

عنوان مقاله:

AN INVESTIGATION ON THE UPLIFT FORCES IN BUILDINGS EQUIPPED WITH OPRCB ISOLATORS

محل انتشار:

هفتمین کنفرانس بین المللی زلزله شناسی و مهندسی زلزله (سال: 1394)

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خلاصه مقاله:

Recent studies on Orthogonal Pairs of Rollers on Concave Beds (OPRCB), as a somehow new isolating system, show that these isolators are weak subjected to uplift. In this paper a set of regular 3-, 6-, and 9-story steel buildings, with dual moment frames and chevron bracing system, installed on OPRCB isolators, have been considered subjected to near-fault earthquakes with moderate to high vertical accelerations. The buildings were analyzed subjected to 19 three-component records of selected near-fault earthquakes. By using nonlinear regression analysis, empirical formula was derived for predicting the uplift forces, based on six main parameters, including PGA values in three directions, the structure's volume, and its aspect ratios in two directions. To check the accuracy of the proposed formula another building with different parameters was analyzed and the values of axial forces at the level of isolators were compared to the corresponding values obtained by the proposed formula. The relatively high Index of Agreement between the predicted and observed results and low values of error indices indicate the good performance and accuracy of the proposed formulas.

کلمات کلیدی:

Uplift Forces, Empirical Formula, Time History Analysis, Nonlinear Regression, Near Fault Earthquakes

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