

Effect of width and layers of GFRP strips on deflection of Reinforced Concrete – GFRP Composite Beam

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Abstract

This paper presents the experimental results on Reinforced Concrete (RC) beams strengthened by GFRP wraps in the tension-zone of reinforced concrete (RC) beams. The beam dimensions were 150mm x 150mm x 620mm span lengths (center to center between supports with full length 700mm). The GFRP laminates were applied length beams. The specimens of RC beams were tested in four points bending to failure. The width and layers of GFRP strips were varied in the tests. The paper provides information on behavior on the degree of GFRP enhancement of the reinforced concrete members due to GFRP strips and increase in load capacity with and without GFRP wrapping. A total number of 12 such specimens along with control RC beams were used in this experimental study. Consequently it has been noted that the GFRP materials enhance both strengthening and ductility of reinforced concrete beam sections because of the tensile strength increased in the tension zone due to the presence of GFRP. Tests results indicated that the load capacity for two layers of 25 mm width giving capacity higher than for one layer of 50 mm width with same thickness, because of for two layers increased in arm depth between GFRP center and the center of compression zone. Also, in case of two layers the number of longitudinal strand become stiffer and increased the capacity of beam because of increasing in reinforcement in tension zone and become more ductile, so that the time and load required to cause cracks become more. The results of tests have been evaluated and compared with international codes.