

	STEEL SHEET PILING	Section 31 62 16.13
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Harbour Development		
Prosser Rock, St. John's, NL		2019-01-01

PART 1 - GENERAL

1.1 RELATED SECTIONS .1 Section 05 50 00 - Metal Fabrications.

1.2 REFERENCES .1 ASTM International:

- .1 ASTM A6/A6M-11, Standard Specification for General Requirements for Rolled Structural Steel Bars, Plates, Shapes, and Sheet Piling.
- .2 ASTM A307-10, Standard Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile.
- .3 ASTM A615/A615M-09b, Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.
- .4 ASTM A1011/A1011M-10, Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability, and Ultra High Strength.
- .5 ASTM A328/A328M-07, Standard Specification for Steel Sheet Piling.
- .6 ASTM A857/A857M-07, Standard Specification for Steel Sheet Piling, Cold Formed, Light Gage.

.2 CSA International:

- .1 CSA G40.20/G40.21-04(R2009), General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
- .2 CSA W47.1-09, Certification of Companies for Fusion Welding of Steel Structures.
- .3 CSA W59-03(R2008), Welded Steel Construction (Metal Arc Welding).

1.3 SUBMITTALS .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.

.2 Product Data:

- .1 Submit manufacturer's instructions, printed product literature and data sheets for piles and include product characteristics, performance criteria, physical size, finish and limitations.

.3 Shop Drawings:

- .1 Submit shop drawings for the permanent sheet piling, tie back system, sheet pile cap, and all

associated walers/bolts, etc.

.2 For the temporary sheet piling, submit drawings stamped and signed by professional engineer registered or licensed by PEG-NL to practice in NL.

1.4 MATERIALS

.1 Steel sheet piles: to CSA G40.21, including chemical and mechanical requirements grade 350W, to match those equivalent sections shown on the drawings. Coating to be installed on all surfaces, full height, of the permanent front sheet pile wall (coating to be 3 full coats of amerlock 2 surface tolerant epoxy with 6-8mils dry film thickness per coat). No coating required on permanent back tie-back wall. All wales, plates, splices, channels, angles, tie rods, sleeves, nuts, connectors, bolts and washers associated with the permanent sheet piling (including tie back wall), to be galvanized.

.2 Structural steel for wales, bearing plates, wales splices, capping channels, support angles and miscellaneous steel: to CSA G40.21, Grade 300 W.

.3 Tie rods: to ASTM A615, Grade 75.

.4 Tie rods: continuously threaded bar with single corrosion protection.

.5 Sleeve nuts, and connector sleeves: to have load capacity in excess of capacity of tie rod.

.6 Preassemble, mark and test tie rod assemblies in shop. Align threaded connection to following tolerances at sleeve nut or connector sleeve: 1/80 of normal rod diameter, deviation of centreline, 1 in 160.

.7 Nuts and bolts: hexagon nuts, bolts, and washers: to ASTM A307.

1.5 QUALITY CONTROL

.1 Provide results of tests of sheet piling material to be used on project as follows:

- .1 One tension test and 1 bend test from each heat for quantities of finished material less than 50 tonnes.
- .2 Two tension tests and 2 bend tests from each heat for quantities of finished material exceeding 50 tonnes.

.2 Tension tests in accordance with CSA G40.20/G40.21.

- .1 Bend tests: to ASTM A6/A6M.

1.6 EXAMINATION

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for steel sheet piles installation in accordance with manufacturer's written instructions.
- .2 Visually inspect substrate in presence of Departmental Representative.
- .3 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
- .4 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative.
- .5 Submit full details of method and sequence of installation of piling to Departmental Representative for approval prior to start of pile installation work. Details must include templates, bracing, setting and driving sequence and number of piles in panels for driving.
- .6 Permanent steel sheet piles shall be driven to elevations shown on the drawings.
- .7 When installation is complete, face of wall at top of sheet piles to be within 75 mm of location as indicated and deviation from vertical not to exceed 1 in 100.
- .8 Cut drain holes and install steel pipe elbows as recommended by manufacturer. Include filter material in area of drain holes as indicated.

1.7 OBSTRUCTION

- .1 Advise Departmental Representative immediately if impossible to drive pile to full penetration, and obtain direction from

Departmental Representative on further steps required to complete Work.

1.8 SPLICING .1 Use full length piles. No splicing permitted.

1.9 TIE-ROD ANCHORAGE .1 Do not place backfill behind anchored bulkhead until piles have been completely driven, adjusted and secured in final position by anchorage system.
.2 Fit and adjust tie rod systems so that connections at waling and anchor end of tie rods are tight before backfilling.
.3 Brace steel sheet pile with waling strips in accordance with shop drawings. Make wales one length between corners and bolt to piles.

1.10 CUTTING .1 When flame cutting tops of piles, and flame cutting holes in piles approved by Departmental Representative, use following procedure:
.1 When air temperature is above 0 degrees C, no pre-heat is necessary.
.2 When air temperature is below 0 degrees C, pre-heat until steel 25 mm on each side of line of cut has reached a temperature very warm to hand (approximately 35 degrees C). Tempil sticks or Temperature indicating crayon marks may be used to measure temperature.
.3 Use torch guiding device to ensure smooth round holes or straight edges.
.4 Make cut smooth and free from notches throughout thickness. If grinding is employed to remove notch or crack, finished radius to be minimum 5 mm.

1.11 MEASUREMENT FOR PAYMENT .1 The permanent (front and back wall) and temporary sheet piling will not be measured separately for payment and is to be included in the lump sum arrangement. Include all costs, including coatings, tie backs, wales, sheet piling, bolts, caps, nuts, welding, equipment, labour and plant.