

1 GENERAL

1.01 RELATED REQUIREMENTS

- .1 Section 01 33 00 - Submittal Procedures.
- .2 Section 06 08 99 - Rough Carpentry for Minor Works.
- .3 Section 35 51 24 - Floating Wharves Installation.

1.02 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.
 - .2 Supply and installation of inter float connections, cover plates and all associated items, as indicated on the drawings.
 - .3 Supply and installation of tire fender systems as indicated on the drawings, or as specified by the Departmental Representative.
 - .4 Supply and installation of yokes as indicated on the drawings.
 - .5 Supply and installation of an aluminum gangway at Dipper Harbour.
 - .6 The supply and delivery of one aluminum gangway at Black's Harbour

1.03 MEASUREMENT FOR PAYMENT

- .1 No separate payment shall be made for spikes, anchor bolts, machine bolts, lagscrews, nuts and washers, inserts, holdfasts, ladder rungs, mooring rings, angles, channels, plates, any other metal required to complete the work. All these metals items will be included under the unit price under section 06 08 99.
- .2 Supply and installation of inter float connections, cover plates, tire fender systems, ladders, safety chains, and all associated metal items associated with the complete installation of the floats will be include in the unit bid pride under section 06 08 99.
- .3 Supply and delivery of one aluminum gangway at Dipper Harbour and one at Black's Harbour, as indicated on the drawings will be paid by the unit.
- .4 Supply and installation of new yokes at Boynes Cove, and the supply and delivery for both yokes for the new floating wharves at both Dipper Harbour and Blacks Harbour will be paid with the unit price under section 06 08 99.
- .5 All other necessary hardware and items indicated on the drawings to complete the floating wharves and their connections will be paid under the unit price under section 06 08 99.
- .6 Payment for the supply and installation of checkered cover plates and neoprene mats, as indicated on the drawings, will be included in the unit bid price under section 06 08 99.

1.04 REFERENCES

- .1 ASTM International
 - .1 ASTM A 53/A 53M-07, Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless.
 - .2 ASTM A 269-08, Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service.
 - .3 ASTM A 307-07b, Standard Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.
 - .4 ASTM B928/B928-07, Standard Specification for High Magnesium Aluminum-Alloy Sheet and Plate for Marine Service and Similar Environment.
 - .5 ASTM D 2000 Standard Classification System for Rubber Products in Automotive Applications.
 - .6 ASTM B928/B928-07 Standard Specification for High Magnesium Aluminum-Alloy Sheet and Plate for Marine Service and Similar Environment.
 - .7 CSA CAN3-S16.1-M78, Steel Structures for Building-Limit States Design.
 - .8 ASTM D 2000 Standard Classification System for Rubber Products in Automotive Applications.
- .2 CSA International
 - .1 CSA G40.20/G40.21-04(R2009), 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 CSA S16-09, Design of Steel Structures.
 - .4 CSA W48-06, Filler Metals and Allied Materials for Metal Arc Welding (Developed in co-operation with the Canadian Welding Bureau).
 - .5 CSA W59-M03(R2008), Welded Steel Construction (Metal Arc Welding) Metric. CSA HA Series-M1980, CSA Standards for Aluminum and Aluminum Alloys.
 - .6 CAN3-S157-M83, Strength Design in Aluminum.
 - .7 CSA W59.2-M1991, Welded Aluminum Construction.
 - .8 CSA W57.2-M1987, Certification of Companies for Fusion Welding of Aluminum.
 - .9 CAN3-S157, Surface preparation of aluminum in contact with dissimilar materials.
- .3 Environmental Choice Program
 - .1 CCD-047-98(R2005), Architectural Surface Coatings.
 - .2 CCD-048-98(R2006), Surface Coatings - Recycled Water-borne.
- .4 Green Seal Environmental Standards (GS)
 - .1 GS-11-2008, 2nd Edition, Paints and Coatings.
- .5 Health Canada / Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS).
- .6 The Master Painters Institute (MPI)
 - .1 Architectural Painting Specification Manual - current edition.
- .7 CSA HA Series-M1980, CSA Standards for Aluminum and Aluminum Alloys.
- .8 CAN3-S157-M83, Strength Design in Aluminum.
- .9 CSA W59.2-M1991, Welded Aluminum Construction.

