

PART 1 General

1.1 MEASUREMENT FOR PAYMENT

- .1 Refer to Section 01 29 00 - Measurement for Payment.

1.2 RELATED SECTIONS

- .1 Section 01 33 00 - Submittal Procedures.
- .2 Section 01 74 21 - Construction/Demolition Waste Management & Disposal.
- .3 Section 03 30 00 - Cast-in-Place Concrete.

1.3 DESCRIPTION OF WORK

- .1 The work of this Section comprises the furnishing of all labour, materials and equipment necessary for the supply and installation of items of work specifically listed under Part 2 - PRODUCTS of this Section, as specified in this Section and shown on the Drawings.

1.4 REFERENCES

- .1 American Welding Society (AWS)
  - .1 AWS D3.6M:2017, Underwater Welding Code.
- .2 American Society for Testing and Materials International (ASTM)
  - .1 ASTM F3125 Grade 325, Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength.
- .3 Canadian Standards Association (CSA)
  - .1 CSA-G40.20/G40.21-13 (R2018), General Requirements for Rolled or Welded Structural Quality Steels.
  - .2 CSA G164-18 Hot Dipped Galvanizing of Irregularly Shaped Articles.
  - .3 CAN/CSA-S16-14, Design of Steel Structures.
  - .4 CSA-W47.1-09 (R2014), Certification of Companies for Fusion Welding of Steel Structures.
  - .5 CSA-W47.2-11 (R2015), Certification of companies for fusion welding of aluminum.
  - .6 CSA-W48-18, Filler Metals and Allied Materials for Metal Arc Welding.
  - .7 CSA-W55.3-2008 (R2013), Certification of companies for resistance welding of steel and aluminum.
  - .8 CSA-W59-18, Welded Steel Construction (Metal Arc Welding).

1.5 SOURCE QUALITY CONTROL

- .1 The Contractor is to provide written documentation from the Canadian Welding Bureau certifying that all welders used for this work are qualified to the requirements of

CSA-W47.1, Division 1 or 2.1 and CSA-W47.2.

- .2 Provide written procedures to Department Representative for review and approval indicating methods to be used for all welding on this project.
- .3 Provide evidence to the Department Representative of current qualifications of welders.

#### 1.6 SHOP DRAWINGS

- .1 Submit fabrication and erection documents and material lists in accordance with Section 01 33 00 Submittal Procedures.
- .2 It is the responsibility of this Contractor to field confirm the exact locations and construction of related work to which work under this section connects to, or is supported on.
- .3 Each drawing submission shall bear signature and stamp of qualified Professional Engineer registered or licensed to practice in the Province of Prince Edward Island, for all assemblies, components, details and connections not shown on the drawings.
- .4 Review of procedure and erection drawings will extend to general design concept only. This review does not relieve the Contractor of the responsibility for accuracy of the detail dimensions, general fit-up of parts to be assembled, adequacy of proposed methods and procedures or for errors or defects contained in the details.

#### 1.7 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.

#### 1.8 PROCEDURE AND WELDER QUALIFICATION FOR UNDERWATER WELDING

- .1 No underwater welding is to proceed until qualification of welding procedure and performance qualifications to Section 5, "Qualification" and verification of procedure and performance qualification to Section 6, "Inspection" as per AWS D3.6M:2010, has taken place.
- .2 Contractor is responsible to provide satisfactory evidence to the Department Representative that the procedure and welders have been qualified and a verification of procedure and performance qualification has been carried out. No production welding is to be done prior to this submission being approved by the Department Representative.

## 1.9 WASTE MANAGEMENT AND DISPOSAL

- .1 Divert unused metal materials from landfill to an approved metal recycling facility approved by Department Representative.

## PART 2 Products

### 2.1 MATERIALS

- .1 Steel Sections, Plates, Angles and Rods: to CAN/CSA-G40.2/G40.21, Grade 350W.
- .2 HSS: to ASTM A500, Grade C.
- .3 Structural Steel for wales, plates, splices, channels, angles and miscellaneous steel: to CSA G40.21 Grade 350W.
- .4 Welding Electrodes, (above water): to CSA W48 Series.
- .5 Welding Electrodes, (underwater): to be wet welding electrodes.
- .6 Anchor Studs: to conform to CSA W59 Appendix H.

