Strengthening of Concrete Structures with cement based bonded composites

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Due to demands on higher loads, degradation, re-construction etc. there is a constant need for repair or strengthening of existing concrete structures. Many varying methods exist to strengthen concrete structures, one such commonly used technique utilizes surface epoxy bonded FRPs (Fibre Reinforced Polymers). The method is very efficient and has achieved world wide attention. However, there are some drawbacks with the use of epoxy, e.g. working environment, compatibility and permeability. Substituting the epoxy adherent with a cement based bonding agent will render a strengthening system with improved working environment and better compatibility to the base concrete structure. This study gives an overview of different cement based systems, all with very promising results for structural upgrading. Studied parameters are structural retrofit for bending, shear and confinement. It is concluded that the use of carbon FRPs provides the highest strengthening effect and that the fibres should be imbedded into a matrix for enhanced utilisation of inherent strain capacity.

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