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Behavior Factors Evaluation for Reinforced Concrete Structures

Authors : Muhammad Rizwan, Naveed Ahmad, Akhtar Naeem Khan

Abstract : Seismic behavior factors are evaluated for the performance assessment of low rise reinforced concrete RC frame structures based on experimental study of unidirectional dynamic shake table testing of two 1/3rd reduced scaled two storey frames, with a code confirming special moment resisting frame (SMRF) model and a noncompliant model of similar characteristics but built in low strength concrete .The models were subjected to a scaled accelerogram record of 1994 Northridge earthquake to deformed the test models to final collapse stage in order to obtain the structural response parameters. The fully compliant model was observed with more stable beam-sway response, experiencing beam flexure yielding and ground-storey column base yielding upon subjecting to 100% of the record. The response modification factor - R factor obtained for the code complaint and deficient prototype structures were 7.5 and 4.5 respectively, which is about 10% and 40% less than the UBC-97 specified value for special moment resisting reinforced concrete frame structures.

Keywords : Northridge 1994 earthquake, reinforced concrete frame, response modification factor, shake table testing
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