

Seismic Response Analysis of Frame Structures Based on Super Joint Element Model

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Abstract : Experimental results of many RC beam-column subassemblage indicate that slippage of longitudinal beam rebar within the joint and the shear deformation of joint core have significant influence on seismic behavior of the subassemblage. However, rigid joint assumption has been generally used in the seismic response analysis of RC frames, in which two kinds of inelastic deformation of joint have been ignored. Based on OpenSees platform, 'Super Joint Element Model' with more detailed inelastic mechanism is used to simulate the inelastic response of joints. Two finite element models of typical RC plane frame, namely considering or ignoring the inelastic deformation of joint respectively, were established and analyzed under seven strong earthquake waves. The simulated global and local inelastic deformations of the RC plane frame is shown and discussed. The analyses also confirm the security of the earthquake-resistant frame designed according to Chinese codes.

Keywords : frame structure, beam-column joint, longitudinal bar slippage, shear deformation, nonlinear analysis

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