### 2.2 FABRICATION - GENERAL

- .1 Fabricate steel plate panels, wheel guard angles and plates, and ladder assemblies as indicated, in accordance with CAN/CSA-S16 and in accordance with reviewed shop drawings.
- .2 Fabricate work square, true, straight and accurate to required size, with joints closely fitted and properly secured.
- .3 Where possible, fit and shop assemble work, ready for erection.
- .4 Ensure exposed welds are continuous for length of each joint. File or grind exposed welds smooth and flush.

### 2.3 MISCELLANEOUS METAL

- .1 Steel sections and plates: to CAN/CSA G40.21, Grade 350W except where specified otherwise.
- .2 Steel pipe and handrails: to ASTM A53, CSA S16.1, Schedule 40 and as indicated on drawings.
- .3 Ladder rungs: to CSA C-40.21 round bars to size as indicated.
- .4 Welding materials: to CSA W59.
- .5 Bolts and anchor bolts to ASTM F3125 Grade 325.

### 2.4 FINISHES

- .1 Unless noted otherwise, all metal fabrications shall be hot dipped galvanized to CAN/CSA G164, minimum zinc coating of 760 g/m<sup>2</sup> suitable for marine environment.

## PART 3 Execution

### 3.1 GENERAL

- .1 Do steel work in accordance with CAN/CSA-S16.
- .2 Do welding work in accordance with CSA W47.1 and CSA W47.2 unless specified otherwise.
- .3 Erect metalwork square, plumb, square, and true, accurately fitted, with tight joints and intersections.

### 3.2 PREPARATION AND CLEANING

- .1 Clean all fouling, marine growth and corrosion from full outer surface of existing steel sheet piling.
- .2 Cleaning of existing steel sheet piling surfaces to be by waterjet or other approved method.
- .3 Degree of cleaning to be as required for proper fit and welding of new work to existing as per CSA W59-03, and AWS D3.6M:2010.

### 3.3 INSTALLATION

- .1 Install new work as indicated and in accordance with CAN/CSA-S16 and reviewed shop drawings.
- .2 Provide temporary bracing, clamping or other approved means of holding the new steel panel section tight to the prepared flange of the existing steel sheet piling as required until permanent welded connections are complete.

### 3.4 WELDING

- .1 Do welding in accordance with CSA-W59 for above water welding and AWS D3.6:2010 for underwater welding.
- .2 Companies to be certified under Division 1 or 2.1 of CSA-47.1 for fusion welding of steel structures and/or CSA-W55.3 for resistance welding of structural components.
- .3 In addition to requirements of 3.4.1 and 3.4.2, all underwater welding to be in strict accordance with AWS D3.6M:2010, Specification for Underwater Welding.
- .4 All underwater welds to be Class 'B' in accordance with AWS D3.6M:2010, Specification for Underwater Welding.

### 3.5 WELDING INSPECTION

- .1 The contractor is responsible to assure that materials, fabrication, and examination procedures for all welding conforms to CSA W59 and AWS D3.6M:2010.
- .2 Quality assurance inspection and testing of welds will be carried out by a Testing Agency designated by Department Representative.
- .3 Provide safe access and working areas for inspection and

testing on site, as required by Testing Agency and as authorized by Department Representative.

- .4 Inspection or testing by Department Representative will not augment or replace Contractor quality control nor relieve him of his contractual responsibility.

### 3.6 MISCELLANEOUS METALS

- .1 Do miscellaneous steel work in accordance with CAN/CSA S16.1.
- .2 Welding in accordance with CSA W59. Install miscellaneous site items as indicated on drawings.

### 3.7 FABRICATION GENERAL

- .1 Fabricate steel, as indicated, in accordance with CAN/CSA-S16.1 and in accordance with reviewed shop drawings.
- .2 Fabricate work square, true, straight and accurate to required size, with joints closely fitted and properly secured.
- .3 Use welded connections for both interior and exterior metal work unless otherwise indicated or approved by Departmental Representative.
- .4 Use self-tapping, shake-proof countersunk flat headed screws on items requiring assembly by screws, or as indicated.
- .5 Where possible, fit and shop assemble work, ready for erection.
- .6 Ensure exposed welds are continuous for length of each joint. File or grind exposed welds smooth and flush.
- .7 Grind and polish all exposed edges and corners to leave smooth surface free from burrs or other sharp protrusions.
- .8 All holes shall be punched or drilled. Burning holes in any steel member is NOT permitted.

### 3.8 CONNECTION TO EXISTING WORK

- .1 Examine dimensions, alignment, elevations and condition of work before commencing fabrication and report any discrepancies and potential problem areas to Departmental Representative and await instructions.

**END OF SECTION**