DEPARTMENT *of* INFRASTRUCTURE, ENERGY *and* RESOURCES, TASMANIA

BRIDGEWORKS SPECIFICATION

B28 - CATHODIC PROTECTION OF STRUCTURES April 2003

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B28.1 SCOPE

This specification sets out the requirements for the installation and maintenance of cathodic protection systems on concrete and steel structures.

B28.2 MATERIALS

B28.2.1 Anodes

Anodes shall have a recognised history of use in the cathodic protection of structures. Details shall be included in the tender, and may be selected from:

• zinc blocks	• magnesium blocks	• conductive wrappings
• sprayed zinc	• discrete anodes	• conductive strips
• silicon-iron soil anodes	• water anodes	• titanium mesh

B28.2.2 Concrete Repair

Concrete repair materials shall generally be in accordance with Specification B10 - Supply of Concrete, B15 - Concrete Repairs or B16 Concrete Crack Injection. The resistivity of the repair materials shall be compatible with that of the parent concrete and the requirements of the cathodic protection system.

Specifications for repair materials shall be detailed by the Contractor and include, amongst other details, pull off test results.

B28.2.3 Electrical

Electrical work shall comply with the relevant Australian Standards.

B28.3 STANDARDS

The impressed current cathodic protection system shall be designed and specified to be in accordance with recognised industry standards such as those recommended by “Concrete Society Technical Report No. 37”, including reference documents:

(i) BS CP 1021:1973 (1979) - Code of practice for cathodic protection

(ii) NACE RP 01-87 - Design Considerations for Control of Reinforcing Steel in Concrete

(iii) NACE RP 02-90 - Cathodic Protection of Reinforcing Steel in Atmospherically Exposed Concrete Structures

(iv) NACE RP 03-90 - Maintenance and Rehabilitation Considerations for Corrosion Control of Existing Steel Reinforced Concrete Structures.

The Contractor shall nominate, with the design documentation, publications supporting the proposed system.

B28.4 DESIGN PARAMETERS

The design life of the work shall be not less than 30 years.

The cathodic protection system shall deliver enough current through either the impressed current system or the size and distribution of sacrificial anodes to satisfactorily polarise the structure.

Satisfactory polarisation shall be demonstrated by meeting as many of the following criteria and additional criteria accepted by the Superintendent as are relevant:

- most negative instantaneous potential of -1100 mV Ag/AgCl
- instantaneous off criteria
- decay criteria
- loop resistance.

B28.5 INSTALLATION

The cathodic protection system shall be installed to the designer's or supplier's specification.

Conduits and fastenings shall be of stainless steel. All wiring that is within 3m of an accessible ground surface shall be chased into the concrete. Junction and control boxes shall be constructed of stainless steel and located to avoid vandalism or suitable protective measures taken.

B28.6 MONITORING FOLLOWING COMMISSIONING

The Contractor shall monitor the performance of the cathodic protection system and make any necessary system adjustments. The minimum frequency of inspections shall be as follows:

- 1 per 3 weeks for first 3 months following commissioning
- 1 per month for period 3 to 6 months following commissioning
- 1 per 6 months for period 6 months to 2 years following commissioning.

Written reports to the Superintendent are required at 3 and 12 months after system commissioning and thereafter at annual intervals and such other times as may be necessary.

Where a sacrificial anode system is installed, and anodes of one material installed to initially polarise the structure are subsequently changed to anodes of another material, the Contractor shall monitor the system for a period of two years following the installation of the second set of anodes.

B28.7 DOCUMENTATION

A detailed operation and maintenance manual, in draft form, shall be forwarded to Superintendent at time of commissioning. The Superintendent undertakes to provide written comments within one month of receipt of the draft manual. Five copies of the final manual shall be supplied not less than 6 months from the date of commissioning.

The manual shall include, but not be limited to, the following information:

(i) as-built drawings showing exact location of all cables, reinforcing connections, reference electrodes and conduits. They shall also show all repair locations.

(ii) all system wiring diagrams.

(iii) details of spare parts supplied.

(iv) name and address of suppliers and manufacturers of all electrical equipment including system components. This information is also required for all cables, conduits, pits and enclosures used.

(v) criteria for ensuring that the system is protecting the structure

(vi) fault finding information for minor repair or replacement of components.

(vii) instructions on the operation of the system.

B28.8 PAYMENT

Payment for cathodic protection systems shall be at the items as listed in the Schedule of Rates.

Payment shall include the provision of all plant, labour and materials to undertake the works, including:

- preparation of all designs, drawings, specifications and reports
- supply and installation of all materials
- undertaking of any repairs associated with the installation
- supply of operation and maintenance manual
- monitoring of the system following commissioning in accordance with this Specification.
- and the disposal of any debris.