



The Effect of using Additional Isolated Upper Floor on the Performance Point of R.C. Frame Structures in Armenia

Armen Assatourians ^{1*}, Mohammad Reza Mehrdoust ², Sohrab Fallahi ³

^{1*} Earthquake Engineering Research Consultant, Yerevan, Armenia

(ar_ast@gmail.com)

² Earthquake Engineer, Head of North-East branch of BHRC, Mashhad, Iran

³ Senior Structural Designer, E.S.S. Consulting Eng. Co., Tehran, Iran

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ABSTRACT

Widely distributed 111 series, 10 story R.C. frame buildings are constructed during former soviet union in Armenia and Nagorno-Karabakh province. In current research we illustrate the concept of seismic upgrading of above mentioned buildings, using an Additional Isolated Upper Floor (AIUF). For this purpose, a three dimensional of 111-c R.C. frame building is modeled and analyzed according to Armenian SNIP II-6.02 code, based on 3 soil categories of Rock ($V_s > 800\text{m/s}$), Dense Soil ($500 < V_s < 800\text{m/s}$) and Loose Soil ($150 < V_s < 500\text{m/s}$) respectively and spectral acceleration level of $S_a = 0.40g$. Later, the AIUF which behaves as a Tuned Mass Damper is added to the model and after tuning for the frequency and damping ratios, Modal Pushover Analysis is carried out on both preliminary and secondary structural models. Finally by the means of FEMA356 guideline, Capacity Spectrum and Performance Point characteristics due to related soil categories are computed for each model, using Armenian SNIP II-6.02 pseudo-acceleration spectrums. The final analysis results show a constant base shear forces with variable displacements during soil degradation, when using Additional Isolated Upper Floor.

Keywords:

Seismic Upgrading, Additional Isolated Upper Floor, Performance Point, Modal Pushover Analysis, Capacity Spectrum.