

PART 1 - GENERAL

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| <u>1.1</u> | <u>Related Sections</u> | .1 | Section 01 74 21 Construction/Demolition Waste Management & Disposal. |
| | | .2 | Section 31 62 16 Steel H-Piles. |
| <u>1.2</u> | <u>Description</u> | .1 | The work under this section covers the supply and installation of all metal fabrication items including, but not limited to: <ul style="list-style-type: none">.1 Supply and installation of tie-rods, tie-rod connection brackets, galvanized ladders, galvanized channel grating system, wall panel support clips, struts, end channels and threaded rods. |
| <u>1.3</u> | <u>Measurement Procedures</u> | .1 | <u>Tie-Rods</u> : Tie-rod assemblies complete with plates, brackets and nuts will be measured by the unit supplied and acceptably installed in the work. |
| | | .2 | <u>Ladders</u> : Galvanized ladders, including wood uprights and all galvanized steel fasteners, will be measured in units supplied and acceptably installed in the work, including galvanizing. |
| | | .3 | <u>Channel Grating Walkway</u> : The galvanized steel channel grating walkway system, including channels, angles and stiffeners at mooring cleats, will be measured in linear meters, (lm), supplied and acceptably installed in the work. Measurement to be taken along the outside face of the wharf. |
| | | .4 | <u>Concrete Panel Support Clips</u> : will be measured in units supplied and acceptably installed in the work. |
| | | .5 | <u>Timber Lagging Support Clips</u> : will be measured in units supplied and acceptably installed in the work. |
| | | .6 | <u>Steel Struts</u> : will be measured in units supplied and acceptably installed in the work. |
| | | .7 | <u>Miscellaneous Steel</u> : The end wall closure channels and plates will be measured as a lump sum item (LS). |

- .8 Miscellaneous anchors, rods, bolts, nuts, washers, clips, plates, sleeves, angles and fasteners will not be measured separately for payment but will be considered as incidental to the work for which they are supplied. This includes all welding, cutting, drilling and other work necessary to complete the project.

1.4 References

- .1 American Welding Society (AWS)
.1 AWS D3.6M:2010, Underwater Welding Code.
- .2 American Society for Testing and Materials International (ASTM).
.1 ASTM A123/A123M-12, Standard Specification for Zinc, (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
.2 ASTM A307-14e1 Standard Specification for Carbon Steel Bolts and Studs, 60 000 PSI Tensile Strength.
.3 ASTM F3125/F3125M-15a Standard Specification for High Strength Structural Bolts, Steel and Alloy Steel, Heat Treated, 120 ksi (830 MPa) and 150 ksi (1040 MPa) Minimum Tensile Strength, inch and metric dimensions.
- .3 Canadian Standards Association (CSA)
.1 CSA-G40.20/G40.21-04 (R2009), General Requirements for Rolled or Welded Structural Quality Steels.
.2 CSA-S16-09, Design of Steel Structures.
.3 CSA-W47.1-09, Certification of Companies for Fusion Welding of Steel Structures.
.4 CSA-W48-06 (R2011), Filler Metals and Allied Metals for Metal Arc Welding.
.5 CSA-W55.3-08, Certification of companies for resistance welding of steel and aluminum.
.6 CSA-W59-03 (R2008), 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

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- requirements of CSA-W47.1, Division 1 or 2.1 or CSA-W47.2.
- .2 Provide written procedures to Departmental 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 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, has taken place.
- .2 Contractor is responsible to provide satisfactory evidence to the Departmental 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 Departmental Representative.
- 1.7 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 New Brunswick, 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.

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| <u>1.8</u> | <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. |
| | | .3 | Provide manufacturer's product specifications and written instructions for cleaning, surface preparation and application for field touch-up of all galvanized steel supplied under this section. |
| <u>1.9</u> | <u>Waste Management and Disposal</u> | .1 | Divert unused metal materials from landfill to an approved metal recycling facility approved by Departmental Representative. |

PART 2 - PRODUCTS

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| <u>2.1</u> | <u>Materials</u> | .1 | Steel angles, plates and Channels to CSA G40.20/G40.21, Grade 300W. |
| | | .2 | H-piles: refer to Section 31 62 16 Steel H-piles. |
| | | .3 | HSS sections to CSA G40.20/G40.21, Grade 350W, class C. |
| | | .4 | Tie-Rods and nuts: to ASTM A615, Grade 75 ksi. |
| | | .5 | Channel Grating: to be 11 gauge galvanized steel dimple channel grating. 12 inch wide by 2 inch deep.
Acceptable supplier:
.1 Accurate Screen and Grating.
.2 Alternate supplier: Approved by addendum in accordance with Instructions to Tenderers. |
| | | .6 | Welding Electrodes (underwater): to be wet welding electrodes, Thyssen Nautica 20, Hydroweld FS, or approved equal. |

- .7 Welding Electrodes (above water): to CSA W48 Series.
- .8 Structural Bolts, nuts and washers: to ASTM F3125, grade A325.
- .9 Threaded anchor rods, nuts and washers: to ASTM A307.
- .10 Galvanizing: Hot Dip to ASTM A123/A123M. (610g/m²).
- .11 Galvanizing Touch-Up/Repair:
 - .1 Touch-up galvanizing for repair to damaged galvanized surfaces shall be with a purpose-made cold-applied film galvanizing system consisting of zinc powder, aromatic hydrocarbon and binder. Coating system to meet the following minimum requirements:
 - .1 Dry film content 96% by weight with zinc purity of 99.995% to ISO 3549.
 - .2 Recognized for use as repair coating for hot-dip galvanizing.
 - .3 Dry film non-toxic to AS/NSZ 4020.
 - .4 UV resistant.

2.2 Fabrication - General

- .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 Provide adequate drainage at low points of all closed sections. Indicate drain hole locations on shop drawings.

PART 3 - EXECUTION

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| <u>3.1</u> | <u>General</u> | .1 | Do steel work in accordance with CSA-S16. |
| | | .2 | Do welding work in accordance with CSA W47.1 or CSA W47.2 unless specified otherwise. |
| | | .3 | Erect metal work square, plumb, square, and true, accurately fitted, with tight joints and intersections. |
| | | .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 Departmental Representative. |
| | | .5 | Touch-up galvanized surfaces with zinc rich primer where burned by field welding. |
| <u>3.2</u> | <u>Touch-up of Galvanized Surface</u> | .1 | Touch up all damaged, scratched or exposed steel at welds of galvanized components in field with cold applied film galvanizing system. |
| | | .2 | Prepare all surfaces to be touched-up by de-greasing and cleaning to SSPC-SP12. |
| | | .3 | Refer to manufacturers written instructions for additional cleaning, surface preparation and application requirements. |
| <u>3.3</u> | <u>Welding Inspection</u> | .1 | The Contractor is responsible to assure that materials, fabrication, and examination procedures for all welding conforms to CSA W59 or W59.2. |
| | | .2 | Quality assurance inspection and testing of welds will be carried out by a Testing Agency designated by Departmental Representative. |
| | | .3 | Provide safe access and working areas for inspection and testing on site, as required by Testing Agency and as authorized by Departmental Representative. |
| | | .4 | Inspection or testing by Departmental Representative |

Temporary Wharf Reinforcement
Structure 402
Lameque, NB
Project No. R.101516.001

METAL FABRICATIONS

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will not augment or replace Contractor's quality
control nor relieve him of his contractual
responsibility.

END OF SECTION
