

DESIGN OF SHEAR REINFORCEMENT OF BEAMS: NEW APPROACH

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Shear failure occurs suddenly in beams without properly designed shear reinforcement. A set-up of swimmer bars system takes the shape of plane crack interceptors and is employed to counteract the potential diagonal tension failure. Each counteract plane crack interceptor is formed by swimmer bars will generate a plane intercepting approximately and perpendicularly the inclined plane of the diagonal tension failure. A reference to testing programs of beams subjected to shear was used. The results obtained from testing has proved that the efficiency of using swimmer bars system in beams has increased their shear capacity to more than 250% and has decreased their deflection by increasing the stiffness of the beams in the vicinity of the concentrated loads, moreover, the nature of the shear failure becomes ductile instead of brittle and obviates sudden failure. The ultimate strength of shear is limited by the compression shear failure, which was never measured for the case of shear. The gain in ductility can reach levels matching those in flexural behaviour.

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