

# Structural Strengthening

Structural Assessment

Feasibility Studies & Budgets

Detailed Design

CFRP Plate & Wrap Installation

UHM Plate Installation

UHPFRC Installation

Load Testing



# CRL is a Specialist Contractor experienced in the structural strengthening of concrete assets



Nothing is so **important** that it cannot be done **safely** and **sustainably**

a **sustainable** future starts with **understanding** our impact **today**

## Composite Strengthening prolonging the life of your structure

FRP composites combine fibres with a polymer-based resin to create a structural material that is both lightweight and durable. The resin transfers stress between the fibres while providing protection. Compared to steel plate strengthening, equivalent carbon fibre plates represent just 15% of the cross-sectional area and 3% of the dead load. These materials offer sustainable engineering solutions and have been successfully employed across multiple industries for over 60 years.

**Ultra High Performance Fibre Reinforced Concrete** strengthening which **lasts**

## 70 Years of Experience

As a specialist contractor, CRL is proficient in the design and installation of both CFRP (Carbon Fibre Reinforced Polymer) and UHPFRC (Ultra-High Performance Fibre Reinforced Concrete) composite strengthening systems for steel, concrete, masonry and cast iron structures. In 1996, the company was the first in the UK to use FRP composites for strengthening concrete, establishing CRL

as an industry pioneer. A key role has been played in developing the technique and assisting with the development of standards and guidance documents for the design, installation and management of composite systems published by the Concrete Society as Technical Reports 55 & 57. Innovative strengthening techniques using FRP composite materials which comply with Eurocodes.



## Methods & Options

### Plate Bonding & FRP Wrap

CFRP strengthening can be achieved using two methods. Plate bonding involves off-site manufactured CFRP plates bonded to the structure with epoxy adhesives, offering easier quality control. FRP wrap applies fibre fabric on-site, either rolling dry fabric into wet resin or applying resin to the fabric before installation, ideal for beams and columns. Both methods require strict quality control to ensure long-term performance and structural reliability.

### UHPFRC

Ultra-High Performance Fibre Reinforced Concrete is an advanced concrete combining high strength, enhanced durability, and steel fibre reinforcement to improve tensile performance and crack control. Used in structural strengthening, UHPFRC can be applied as overlays or structural repairs to extend service life, increase load capacity, and enhance durability. Its advantages include superior mechanical properties, reduced maintenance requirements, and excellent resistance to environmental degradation, making it ideal for efficiently and sustainably upgrading ageing infrastructure.

## Reinstating Integrity

CRL continues to lead the construction industry in the innovative use of CFRP composites and UHPFRC. Over the past 35 years, the company has strengthened numerous concrete, steel, masonry and cast iron structures using a combination of techniques, working closely with universities to enhance knowledge and understanding of these materials and their long-term performance. The largest

project to date involved the installation of 15 km of CFRP plates to strengthen floors in an office building. More recently, CRL has begun developing the use of FRP composites for new bridge structures and replacement decks. These solutions are lightweight, manufactured off-site, quick to install, and durable - a sustainable approach for the modern world.





Renew | Protect | Maintain

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