ANALYSIS OF CHANGES IN PHYSICAL CHARACTERISTICS, MECHANICAL AND DYNAMIC OF DRYING WETTING CYCLES ON NATURAL SOIL AND STABILIZATION SOIL BY USE LIME AND FLY ASH IN SUMBER AJI VILLAGE OF KOTA BATU- MALANG

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ABSTRACT

Indonesia is a country that is underlined equator so that the Indonesian state is influenced by two seasons: the rainy season and dry season. This resulted in soil naturally suffered repeated cycles of wetting drying thereby affecting soil characteristics, good physical properties, mechanical properties and dynamic properties that occur due to changes in volume due to changes in soil water content. This cycle also occurs in the soil on the slopes of Sumber Aji village Kota Batu - Malang.

Due to the drying and wetting cycles are repeated soil strength on the slopes of Sumber Aji village Kota Batu - Malang decreased soil stabilization so that needs to be done. By increasing the strength of the soil chemically induced in the laboratory, which is in this study used lime and fly ash as stabilization material. The study on soil physical properties include water content (Wc), void ratio (e), the degree of saturation (Sr), specific gravity (Gs), dry density (Ɣd), heavy soil volume (Ɣt), Atterberg limits (LL, PL, PI), with sieving analize and hydrometer. Mechanical properties include cohesion (c) and pore water pressure is negative (-Uw). Dynamic properties include the maximum shear modulus (Gmax) with bender element testing.
The priority of this research is to influence the drying wetting cycles using two cycles of addition and subtraction with the percentage of water by 10%. The results also showed that the soil stabilized with 5% fly ash gives a better effect against soil reinforcement. This is shown in the value obtained from each natural soil, natural soil + 4% lime and natural soil + 5% fly ash under the same conditions (eg initial point of wetting 1x) below; dry density of soil (\( \gamma_d \)) gr/cm\(^2\) increased from 1,033, 1,073 and 1,076 gr/cm\(^2\) gr/cm\(^2\), degree of saturation (Sr) decreased from 68 433% 65 007% 63 987% and, void ratio (e) decreased from 1,445, 1,363 and 1,298, cohesion (c) increased from 0.191 kg/cm\(^2\), 1,116 kg/cm\(^2\) and 1201 kg/cm\(^2\), the negative pore water pressure (-Uw) increased from 238 033 kPa, kPa 387 502 and 313 941 kPa, the maximum shear modulus (Gmax) increases from 92 998 kPa, 297 472 kPa and 455 837 kPa.

**Keywords:** drying wetting cycle, physical properties, mechanical properties, dynamic properties, stabilization, stabilizer, natural, lime and fly ash.