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INVESTIGATING THE EFFECT OF VERTICAL COMPONENT IN CONCRETE STRUCTURES WITH IRREGULARITIES OF MASS AND HARDNESS

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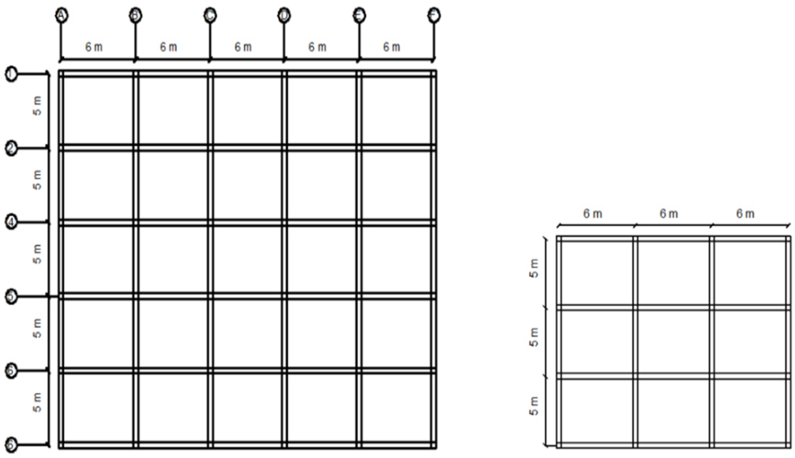
Today, in many countries, a large number of buildings are built for different uses, for example, stores or companies in higher classes may be used that use, due to gravity loads most, including live loads and dead loads, will certainly have more weight than the adjacent floors. Therefore there is a possibility of irregularity of mass in the higher classes. It is natural that the performance of these buildings is not possible with static and linear analysis, and it is not reliable, and nonlinear dynamic analysis should be considered in the structures as well. Most of the vast majority of conventional structures during the earthquake enter the non-linear region of Shaq and show themselves non-reciprocal behavior, so using conventional methods that are based on linear analyzes, you cannot control the behavior of structures after entering the non-partition zone. So far, several studies have been done on the effects of the vertical component of the earthquake on steel buildings and irregular effects on the seismic behavior of buildings inside and outside the country. In a study by Hosseini and Firoozi Nezamabadi (2004), the effect of the vertical component of the earthquake on the steel structure was investigated and it was determined that the effect of this component on the middle pillars is more than the pillars of the side and the corners. In a study by Hosseini and Firoozi Nezamabadi (2004), the effect of the vertical component of the earthquake on the steel structure was investigated and it was determined that the effect of this component on the middle columns is more than the side columns and corners. Sadashiva et al. (2008) showed that the irregular effect depends on the structural model used, the irregular location and amount, and the analysis method used. In another study, Karavacillis et al. (2008) examined the non-reciprocal behavior of an arbitrary mass of steel flattened frames in height and concluded that irregularities in mass and stiffness at the height of the structure make the rotation of the ductile joints in a class with irregularities of mass and stiffness. It is much larger than the other classes, and indeed a soft class. In this research, three concrete structures of 8 floors with a frame structure of the type II soil, each of which on the fifth floor, have a different irregularity of mass and stiffness at the boundary recommended by Standard 2800, and after initial design under dynamic analysis non-linear with seven earthquakes near the area (Standard 2800, 4th edition). In this collection, a nonlinear dynamic analysis has been performed on concrete structures based on the linear analysis outlined in the 2800 regulations and it is intended to investigate the effect of the vertical component of the earthquake on seismic behavior of irregular concrete structures in mass and hardness with a framing frame system is considered. Plan models in Figure 1-a and 1-b and irregular models Figures 3 and 4 are shown.

According to Standard 2800, the maximum of seven earthquake responses has been averaged and considered as the final result. Maximum lateral displacement and drainage were discussed. The results of nonlinear dynamical analysis showed that the fifth and sixth classes have larger shape changes than other classes. These classes have behaved in the soft-state class. Table 1 describes the records used.



(a) (b)

Figure 1. Floor plans from 1 to 4 and 5 to 8.

Table 1 Near-fault ground motion database.

	Earthquake	**Year**	**Station**	**Distance (km)**	**M_w**	**PGA-H_{max} (g)**	**PGA-H_{min} (g)**	**PGA-V_{ert} (g)**
1	Imperial Valley	1979	Bonds Corner	2.7	6.4	0.755	0.588	0.425
2	Gazli	1976	Karakyr	5.46	*7.1*	0.718	0.608	1.264
3	Landers	1992	Col	2.19	7.3	0.417	0.284	0.176
4	Kocaeli	1999	Gebz	4.38	17	0.244	0.137	0.203
5	Erzincan	1992	Erzincan	4.4	6.7	0.496	0.234	0.387
6	Loma Prieta	1989	Bran	10.3	6.9	0.501	0.453	0.507
7	Northridge	1994	Cobyon	12.44	6.7	0.472	0.404	0.303

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