1. Introduction to the design and application of FRP Materials

This document offers a guide to the application of S&P FRP materials used in the strengthening of concrete and timber structures. It addresses strengthening by the application of carbon fibre reinforced polymers (CFRP), aramid fibre reinforced polymers (AFRP) and glass fibre reinforced polymers (GFRP) to the external parts of structural elements, both by bonding to the external surface and/or bonding within slots cut in the surface layers of the substrate. The prestressed S&P FRP systems are not part of this application guide.

Fig. 1: Bonding to the surface

Fig. 2: Bonding with slots

The information contained herein has been researched from many references and is considered current as at the date given at the bottom of this page. As the use of FRPs is the subject of a large number of on-going research programmes around the world, conditions pertaining to their usage may vary from time to time.

The successful application and use of this manual is the sole responsibility of the user and is dependent on the application of sound judgement by a qualified Engineer who has a thorough understanding of structural mechanics and material behaviour, especially as it relates to reinforced concrete. The user of the manual must ensure that the design procedure adopted is relevant for use on the intended application and must select appropriate values suitable for the specific application. Reference to an appropriate set of Design Recommendations is essential (either the German or French General Guidelines, The UK Concrete Society Design Guidance or the draft ACI 440 Recommendations would be appropriate documents for this purpose). Any design carried out must comply with the relevant Codes of Practise for the country concerned.

Both specifier and contractor have to ensure that all working procedures are carried out according to the relevant static dimensioning. Under no circumstances may structural building parts be removed before the FRP strengthening is in place and the responsible engineer has given his approval.