

Studi Efek Individual Vacuum Consolidation Pada Kompresibilitas Tanah Lunak Menggunakan Software Midas GTS NX = Study of Individual Effects of Vacuum Consolidation on Soft Soil Compressibility Using Midas GTS NX Software

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Abstrak

Tanah lunak seringkali menjadi permasalahan dalam proses pembangunan infrastruktur seperti gedung atau jalan. Tanah lunak merupakan jenis tanah yang memiliki daya dukung rendah serta tingginya tingkat kompresibilitas tanah tersebut. Oleh karena itu, stabilisasi tanah lunak diperlukan, salah satu metode yang tepat untuk digunakan dalam melakukan stabilisasi tanah adalah metode vacuum consolidation. Metode vacuum consolidation merupakan salah satu metode stabilisasi tanah yang menggunakan bantuan pompa sebagai vakum dan prefabricated vertical drain (PVD) sebagai saluran drainase airnya. Data dan parameter tanah lunak didapatkan dari uji lapangan dan uji laboratorium. Dalam menganalisa data untuk mengetahui efek metode vacuum consolidation terhadap kompresibilitas tanah lunak dilakukan analisa perhitungan penurunan menggunakan bantuan software Midas GTS NX, dimana hasil dari analisa permodelan akan dibandingkan dengan penurunan aktual di lapangan. Analisa data dengan software Midas GTS NX dilakukan dalam tahapan construction stage, yaitu: kondisi awal (initial state), kondisi saat proses vakum dimulai (suction drain), dan kondisi setelah proses vacuum consolidation dihentikan (leave time). Hasil dari perhitungan penurunan (settlement) menggunakan software Midas GTS NX adalah 0,801 meter dengan waktu proses vakum selama 90 hari, dan hasil penurunan (settlement) aktual di lapangan akibat proses vakum adalah 0,974 meter (SP1) dan 0,866 meter (SP2).

.....Soft soil is often a problem in the process of developing infrastructure such as buildings or roads. Soft soil is a type of soil that has a low bearing capacity and a high level of soil compressibility. Therefore, stabilization of soft soil is needed, one of the appropriate methods to be used in conducting soil stabilization is the vacuum consolidation method. The vacuum consolidation method is a soil stabilization method that uses a pump as a vacuum and prefabricated vertical drain (PVD) as a water drainage channel. Soft soil data and parameters were obtained from field tests and laboratory tests. In analyzing the data to determine the effect of the vacuum consolidation method on the compressibility of soft soil, a settlement analysis was carried out using the Midas GTS NX software, where the results of the modeling analysis will be compared with the actual settlement in the field. Data analysis with Midas GTS NX software was carried out in the construction stage, namely: initial conditions, conditions when the vacuum process was started (suction drain), and conditions after the vacuum consolidation process was stopped (leave time). The results of the settlement calculation using the Midas GTS NX software are 0.801 meters with a vacuum processing time of 90 days, and the actual settlement results in the field due to the vacuum process are 0.974 meters (SP1) and 0.866 meters (SP2).