

# CORROSION CONTROL SERVICES



- UKAS accredited inspections ■
- impressed current cathodic protection ■
- protective coatings ■
- galvanic cathodic protection ■
- corrosion inhibitors ■
- corrosion monitoring ■

CRL IS A SPECIALIST contractor for the inspection and repair of concrete buildings and structures both in the UK and overseas based on 60 years' experience in the industry. The service includes the design and installation of corrosion control systems to slow down or stop any steel reinforcement corrosion.

Reinforced concrete structures often deteriorate due to corrosion of the reinforcement which causes spalling of the concrete and can lead to structural failure. The corrosion is initiated due to either carbonation of the concrete, which lowers the alkalinity of the concrete surrounding the steel or high chloride ion levels at the reinforcement from either the original concrete mix,

de-icing salts or a marine/saline environment.

Our survey division, CRL Surveys Ltd, is UKAS accredited to undertake the initial condition surveys to identify the nature, cause and extent of any concrete damage and steel reinforcement corrosion. Using half-cell potential surveys and linear polarisation resistance measurements a corrosion risk assessment can be undertaken to determine the corrosion rate and location of corrosion activity. Analysis of the concrete will determine the concentration of chloride ions and depth of carbonation. This allows us to then provide professional and informed advice on whether to implement corrosion control techniques to enhance durability and extend the life of the structure.



REINFORCED CONCRETE which is carbonated can usually be treated using coatings and thin coat renders to stop the carbonation front moving further into the concrete. Coatings can also slow down the rate of

corrosion activity which may already be occurring. Where there are high chloride ion levels in excess of 0.3% by weight of cement at the reinforcement a corrosion control

## PROTECTIVE COATINGS

system may be needed to improve the durability and service life of the concrete. CRL can design and install corrosion control systems and offers a range of systems to suit all situations and the client's objectives in terms of cost and service life.





**CATHODIC PROTECTION** is an industry standard for corrosion control of reinforced concrete. Galvanic or sacrificial systems use zinc or aluminium alloys which corrode in favour of the steel reinforcement. They can be used in concrete repair areas to stop corrosion around the repair which is known as the incipient anode effect or installed in sound concrete to stop or reduce the risk of corrosion across the whole structure. Galvanic anodes are consumed during the service life of the structure and may last 15-20 years before replacement is needed.

Impressed current cathodic protection uses a range of generic anodes which are placed on or in the concrete:

- **Conductive paint**
- **Titanium mesh**
- **Titanium ribbon mesh**
- **Discrete titanium anodes**
- **Conductive cementitious overlay**

A small current at low voltage is passed between the anode and the steel reinforcement which makes the steel cathodic and stops further corrosion from occurring. These anodes can have service lives in excess of 60 years.

Hybrid CP systems use impressed current to passivate the steel reinforcement and then are left in galvanic mode to control future corrosion. This method only requires a temporary power supply for a few weeks but the aluminium alloy anode has a finite life and will need replacing after 15-20 years.

CRL have been a leading installer and innovator of corrosion control systems since the 1980s. As well as reinforced concrete we also supply systems for steel piles and sheet piles in marine environments using similar galvanic or impressed current CP.

Our systems are designed in accordance with the European Standards EN12696 and EN12473 and installed by our CP Engineers and Technicians who are certified in accordance with EN15257.

CRL are founding members of the Corrosion Prevention Association and work with the association technical committee to develop standards and guidance documents for the industry.



**CORROSION INHIBITORS** are chemical compounds which are used in many industries to inhibit steel corrosion by forming a protective layer on the steel surface. The construction industry has been using these materials for 15



years as an additive to some concrete mixes. For the repair

of reinforced concrete where there is a medium/low risk of

corrosion, inhibitors can be used by application in or on the

concrete surface. These materials migrate through the concrete cover to the steel reinforcement surface

