

Influence of Flexural Reinforcement on the Shear Strength of RC Beams Without Stirrups

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Abstract : Numerical investigations were conducted to study the influence of flexural reinforcement ratio on the diagonal cracking strength and ultimate shear strength of reinforced concrete (RC) beams without stirrups. Three-dimensional nonlinear finite element analyses (FEAs) of the beams with flexural reinforcement ratios ranging from 0.58% to 2.20% subjected to a mid-span concentrated load were carried out. It is observed that the load-deflection and load-strain curves obtained from the numerical analyses agree with those obtained from the experiments. It is concluded that flexural reinforcement ratio has a significant effect on the shear strength and deflection capacity of RC beams without stirrups. The predictions of the diagonal cracking strength and ultimate shear strength of beams obtained by using the equations defined by a number of codes and researchers are compared with each other and with the experimental values.

Keywords : finite element, flexural reinforcement, reinforced concrete beam, shear strength

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