

Analysis of Retrofitted Reinforced Concrete Shear Beams using Carbon Fiber Composites

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ABSTRACT

This paper presents the numerical study to simulate the behavior of retrofitted reinforced concrete (RC) shear beams. The study was carried out on the unretrofitted RC beam designated as control beam and RC beams retrofitted using carbon fiber reinforced plastic (CFRP) composites with $\pm 45^\circ$ and 90° fiber orientations. The effect of retrofitting on uncracked and precracked beams was studied too. The finite elements adopted by ANSYS were used in this study. A quarter of the full beam was used for modeling by taking advantage of the symmetry of the beam and loadings. The load deflection plots obtained from numerical study show good agreement with the experimental plots reported by Tom Norris, et al (1997). There is a difference in behavior between the uncracked and precracked retrofitted beams though not significant. The crack patterns in the beams are also presented.

KEYWORDS

Reinforced concrete, finite element modeling, retrofitting, shear beam
