

Part 1 General

1.1 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 – Cast-in-Place and Pre-Cast Concrete

1.2 REFERENCES

- .1 American Society for Testing and Materials International (ASTM)
 - .1 ASTM A53/A53M-20, Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless.
 - .2 ASTM A307-21, Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60,000 PSI Tensile Strength.
 - .3 ASTM A500/A500M-21a, Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural tubing in rounds and Shapes
 - .4 ASTM A615/A615M-20, Standard Specification for Deformed and Plain Carbon Steel Bars for Concrete Reinforcement.
- .2 Canadian General Standards Board (CGSB)
 - .1 CGSB-1.181-99, Ready-Mixed, Organic Zinc-Rich Coating.
- .3 Canadian Standards Association (CSA International)
 - .1 CSA G40.20-13/G40.21-13 (R2018), General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
 - .2 CSA G164-18, Hot Dip Galvanizing of Irregularly Shaped Articles.
 - .3 CSA S16-14 (R2019), Design of Steel Structures.
 - .4 CSA W48-19, Filler Metals and Allied Materials for Metal Arc Welding.
 - .5 CSA W47.1-19, Certification of Companies for Fusion Welding of Steel.
 - .6 CSA W59-18, Welded Steel Construction.
 - .7 CSA S6-19, CSA S6 Canadian Highway Bridge Design Code (CHBDC).

1.3 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 specifications and data sheet in accordance with Section 01 33 00 – Submittal Procedures.
- .3 Shop Drawings:
 - .1 Submit shop drawings in accordance with Section 01 33 00 – Submittal Procedures.
 - .2 Submit drawings stamped and signed by Professional Engineer registered or licensed in the Province of New Brunswick, Canada.

- .3 Indicate materials, all necessary geometric details, core thicknesses, finishes, connections, joints, method of anchorage, number of anchors, supports, reinforcement, details, and accessories.

1.4 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.
- .3 Pre-installation Meetings: Conduct pre-installation meeting to verify project requirements, manufacturer's installation instructions and manufacturer's warranty requirements.

1.5 DELIVERY, STORAGE AND HANDLING

- .1 Packing, Shipping, Handling and Unloading:
 - .1 Deliver, store, handle and protect materials from damage.
- .2 Storage and Handling Requirements:
 - .1 Store materials off ground and in accordance with manufacturer's recommendations.
 - .2 Replace defective or damaged materials with new.
- .3 Packaging Waste Management: as much as possible, remove for reuse by manufacturer any pallets, crates, padding and packaging materials.

1.6 WASTE MANAGEMENT DISPOSAL

- .1 Separate and recycle waste materials in accordance with Section 01 74 21 – Construction/Demolition Waste Management and Disposal.
- .2 Remove from site and dispose of packaging materials at appropriate recycling facilities.

1.7 MEASUREMENT FOR PAYMENT

- .1 Refer to Section 01 29 10 – Measurement and Payment.

Part 2 Products

2.1 MATERIALS

- .1 Steel sections, plates, angles, and round bar: to CSA G40.20/G40.21, Grade 350W.
- .2 HSS: to ASTM A500, Grade C.
- .3 Tie-Rods:
 - .1 Tie rods shall be 43mm diameter continuously threaded bar with a minimum ultimate tensile capacity of 1001 kN.
 - .2 Tie rods shall meet the requirements of ASTM A615.
 - .3 The minimum yield stress shall be 517 MPa.

- .4 The tie rods shall be continuously threaded bar.
 - .5 The nut shall be capable of developing the full yield capacity of the bar.
 - .6 Welding of tie rods is not acceptable unless approved by a Departmental Representative.
- .4 Threaded Rod: to ASTM A307, Grade A.

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 Welding: in accordance with CSA W59, latest edition.
- .4 Ensure exposed welds are continuous for length of each joint. File or grind exposed welds smooth and flush.
- .5 Steel Piles:
 - .1 All steel piles shall have the tie rod box stiffeners installed prior to the pile installation.
 - .2 The tip of the steel piles shall be trimmed onsite to the required as-built length measured after the casing has been installed and cleaned out.

2.3 FINISHES

- .1 The following steel components shall be hot dip galvanizing: to CSA G164, minimum zinc coating of 600 g/m².
 - .1 Holdfast bars.
 - .2 Ladder assemblies.
 - .3 Panel support straps.
 - .4 All threaded rods, anchor rods, and all hardware.
 - .5 All washer plates and nuts.
 - .6 Steel wheel guard assembly.
- .2 The following components shall be black steel:
 - .1 Steel H-Piles.
 - .2 Steel casings.
 - .3 Stiffeners plates welded to the H-Piles.
 - .4 Tie rods and associated nuts.
 - .5 Fabricated tie rod connection box "C-Channel" section.
 - .6 Steel angles installed along the backside of the piles.

Part 3 Execution

3.1 ERECTION

- .1 Supply components for work by other trades in accordance with shop drawings and schedule.
- .2 Touch-up damaged galvanized surfaces with zinc rich primer.
- .3 Install items as per Contract Drawings / Approved Shop Drawings.
- .4 All embedded anchors shall be installed with an epoxy adhesive which can develop the full strength of the bar. All anchors shall be installed as per the manufacturer's specification.

3.2 CLEANING

- .1 Perform cleaning after installation to remove construction and accumulated environmental dirt. All cleaning shall meet the approval of Departmental Representative.
- .2 Upon completion of installation, remove surplus materials, rubbish, tools, and equipment barriers.

3.3 PROTECTION

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

END OF SECTION