

## **Abstrak**

Salah satu daerah yang sedang dilakukan perluasan perumahan yaitu Kosambi City, Tangerang. Kondisi tanah di Kosambi City merupakan tanah lunak dengan kadar air dan plastisitas tanah yang tinggi, permeabilitas dan daya dukung tanah yang rendah, serta tingginya tekanan air pori. Kondisi tanah lunak ini membuat penurunan konsolidasi membutuhkan waktu yang sangat lama. Untuk mengatasi masalah lamanya waktu penurunan konsolidasi ini, perlu dilakukan perbaikan tanah. Perbaikan tanah yang dilakukan yaitu metode vacuum consolidation dengan preloading. Kombinasi pada metode ini dilakukan dengan cara memasang sistem drainase vertikal berupa prefabricated fabricated drain (PVD) di dalam tanah lunak, kemudian diberikan beban awal yaitu berupa timbunan (preloading) pada tanah tersebut. Hasil perhitungan menunjukkan besar penurunan konsolidasi yang terjadi jika tanah lempung dibebani dengan timbunan setinggi 1,2 m, water surcharge setinggi 1,3 m dan beban vacuum adalah 1,0048 m dan 1,7427 m. Metode kombinasi preloading dan PVD terbukti mampu mempercepat waktu konsolidasi, dimana Preloading dan PVD dipasang dengan pola segitiga berjarak 0,80 m hingga kedalaman 12 m, mampu mencapai waktu konsolidasi dan  $U$  90% tercepat dalam waktu 8 minggu.

**Kata kunci:** Vacuum consolidation, prefabricated vertical drain, preloading, waktu konsolidasi.

### ***Abstract***

*The expansion of housing in big cities cannot be denied given the rapid population growth in Indonesia. One of the areas that is currently expanding housing is Kosambi City, Tangerang. Soil conditions in Kosambi City are soft soil with high moisture content and soil plasticity, low permeability and soil bearing capacity, and high pore water pressure. This soft soil condition makes the consolidation decline take a very long time. To overcome the problem of the length of time for this consolidation settlement, it is necessary to improve the land. Soil improvement is being carried out, namely the method of vacuum consolidation with preloading. The combination of these methods is carried out by installing a vertical drainage system in the form of prefabricated fabricated drain (PVD) in soft soil, then the initial load is given in the form of preloading on the soil. The calculation results show that the amount of consolidation reduction that occurs when clay soil is loaded with a stockpile of 1.2 m high, a water surcharge of 1.3 m and a vacuum load is 1,0048 m and 1,7427 m. The combined method of preloading and PVD is proven to be able to accelerate the time of consolidation, where Preloading and PVD are installed in a triangle pattern between 0.80 m to a depth of 12 m, capable of achieving the fastest consolidation time and a consolidation degree of 90% within 8 weeks.*

***Keywords:*** Vacuum consolidation, prefabricated vertical drain, preloading, consolidation time.