

The dynamic response of unsaturated clean sand at a very low frequency

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Abstrak

A series of cyclic triaxial tests at very low frequency was carried out on unsaturated clean sand in order to quantitatively investigate the influence of the degree of saturation on dynamic response. The conventional triaxial testing apparatus, which is usually used on saturated soil, was employed to test the unsaturated soil with the additional pore air pressure controller. During the series of tests, four different degrees of saturation level ($S_r = 55\%, 70\%, 85\%, 98\%$) were applied to the soil specimen based on a single value of effective confining pressure (σ'_3). The results revealed that the application of cyclic loading at a very low frequency occurring continuously triggered the decrease of soil resistance. For degree saturation, $S_r = 55\%$ revealed that the resistance of soil was stronger in comparison to another level. Furthermore, the experimental results confirmed that applied cyclic loading induced a change in saturation level before and after testing. In addition, at a certain level of saturation, a phenomenon of settlements was likely to occur and the soil specimen then underwent liquefaction.