
Part 1 GENERAL

1.1 Reference Standards

- .1 ASTM A123/A123M-17, Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
- .2 ASTM A307-21, Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60,000 psi Tensile Strength.
- .3 ASTM F3125/F3125M-19e2, Standard Specification for High Strength Structural Bolts and Assemblies, Steel and Alloy Steel, Heat Treated, Inch Dimensions 120 ksi and 150 ksi Minimum Tensile Strength, and Metric Dimensions 830 MPa and 1040 MPa Minimum Tensile Strength.
- .4 ASTM A240/A240M-20a, Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications.
- .5 ASTM A276/A276M-17, Standard Specification for Stainless Steel Bars and Shapes.
- .6 ASTM F393-17, Standard Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs.
- .7 ASTM F594-09(2020), Standard Specification for Stainless Steel Nuts.
- .8 ANSI AWS D1.6/D1.6M:2017, Structural Welding Code – Stainless Steel.
- .9 CSA G40.20-13 / G40.21-13(R2018), General Requirements for Rolled or Welded Structural Quality Steel / Structural Quality Steel.
- .10 CSA S16:19, Design of Steel Structures.
- .11 CSA W59-18, Welded Steel Construction.
- .12 CSA S157/S157.1-17, Strength Design in Aluminum/Commentary on S157-17, Strength Design in Aluminum.
- .13 CSA W47.1:19, Certification of Companies for Fusion Welding of Steel.
- .14 CSA W47.2-11 (R2020), Certification of Companies for Fusion Welding of Aluminum.
- .15 CSA W48-18, Filler Metals and Allied Materials for Metal Arc Welding.
- .16 CSA W55.3-08 (R2018), Certification of Companies for Resistance Welding of Steel and Aluminum.

1.2 Related Work

- .1 Refer to other Specification Sections for related information.
- .2 Refer to Section 01 33 00 for Shop Drawing and Submission requirements.

1.3 Shop Drawings

- .1 Submit shop drawings in accordance with Section 01 33 00 – Submissions and Shop Drawings.
 - .2 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.
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- .3 Types of materials used, finishes and core thickness.
 - .4 All other pertinent details and accessories.
 - .5 Each drawing submission shall bear signature and stamp of a registered Professional Engineer licensed to practice in the Province of New Brunswick, for all assemblies, components, joint details and connections not shown on the drawings.
- .3 Test Results:
- .1 Provide test results for the galvanized items.

Part 2 PRODUCTS

2.1 Materials

- .1 Steel sections: to CSA G40.21, Grade 350W.
- .2 Hollow steel sections: to CSA G40.21, Class C Grade 350W.
- .3 Steel rod, plate, and angles: to CSA G40.21, Grade 350W.
- .4 Welding materials: to CSA W59.
- .5 Anchor bolts/rods: to ASTM A307.
- .6 Bolts, nuts and washer: to ASTM F3125/F3125M.
- .7 Galvanizing: hot dipped galvanizing with zinc coating 610 g/m² to ASTM A123. All hardware to be galvanized unless otherwise noted on the drawings.
- .8 Zinc primer: Zinc rich, ready mix to ASTM 123.
- .9 Do not use items manufactured or fabricated from scrap steel of unknown chemical composition or physical properties.
- .10 For adhesive anchors see Cast-in-Place concrete, Section 03 30 00.
- .11 Steel Tie Rods:
 - .1 Substitute different size or strength of tie rods only if permitted in writing by *Departmental Representative*.
- .12 Tie rod shall conform to ASTM A615/A615M, grade 517 MPa, unless indicated otherwise
- .13 Aluminum: to CSA HA-Series M, alloy 6061-T6.
- .14 Stainless steel: to ASTM A240/A240M or ASTM A276/A276M of type UNS S31603 (316L) for angles, plates, rods, and channels.
- .15 Welding of aluminum to be mig welding with 5356 filling alloy in accordance with CSA W47.2.
- .16 Polyethylene sheet: high density, white HDPE, thickness as indicated.
- .17 Aluminum deck: Perf-O Z Grip, size hole Plank – 5052 aluminum alloy, 305 mm width, Model No. P-620.125-A by Pacific Grating, or approved alternative.

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.

2.3 Gangway Fabrication

- .1 Fabricate metal components as indicated, in accordance with CSA S16, CSA S157, and reviewed shop drawings.
- .2 Minimum fillet weld size shall be 5 mm.
- .3 All welding operations and procedures used are to be qualified to CSA W47.2 for aluminum and W47.1 for steel.
- .4 All stainless steel welding to be in accordance with AWS D1.6/D1.6M.
- .5 Fabricate gangway structure square, plumb, straight, and true with all joints neatly and accurately aligned.
- .6 Remove burs from cut sections.
- .7 Make punched or drilled holes in components clean and accurately spaced without deformation to components.

2.4 Miscellaneous Metal Work Items

- .1 Miscellaneous anchors, bolts and inserts:
 - .1 Where size, spacing and the like are not indicated, provide as necessary for the purpose.
 - .2 Galvanize all miscellaneous anchors, bolts and inserts.
- .2 Miscellaneous Steel:
 - .1 Provide miscellaneous steel as required for guide units and the like to shape, size and details required.
 - .2 Galvanize all miscellaneous steel items.

Part 3 EXECUTION

3.1 Erection

- .1 Install metalwork square, plumb, straight and true, accurately fitted, with tight joints and intersections.
- .2 Make field connections with bolts to CSA S16, or weld.
- .3 Touch-up bolts and scratched surfaces after completion of erection with zinc primer.

3.2 Steel Tie Rods

- .1 Tie rods to be installed as shown on structural drawings.
- .2 Do not place backfill behind concrete wall panel bulkhead until steel piles have been completely driven and secured in final position by the anchorage system, until concrete wall panels have been installed and adjusted, and until anchor wall has achieved the 28-day strength.
- .3 Fit and adjust the tie rod systems so that the connections at the steel H piles and anchor wall are tight before commencing backfilling.

- .4 Prior to backfilling, contractor to ensure the surroundings of the backfill area have been completely enclosed in accordance with the structural drawings and to obtain a written approval from the *Departmental Representative*.
- .5 Contractor shall provide temporary supports for tie rods during backfilling and replacing any tie rod that is damaged during backfilling at no extra cost.
- .6 Contractor shall protect tie rod threads from damage during handling and installation. Tie rods with damaged threads will be rejected.

3.3 Dissimilar Metals

- .1 Isolation between black reinforcing steel and galvanized anchor bolts is required, and is the responsibility of the contractor to avoid potential galvanic reaction. Isolation to be achieved by 30 mm clear spacing between black and galvanized steel or denso tape on black steel at contact areas if 30 mm clear spacing cannot be achieved.
- .2 Provide full isolation gaskets (4 mm neoprene) between aluminum electrical shrouds and galvanized anchor bolts as shown on drawings.

END OF SECTION