عنوان مقاله:

EFFECT OF MULTIPLE LOW INTENSITY EARTHQUAKES IN LOW-RISE REINFORCED CONCRETE BUILDINGS

محل انتشار:

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

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خلاصه مقاله:

The basic approach for seismic design of structures utilizes a single loading scenario and a single performance criterion;usually life-safety (DiSarno, 2013); while structures, built in seismic areas, are often affected by earthquakes with various frequency and magnitude during their lifetime. Current seismic codes specify design earthquake loads as single events and assume that all of the structures in earthquake prone regions are able to withstand frequent low intensity earthquakes that is likely to occur at their location; however, the structure may experience multiple ground accelerations including small multiple earthquakes in their lifetime. Despite the fact that low intensity earthquakes do not cause remarkable damage to the structures singly, high occurrence probability and inducing accumulated damage to the structures during their lifetime, make this types of earthquakes important. The present study investigated the nonlinear behaviour of moment resisting reinforced concrete structures under real multiple low intensity earthquakes and their effects on structure's performance level. For this purpose, a regular three-bay 4-story moment resisting RC building, having standard occupancy with different types of concrete and steel Material were modeled, considering non-degrading and degrading features of both concrete and steel reinforcements. The above building was first used in research by Tran-Gilmour (2004). In order to examine the effect of multiple low intensity earthquakes on the performance of RC structures, we employed some kind of concrete and steel reinforcement models, used in OpenSees program, to consider which concrete and steel reinforcement models can represent more realistic performance of structure. The models used in this study are shown in Table 1. Records were selected from Fin1 station, near Bandar Abbas, Iran. This data includes earthquakes with low magnitudes (range of 3 to 5 degrees on the Richter scale) recorded since the establishment of the station in 1994 which are collectedfrom Iran Strong Motion Network (ISMN). In order to examine the effect of the cumulative damage from low intensity earthquakes, multiple earthquakes with different number of sequences (20, 40 and 60 records) were considered. The inelastic behavior of the examined RC framed structures, which are subjected to the above-mentioned seismic sequences, is investigated. Also, by using the obtained data and comparing with the drift values given in ASCE 41-06, values that provided to ... illustrate the overall structural response associated with various structural per

کلمات کلیدی:

Low intensity earthquakes, Multiple earthquakes, Reinforced concrete building, Cumulative accumulation,Structural demand