

Model Test and Corresponding Simulation on Compressive Characteristics of Soilbags

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Abstract - It is known that response acceleration of superstructure supported by spread foundation will decrease due to the rocking of the footing when subjected to earthquake loading, which makes it possible to reduce the cross section of the pier supporting the superstructure. However, supporting ground of a spread foundation should have enough bearing capacity. Therefore, when a spread foundation is constructed on soft ground, it should be improved by replacement of gravel or ground improvement method to increase the bearing capacity. The authors have already proposed a foundation by replacing the soft ground beneath a footing with soilbags. It is well-known that soilbags will receive much larger compressive force than filled material only. Thus, it is expected that soilbags will withstand large load beneath the footing even during earthquake. In verifying the effectiveness of the proposed foundations, the compressive characteristics of soilbags is crucial. Therefore, in this study, a compression test on soilbags was conducted and the compressive characteristics of soilbags was carefully investigated. Moreover, numerical simulation of the compression test was carried out and the mechanism of compression deformation of soilbags was examined. The calculated results coincided almost exactly with the experimental results. The calculated results also showed that vertical stress was largely shared by the centre part of soilbags, where restraint effect of a bag was more prominent.

Keywords: Soilbag, compression characteristics, subloading t_{ij} model, spread foundations with soilbags.