عنوان مقاله:

A Comparison of different Non-linear Numerical Models for Pier Shaft interaction analysis for study of the seismic performance of Bridges

محل انتشار:

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خلاصه مقاله:

The AASHTO code of practice for design of bridges shows that the ductility level for foundation is given equal to one. Bridges are classified in three classes of bridges. For class of essential and normal bridges a question for not to use ductility level due to the importance of bridges' costs is become an important item in different countries particularly in Middle east.this paper aimed to study on performance of bridges based on the effect of soil non-linear behavior. A comparison between Finite Difference (F.D), Finite Element (F.E) methods and close form solutions has been carried out on single and group piles under lateral loads in multilayered soils. Winkler model with non-linear springs, FLAC-3D, ANSYS5.4 and ABAQUS software were used for verifications. the Lagrangian method was considered in FLAC-3D and the Drucker-Prager was used in ANSYS. Pile behavior in sandy soils, uniform clayey soils, clayey deposits including sandy lenses, and Sand deposits with thin clay layers were analyzed. Verification between traditional close form solution methods with those analysis methods were carried out.Results show the effectiveness of foundation ductility in compare with the expected ductility levels and structural performance for superstructure. The ductility level of substructure due to the pile soil interaction has found equal to 3.5 to 4.5 for different soil types. It show in Pile and Deck (pier shaft) model in bridges for the normal and essential bridges classes the use of ductility should be taken into account in accordance with soil-structure performance.In conclusion the paper shows that for the pier shaft system it would be possible to use ductility level for foundations for normal and essential class of bridges and for those countries that they use the structural ductility for design of all components of structure including piles, the level of performance should be precisely investigated and using of structural ductility level is under question for design of pier shaft models

کلمات کلیدی:

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