

Evaluation of Response Modification Factor and Behavior of Seismic Base-Isolated RC Structures

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Abstract : In this paper, one of the significant seismic design parameter as response modification factor in reinforced concrete (RC) buildings with base isolation system was evaluated. The seismic isolation system is a capable approach to absorbing seismic energy at the base and transfer to the substructure with lower response modification factor as compared to non-isolated structures. A response spectrum method and static nonlinear pushover analysis in according to Uniform Building Code (UBC-97), have been performed on building models involve 5, 8, 12 and 15 stories building with fixed and isolated bases consist of identical moment resisting configurations. The isolation system is composed of lead rubber bearing (LRB) was designed with help UBC-97 parameters. The force-deformation behavior of isolators was modeled as bi-linear hysteretic behavior which can be effectively used to create the isolation systems. The obtained analytical results highlight the response modification factor of considered base isolation system with higher values than recommended in the codes. The response modification factor is used in modern seismic codes to scale down the elastic response of structures.

Keywords : response modification factor, base isolation system, pushover analysis, lead rubber bearing, bi-linear hysteretic

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