

Evaluation of Response Modification Factors in Moment Resisting Frame Buildings Considering Soil Structure Interaction

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Abstract : Seismic response of the multi-storey buildings is created by the interaction of both the structure and underlying soil medium. The seismic design philosophy is incorporated using response modification factor 'R'. Current code based values of 'R' factor does not reflect the SSI problem as it is based on fixed base condition. In this study, the modified values of 'R' factor for moment resisting frame (MRF) considering SSI are evaluated. The response of structure with and without SSI has been compared using equivalent linear static and nonlinear static pushover analyses for 10-storied moment resisting frame building. The building is located in seismic zone 2B situated on different soils with shear wave velocity (V_s) of 300m/sec (SD) and 1200m/s (SB). Code based 'R' factor value for building frame system has been taken as 5.5. Soil medium is modelled using identical but mutually independent horizontal and vertical springs. It was found that the modified 'R' factor values have been decreased by 47% and 43% for soil SD and SB respectively as compared to that of code based 'R' factor.

Keywords : buildings, SSI, shear wave velocity, R factor

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