1.0 GENERAL

1.1 REFERENCES

.1 Provide steel sheet piling in accordance with the following standards (latest revision) except where specified otherwise.

.2 Canadian Standards Association (CSA)

.1 CSA-G40.21 Structural Quality Steel.

1.2 SUBMITTALS

.1 Provide the following submittals.

.2 Product data for the steel sheet piling prior to delivery to the Site. Include the manufacturer's name, material specifications including mill test certificates, yield stress, section modulus, minimum web thickness, weight per lineal metre, weight of wall per square metre, and the driving width, [and coating specifications include repair procedures].

.3 A detailed description of the template guide structure, crane, and the sheet pile driving equipment at least 30 days prior to mobilizing the equipment to the Site. Include the type of hammer, hammer energy, efficiency factor, details and dimensions of the driving cap, and the type of leads [or the type of vibratory driver/extractor].

.4 The sheet pile installation record within 48 hours after driving of the sheet pile is completed.

1.3 QUALITY CONTROL

.1 Provide a qualified supervisor to oversee the sheet pile driving operations.

.2 Sheet Pile Installation Records: During sheet pile driving operations, prepare the following installation records for each sheet:

.1 Project and Contract names, and name and signature of the Contractor's personnel responsible for quality control including preparing records.

.2 Date of driving and site conditions.

.3 Specified sheet pile identification, location, and cutoff elevations.

.4 Size and initial length of the sheet pile.

.5 Penetration and number of blows.

.6 Elevation, time, and duration of any interruption in driving or any erratic or unusual sheet pile behaviour.

.7 Other pertinent information, including any required by the Minister.

1.4 DELIVER, STORAGE, AND HANDLING

.1 Inspect each shipment of material and timely replacement any damaged materials. Replace piles that have damaged interlocks or are excessively deformed or deflected.

.2 Unload, handle, and store materials in accordance with the manufacturer's written instructions. Do not damage the piles or shop-applied coatings. Do not store piles in direct contact with the ground, and keep the interlocks free of dirt, sand, mud or other debris.

2.0 PRODUCTS

2.1 MATERIALS

.1 Provide materials in accordance with the following.

.2 Steel Sheet Piling:

.1 In accordance with CSA-G40.21, Grade [ ].

.2 Continuous interlock piles with a minimum section modulus of [cm^3] per lineal metre of single pile, and a minimum steel thickness of [mm], and having sufficient strength and rigidity for the handling and driving methods and equipment used by the Contractor.

.3 Working stress for the bending moment is not to exceed 60% of the yield point strength of the steel of the pile.

.4 Piles that are free of excessive camber or sweep, and with truly formed and unobstructed interlocks.

2.2 SHOP FABRICATION

.1 Shop press or weld 2 piles to form a pair for driving.

.2 Provide lifting holes near the top of each sheet pile.

.3 Shop coating: [ ].

3.0 EXECUTION

3.1 PREPARATION

.1 Inspect the work site, and remove any boulders or any other obstructions that may affect piling installation.

.2 Design and provide a temporary template guide structure capable of keeping the sheet piles plumb during driving.

.3 Provide pile driving hammers [or vibratory driver/extractor] of sufficient size and type suitable for the work. Provide cranes with a boom length that is at least twice the length of the piles being driven.

.4 Provide a driving cap designed to fit the steel sheet piling and to prevent unsuitable damage to the pile tops.

3.2 INSTALLATION

.1 Install the steel sheet piling at the locations and in sufficient numbers and lengths to obtain the specified penetration and outline specified in the Contract Documents.

.2 Completely inspect the interlocks of each pile immediately before its installation, and protect the interlocks from damage at all times.

.3 Drive the piles in pairs unless authorized otherwise by the Minister.

.4 Whenever possible, drive the pile with the male interlock, ball or thumb leading in order to eliminate the possibility of the pile developing a plug due to soil filling the interlock. If a pile is driven with the female or socket end leading, insert a bolt or other suitable object at the bottom of the pile to keep soil out of the interlock.

.5 At regular intervals as required by the Minister, verify that the piles are plumb during driving and that creeping or walking has not occurred. Promptly extract and re-install piles as required.

.6 If obstructions such as boulders are encountered, make every effort to place the piling to the required depth using methods acceptable to the Minister.

.7 Install the sheet piles by “driving in steps” in which adjacent sheet piles are driven in sequence using a series of short steps until the specified depth is achieved.

.8 Do not drive piles below the specified elevations for the top of the pilings.

.9 Neatly trim the top of the piles to the specified lines and elevations.

.10 Remove temporary template guide structures when no longer required as authorized by the Minister.

.11 Prevent the piles from becoming twisted, bent, or otherwise damaged during the pile handling and driving operation and, if applicable, during any adjacent construction work.

3.3 INSTALLATION TOLERANCES

.1 Location: Maximum deviation of [+/-75] mm at the cutoff level from the specified location.

.2 Elevation: Maximum deviation of [+/-25] mm at the specified cutoff or driving elevation.

.3 Orientation: Maximum deviation of [1%] of the sheet pile length from plumb.

3.4 REPAIR OF DAMAGED OR IMPROPERLY INSTALLED PIPES

.1 Remove sheet piles that are out of line or plumb, twisted, broken, or otherwise damaged and replace with undamaged piles.

.2 Repair damaged coatings in accordance with the manufacturer's written instructions.

END OF SECTION