



Fact sheet – *Cathodic protection of concrete structures*

Number 4, 2013

Part of the [Tranzinfo Hot Topics](#) series, this fact sheet offers a selection of material on *Cathodic protection of concrete structures*, especially marine bridges, a method for extending the life of existing concrete structures.

Contents:

[Glossary](#)

[Case studies & research](#)

[Practice guides](#)

[Standards](#)

[Presentations, lectures, conferences](#)

[Media reports](#)

[Websites](#)

Glossary

Cathodic protection - The prevention or reduction of corrosion of metal by making the metal the cathode in a galvanic or electrolytic cell.

Sacrificial anode - A method of protecting iron and steel objects by alloying with a more reactive electropositive metal such as zinc, where the electropositive metal supplies the electrons required by oxygen and forms an anode. The electropositive metal becomes the site for corrosion instead of the iron and steel.

Impressed current anode – The protection of metal from corrosion by making the metal a cathode in an electrolytic cell. Impressed current systems employ an inert or low dissolution anode and use an external source of direct current power to impress a current from an external source onto the cathodic metal surface.

[Back to top](#)

Case studies & research

[Cathodic protection for life extension of existing reinforced concrete bridge elements : a synthesis of highway practice](#)

A Transportation Research Board publication which summarises practices in cathodic protection for reinforced concrete bridges.

[Evaluation of cathodic protection systems for marine bridge substructures](#)

A report by the Center for Transportation Research at the University of Texas which evaluates four different cathodic protection systems on substructures of a Texas bridge.

The application of sacrificial cathodic protection as a corrosion control measure for the protection of reinforced concrete bridges

Jesmin F, Moore M, Tao S & Beedles A

In *Life-Cycle and Sustainability of Civil Infrastructure Systems : proceedings of the Third International Symposium on Life-Cycle Civil Engineering (IALCEE'12)*, Vienna, Austria, October 3-6, 2012

CRC Press, Boca Raton, Fla.

ISBN 9780415621267

The selection and use of cathodic protection systems for the repair of reinforced concrete structures

Wilson K, Jawed M & Ngala, V

Construction and building materials 2013

Volume 39, pages 19-25

This paper discusses the advantages and disadvantages of the two cathodic protection systems: sacrificial anode and impressed current. Impressed current cathodic protection is recommended for large scale projects where a long term solution is required such and applied in traffic related structures.

[Using cathodic protection to control corrosion of reinforced concrete structures in marine environments](#)

Steven Daily of Corpro Companies reviews the forms of cathodic protection of reinforced concrete structures in marine environments which have direct and indirect exposure.

[Analysis of climate change impacts on the deterioration of concrete infrastructure](#)

CSIRO report released in 2011 on the suitable responses and techniques to manage corrosion on concrete infrastructure due to climate change.

[Back to top](#)

Practice guides

[Cathodic protection of concrete bridges: a manual of practice](#)

United States government-produced manual providing direction on the incorporation of cathodic protection in bridge projects

[Back to top](#)

Standards

AS 2832.5 2008. Cathodic protection of metals. Steel in concrete structures

This standard specifies the requirements for the cathodic protection of reinforcing steel in concrete that is exposed to atmospheric, submerged or buried conditions, to prevent or control corrosion within acceptable limits.

ISO 12696: 2012. Cathodic protection of steel in concrete

Guidelines for the cathodic protection of steel in cement based concrete in new and existing structures, embedded in atmospherically exposed, buried, immersed and tidal conditions

[Back to top](#)

Presentations, lectures and conferences

[Cathodic protection for extending the life of concrete bridges](#)

Lecture presentation by Rob Polder, Delft University of Technology, 2009.

[FDOT cathodic protection practices for bridge preservation](#)

Presentation at the National Bridge Management, Inspection and Preservation Conference, St. Louis, Missouri, 2011.

An outline of the methods for the cathodic protection of bridges employed by the Florida Department of Transportation.

[Sacrificial cathodic protection of reinforced concrete bridges](#)

Presentation at the 8th Austroads Bridge Conference, 'Sustainable Bridges – The Thread of Society', Sydney 2011.

NOTE: click on the down arrow to download the presentation or paper

[Swansea Bridge cathodic protection works](#)

Presentation at the 8th Austroads Bridge Conference, 'Sustainable Bridges – The Thread of Society', Sydney, 2011.

NOTE: click on the down arrow to download the presentation or paper

[Back to top](#)

Media reports

[Cathodic protection & corrosion maintenance a requirement for US bridges](#)

2005 YouTube Fox News interview on the Minnesota, USA, Bridge collapse.

[Bideford bridge repairs completed](#)

2009 report from the North Devon Gazette (UK) on repairs to the historic bridge.

[Power to fight corrosion](#)

2012 Otago Daily Times (NZ) report on cathodic protection of the Brighton Road Kaikorai Estuary Bridge.

[Fears bridge's concrete cancer will paralyse traffic](#)

2012 Canberra Times report on major repairs to the Nelligen Bridge.

[Back to top](#)

Websites

[Swansea Bridge cathodic protection work](#)

Project information from consulting company GHD Australia on its protection work on the Swansea Bridge in Newcastle, New South Wales.

[Cathodic protection](#)

Useful information on cathodic protection from remedial contracting company Marine and Civil Maintenance.

[BBR Contech](#)

Overview reference documents from New Zealand construction company Contech on cathodic protection. Click on Project References link and search for 'cathodic'. Details of the company's construction projects are provided.

[Back to top](#)

This fact sheet was produced by the University of Tasmania Library, a member of Tranzinfo, the Australian and New Zealand network of land transport libraries.

Australia

ARRB Group, MG Lay Library
Centre for Automotive Safety Research Library
Commonwealth Department of Infrastructure and Transport Library
Hargrave-Andrew Library, Monash University
Main Roads Western Australia Library
Queensland Department of Transport and Main Roads Library
Roads and Maritime Services Library
SA Department of Planning, Transport & Infrastructure Library
Sinclair Knight Mertz Library
SMEC Library
Tasmanian Department of Infrastructure, Energy & Resources Library
University of Tasmania Launceston Campus, incorporating former Australian Maritime College Library
VicRoads Library
Victorian Department of Transport, Planning and Local Infrastructure Library
WA Department for Transport Library

New Zealand

Ministry of Transport Library
New Zealand Transport Agency Library
Opus International Consultants Library