

## ABSTRACT

Clay is ground easily changeable consistency, when dry will be hard, if wet will be soft plastic, berkohesif and have fireworks shrinkage rapid influence of moisture content, therefore the need for soil stabilization for the sake of inability of the soil to maintain consistency and load bearing which is above it. Chemical stabilization is mixing the soil with certain materials to improve soil physical and mechanical properties such as development and the carrying capacity (CBR). Clay generally has a large development and soil bearing capacity (CBR) is relatively low, therefore it will be an examination of the clay from areas Kasongan, Bantul, Yogyakarta, stabilized using cement and DIFA<sup>®</sup> SS expected to improve and qualify a technical construction.

Procedures were divided two stages: a preliminary study to determine the physical properties of the soil, initial testing includes moisture content, density and boundaries of consistency, having known physical properties of soil research is conducted the second stage of testing the mechanical properties of the soil. Testing of mechanical properties of soil covering proctor testing standards, after getting the optimum moisture content (OMC) and a maximum dry volume weight (MDD), and the addition of cement and DIFA<sup>®</sup> SS to the sample specimen with a large percentage of cement 8%, 10%, and 12 % of the dry weight of the sample volume, and 2.5% of the weight percentage DIFA<sup>®</sup> SS cement addition, CBR further testing and development of land.

Results from the study showed that the stabilization of a mixture of 8%, 10% and 12% of cement by 2.5% DIFA<sup>®</sup> SS on one day curing properties change physical and mechanical properties are significant variations in the sample that had been in testing. In a variation of 8% PC + 2.5% DIFA<sup>®</sup> SS when compared to the native soil, indigo PI decreased by 37.04% where the original soil has a PI of 25% and 8% Variation PC + 2.5% DIFA<sup>®</sup> SS has a value PI 15.74%, its CBR value increased by 236.24% which the CBR value of the native land of 11.37% and a variation of 8% PC + 2.5% DIFA<sup>®</sup> SS has a CBR value amounted to 38.23%, the value decreases development 66.67% where the value of the original land development by 2.25% while the variation of 8% PC + 2.5% DIFA<sup>®</sup> SS development value of 0.75%. In a variation of 10% PC + 2.5% DIFA<sup>®</sup> SS when compared to the native soil, indigo PI decreased by 51.32% where the original soil has a PI of 25% and 10% Variation PC + 2.5% DIFA<sup>®</sup> SS has a value PI 12.17%, its CBR value increased by 263.50% which the CBR value of the native land of 11.37% and a variation of 10% PC + 2.5% DIFA<sup>®</sup> SS has a CBR value amounted to 41.33%, the value decreases development amounting to 81.33% where the value of the original land development by 2.25% while the variation of 10% PC + 2.5% DIFA<sup>®</sup> SS development value of 0.42%. In a variation of 12% PC + 2.5% DIFA<sup>®</sup> SS when compared to the native soil, indigo PI decreased by 74.64% where the original soil has a PI of 25% and 12% Variation PC + 2.5% DIFA<sup>®</sup> SS has a value PI 6.34%, its CBR value increased by 299.91% which the CBR value of the native land of 11.37% and a variation of 12% PC + 2.5% DIFA<sup>®</sup> SS has a CBR value amounted to 45.47%, the value decreases development amounting to 88.89% where the value of the original land development by 2.25% while the variation of 12% PC + 2.5% DIFA<sup>®</sup> SS development value of 0.25%.

*Keywords: Stabilization, Soil Clay, Cement, DIFA<sup>®</sup> SS, CBR.*

## ABSTRAK

Tanah lempung merupakan tanah yang mudah berubah-ubah konsistensinya, apabila kering akan bersifat keras, jika basah akan bersifat lunak plastis, berkohesif dan mempunyai kembang susut yang cepat pengaruh kadar air, oleh karena itu perlu adanya stabilisasi tanah demi kemampuan tanah mempertahankan konsistensi dan menahan beban yang berada di atasnya. Stabilisasi kimiawi adalah pencampuran tanah dengan bahan tertentu untuk memperbaiki sifat fisik dan mekanik tanah seperti pengembangan dan daya dukung (CBR). Tanah lempung umumnya mempunyai pengembangan yang besar dan daya dukung tanah (CBR) yang relatif rendah, oleh karena itu akan dilakukan penelitian terhadap tanah lempung yang berasal dari daerah Kasongan, Bantul, Yogyakarta yang distabilisasi menggunakan semen dan DIFA<sup>®</sup> SS diharapkan mampu memperbaiki dan memenuhi syarat teknis suatu konstruksi.

