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Study on Flexural Behaviour of RC Beams with Extra Addition of Glass Fibre and CFRP Composites under Flexural Loading

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Abstract: In our country many of the existing reinforced concrete structures are in need of repair or reconstruction, rehabilitation, because of deterioration due to various factors like corrosion, lack of detailing, failure of bonding between beam, column, slab, etc...Strengthening of existing reinforced concrete structures is necessary to obtain an expected life span and achieve specific requirements. The need for efficient rehabilitation and strengthening techniques of existing concrete structures has resulted in research and development of composite strengthening systems. Recent experimental and analytical research have demonstrated that the use of composite materials for existing structural components is more cost-effective and requires less effort and time than the traditional means. Carbon Fiber Reinforced Polymer (CFRP) composite has been accepted in the construction industry as a capable substitute for repairing and strengthening of RCC structures. During past two decades, much research has been carried out on flexural strengthening of reinforced concrete beams using different types of fiber reinforced polymers and adhesives. A detailed Literature review based on the previous experimental and analytical research on reinforced concrete beams is presented. Proposed method of strengthening the RC beam is decided based on the previous experimental and analytical research. Behaviors of reinforced concrete beams with externally bonded CFRP with various types of resins is investigated. Static load responses of all the beams under two point load method had evaluated in terms of flexural strength, crack observation, compositeness between CFRP fabric and concrete, and the associated failure modes.

Keywords: Carbon Fibre Reinforced Polymer, CFRP strengthened beam, Beam flexural behavior, CFRP laminates.

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