

MODELLING SEISMIC RESPONSE OF PRECAST RC INDUSTRIAL BUILDINGS WITH STRONG CONNECTIONS

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Abstract: Precast structural system addressed in this paper consists of an assemblage of cantilever columns tied together with strong connections and a roof system, which is rigid in its own plane. Inelastic seismic response of such structures is controlled by RC columns. Cyclic behaviour of slender cantilever columns in full-scale models of precast industrial buildings was studied experimentally and analytically. The shear-span ratio of the columns was very high (12.5). The behaviour of such columns is basically different than the behaviour of the shorter columns studied in the past. Therefore none of the existing, empirically based models was directly applicable for modelling cyclic behaviour of the analysed columns. Good correlation between the experimental and numerical results was obtained by appropriately modified “Ibarra” lumped plasticity model incorporating in-cycle and repeated-cycle strength deterioration.

Key words: seismic response, industrial buildings, slender columns, shear-span ratio, cyclic tests, inelastic models, strength degradation.



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