Prosedur penelitian dibagi 2 tahap yaitu penelitian awal untuk mengetahui sifat-sifat fisik tanah, pengujian awal meliputi kadar air, berat jenis dan batas-batas konsistensi, setelah diketahui sifat fisik tanah maka dilakukan penelitian tahap kedua yaitu pengujian sifat mekanik tanah. Pengujian sifat mekanik tanah meliputi pengujian proktor standar, setelah mendapatkan kadar air optimum (OMC) dan berat volume kering maksimum (MDD), lalu dilakukan penambahan semen dan DIFA<sup>®</sup> SS terhadap sampel benda uji dengan besar persentase semen 8%, 10%, dan 12% dari berat volume kering sampel, dan 2,5% DIFA<sup>®</sup> SS dari berat persentase penambahan semen, selanjutnya dilakukan pengujian CBR dan pengembangan tanah.

Hasil dari penelitian menunjukkan, bahwa stabilisasi campuran 8%, 10% dan 12% semen dengan 2,5% DIFA<sup>®</sup> SS pada pemeraman 1 hari terjadi perubahan sifat fisik maupun sifat mekanik yang cukup signifikan pada variasi-variasi sampel yang telah di ujikan. Pada variasi 8% PC + 2,5% DIFA<sup>®</sup> SS jika dibandingkan dengan tanah asli, nilai PI menurun sebesar 37,04% dimana tanah asli memiliki PI sebesar 25% dan Variasi 8% PC + 2,5% DIFA<sup>®</sup> SS memiliki nilai PI 15,74%, nilai CBR nya meningkat sebesar 236,24% dimana nilai CBR tanah asli sebesar 11,37% dan variasi 8% PC + 2,5% DIFA<sup>®</sup> SS memiliki nilai CBR sebesar 38,23%, nilai pengembangan menurun sebesar 66,67% dimana nilai pengembangan tanah asli sebesar 2,25% sedangkan variasi 8% PC + 2,5% DIFA<sup>®</sup> SS nilai pengembangannya sebesar 0,75%. Pada variasi 10% PC + 2,5% DIFA<sup>®</sup> SS jika dibandingkan dengan tanah asli, nilai PI menurun sebesar 51,32% dimana tanah asli memiliki PI sebesar 25% dan Variasi 10% PC + 2,5% DIFA<sup>®</sup> SS memiliki nilai PI 12,17%, nilai CBR nya meningkat sebesar 263,50% dimana nilai CBR tanah asli sebesar 11,37% dan variasi 10% PC + 2,5% DIFA<sup>®</sup> SS memiliki nilai CBR sebesar 41,33%, nilai pengembangan menurun sebesar 81,33% dimana nilai pengembangan tanah asli sebesar 2,25% sedangkan variasi 10% PC + 2,5% DIFA<sup>®</sup> SS nilai pengembangannya sebesar 0,42%. Pada variasi 12% PC + 2,5% DIFA<sup>®</sup> SS jika dibandingkan dengan tanah asli, nilai PI menurun sebesar 74,64% dimana tanah asli memiliki PI sebesar 25% dan Variasi 12% PC + 2,5% DIFA<sup>®</sup> SS memiliki nilai PI 6,34%, nilai CBR nya meningkat sebesar 299,91% dimana nilai CBR tanah asli sebesar 11,37% dan variasi 12% PC + 2,5% DIFA<sup>®</sup> SS memiliki nilai CBR sebesar 45,47%, nilai pengembangan menurun sebesar 88,89% dimana nilai pengembangan tanah asli sebesar 2,25% sedangkan variasi 12% PC + 2,5% DIFA<sup>®</sup> SS nilai pengembangannya sebesar 0,25%.

Kata kunci : Stabilisasi, Tanah Lempung, Semen, DIFA<sup>®</sup> SS, CBR.