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

1.05 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for sections, plates, pipe, tubing, bolts and include product characteristics, performance criteria, physical size, finish and limitations.
 - .2 Submit two copies of WHMIS MSDS in accordance with Section 01 35 29.06 - Health and Safety Requirements and 01 35 44 - Environmental Mitigation Measures.
 - .1 For finishes, coatings, primers, and paints applied on site: indicate VOC concentration in g/L.
- .3 Shop Drawings:
 - .1 Submit drawings stamped and signed by professional engineer registered or licensed in Province of New Brunswick, Canada.
 - .2 Indicate materials, core thicknesses, finishes, connections, joints, method of anchorage, number of anchors, supports, reinforcement, details, and accessories.

1.06 QUALITY ASSURANCE

- .1 Test Reports: submit certified test reports showing compliance with specified performance characteristics and physical properties.
- .2 Certifications: submit product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

1.07 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original

factory packaging, labeled with manufacturer's name and address.

- .3 Storage and Handling Requirements:
 - .1 Store materials off ground in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Replace defective or damaged materials with new.
- .4 Packaging Waste Management: in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

2 PRODUCTS

2.01 MATERIALS

- .1 Steel sections and plates: to CSA G40.20/G40.21, Grade 300W.
- .2 Bolts and anchor bolts: to ASTM A 307.
- .3 Wire nails and spikes shall conform to B111-1974.
- .4 Stainless Steel bolts: To AISI Steel Products Manual No. 13.
- .5 Cast iron: to ASTM A48-74.
- .6 Lag crews and Machine Bolts:
 - .1 Lags crews 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.
- .7 Galvanizing: hot dipped galvanizing with minimum zinc coating of 610g/m² to CSA G164-M1981. All anchor bolts, machine bolts, spikes, lags crews, nuts, washers, to be galvanized.
- .8 Galvanized primer: to CSB 1-GP-183M.
- .9 Steel sections, bars, tie rods, anchor dowels, plates and washers: to CSA G40.21-M1981, Type 300W.
- .10 13mm diameter galvanized steel mooring chain for tire fender assemblies: Crosby Spectrum 3, 13mm diameter, working load Limit, 4500 Kilograms.
- .11 Safety Chain between floats: Crosby Trawlex long link 19mm, minimum breaking load of 45 tonne or an approved equivalent.

- .12 Shackles to fit as required: grade 30.
- .13 Mooring Cleats: cast iron cleats to ASTM A48, 508mm B1 style with a capacity of 13kg as per the type shown on the drawings.
- .14 Mooring Cleat Paint:
 - .1 Primer coat: Inorganic zinc to CGSB standard 1-GP-171M (min. 85% zinc in dry film);
 - .2 Intermediate coat: High build epoxy polyamide to CGSB standard 1-GP-193Ma;
 - .3 Top coat: High build epoxy polyamide to CGSB standard 1-GP-193Ma;
 - .4 All paint material to be compatible with surface to which it is being applied.
 - .5 Colour of intermediate and top coat of mooring cleats to be orange.
- .15 Rubber Units for Inter Float Connections: 178 mm x 254 mm x 200 mm marine engineered rubber. Weight: 57.3 kg/m. Reaction: 119 tonne/m. Energy: 4.5 tonne/m.
- .16 Adhesive anchoring system to be HVA Capsule Adhesive Anchor System by Hilti or approved equal.
- .17 Welding materials: to CSA W59, latest edition.
- .18 Welding electrodes: to CSA W48 Series.
- .19 Aluminum chequered cover plates and inter float cover plates: Alloy 5052 - H321, or an approved alternative.
- .20 Neoprene mat: ASTM D2000-90 type BG
- .21 Holdfasts, ladder rungs: to ASTM A307
- .22 Aluminum Service Bay Covers as per 6063-T6.

