Flow Failure of Saturated Bauxite Under Undrained Monotonic Loading



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Introduction

Bauxite Ore is storage in heaps and transported overseas for its refinery using vessels. There have been many cases of failures of Bauxite Ore Heaps due to liquefaction leading to vessel capsizing.







Bauxite is Storage in Vessels

Dynamic Loading due to Rolling Motion

Capsizing of Vessel due to Flow Failure

Flow Failure Susceptibility Based on Steady State Approach

The susceptibility to Flow Failure can be evaluated by using the Steady State Line (SSL) obtained from undrained monotonic tests. Currently, there is a gap in data on the undrained monotonic behavior of Bauxite.



Susceptibility of Bauxite Ore Heaps

Bauxite heaps of 10m height are susceptible to Flow Failure within ranges of 1.172-1.320 of void ratio