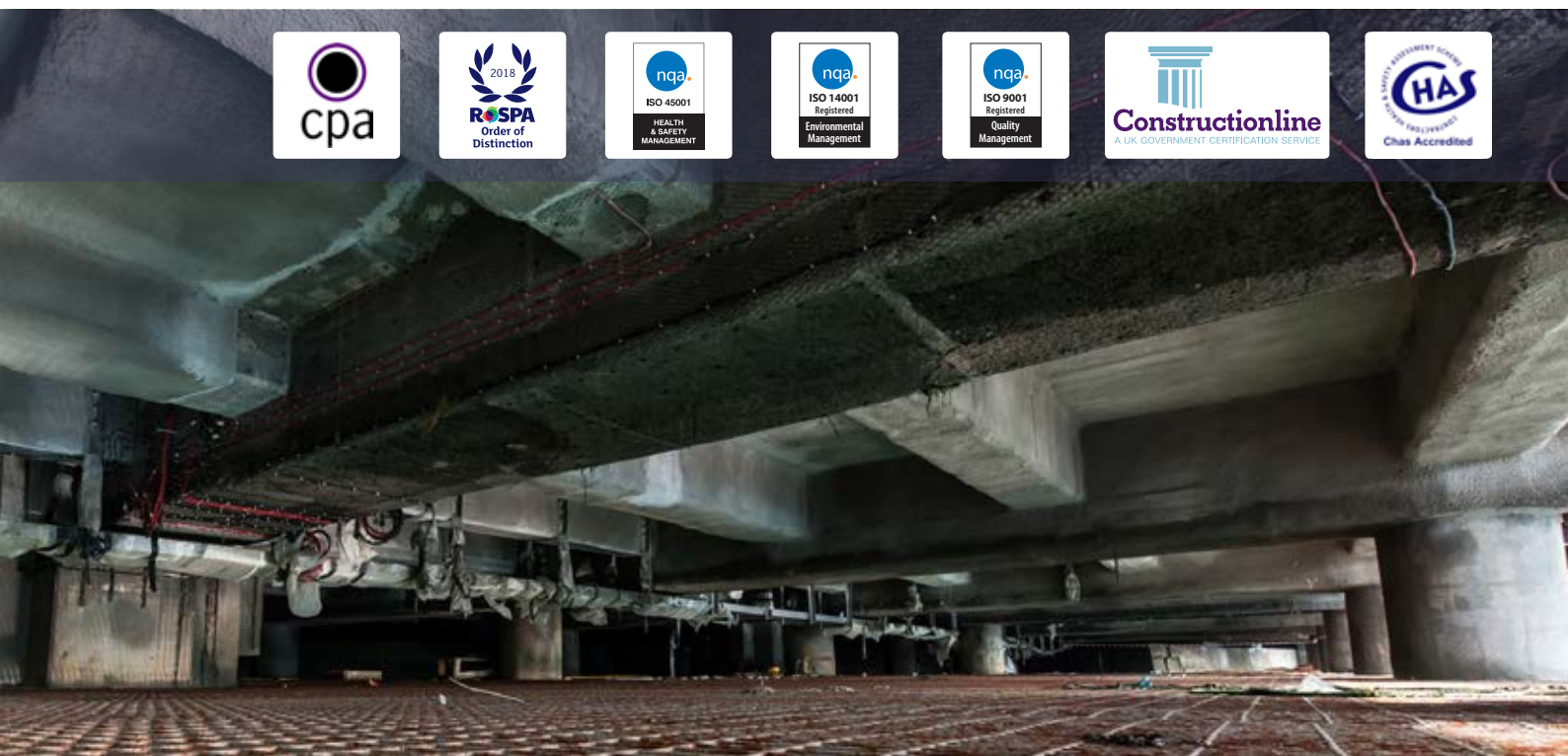
and form a protective layer. The materials may inhibit corrosion for 10-15 years before reapplication is

required and should be used in conjunction with a surface coating.

## CORROSION CONTROL SYSTEMS

A92 Tay Road Bridge Joint Board	Hammerson
Amey	High Wycombe District Council
BAM Nuttall	Highland Council
Brighton Marine Estates Management	Highways Agency
British Airports Authority	Milford Haven Port Authority
Devon County Council	Port of Felixstowe
EDF Energy	Roads Scotland
EM Highways	Shell Oil
Essex County Council	States of Guernsey
Glasgow City Council	States of Jersey
Halton Borough Council	Transport for London

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