

PART 1 - GENERAL

1.1 Related Sections

- .1 Section 01 74 21 - Construction/Demolition Waste Management And Disposal.
- .2 Section 03 30 00 - Cast-in-Place Concrete.
- .3 Section 06 10 10 –Dimension Timber.

1.2 Description

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

1.3 References

- .1 Canadian Standards Association (CSA International)
 - .1 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 CAN/CSA-S16.1-01, Limit States Design of Steel Structures.
 - .4 CSA W48-01, Filler Metals and Allied Materials for Metal Arc Welding (Developed in co-operation with the Canadian Welding Bureau).
 - .5 CSA W59-1989 (R2001), Welded Steel Construction(Metal Arc Welding) (Imperial Version).
 - .6 CSA HA Series-M1980, CSA Standards for Aluminum and Aluminum Alloys.

.7 CAN3-S157-M83, Strengths Design in Aluminum.

.8 CSA W59.2-M1991, Welded Aluminum Construction.

.9 CSA W57.2-M1987, Certification of Companies for Fusion Welding of Aluminum.

.10 CAN3-S157, Surface Preparation of Aluminum in contact with dissimilar materials.

.11 CSA CAN3-S16.1-M78, Steel Structures for Buildings-Limit States Design.

.2 American Society for Testing and Materials:

.1 ASTM B928/B928-07 Standard Specification for High Magnesium Aluminum-Alloy Sheet and Plate for Marine Service and Similar Environment.

.2 ASTM D 2000 Standard Classification System for Rubber Products in Automotive Applications.

.3 Do welding to CSA W59-M1989 unless specified otherwise. Welding companies and welders to be certified under CSA W47.1.

.4 Submit welder's certificate for review by Departmental Representative.

1.4 Measurement
For Payment

.1 No separate Payment: steel, plates, angles and fasteners: Include cost of supply and installation in items for payment in their respective Sections. This will also include all welding, cutting, drilling and other work necessary in the field to complete the work.

.2 No separate payment shall be made for anchor bolts, machine bolts, nuts and washers, pipe sleeves, inserts, resin anchors, neoprene mat, galvanizing touch-up, etc. Include cost of these items in items of work where applicable.

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| 1.5 <u>Submittals</u> | .1 | Shop Drawings
.1 Indicate materials, core thicknesses, finishes, connections, joints, method of anchorage, number of anchors, supports, reinforcement, details, and accessories. |
| 1.6 <u>Quality Assurance</u> | .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 <u>Waste Management
And Disposal</u> | .1 | Divert unused metal materials from landfill to metal recycling facility approved by Departmental Representative. |

PART 2 - PRODUCTS

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| 2.1 <u>Materials</u> | .1 | Steel sections and plates: to CSA G40.20/G40.21-98, Grade 300W. |
| | .2 | Welding materials: to CSA W59-1989 (R2001). |
| | .3 | Welding electrodes: to CSA W48-01 Series. |
| | .4 | Bolts, washers, and anchor bolts etc: to ASTM A307. |
| | .5 | Wire nails and spikes shall conform to CSA Standard B111-1974. |
| | .6 | Lag Crews, Machine Bolts, Drift Bolts:
.1 Lag screws shall meet the requirements of CSA Standard B18.2.3.3-M1979 and B34-1967(R1972).

.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 four washers. |

.3 Drift bolts to be pressed and of full dimensions specified with approved countersunk heads and wedge points. Heads to be enlarged to a diameter 13 mm greater than bolt and strongly swelled at the shoulder.

.4 Standard Cast Iron Washers suitable for the sizes of the 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 Design Manual 1980 issued by Laminated Timber Institute of Canada and as follows: ogee washers to be cast iron free from injuries defects or impurities.

.5 As an alternate to ogee washers, standard plate washers can be used. The washer is to be three times bolt diameter and a minimum thickness of 8mm unless noted otherwise.

.7 Cast Iron: to ASTM A48-74.

.8 Steel pipe: to ASTM-A53.

.9 Resin Anchorage Cartridge: Epoxy resin cartridge providing 120Kn ultimate tensile strength for size and depth of embedment shown on drawings.

.10 Galvanizing: hot dipped galvanizing with minimum zinc coating of 610g/m² to CSA G164-M1981. All anchor bolts, spikes, nuts, washers, plates, steel sections to be galvanized unless otherwise approved by the Departmental Representative.

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 8 mm. Square washers is not permitted.
- .6 Drift Bolts: All drift bolts used in work will have a length equal to thickness of timbers being fastened less 50 mm unless otherwise specified. Holes for drift bolts will be bored 2 mm smaller diameter than size of steel used for full length of bolts.
- .7 The fabrication of all structural steel shall conform to the requirements of CSA CAN3-S16.1-M78.
- .8 Provide suitable and acceptable means of anchorage, such as dowels, anchor clips, bar anchors, bolts and washers, etc., as shown on the drawings.

2.3 Finishes

- .1 Galvanizing: all galvanized hardware as identified dipped galvanizing with zinc coating 610 g/m² to CAN/CSA-G164-M1981.
- .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. All anchorage to concrete will be Stainless Steel.

PART 3 - EXECUTION

3.1 Erection

- .1 Do welding work in accordance with CSA W47.1-M1987 (R1998) 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 the Departmental Representative.
- .5 Touch-up galvanized surfaces with zinc rich primer where burned by field welding.
- .6 All work to conform to CSA CAN3-S16.1-M78.

3.2 Installation of Lag Screw
Machine Bolts, Drift Bolts and
Anchor Bolts

- .1 Pre-drill holes for lag screws in accordance with CSA 086-M80, bored 3 mm less than diameter of screw and depth 100 mm less than the length of the screws.
- .2 Holes for drift bolts will be bored 1.5 mm smaller diameter than bolt. Holes for drift bolts will be bored to a depth 50 mm less than the length of bolt. The heads of the drift bolts will be driven sufficiently far into the timbers to permit succeeding timbers to have a full and proper bearing on the ones beneath.
- .3 Holes for machine bolts will be bored to the same diameter as that of the bolts. 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.
- .4 Machine bolts will be placed in the work with their heads on the outside. The heads of 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.
- .5 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.

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- .6 Where indicated, use steel washers of size shown.
 - .7 Holes for anchor dowels will be bored 1.5mm smaller than anchor dowel.