

Shear strength of plated RC beams

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Abstract: Use of externally bonded plates to strengthen or repair damaged reinforced concrete (RC) beams and slabs has gained universal acceptance. However, questions remain regarding the possibility of a highly brittle mode of failure, referred to in the literature as shear failure for certain combinations of plate geometry and other parameters. The paper surveys available experimental evidence from laboratories in the UK and Saudi Arabia and identifies parameters that play a primary role in shear or concrete rip-off failure. It is shown that ultimate load for certain plated RC beams failing in shear is overestimated by the ACI expression for shear strength of unplated RC beams, because crack profile renders stirrups inefficacious. An expression is suggested for predicting the degree of efficiency of stirrups for use in the design of plated RC beams.