

# Structural Strengthening

**Design**

Pultruded Plate **Installation**

**Structural** Assessment

**FRP Composite Wrap** Installation

Load **Testing**

**Post Installation** Monitoring





# Specialist Contractor

protecting your **vital infrastructure**

**CRL** is a specialist contractor for the **design** and **installation of fibre reinforced polymer (FRP)** composite strengthening schemes for **steel, concrete, masonry** and **cast iron structures**. **CRL** was the **first company in the UK to use FRP composites** for strengthening concrete in 1996. **CRL** have played a **key role in developing** the technique and assisted 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. **CRL provide** the construction industry with **innovative strengthening techniques** using **FRP composite** materials which comply with current Eurocodes.



**CRL** continue to **lead** the **construction industry** in the innovative use of **FRP composites**. **CRL** have strengthened many concrete, steel, masonry and cast iron structures in the last 20 years using a combination of techniques and **worked closely with Universities** to **enhance** our **knowledge** and understanding of these materials and their long term performance. Our largest project has been the installation of 15 KM of CFRP plates to strengthen floors in an office building. 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. A **sustainable** solution for the modern construction industry.



# Composite Strengthening

prolonging the life of your structure

There are

**two methods** for

**composite strengthening:** 1) **Plate**

**bonding** where the composite plates, which are usually **carbon**

**fibre reinforced**, are manufactured off site and then bonded to the structure using

epoxy adhesives. 2) **FRP wrap** where on site the dry fibre fabric is either rolled into the wet resin on the structure surface (dry lay) or the resin is applied to the fibre fabric which is then applied to the structure (wet lay).

Understandably **quality control** is easier with plates manufactured off site but for **strengthening around beams and columns the wrap system is the only solution.** In both cases there are strict

quality control procedures to follow. **CRL is qualified to design and install**

using both techniques and **approved** by the **leading material suppliers.**



**FRP composites** are a combination of fibres and polymer based resin which form a structural material which is both **lightweight** and **durable.** The resin transfers the stress between the fibres and also protects them. Compared to steel plate strengthening the equivalent carbon fibre plates are **15% of the cross sectional area** and **3% of the dead load.** These materials provide sustainable engineering solutions and have been successfully used in many industries for over 60 years.



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