


Sustainable Structural Maintenance Services



Concrete **Repair**
Condition **Surveys**
Coatings
Corrosion **Control**
Bearing Replacement
Membranes
Anchors/Remedial Ties
Structural Strengthening
Cleaning & Preparation
Grouting & Injection
Early Contractor **Involvement**
External Façade **Refurbishment**

A large-scale construction project featuring a massive concrete structure, possibly a dam or bridge pier, under renovation. The structure is heavily scaffolded with metal frames. In the foreground, a worker in a bright orange safety suit and white helmet is operating a small inflatable boat on the water. The background shows a clear blue sky and a modern building with a glass facade.

CRL is a **Specialist Contractor** experienced in repairing **vital infrastructure assets**

CRL (part of the Centura Group) is a **specialist asset maintenance contractor** for the **inspection, repair & refurbishment of concrete buildings and structures**. Established in 1955, **CRL** have a network of six regional offices in the UK providing a **comprehensive refurbishment service**. **CRL Surveys** (also part of the Centura Group) is able to undertake the initial condition surveys to identify the nature and extent of any structural deterioration. This allows us to then provide professional and **informed advice** on how to repair the defects in a **cost effective and sustainable manner**. **CRL** are a **multi-award winning company**, renowned for providing professional, **innovative engineering solutions**.

CRL is **Multi-Disciplined** and works across **various sectors** in the **construction industry**



CRL Highways

sustainably restoring & maintaining the UK's infrastructure

Reinforced concrete **highway and rail** structures frequently suffer from deterioration due to **corrosion of the steel reinforcement**. This is usually initiated by high chloride ion levels in the concrete from de-icing salts spread on the roads and structures. **CRL**, with its vast experience in this sector, is able to repair the concrete with **minimal disruption** to traffic in accordance with **BS EN1504**. Where necessary we can also design and install corrosion control systems to **ISO 12696** to enhance the durability of the structures and extend their design life. These can be **galvanic, ICCP** or **hybrid** systems. **CRL** have been carrying out the **inspection, repair and refurbishment of bridges and tunnels** since 1955. **CRL Surveys** are **UKAS Accredited** to undertake the initial condition surveys to identify the nature and extent of any structural deterioration. This allows us to then provide **professional** and informed **advice** on how to repair the defects in a **cost effective** and **sustainable** manner.





CRL Surveys

structure & building assessment

With all **refurbishment** schemes it is **essential** that the **structure is inspected** to assess the nature and extent of the deterioration so that a repair specification and bill of quantities can be prepared. **CRL Surveys**, who are **UKAS Accredited** and have **over 20 years' experience**, are able to undertake the **initial investigation** using the latest NDT techniques. **CRL Surveys** are qualified for confined space working & rope access if required to access all areas of a structure. A detailed report is provided with CAD drawings which identify the condition of the structure and assist with any further structural analysis. **CRL Surveys** can also recommend **suitable methods of repair** and **provide budget costs** for the work which **allows clients to plan their maintenance activities**.

Visual, hammer test & make safe

Covermeter & Ferrosan

Carbonation testing

Corrosion investigations

Chloride analysis

Resistivity

Core sampling

Half cell potential surveys

ASR & HAC analysis

Borescope inspection

Corrosion rate measurements

Load testing

Thermal imaging

Electro magnetic scanning

Structural analysis

3D scanning

Ground penetrating radar

Fire & other accidental damage



Structural Strengthening using FRP Composites

a **sustainable** solution for the **modern** construction **industry**

CRL continue to
lead the construction

industry in the innovative use of fibre reinforced

polymer (**FRP composites**) to **strengthen structures**. These

lightweight materials are bonded to the structure using adhesives to **significantly**

enhance their **structural performance**. **CRL** have **strengthened** numerous concrete, steel, masonry and cast iron **structures** in the last **25 years** using a combination of techniques and have worked closely with universities to enhance our knowledge and understanding of these materials and their long term performance. Recently **CRL** have started to **develop the use of FRP composites**

for new **bridge structures and replacement decks**. These are

lightweight, manufactured off site, **quick to install**

and durable.



CRL in the Water Industry

supplying **best value solutions** since **1955**



Reliance

CRL provide **cost-effective** solutions, using the latest refurbishment techniques and materials to clients in both the **clean & dirty water** industries. We are well versed in the use of **DWI** materials and understand the importance of **IFU's**. As well as specifying work practises consistent with **best value solutions**, CRL understand the importance of maintaining **water quality** and supply, programming of the works and the utilisation of the assets being repaired. These factors are always foremost in mind when deciding on the materials and repair **methodology** to be used. As such we endeavour to work with the water companies to determine the **cause of the problems** at an early stage, **quantifying** the repairs to be carried out and the **timescale** for the refurbishment works.

