

Effect of age to young deposited sand

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In the traditional soil-mechanics, earth structures were designed based on the experimental data using artificially constructed soil samples in laboratory. However, it has been recognized recently that the experimental behavior of artificial samples can not be comparable with those of natural deposit samples. A typical example is the liquefaction potential of naturally deposited sand. Development of high quality sampling technique of sand has revealed that most of the liquefaction resistances of naturally deposited sands were significantly higher than those of artificially remolded sands in same physical property. These effects of age may be divided into two parts according to the age of deposited sand. One is the phenomenon that naturally deposited sand may be hardened with time by weak cementation resulted by formation of precipitation at the contact points between sand particles. This phenomenon was mostly reported for the deposit before Pleistocene. The other is the change in property of naturally deposited and artificially deposited sand, or artificially improved sand (e.g. densified by compaction) along the passage of time in Holocene. Although there are some suggested mechanisms for the latter phenomena, the common explanation seems to be the physical change in micro-fabric of interlocking between sand particles.

Effect of age for young deposited sand described above is very important on geotechnical problems, i.e. evaluation of liquefaction potential or slope stability, and is mentioned in many aspects. However the mechanisms are not studied sufficiently partly because of the difficulty to reproduce these phenomena by the experiments in laboratory, as well as the other geological phenomena. The author has aimed at the mechanisms of aging for young deposited sand and studied the method to reproduce the phenomena. In this presentation, the author will report results of the study.