

PART 1 - GENERAL1.1 Reference Standards

- .1 ASTM A123/A123M-15, Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
- .2 ASTM A307-14e1, Specification for Carbon Steel Bolts and Studs, 60,000 psi Tensile.
- .3 CAN/CSA-G40.21-13, Structural Quality Steels.
- .4 CAN/CGSB-1.181-1999, Ready-Mixed Organic Zinc-Rich Coating.
- .5 CAN/CSA-S16-14, Limit States Design of Steel Structures.
- .6 CSA W59-13, Welded Steel Construction (Metal Arc Welding).

1.2 Related Work

- .1 Section 01 33 00 - Shop Drawings/Submissions requirements.
- .2 Section 03 30 00 - Concrete.

1.3 Shop Drawings

- .1 Shop Drawings:
  - .1 Clearly indicate the following items:
    - .1 General arrangements, dimensions, clearance locations and directions of assemblies as installed on structures.
    - .2 Locations, sizes and installation tolerances of anchor bolts, eye bolts and embedded parts.
    - .3 Types of materials used, finishes and core thickness.
    - .4 All other pertinent details and accessories.
- .2 Test Results:

.1 Provide test results for the galvanized items.

.3 Submissions

.1 Provide submissions in accordance with Section 01 33 00.

1.4 Measurement  
For Payment

.1 Metal fabrications will be measured in accordance with Section 01 29 00.

PART 2 - PRODUCTS

2.1 Materials

.1 Steel Sections: to CAN-G40.21, Grade 350W.

.2 Steel rod, plate and angles: to CAN-G40.21, Grade 300W.

.3 Tie rods: continuous thread bar to CSA G30.18, 517 MPa yield strength. Anchor nuts and couplers to be capable of developing 125% of the yield tensile strength of the bar.

.1 All tie rod couplers and hexagonal nuts shall develop a minimum of 125% of the guaranteed yield strength of the tie rod.

.4 Welding materials: to CSA W59.

.5 Bolts and anchor bolts: to ASTM A307.

.6 Galvanizing: hot dipped galvanizing with zinc coating 600 g/m<sup>2</sup> to ASTM A123/A123M.

.7 Zinc primer: Zinc rich, ready mix to CGSB 1-GP-181.

.8 Do not use items manufactured or fabricated from scrap steel of unknown chemical composition or physical properties.

- .9 For adhesive anchors see Cast-in-Place concrete, Section 03 30 00.

## 2.2 Fabrication

- .1 Build work square, true, straight and accurate to required size, with joints closely fitted and properly secured.
- .2 Fabricate items from steel unless otherwise noted.
- .3 Where possible, fit and shop assemble work, ready for installation.
- .4 Ensure exposed welds are continuous for length.

## PART 3 - EXECUTION

### 3.1 Miscellaneous

- .1 Fabricate and install steel channels, steel plates and bent plates, beveled washers, and other miscellaneous metal items shown on the drawings.

### 3.2 Connection to Existing Work

- .1 Verify dimensions and condition of existing work, report any discrepancy and potential problem areas to Departmental Representative for direction before commencing fabrication.

### 3.3 Tie Rod System

- .1 Tie back the steel sheet pile with steel tie rods as located and dimensioned on the drawings. All tie rods will have the dimensions shown on the drawings.
- .2 Provide each rod with two heavy-duty hexagonal nuts, plate washers, bearing plates and connector as shown on the drawings. Nuts to bear evenly and truly on the washers.

- .3 Provide suitable support near the middle of the tie rods to prevent sagging during construction and filling. Replace all tie rod threads damaged during shipment or installation, with new ones of full length and thread dimensions, as directed by the Departmental Representative.
- .4 The tie rods must be straight and true to dimensions over their full length. Bent rods will be cause for their rejection unless straightened to the satisfaction of the Departmental Representative.
- .5 Exercise care in tightening the tie rods so that the tension in each rod will be approximately equal when the work is completed.
- .6 Fix and adjust tie rod system so that connections each end of tie rods are tight before backfilling.
- .7 Provide minimum of 500 mm compacted fill thickness above tie rods prior to operating heavy construction equipment over the tie rods.

**END OF SECTION**