

PART 1 - GENERAL

- 1.1 DESCRIPTION .1 The work under this section will include the supply, fabrication and installation of all machine bolts, nuts, washers, anchor bolts, angles, plates, bars, holdfast, embedded metals in concrete, tie-rods and connections to steel H-piles, channels, steel clip angles to support concrete wall panels at steel H-piles, ladder units, floating dock connectors, chains, strongarm unit, hinges and all other miscellaneous steel.
- 1.2 RELATED SECTIONS .1 Section 01 33 00 - Submittal Procedures.
- .2 Section 01 74 21 - Construction/Demolition Waste Management And Disposal.
- .3 Section 03 30 00 - Structural Concrete.
- .4 SECTION 31 62 16.16 - Steel H-Piles
- 1.3 REFERENCES .1 Canadian Standards Association (CSA International)
- .1 CSA G40.20/G40.21-13, General Requirements for Rolled or Welded Structural Quality Steel.
- .2 CAN/CSA-S16-14, Limit States Design of Steel Structures.
- .3 CSA W48-14, Filler Metals and Allied Materials for Metal Arc Welding (Developed in co-operation with the Canadian Welding Bureau).
- .4 CSA W59-13, Welded Steel Construction (Metal Arc Welding) (Imperial Version).
- .5 ASTM A123-12/A123M-12, Zinc (Hot Dip Galvanized) Coating and Iron and Steel products.
- .2 Do welding to CSA W59-13 unless specified otherwise. Welding companies and welders to be certified under CSA W47.1.
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1.4 MEASUREMENT FOR
PAYMENT

- .1 Prefabricated ladder inserts: Include cost of supply and installation in items for payment in their respective Sections. This will also include all fabrication and galvanizing of the units and ladder holdfasts. Refer to section 03 30 00 - Structural Concrete.
- .2 Mooring Holdfast: Measurement for payment to be measured by the unit supplied and installed in the work including surface preparation, galvanizing, nuts and washers.
- .3 Metal Wheelguard: The supply and installation of the new galvanized steel wheelguard system as shown on drawings will be measured by the linear meter for payment. Handling, fabrication, welding, anchor bolts, cover plates, rubber isolation pad and galvanize will be considered incidental to the pay item.
- .4 Tie-Rods/Misc Steel: The supply and installation of all the tie-rods, washers, nuts, bearing plates, brackets and miscellaneous steel for connections to H-piles required to complete the work for the Berlin Wall as shown will be measured as a fixed price item. The welding, cutting, drilling and other work necessary to complete the project will be considered incidental to this item.
- .5 Steel Clip Angles, corner brace: The supply and installation of steel clip angles, steel straps, bent plates, pile cover plates, corner brace and all miscellaneous steel required to complete the work for the Berlin Wall as shown will be considered incidental to this section. The welding, cutting, drilling and other work necessary to complete the project will also be considered incidental to this Section.
- .6 Strongarm and floating dock bracket/connectors will be paid under section 01 74 21, Floating Dock Installation.
- .7 Chains, shackles, chain links and zinc sacrificial anodes will be paid under section 03 30 00, Floating Dock concrete anchor blocks.

- 1.5 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.
- 1.6 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.
- 1.7 WASTE MANAGEMENT AND DISPOSAL .1 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 CSA G40.20/G40.21, Grade 300W.
.2 Welding materials: to CSA W59.
.3 Welding electrodes: to CSA W48 Series.
.4 Bolts, washers, and anchor bolts etc: to ASTM A307.
.5 Tie-Rods: Hot-Rolled ThreadBar (ASTM A615) Grade75(517MPa).
.1 Dywidag or approved alternate.
.2 Nuts to be Hex type, 100mm long.
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2.2 FABRICATION

- .1 Fabricate work square, true, straight and accurate to required size, with joints closely fitted and properly secured.
- .2 Where possible, fit and shop assemble work, ready for erection.
- .3 Ensure exposed welds are continuous for length of each joint. File or grind exposed welds smooth and flush.
- .4 Machine bolts will have standard heads, nuts and when in position will be of sufficient length to permit a full nut and two washers. Treads shall be Coarse Thread Series as specified in latest ANS/B1-1 having a Class 2A tolerance.
- .5 Standard cast iron washers suitable for the size of the bolt specified will be placed under the heads and nuts of all machine bolts bearing on timber surfaces unless noted otherwise on the drawings. Ogee washers to Timber Design Manual issued by Laminated Timber Institute of Canada and to be cast iron, free from injurious defects or impurities. As an alternative to Ogee washers, standard galvanized plate washers can be used. The washer is to be three times the bolt diameter and a minimum thickness of 6 mm. Square washers are not permitted.

2.3 Chains,
shackles and anodes

- .1 Chain: Grade 80 Alloy chain, working load 11.2 tonnes, 19mm diameter.
 - .2 Master link: long link alloy steel, suitable for grade 100 or 80, working load 14 tonnes, 16mm.
 - .3 Shackles: Grade 80, alloy bolt type, stainless cotter pin.
 - .4 Chain anodes: sacrificial zinc, one each 3.0 lineal meter of chain.
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2.4 FINISHES

- .1 Galvanizing: all galvanized hardware as identified to be hot dipped galvanizing with zinc coating 610 g/m² to CAN/CSA-G164.
- .2 Zinc primer: zinc rich, ready mix to CAN/CGSB-1.181.
- .3 All Metals or materials specified in this section are either hot dip galvanized and/or Stainless Steel except tie-rods and tie-rod connections to H-piles and dead man anchor blocks, and floating dock connectors to H-piles and concrete anchor blocks. All fasteners embed into concrete will be Stainless Steel.

PART 3 - EXECUTION

3.1 ERECTION

- .1 Do welding work in accordance with CSA W47.1 unless specified otherwise.
- .2 Erect metalwork square, plumb, straight, and true, accurately fitted, with tight joints and intersections.
- .3 Touch-up field welds, bolts and burnt or scratched surfaces after completion of erection with primer.
- .4 Take necessary care in the handling of all galvanized steel parts to prevent damage to the galvanized coating. Evidence of damage shall be cause for rejection. Damage may be touched-up if approved by Departmental Representative.
- .5 Touch-up galvanized surfaces with zinc rich primer where burned by field welding.