

Product Description:

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

Application Information:

Anodes are spaced for uniform current discharge and consumption. Although HSCI in sea water can withstand current discharge amperages exceeding 5 A / sq ft (55 A / sq m), the following factors should be considered.

(a) **Environmental Regulations** may restrict sled discharge current to lower values. (i.e. less than 1 volt / meter electric field strength in natural waters).

(b) **Sled Life** will depend upon the weight of anodes, the amperage, their consumption rate and

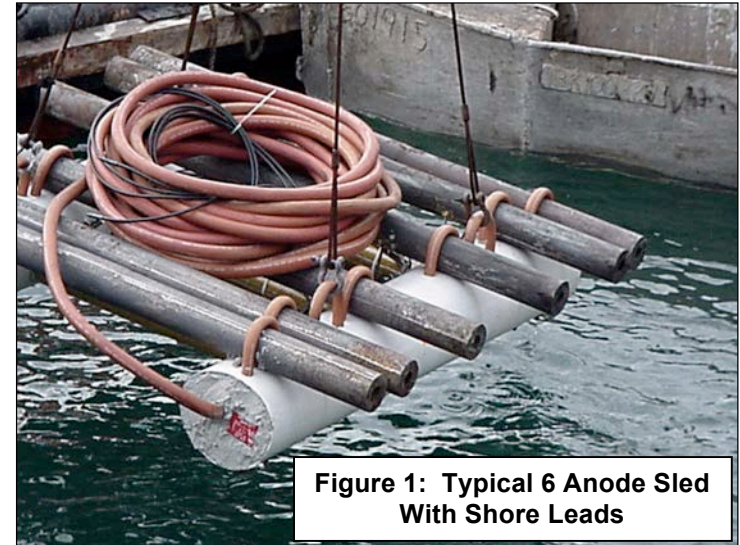


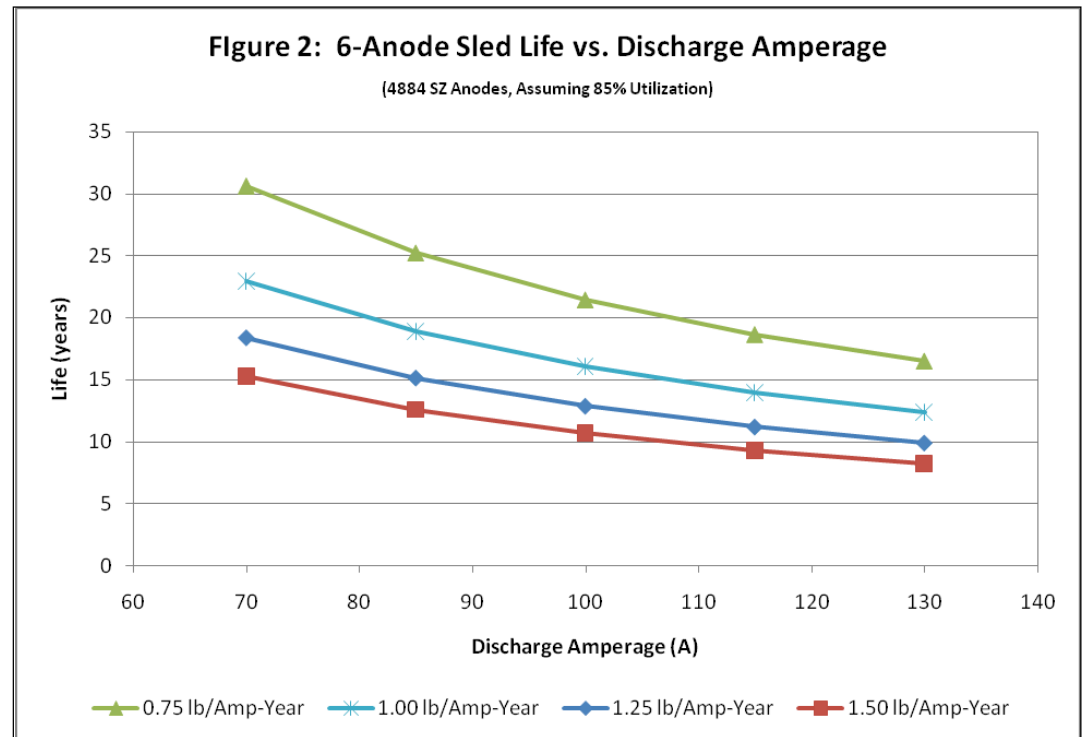
Figure 1: Typical 6 Anode Sled With Shore Leads

