

Fracture energy of weakly reinforced concrete beams

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Fatigue and Fracture of Engineering Materials and Structures

Vol. 12, Issue.1, 1989

Abstract: An experimental investigation was conducted on a series of simply supported concrete beams with an aim to determine the fracture energy of the composite beam and apply the concept of fracture mechanics to predict flexural strength. In order that a single crack from the tip of the premolded central notch would propagate, the beams were lightly reinforced with a large cover so that the moment capacity of the beam as unreinforced section would be greater than that of the reinforced section. Based on test data, compliance calibration and energy release rate (GI) curves are presented for progressive cracking and a correlation between the critical energy release rate and ultimate moment capacity is suggested.