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عنوان مقاله:

MODIFICATION FACTORS FOR RESIDUAL DRIFT ASSESSMENT OF ADJACENT SMRFS CONSIDERING STRUCTURAL POUNDING

محل انتشار:

هشتمین کنفرانس بین المللی زلزله شناسی و مهندسی زلزله (سال: 1398)

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خلاصه مقاله:

Maximum Residual Interstory Drift Ratio (MRIDR) is permanent lateral deformations at the end of the severe earthquake, even though the structure did not experience severe damage or total collapse. It was noted that Reinforced Concrete (RC) structures having members with stiffness-and-strength degrading features experience smaller Residual Drift (RD) than those steel structure having members with non-degrading features. Due to record-to-record variability of RD, the estimation of this parameter is important during the performance-based assessment of existing structure. Therefore, some researchers proposed approximate methods to estimate RD (Ruiz-García and Chora, 2015). Yahyazadeh and Yakhchalian (2018) evaluated the effects of using fluid viscous dampers on the MRIDR response of steel structures and concluded that linear dampers have better performance than nonlinear one. Approximate estimation of RD is important especially for adjacent structures because pounding phenomenon can significantly influence the amount of RD. Recently, Kazemi et al. (2019) investigated the effects of pounding phenomenon on the seismic collapse capacity of the 2, 4-, 6- and 8-Story adjacent structures, and proposed modification factors to estimate seismic collapse capacity of a structure considering pounding. In this study, the 4- and 8-Story RC SMRFs designed by Haselton and Deierlein (2007) were considered (design ID of 4- and 8-Story structures are 1003 and 1011, respectively). The site of interest was considered in Northern Los Angeles, which is a high seismic regions of California, with soil class D and seismic design parameters of SDS=1.5g and SD1=0.9g. Moreover, adjacent structures of the 3- and 6-Story steel SMRFs designed by Kitayama and Constantinou (2016) were considered. Steel SMRFs were assumed to be located in California at latitude 37.8814°N and longitude 122.08°W, with soil class D and seismic design parameters of SDS=1.25g and SD1=0.6g. To consider the P-Delta effect, which this effect plays a key role in sideway collapse, all columns except those in the SMRFs are assumed as gravity columns and were modeled as leaning column. In addition, nonlinear behavior of the structures' elements were modeled as a nonlinear rotational spring at both ends of each element using the Modified Ibarra–Krawinkler bilinear-hysteretic model (Kazemi et al., 2018a and 2019). Therefore, an element in the SMRFs was modeled with an elastic beam-column element in the middle and two zero-length elements located at both ends. The linear viscoelastic ... contact model (Kelvin-Voigt model) was

کلمات کلیدی:

Modification factor, Residual drift, Reinforced concrete, Structural pounding, Incremental dynamic analysis

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