

Three dimensional finite element modeling of reinforced concrete beams, using lagrangian and truss-linkage elements.

ABSTRACT

Application of Finite Element techniques of RC structures has been well established. However, this area still needs more research, because of the difficulty of modeling concrete in finite element analysis. Aim of this work is to develop a numerical approach based on the finite element formulation of three dimensional reinforced concrete beams. Concrete is modeled using twenty seven node brick lagrangian element. Bars and bond slip of the bar and concrete were modeled together by introducing the three dimensional truss-linkage elements. The validity of the model is established using comparison of the results with several well-known tests from the literature.

Keyword: Finite Element; Lagrangian; Brick Element; Concrete; Truss-Linkage; Bond-Slip.