

The Efficiency of Basalt Fibres in Strengthening the Reinforced Concrete Beams

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Abstract text:

The technique of externally bonding fibre reinforced polymer (FRP) composite laminates on the tension side of reinforced concrete (RC) beams is already widely accepted as an easy to apply, corrosion resistant and effective solution due to the high strength as well as the low weight of the composite material. The basalt fibres are produced from volcano rocks by a simple process; their applicability as reinforcing material composites utilized for plate bonding of RC beams was not enough researched up to now but it seems to be a cost-effective, durable and fire resistant alternative to traditional fibres. High basalt fiber's advantages, related to physical-mechanical characteristics and cost, stipulate a new high efficient structural composite materials, which can replace asbestos, metal, timber, plastic materials, etc. The paper investigates the applicability of externally bonded Basalt Fibre Reinforced Polymer (BFRP) laminates in strengthening of rectangular reinforced section of a RC beam. The influence of the cross-sectional BFRP area on service and ultimate bending moments and also on service deflection, are analysed. The procedure is based on section analysis, equilibrium of forces and compatibility of strains, considered appropriate for any type of fibres, in case of rectangular RC beams.

Key Words:

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