 - .2 Leave protective covering in place until final cleaning of building. Provide instructions for removal of protective covering.

1.9 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate and recycle waste materials in accordance with Section 01 74 19 - 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 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 300W.
- .2 Welding materials: to CSA W59, latest edition.
- .3 Welding electrodes: to CSA W48 Series.
- .4 Bolts and anchor bolts: to ASTM A 307.
- .5 Adhesive anchoring system to be HVA Capsule Adhesive Anchor System by Hilti or approved equal.
- .6 Stainless Steel Tubing: to ASTM A269
- .7 Wire nails and spikes shall conform to B111-1974.

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- .8 Stainless Steel bolts: To AISI Steel Products Manual No. 13.
 - .9 Cast iron: to ASTM A48-74.
 - .10 Lagcrews and Machine Bolts:
 - .1 lagscrews shall meet the requirements of B18.23-8-M1979.
 - .2 Machine bolts will have standard heads, nuts, and threads and when in position will be of sufficient length to permit a full nut and two washers. Threads shall be the Coarse Thread Series as specified in the latest issue of ANSI B1-1 having a Class 2A tolerance.
 - .3 Standard cast iron washers suitable for the sizes of bolts specified will be placed under the heads and nuts of all machine bolts bearing on timber surfaces unless noted otherwise on drawings. Ogee washers to Timber Institute of Canada and as follows: ogee washers to be cast iron free from injuries, defects or impurities.
 - .4 As an alternative to ogee washers, standard plate washers can be used. The washer is to be three times bolt diameter and a minimum thickness of 6mm unless noted otherwise.
 - .11 Galvanizing: hot dipped galvanizing with minimum zinc coating of 610g/sq.m. to CSA G164-M1981. All anchor bolts, machine bolts, spikes, lagscrews, nuts, washers, to be galvanized.
 - .12 Galvanized primer: to CSB 1-GP-183M.
 - .13 Steel sections, bars, tie rods, anchor dowels, plates and washers: to CSA G40.21-M1981, Type 300W.
 - .14 Aluminum checkered cover plates: Alloy 5052-H321, or an approved alternative.
 - .15 Neoprene Mat ASTM D2000-90, Type BG.
 - .16 Resin Anchorage: epoxy resin cartridge providing 120KN ultimate tensile strength for size and depth of embedment.
 - .17 13mm diameter galvanized steel mooring chain for tire fender assemblies: Crosby Spectrum 3, 13mm diameter, Working load Limit, 4500 Kilograms.

2.2 FABRICATION

- .1 Fabricate work square, true, straight and accurate to required size, with joints closely fitted and properly secured.
- .2 Use self-tapping shake-proof flat headed screws on items requiring assembly by screws or as indicated.
- .3 Where possible, fit and shop assemble work, ready for erection.
- .4 Ensure exposed welds are continuous for length of each joint. File or grind exposed welds smooth and flush.
- .5 All steel members and assembled units shall be hot dip galvanized to CSA G164-M81

(610g/sq.m) unless specified otherwise. All welded units are to be completed, including punching of connection bolt holds, prior to the units being hot dip galvanized.

Pre-assembly of the framework shall be carried out to ensure no cutting, welding, or other fabrication will be necessary subsequent to hot dip galvanizing

- .6 The fabrication of all structural steel shall conform to the requirements of CSA CAN3-S16.1-M78.
- .7 Checkered Cover Plates: fabricate in accordance with ASTM B928/B928-07.

2.3 FINISHES

- .1 Galvanizing: hot dipped galvanizing with zinc coating 610 g/m² to CAN/CSA-M81.
- .2 Shop coat primer: to CAN/CGSB-1.40.
- .3 Zinc primer: zinc rich, ready mix to CAN/CGSB-1.181.

2.4 ISOLATION COATING

- .1 Isolate aluminum from following components, by means of bituminous paint:
 - .1 Dissimilar metals except stainless steel, zinc, or white bronze of small area.
 - .2 Concrete, mortar and masonry.
 - .3 Wood.

