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خلاصه مقاله:

In this paper, a new applied relationship is introduced for the analysis of integrated bridges where no expansion joint embedded on the deck. It can be used to investigate the seismic behavior and actual performance of integrated bridges under earthquake force and, in spite of its simplicity, its accuracy is acceptable. In fact, this relationship can be considered as a combination of incremental dynamic analysis and modal pushover analysis, benefiting from the advantages of both approaches, i.e. an appropriate loading pattern factor of Modal Pushover Analysis can be obtained by using Incremental Dynamic approach. To this end, the average acceleration - displacement and average acceleration - shear base of ۱۲۰ earthquake records applied on the bridge are calculated and then the obtained incremental dynamic curve is plotted in the coordinates of displacement and shear base. For the obtained modal pushover curve, the sum of the first three SRSS modes is selected. The literature shows no record of the study conducted on the comparison of the two curves. In this paper, the aforementioned comparison was made using Incremental Dynamic Approach through examining six regular and irregular integrated bridges and applying ۱۲۰ earthquake records in ۱۰ acceleration levels. It was observed that the accuracy of the proposed relationship in predicting the bridge displacements and shear forces of columns' piers was high, and the calculation output showed negligible differences with dynamic analyze results. In this study, the soil-structure interaction is ignored.

کلمات کلیدی:

Loading pattern factor, Integrated bridges, Modal pushover analysis, Incremental Dynamic Analysis