

Studying on Pile Seismic Operation with Numerical Method by Using FLAC 3D Software

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Abstract : Usually the piles are important tools for safety and economical design of high and heavy structures. For this aim the response of single pile under dynamic load is so effective. Also, the agents which have influence on single pile response are properties of pile geometrical, soil and subjected loads. In this study the finite difference numerical method and by using FLAC 3D software is used for evaluation of single pile behavior under peak ground acceleration (PGA) of El Centro earthquake record in California (1940). The results of this models compared by experimental results of other researchers and it will be seen that the results of this models are approximately coincide by experimental data's. For example the maximum moment and displacement in top of the pile is corresponding to the other experimental results of pervious researchers. Furthermore, in this paper is tried to evaluate the effective properties between soil and pile. The results is shown that by increasing the pile diagonal, the pile top displacement will be decreased. As well as, by increasing the length of pile, the top displacement will be increased. Also, by increasing the stiffness ratio of pile to soil, the produced moment in pile body will be increased and the taller piles have more interaction by soils and have high inertia. So, these results can help directly to optimization design of pile dimensions.

Keywords : pile seismic response, interaction between soil and pile, numerical analysis, FLAC 3D

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