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BEHAVIOUR OF REINFORCED CONCRETE BEAMS DETAILED FOR SHEAR IN COMPLIANCE WITH COMPRESSIVE FORCE PATH METHOD

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Abstract:

Compressive force path (CFP) method has been developed to explain shear behaviour of reinforced concrete (RC) beams. This method identifies four types of behaviour of RC beams on the basis of shear-span to depth (a/d) ratio and provides shear designing and detailing guidelines. This paper attempts to use CFP method as a practical tool for shear designing of RC beams, particularly for Type II ($2 < a/d < 5$) and Type III ($1 < a/d < 2$) behaviours. Eleven RC beams have been tested up to failure under four-point bending to validate the method on the basis of behaviour and failure mechanism. The results showed that CFP method better estimates the amount of shear sustained by the concrete (V_c) and furthermore, better predicts the actual shear behaviour of the beam, in comparison to ACI code approach. The experimental loads attained by both CFP and ACI models have been found to be comparable in terms of failure load predictions, except for a/d ratio less and equal to 3.5. Most of the beams designed according to CFP method, however, failed in undesirable shear mode particularly for a/d ratio less than 4.44.

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