The Art of Concrete Repair

Break out the concrete using hand tools (or hydro demolition for large scale repairs) ensuring the edges of the repairs are square cut

BS EN1504 Part 10



Prepare the surface & **clean** and **treat** the exposed reinforcement

BS EN1504 Part 9
Principle 11



Fix a **shutter** to the required profile and reinstate the concrete using hand placed mortars, flowable micro-concretes or sprayed repair mortar

EN1504 Part 9
Principle 3



Trowel **finish** the concrete repair (if required) to match the existing concrete. Cure the repair material as per the manufacturer's instructions

BS EN1504 Part 10



Apply a **protective coating** to enhance the durability and appearance of the concrete

BS EN1504 Part 9
Principles 1 & 8



Corrosion **Control** Systems

extending the life of the structure

To **significantly enhance** the **durability** of **concrete structures** CRL can advise on the **design** and installation of **cathodic protection** systems which provide cost **effective sustainable solutions**. For marine facilities we use galvanic CP systems to protect the reinforced concrete, steel piles and sheet piling below the mid-tide level utilising either zinc or aluminium alloy anodes. For reinforced concrete structures and steel framed buildings **CRL** use **impressed current CP systems** with a range of anode types (depending on the exposure and layout).

Our systems are **designed in accordance** with the European Standards **BS EN ISO 12696** and **BS EN12473** & **installed** by our **qualified** and **experienced CP Engineers** and **Technicians** who are certified in accordance with **BS EN15257**.



Masonry and concrete

tunnels often have water ingress which can cause structural and operational problems. **CRL** are **experienced** and **skilled** in the management of **water ingress** using a variety of techniques to stop or control the water flow. After repairing the existing tunnel lining we use **resin injection, grouting and tunnel liners** to manage any future water ingress. **CRL** are **approved applicators** for a wide range of **epoxy, polyurethane and acrylic resins** which can be used to seal cracks and voids in the tunnel lining. Masonry tunnels can be strengthened and lined with a sprayed mortar to **strengthen** the structure and **enhance future durability**.

Waterproof Membranes

protecting our bridges, multi-storey car parks, buildings & tanks

Waterproof membranes,

both **sprayed** and hand **applied**, when fully

bonded to the substrate can **dramatically reduce** the chances

of leaking on **roofs, car park decks, balcony walkways** and **bridge decks.**

Supplied and **installed** by **CRL**, waterproof membranes are also used to line tanks and bunds to protect the concrete and prevent fluids leaking out and polluting the environment. Unlike sheet membranes they do not have joints or seams which might fail and are fully bonded, so water cannot travel underneath the membranes. **Waterproof membranes** can help protect concrete decks from

de-icing salts (which are a major cause of the concrete deterioration), as

well as **dramatically improve** the **aesthetic**

appeal of buildings & car parks.



The calibre of **people CRL employ** are our main reason for **maintaining** the **quality** and **reputation** that we have **achieved** over the last 65 years. The Board of Directors (some of whom joined as young Engineers in the 1980's) provide a wealth of experience and knowledge to the business. On average **our employees** undertake **6 days training per annum** to maintain and **develop** the **standards** of service which our clients expect.

CRL Restoration

cathodic protection & concrete repairs to **iconic, listed and heritage** structures & buildings

Structural maintenance

is an **important part of heritage**

building refurbishment. **CRL Restoration** specialise in the

concrete repairs of historic, period and modern buildings and structures and the **cathodic protection of steel framed buildings**. **CRL Restoration** utilise in-house teams to undertake the works in accordance with the specification and recommendations set down by the client and heritage bodies. **CRL Restoration** are committed to working collaboratively with all the parties involved to value engineer the works, thereby coming up with the right solutions and ensuring that the **clients' expectations** are met and the final works are as anticipated. **CRL Restoration** has extensive experience of working on listed buildings with all Heritage and Conservation Bodies and work closely with our **clients** to offer **technical and budgetary advice** to ensure that their objectives are met.



Multi-Storey Car Park Refurbishment



CRL is a **specialist contractor** providing a comprehensive service for the **inspection, repairs and refurbishment** of multi storey (**MSCP**) and underground car parks.

Car parks are **important assets** for many shopping centres, local councils and businesses and it is essential for these to be maintained both for **safety and commercial** reasons. Working with our clients we undertake **condition and structural assessments** to identify the nature and extent of any defects using our survey division, **CRL Surveys Ltd**. We then advise on the repair options and costs so that CRL can deliver **efficient, innovative solutions** in a **safe and professional** manner with minimal disruption to users.

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