

ANOTEC Industries Ltd.

6 Anode Sled

Rev 0.7 14-Jun-06

Product Description:

Six heavy High Silicon Cast Iron Anodes (each 315lb 140kg) are securely mounted on a Corrosion Resistant Frame (Sled). The Sled weighs approximately 2000kg (4410lb) depending upon the size and length of shore lead cable. The footprint is nominally 2.1m x 2m; of height 0.6m. (7f x 6.5f x2f).

Anodes are spaced for uniform current discharge and consumption.

Table 1 projects CP Life expectation based on the following assumptions:

Consumption Rate range:

- 0.75 to 1.5 lb/AmpYear.
- 0.34-0.68 kg/AmpYear
- Utilization Factor: 85%.



Figure 1: Typical 6 Anode Sled with Shore Lead Cables.

Table 1. Life Expectancy (Years) as a function of Consumption Rate (kg / Ampere Year):

		Sled Discharge: Amps	70	100	130
Average Discharge Density: Amps / M ² .			14.2	20.3	26.5
Amps / ft ²			1.3	1.9	2.5
Anode Mass, gross	6 x 143kg = 860kg	Life Expectancy Years = 730 kg / [Amps x Consumption Rate]			
Utilization Factor	85%				
Net Consumable Mass	0.85 x 860 = 730kg				
Consumption Rates Kg / AmpYear Note 1.	0.45 (1lb/Ayr)	23	16	12.5	
	0.57 (1.25lb/Ayr)	18	12.8	9.9	
	0.68 (1.5 lb/Ayr)	15.3	10.7	8.3	

Note 1: In 1995, Anotec conducted a 120 day Test of anodes submersed in saltwater / mud at the GVRD Seymour-Burrard CP System, operating at 41 Amps / M² 3.8 Amps / ft² Consumption Rate range: 360 to 490 grams/AmpYear.

Refer to Drawing ANO-001 attached.

Each Type 4884 XX anode has a single #8 Halar / Kynar HMWPE cable lead connected to a Shore Based Rectifier (not included) by means of two parallel insulated cables (usually, but not limited to #6, #4 or #2 HMWPE 600V) protected by heavy wall EPDM rubber hose. Length permitting, dual cables of #2 or smaller may be protected by a single hose.

Each anode lead exits from the side of the anode 400mm (16") from the center connection. The lead wire is protected by a sleeve of rubber hose at the hole in the anode wall. The interior of the anode is encapsulated with epoxy for 460mm (18"), covering the anode-lead. Each anode has spare lead-wire coiled slack for on-sled repair / replacement of the shore connections.

The on-sled junction between anode leads and shore leads utilizes high strength ground connectors (copper), sealed and protected by Epoxy (Polyspec 757 or DuoChem 8113) mixed with sand (Anotec WI 4.9.4). the epoxy mass is encased in a PVC tube. The mixture of epoxy and sand has been carefully developed and tested by Anotec to insure that the epoxy-sand mass cures gradually and evenly for optimum sealing quality. The shore lead cables and protection hose(s) are securely encased in concrete in the Sled Frame before terminating in the on-sled junction.

The Sled frame consists of two 12" 300mm PVC Class 63 pipes 78" 2000mm long filled with reinforced concrete. The pipes are connected together by three 4" 100mm fiberglass tubes filled with 35Mpa reinforced concrete.

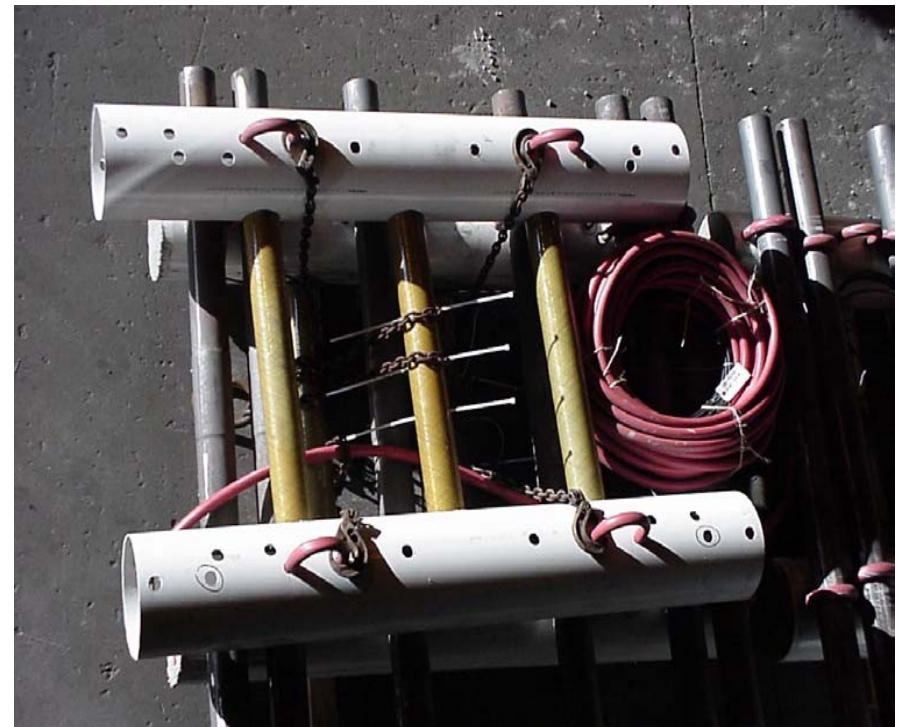
Figure 2: Basic Sled Frame without Anodes

