

PART 1 - GENERAL

- | | | |
|--|----|---|
| <u>1.1 Related Sections</u> | .1 | Section 05 50 00 - Metal Fabrications. |
| <u>1.2 References</u> | .1 | Canadian Standards Association (CSA)
.1 CSA C22.3 No.4-1974 (R1999) Control of Electrochemical Corrosion of Underground Metallic Structures. |
| | .2 | National Association of Corrosion Engineers (NACE). |
| <u>1.3 Shop Drawings</u> | .1 | Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures. |
| | .2 | Indicate location of anodes, installation procedures, hardware and accessories. |
| <u>1.4 Waste Management and Disposal</u> | .1 | Remove from site and dispose of all packaging materials at appropriate recycling facilities. |
| | .2 | Collect and separate for disposal, paper, plastic, polystyrene and corrugated cardboard packaging material for recycling in accordance with provincial standards. |
| <u>1.5 Warranty</u> | .1 | The contractor hereby warrants that all products used for the cathodic protection installation will be effective in accordance with the General Conditions, for five years. |

PART 2 - PRODUCTS

- | | | |
|-------------------------------|----|--|
| <u>2.1 Sacrificial Anodes</u> | .1 | Provide complete cathodic protection system (including all connection hardware) as indicated on the drawings, comprising of: Aluminum Indium alloy sacrificial anodes complete with mounting plate/brackets. All |
|-------------------------------|----|--|

anodes must have the following properties: A total mass as per the contract drawings. The anodes shall have a negative potential of -1.150 V (to a Copper-copper sulfate reference electrode at 25 degree Celsius), a current capacity of 2600 A-hrs/kg and a consumption rate of 3.3 kg/A-yr. The Aluminum Indium alloy shall have the following composition: Zn(3.0%), Si(0.1%), Hg(0.0%), In(0.015%), Al(Remainder) or approved alternate. The alloy shall be designed for use in a seawater environment. The steel sheet pile wall bar anodes shall have a trapezoid shape and have the following tentative dimensions: Length=1.55m, width=0.135m, height=0.152m. All anode dimensions to be approved by a Departmental Representative.

2.2 Heavy Duty Pipe
Pile Wrap/Jacket

- .1 The heavy duty pipe pile wrap/jacket is required to provide a corrosion free environment below the wrap/jacket. The product must also meet the following performance criteria: The product must be designed for a harsh marine environment with a minimum 25 design life, a minimum warranty of 5 years, UV resistant, moisture and air resistant, can be applied to battered and plumb steel pipe piles, be resistant to abrasion in harsh marine conditions near the shoreline caused by sand and silt being washed up against the wrap due to large wave action.
- .2 The approved product shall be a minimum three layer GFRP wrap installed with a submergible resin design for a seawater application. Alternate products including other wrap and jacket systems shall be considered. Contractor to submit proposed products for review and approval by a Departmental Representative.

2.3 Pipe Pile
Wrap/Jacket

- .1 The pipe pile wrap/jacket is required to provide a corrosion free environment below the wrap/jacket. The product must also meet the following performance criteria: The

product must be designed for a harsh marine environment with a minimum 25 design life, a minimum warranty of 5 years, UV resistant, moisture and air resistant, can be applied to battered and plumb steel pipe piles, be resistant to abrasion in harsh marine conditions caused by large wave action and propeller wash.

- .2 The approved product shall be a minimum two layer GFRP wrap installed with a submergible resin designed for a seawater application. Alternate products including other wrap and jacket systems shall be consider. Contractor to submit proposed products for review and approval by a Departmental Representative.

2.4 Steel Sheet Pile
Wall Coating System

- .1 The steel sheet pile wall coating shall consist of two or more marine paint coatings (epoxy, polyurethane or vinyl based) with a total nominal DFT minimum of 350 µm. The coating system shall have a warranty for 5 years. The coating system shall meet the following standards or approved equivalent: No corrosion or blistering after 5000 hours based on the ASTM D870 immersion test in ocean water. In addition, the coating system shall have no blistering after 5000 hours based on the ASTM B117 salt fog test.

3.1 Installation

- .1 Install all products of the cathodic protection system as per the contract drawings and to the manufacturer's specification. If there is a discrepancy between the contract drawings and the manufacturer's specification, consult a Departmental Representative.
- .2 Surface preparation of the steel sheet pile wall shall include high pressure water jet to remove all loose rust, paint and marine growth to SA 2.5 in accordance with ISO 8501.1. Alternate surface preparation guidelines

shall be considered if the coating supplier/manufacturer can provide test data showing acceptable performance with less surface preparation requirements.

- .3 Surface preparation of the steel pipe piles for the installation of the wrap/jacket and anodes shall include high pressure water blasting as required to remove all loose rust, paint and marine growth to SA 1.0 in accordance with ISO 8501.1 supplemented with SSPC-SP-2/SP-3 hand and power tool cleaning on required areas. Alternate surface preparation guidelines shall be considered if the supplier/manufacturer can provide test data showing acceptable performance with less surface preparation requirements.
- .4 All wrap/jacket fasteners/straps shall be stainless steel (if applicable), or approved alternate.