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Designing piles in soils with liquefaction capability

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ABSTRACT:

Piles in fact are like thin and resistant columns that are laterally supported by surrounding soil and there found interaction between piles and soil. Piles that passes from different layers of liquefaction soil due to the liquefaction resulted from earthquake force lose their lateral support. In these conditions the pile could be like a non-resistant column be ready for axial and shear instability. This instability and wasting the interaction between soil and pile could lead to lateral buckling of pile in weaker direction and plastic hinge. In the last years many cases of pile foundation rupture at bridges and buildings due to the liquefaction of soil layers after earthquake have been reported that caused the collapse of the structures, while these piles were designed according to valid regulations such as Japan Road Association and National Earthquake Hazards Reduction Program. Then it seems that the behavior of these piles and their analysis method is not fully known. Therefore in this research we study the buckling capacity of piles in layered liquefaction soils.

Keywords:

Liquefaction, pile, modeling, earthquake

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