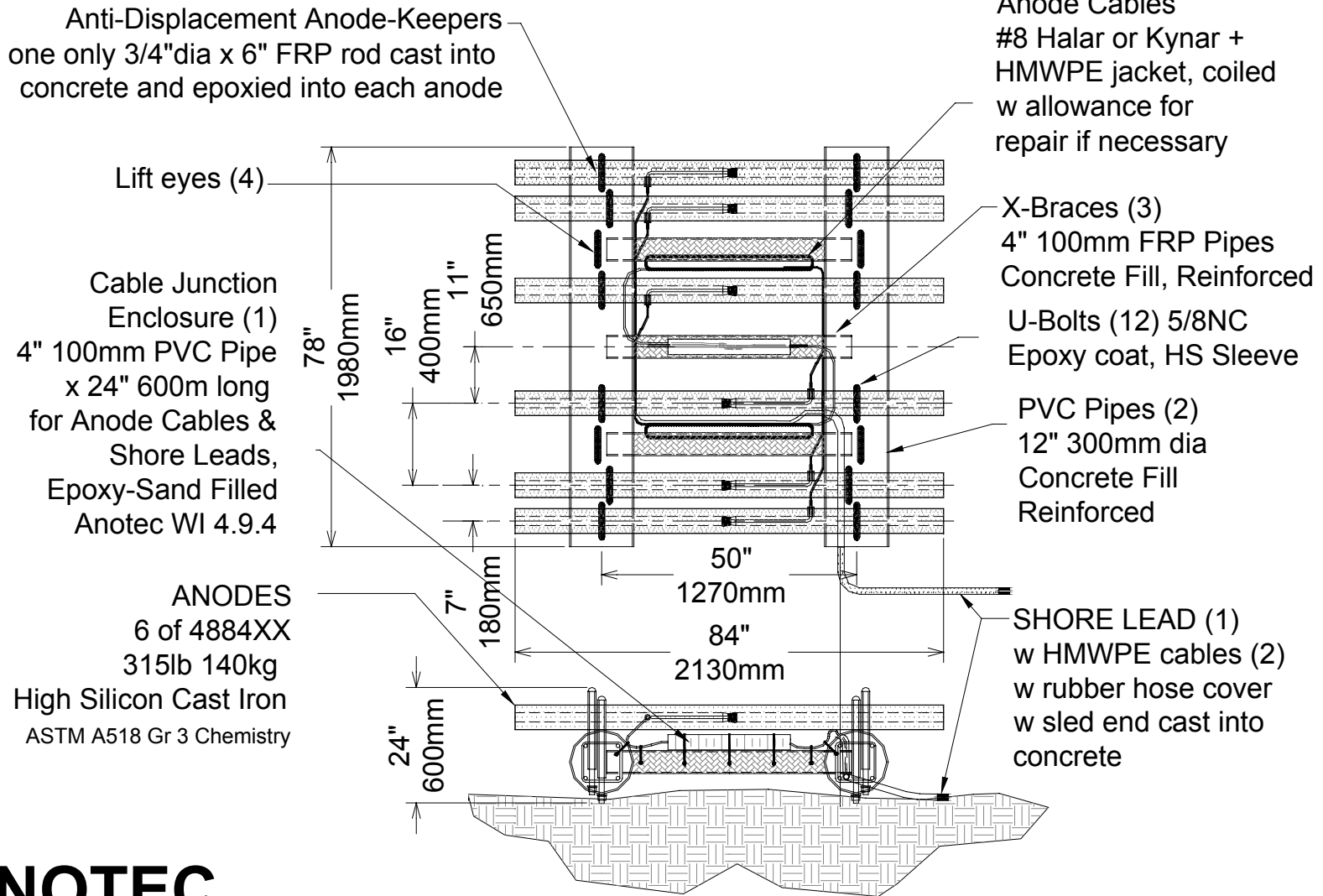
The Sled frame includes 4 lifting eyes, and 12 anode clamps manufactured from 5/8NC steel U-bolts powder coated with epoxy, cover protected by a heat shrink sleeve and a 1" EPDM rubber hose jacket. The U-bolts are cast into concrete and exposed threads are epoxy coated. Heavy Duty all-plastic tie-wraps are cast into the pipes and tubes to secure on-sled cables and the junction enclosure behind and shielded by structural members.

Sleds have been operating since 1993. More than 220 sleds are in service today, primarily on the British Columbia coast. Most of these protect B.C. Ferry Corporation wharf structures in turbulent and silting conditions.

A Name Plate secured into concrete lists Anotec and the Sled Serial Number and Date of Manufacture. Customer Project "information" is optional.

Each sled is manufactured, inspected and tested in accordance with Anotec's ISO 9001 Quality Program.





ANOTEC

INDUSTRIES LTD
Langley BC Canada

Gross Weight 2 Tonnes, nominal

ANODE SLED

Drawing: ANO-001
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