2.5 SHOP PAINTING

- .1 Apply one shop coat of primer to metal items, with exception of galvanized or concrete encased items.
- .2 Use primer unadulterated, as prepared by manufacturer. Paint on dry surfaces, free from rust, scale, grease. Do not paint when temperature is lower than 7 degrees C.
- .3 Clean surfaces to be field welded; do not paint.

PART 3 - EXECUTION

3.1 ERECTION

- .1 Do welding work in accordance with CSA W59 unless specified otherwise.
 - .1 Do not deviate the size, length and location of welds from details shown

- on reviewed shop drawings.
- .2 Use qualified fabricators and welders in accordance with CSA W47.2.
- .3 All welds will be subject to visual inspection requirements of CSA W59.
- .4 Welds which fail the visual inspection will be Subject to further non-destructive testing. This testing may be radiographic, magnetic particle investigation, ultrasonic, or other appropriate testing. The full length of the weld will be examine of the weld.
- .5 If more than 50% of the welds fail the visual inspection requirements, all welds will be tested by non-destructive testing methods.
- .6 The Contractor will be responsible for all costs for non-destructive testing, resulting from visual inspection failure.
- .7 The Contractor will be responsible for all costs for welding repairs as a result of faulty workmanship or materials as determined from visual inspection and or subsequent non-destructive testing.
- .8 Departmental Representative will not approve any weld until all required inspection is completed, found acceptable and marked as such.
- .2 Inspection and testing of materials and workmanship may be carried out by testing laboratory designated by Departmental Representative.
- .3 Erect metalwork square, plumb, straight, and true, accurately fitted, with tight joints and intersections.
- .4 Provide suitable means of anchorage acceptable to Departmental Representative such as dowels, anchor clips, bar anchors, expansion bolts and shields, and toggles.
- .5 Exposed fastening devices to match finish and be compatible with material through which they pass.
- .6 Provide components by other sections in accordance with shop drawings and schedule.
- .7 Make field connections with bolts to CAN/CSA-S16.1, or weld.
- .8 Hand items over for casting into concrete to appropriate trades together with setting templates.
- .9 Touch-up field welds, bolts and burnt or scratched surfaces after completion of erection with primer.
- .10 Touch-up galvanized surfaces with zinc rich primer where burned by field welding.
- .11 Surface preparation of aluminum in contact with dissimilar materials to CAN3-S157. All locations to be treated as if they were in presence of moisture.
- .12 Obtain written permission from Departmental Representative prior to field cutting or altering of structural members.

3.2 INSTALLATION

- .1 Predrill holes for lagscrews in accordance with CSA 086-M84.
- .2 Machine bolts will have standard heads, nuts and threads and when in position will

be of sufficient length to permit a full nut and two washers. Holes for machine bolts will be bored to the same diameter as that of the bolts.

- .3 Machine bolts will be placed in the work with their heads on the outside. The heads of the machine bolts that interfere with succeeding parts of the work being placed, or where directed by the Departmental Representative or shown on the drawings will be countersunk.
- .4 Standard cast iron washers or steel washers of the sizes indicated will be placed under the heads and nuts of all machine bolts bearing on timber surfaces, except where specified otherwise.
- .5 Where indicated, use steel washers of size shown.
- .6 Holes for spikes will be bored 1.5mm smaller than diameter of spike and 50mm less than the length of spike.
- .7 Provide suitable and acceptable means of anchorage, such as dowels, anchor clips, bar anchors, bolts and washers, etc. As indicated on the drawings.
- .8 Erect gangway as indicated and in accordance with CAN3-S157 and reviewed shop drawings.

3.3 PROTECTION

- .1 Take necessary care in handling, packing and shipping of all galvanized steel members to prevent damage to the galvanized coating. Evidence of damage to the galvanized members due to mishandling or lack of adequate protection shall be cause for rejection of the members.

3.4 CLEANING

- .1 Perform cleaning after installation to remove construction and accumulated environmental dirt.
- .2 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.