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Investigating Undrained Behavior of Noor Sand Using Triaxial Compression Test

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Abstract : Noor costal city which is located in Mazandaran province, Iran, regularly visited by many tourists. Accordingly, many tall building and heavy structures are going to be constructed over this coastal area. This region is overlaid by poorly graded clean sand and because of high water level, is susceptible to liquefaction. In this study, undrained triaxial tests under isotropic consolidation were conducted on the reconstituted samples of Noor sand, which underlies a densely populated, seismic region of southern bank of Caspian Sea. When the strain level is large enough, soil samples under shearing tend to be in a state of continuous deformation under constant shear and normal stresses. There exists a correlation between the void ratio and mean effective principal stress, which is referred to as the ultimate steady state line (USSL). Soil behavior can be achieved by expressing the state of effective confining stress and defining the location of this point relative to the steady state line. Therefore, one can say that sand behavior not only is dependent to relative density but also a description of stress state has to be defined. The current study tries to investigate behavior of this sand under different conditions such as confining effective stress and relative density using undrained monotonic triaxial compression tests. As expected, the analyzed results show that the sand behavior varies from dilative to contractive state while initial isotropic effective stress increases. Therefore, confining effective stress level will directly affect the overall behavior of sand. The observed behavior obtained from the conducted tests is then compared with some previously tested sands including Yamuna, Ganga, and Toyoura.

Keywords : noor sand, liquefaction, undrained test, steady state
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