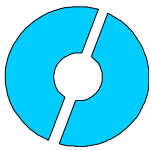
utilization efficiency. For purposes of example only, the following values have been assumed to predict Life Expectancy, according to Anode Model (Size) and Sled Current Discharge (Amps). Refer to Figure 2, based on:

- **Consumption Rate Range:** 0.75 lb / A-Yr (0.34 kg / A-yr) to 1.5 lb / Amp-Year (0.68 kg / Amp-Year).
- **Utilization Efficiency:** 85% (percentage of anode mass that can be reasonably expected to perform CP).
- **Anode Mass:** 6 x 4884 SZ Anodes (1890 lb = 857 kg).

Based on the assumptions, Figure 2 charts 6-Anode Sled Life in relation to Sled Discharge Amperage for the Consumption Rate range.

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 / Amp-Year.





Sled Construction: Refer to Drawing ANO-001 attached (page 3).

Each Type 4884 SZ 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 400 mm (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 460 mm (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" (300 mm) PVC Class 63 pipes 78" (2000 mm) long filled with reinforced concrete. The pipes are connected together by three, 4" (100 mm) fiberglass tubes filled with 35 MPa reinforced concrete.

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.

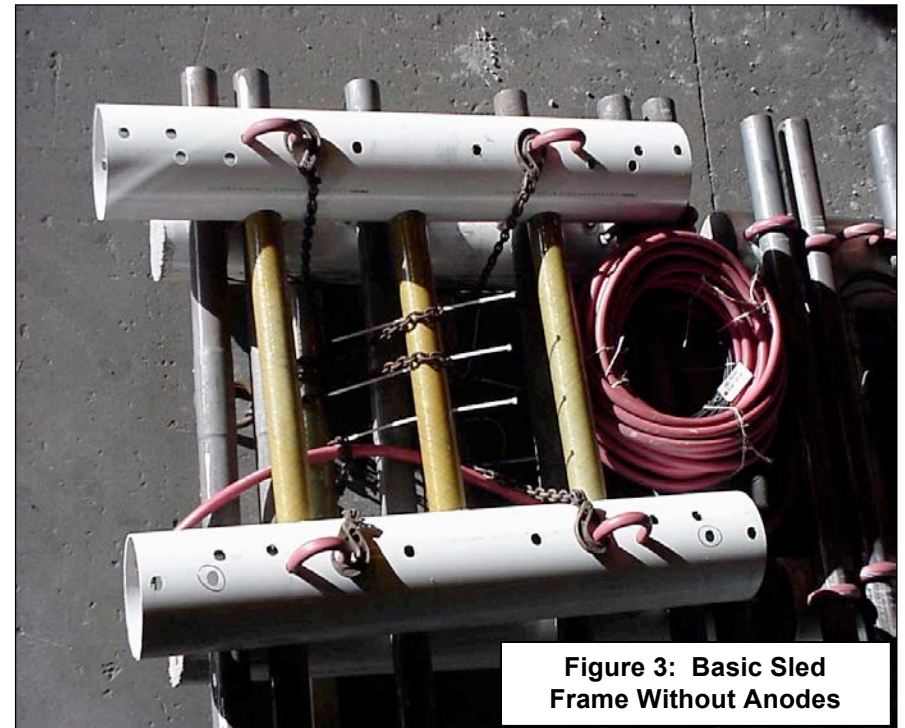
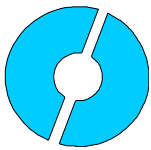


