

STRUCTURAL STRENGTHENING ADVICE FROM THE CRA

The first reaction of most people when asked about structural strengthening with fibre reinforced polymers (FRP) is 'what are they and what are they used for?'

This is exactly why the Concrete Repair Association (CRA) originally produced its Advice Note No. 3 and also why it has just completed a review and updated its content.

Fibre reinforced polymers are typically organised in a laminate structure, such that each lamina (or flat layer) contains an arrangement of unidirectional fibres or woven fibre fabrics embedded within a thin layer of light polymer matrix material. The fibres are normally composed of carbon, aramid (Kevlar) or glass, to provide both strength and stiffness. The matrix, commonly made of polyester, epoxy or nylon, binds and protects the fibres from damage and transfers the stresses between them.

Thanks to FRP composites, rapid, cost effective and relatively simple structural strengthening techniques are now available to the specifier and given the high capital costs of demolition and reconstruction, it makes sound economic sense to upgrade a building or structure, rather than to knock it down.

FRP technology has been in use for a number of decades in the aerospace and motor industry and over the past few years its unique qualities have been utilised in the field of civil engineering and building, for the structural strengthening of concrete, masonry, metallic and timber structures.

The deployment of FRPs has been driven due to the upgrading of vehicle weights and/or changes in the design codes, which have resulted in the need to strengthen bridge structures. In addition, changes-of-use in buildings have led to the need to upgrade or strengthen structural components.

The updated CRA Advice Note No. 3 is designed to give the reader an overview of structural strengthening. The information contained will not make the reader an expert in structural diagnosis, design and installation, but it will enable him/her to avoid basic errors when employing, specifying and/or applying FRP composites for strengthening. It includes information on design, preparation of substrates and testing. It also enlightens the reader with regard to the installation of both composite plate and fibre wrapping systems and their protection. Crucially, it also confirms the important aspect of contractor choice.

Copies can be obtained free of charge by logging on to www.cra.org.uk/info and entering Enquiry No: 1023

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