

Da Ha

Thesis

Effect of Initial Stress State on the Undrained Cyclic Behaviour of Sands.

Abstract

A comprehensive experimental study was carried out to assess the cyclic resistance of a highly contractive sand under simple shear loading. A wide range of initial states characterized by static shear, confining stress and relative density are considered. Two series of comparison tests, one using a more dilative sand and the other using a different loading mode, were carried out to investigate the influence of contractiveness of sand and the influence of loading mode on the cyclic resistance of anisotropically consolidated sands. The corrective factors K_σ and K_α are routinely used in practice to modify the cyclic resistance value at a reference confining stress of 100 kPa and zero static shear to account for higher confining stress and static shear. It is shown that these values depend on several state parameters such as density, confining stress and static shear stress levels. Also, the value of K_α can be profoundly influenced by the contractiveness of sand and the loading mode. It has been demonstrated that sequential application of these correction factors is not proper because they are dependent on each other. Current state of practice does not take this dependency into consideration.

Degree

M.A.Sc.

Completion

2004

Supervisor

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