Figure 3: Basic Sled Frame Without Anodes



6-Anode Sled

08-Jun-08

Anti-Displacement Anode-Keepers
one only 3/4" dia x 6" FRP rod cast into
concrete and epoxied into each anode

Anode Cables
#8 Halar or Kynar +
HMWPE jacket, coiled
w allowance for
repair if necessary

Lift eyes (4)

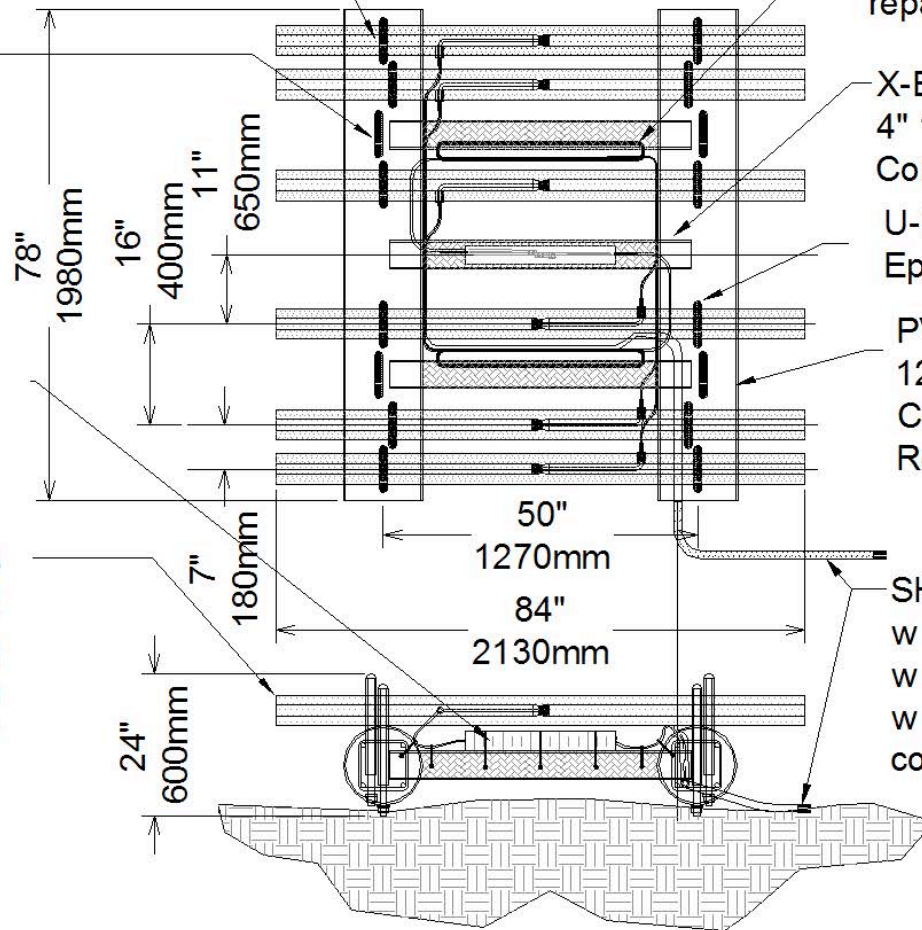
X-Braces (3)
4" 100mm FRP Pipes
Concrete Fill, Reinforced
U-Bolts (12) 5/8NC
Epoxy coat, HS Sleeve

Cable Junction
Enclosure (1)
4" 100mm PVC Pipe
x 24" 600m long
for Anode Cables &
Shore Leads,
Epoxy-Sand Filled
Anotec WI 4.9.4

PVC Pipes (2)
12" 300mm dia
Concrete Fill
Reinforced

ANODES
6 of 4884 SZ
315lb 140kg
High Silicon Cast Iron
ASTM A518 Gr 3 Chemistry

SHORE LEAD (1)
w HMWPE cables (2)
w rubber hose cover
w sled end cast into
concrete



ANOTEC

INDUSTRIES LTD
Langley BC Canada

Gross Weight 2 Tonnes, nominal

ANODE SLED

Drawing: ANO-001

14 Sep 01

Rev. 1.1 10 Nov 11