

ABSTRAK

Salah satu jenis tanah yang memiliki daya dukung rendah yaitu jenis tanah lempung yang mempunyai nilai kembang susut yang tinggi menimbulkan kerusakan pada bangunan seperti terangkatnya pondasi, jalan bergelombang, dan sebagainya. Penelitian ini bertujuan untuk mengetahui pengaruh *fly ash* sebagai bahan stabilisasi tanah lempung yang mampu menaikkan daya dukung tanah. Tanah berasal dari desa Kedungsari, Kecamatan Pengasih, Kulon Progo, Yogyakarta.

Tahap penelitian berupa pengujian pendahuluan yaitu pengujian kadar air, berat jenis, berat volume, analisa granuler, batas-batas Atterberg, dan pemadatan tanah. Kemudian dilakukan pengujian *CBR* rendaman (*soaked*) dan tanpa perendaman (*unsoaked*) masing-masing pengujian terdiri dari tanah asli dan variasi *fly ash* sebesar 5%, 10%, dan 15% dengan perlakuan pemeraman 1 hari, 3 hari, 7 hari dan perendaman 4 hari, dan pengujian pengembangan (*swelling*).

Hasil penelitian menunjukkan bahwa tanah termasuk dalam kelompok A-7-5 yaitu tanah yang berjenis lempung dengan sifat sedang sampai buruk, data tersebut berdasarkan klasifikasi *AASHTO*, sedangkan klasifikasi menurut *USCS* tanah termasuk dalam kelompok CH yaitu tanah lempung tak organik dengan plastisitas tinggi, dan lempung gemuk. Berdasarkan pengujian *CBR* Laboratorium didapatkan nilai *CBR* tanah asli tanpa rendaman (*unsoaked*) sebesar 9,3%, sedangkan nilai *CBR* rendaman (*soaked*) sebesar 1,106%. Setelah penambahan *fly ash* dengan variasi 5%, 10%, dan 15% nilai *CBR* tanpa rendaman (*unsoaked*) pada pemeraman 1 hari mengalami peningkatan berturut-turut sebesar 9,5%, 55%, dan 68,584%. Kemudian peningkatan nilai *CBR* tanpa rendaman (*unsoaked*) pada pemeraman 3 hari berturut-turut sebesar 12,213%, 56,837%, dan 108,763%. Dan peningkatan nilai *CBR* tanpa rendaman (*unsoaked*) pada pemeraman 7 hari berturut-turut sebesar 32,5%, 110%, dan 122,5%. Sedangkan peningkatan nilai *CBR* rendaman (*soaked*) pada pemeraman 7 hari + perendaman 4 hari berturut-turut sebesar 1,443%, 2,26%, dan 2,79%. Kemudian pengujian pengembangan (*swelling*) mengalami penurunan potensi pengembangan berturut-turut sebesar 81,235%, 88,2%, dan 94,724% terhadap nilai *swelling* tanah asli sebesar 7,509%.

Kata kunci: *CBR*, *fly ash*, lempung, stabilisasi, *swelling*

ABSTRACT

It is one type of soil that has a low bearing capacity, namely the type of clay soil which has a high shrinkage value which causes damage to buildings such as foundation lifting, bumpy roads, and so on. This study aims to determine the effect of fly ash as clay stabilization material which is able to increase soil carrying capacity. The land comes from the village of Kedungsari, Kecamatan Pengasih, Kulon Progo, Yogyakarta

The preliminary testing research stage consisted of moisture content, specific gravity, volume weight, granular analysis, Atterberg boundaries, and soil compaction. Then testing the soaked and unsoaked CBR was carried out, each test consisted of 5%, 10%, and 15% fly ash variation with 1 day, 3 days, 7 days and soaking treatment. days, and swelling testing.

The results showed that the soil included in group A-7-5 was clay-type soil with moderate to bad properties, the data was based on AASHTO classification, while the classification according to USCS soil was included in the CH group ie non-organic clay soil with high plasticity, and clay fat. Based on laboratory CBR testing, the CBR value of unsoaked native land was 9.3%, while the CBR value of soaked was 1.106%. After the addition of fly ash with a variation of 5%, 10%, and 15% unsoaked CBR value at 1 day ripening experienced an increase of 9.5%, 55%, and 68.584% respectively. Then the increase in unsoaked CBR value for 3 days ripening was 12.213%, 56.837% and 108.763% respectively. And an increase in unsoaked CBR value on 7 days ripening of 32.5%, 110% and 122.5% respectively. While the increase in the soaked CBR value on 7 days curing + 4 days immersion was 1.443%, 2.26%, and 2.79% respectively. Then the swelling test experienced a decrease in development potential in a row of 81.235%, 88.2%, and 94.724% of the original soil swelling value of 7.509%.

Keywords: CBR, fly ash, clay, stabilization, swelling