

Full-Scale Test of a Causeway Embankment Supported by Raft-Aggregate Column Foundation on Soft Clay Deposit

Authors : Tri Harianto, Lawalenna Samang, St. Hijraini Nur, Arwin

Abstract : Recently, a port development is constructed in Makassar city, South Sulawesi Province, Indonesia. Makassar city is located in lowland area that dominated by soft marine clay deposit. A two kilometers causeway construction was built which is situated on the soft clay layer. In order to investigate the behavior of causeway embankment, a full-scale test was conducted of high embankment built on a soft clay deposit. The embankment with 3,5 m high was supported by two types of reinforcement such as raft and raft-aggregate column foundation. Since the ground was undergoing consolidation due to the preload, the raft and raft-aggregate column foundations were monitored in order to analyze the vertical ground movement by inducing the settlement of the foundation. In this study, two types of foundation (raft and raft-aggregate column) were tested to observe the effectiveness of raft-aggregate column compare to raft foundation in reducing the settlement. The settlement monitored during the construction stage by using the settlement plates, which is located in the center and toe of the embankment. Measurements were taken every day for each embankment construction stage (4 months). In addition, an analytical calculation was conducted in this study to compare the full-scale test result. The result shows that the raft-aggregate column foundation significantly reduces the settlement by 30% compared to the raft foundation. A raft-aggregate column foundation also reduced the time period of each loading stage. The Good agreement of analytical calculation compared to the full-scale test result also found in this study.

Keywords : full-scale, preloading, raft-aggregate column, soft clay

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