

عنوان مقاله:

Evaluation of Seismic Behavior of Bridges under Effect of Abutment Modeling

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خلاصه مقاله:

These Bridges are vital part of the transportation network Department of Civil Engineering. Their destruction caused by the occurrence of a strong earthquake can cause irreparable damages to the regional economy. One of the effective factors on seismic response of a bridge is abutment and its modelling. In most cases, analysis of seismic behavior and modelling of bridges is done using simplifying assumptions. This simplification may cause major changes in prediction of seismic behavior of bridges. Using simplified, roller and full models for abutment is very important in design and evaluation of seismic behavior of bridges. Backfill is a vital factor in modelling abutments. In this study, abutments were analyzed in three scenarios under records related to three stations of Imperial Valley earthquake (1979) and responses compare in two states with and without backfill. The results showed that minimum response (for deck, pier column and abutment) were related to the first modelling scenario (roller abutment) and maximum response were related to the fifth modelling scenario (simplified abutment as suggested by Shamsabadi for cohesive soil). Modelling of backfill was effective on displacement and rotation of pier column and displacement of deck and moment of abutment. For all records of earthquake, wall pier abutment (sixth scenario) was considerably consistent with modelling based on Caltrans guideline for sandy soil (second scenario). In height ranging from 5 to 9 meters, the suggested modelling (wall pier abutment) can be used instead of Caltrans method. In this height range, the results (maximum abutment displacement and abutment pressure) vary from 11 to 23%.

کلمات کلیدی:

abutment modelling, soil-abutment interaction, abutment stiffness, roller abutment, simplified abutment, wall pier

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