2.02 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, round 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/m²) unless specified otherwise. All welded units are to be completed, including punching of connection bolt holds, prior to the units being hot dip galvanized.
- .6 Checkered Cover Plates: fabricate in accordance with ASTM B928/B928-07.

- .7 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.
- .8 The fabrication of all structural steel shall conform to the requirements of CSA CAN3-S16.1-M78 unless specified otherwise.

2.03 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.

2.04 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.

3 EXECUTION

3.01 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 Touch-up field welds, bolts and burnt or scratched surfaces after completion of erection with primer.
- .9 Touch-up galvanized surfaces with zinc rich primer where burned by field welding.
- .10 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.
- .11 Obtain written permission from Departmental Representative prior to field cutting or altering of structural members.
- .12 Erect metalwork square, plumb, straight, and true, accurately fitted, with tight joints and intersections.
- .13 Provide suitable means of anchorage acceptable to Departmental Representative such as dowels, anchor clips, bar anchors, expansion bolts and shields, and toggles.
- .14 Exposed fastening devices to match finish and be compatible with material through which they pass.
- .15 Supply components for work by other trades in accordance with shop drawings and schedule.
- .16 Make field connections with bolts to CSA S16 or Weld field connection.
- .17 Touch-up rivets, field welds, bolts and burnt or scratched surfaces with primer after completion of:
 - .1 Primer: maximum VOC limit 250 g/L to GS-11.
- .18 Touch-up galvanized surfaces with zinc rich primer where burned by field welding.
 - .1 Primer: maximum VOC limit 250 g/L to GS-11.
- .19 Predrill holes for lags crews in accordance with CSA 086-M84.
- .20 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.

- .21 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.
- .22 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.
- .23 Where indicated, use steel washers of size shown.
- .24 Holes for spikes will be bored 1.5mm smaller than diameter of spike and 50mm less than the length of spike.
- .25 Provide suitable and acceptable means of anchorage, such as dowels, anchor clips, bar anchors, bolts and washers, etc. as indicated on the drawings.
- .26 Erect gangway as indicated on the drawings and in accordance with CANS157 and reviewed shop drawings.
 - .1 Gangway hinge plate to be secured to the existing concrete landing with four 19mm diameter x 350mm long stainless steel anchor bolts using an approved resin anchorage system.
 - .2 45 mm diameter hole to be drilled for bronze bushing to be pressed into place.
- .27 New Aluminum checkered inter float connection cover plates will be secured to the new neoprene matt with 13mm diameter x 25.4mm long carriage bolts c/w washer and nut as indicated on the drawings.
 - .1 Neoprene matte will be secured to the existing stringers and top and middle longitudinal with a 13mm diameter x 150mm long lags crews as indicated on the detail.

3.02 STEEL TO STEEL CONNECTIONS

- .1 All steel to steel bolted connections to have high strength steel bolts.
- .2 All high strength bolts to be 19 mm minimum diameter unless noted otherwise on the drawings.

3.03 PAINTING OF MOORING CLEATS

- .1 Surface preparation:
 - .1 Sand or grit blast in accordance with SSPC-SP5.
 - .2 When sandblasting is completed remove dust by brush or vacuum prior to painting.
 - .3 Apply first coating of paint same day as sand or grit blasting is completed.
 - .4 Remove oil, grease or organic matter, with approved solvents or detergents prior to painting.
- .2 Application:

- .1 Apply three coatings, each in accordance with manufacturer's recommendations.
- .2 First coat, inorganic zinc primer applied to average .075 mm dry-film thickness and minimum .065 mm thickness.
- .3 Second and third coatings, to an average single coat dry-film thickness of .18 mm. Ensure adhesion between coats.
- .4 Coatings to be free from sags and runs.

3.04 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.
- .2 Protect installed products and components from damage during construction.
- .3 Repair damage to adjacent materials caused by metal fabrications installation.

3.05 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
 - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.
- .3 Waste Management: separate waste materials in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal

END OF SECTION