

ABSTRAK

Fairuza Marhamah: *Analisis Kuat Tekan dan Kuat Geser Tanah Lempung dengan Nilai Berat Volume Kering yang Sama pada Zona Kering dan Zona Basah dari Uji Kepadatan Standar*. Skripsi. Fakultas Teknik Universitas Negeri Medan. 2023

Penelitian ini bertujuan menganalisis sifat mekanis tanah lempung, khususnya kuat tekan dan kuat geser, dengan mempertimbangkan perubahan kadar air. Tanah lempung memiliki sifat yang kohesif, plastis, dan sangat sensitif terhadap variasi kadar air. Kadar air tanah yang tinggi menyebabkan pengembangan tanah, sementara kadar air yang rendah mengakibatkan penyusutan tanah yang mempengaruhi sifat mekanis tanah tersebut. Kuat tekan tanah dan kuat geser tanah dievaluasi dalam kondisi dengan nilai berat volume kering yang sama pada zona basah dan zona kering. Hasil penelitian menunjukkan bahwa nilai kuat tekan bebas (q_u) tanah Desa Aek Parombunan dan Desa Huta Barangan cenderung lebih tinggi pada zona kering dibandingkan zona basah. Pada pemeraman 14 hari, nilai q_u tanah Desa Aek Parombunan meningkat 3% hingga 20%, dibandingkan pemeraman 7 hari. Sementara tanah Desa Huta Barangan mencapai peningkatan 11% hingga 40% pada pemeraman 14 hari dibandingkan dengan pemeraman 7 hari. Kemudian, nilai kuat geser langsung (τ) tanah Desa Aek Parombunan lebih tinggi pada zona kering, meningkat sekitar 3% hingga 4% dibandingkan dengan zona basah. Tanah Desa Huta Barangan menunjukkan peningkatan sekitar 7% hingga 9% pada zona kering. Namun, pada pemeraman 14 hari nilai kuat geser langsung (τ) hampir sama, hanya sedikit lebih tinggi yaitu 0,6% hingga 2% dibandingkan dengan pemeraman 7 hari. Hasil ini menunjukkan bahwa kuat geser tanah lempung cenderung lebih stabil terhadap perubahan kadar air dibandingkan dengan kuat tekan. Pengetahuan ini memiliki implikasi penting dalam perencanaan dan konstruksi, terutama dalam menghadapi risiko tanah longsor di wilayah tropis seperti Indonesia.

Kata kunci: tanah lempung, kuat tekan, kuat geser, kadar air, zona kering, zona basah



ABSTRAC

Fairuza Marhamah: *Analysis of Compressive Strength and Shear Strength of Clayey Soil with the Same Dry Unit Weight in Wet and Dry Zones from Standard Proctor Compaction Test. Thesis. Faculty of Engineering, State University of Medan. 2023.*

This research aims to analyze the mechanical properties of clayey soil, particularly compressive strength and shear strength, considering variations in moisture content. Clayey soil exhibits cohesive and plastic properties and is highly sensitive to changes in moisture content. High soil moisture leads to soil expansion, while low moisture content results in soil shrinkage, affecting the mechanical properties of the soil. Compressive strength and shear strength of the soil are evaluated under conditions with the same dry unit weight in both wet and dry zones. The research findings indicate that the unconfined compressive strength (q_u) values of soil in Aek Parombunan Village and Huta Barangan Village tend to be higher in the dry zone compared to the wet zone. After 14 days of curing, the q_u values of soil in Aek Parombunan Village increased by 3% to 20%, compared to a 7-day curing period. However, soil in Huta Barangan Village showed an increase of 11% to 40% after 14 days of curing compared to a 7-day curing period. Additionally, the direct shear strength (τ) values of soil in Aek Parombunan Village were higher in the dry zone, increasing by approximately 3% to 4% compared to the wet zone. Soil in Huta Barangan Village exhibited an increase of around 7% to 9% in the dry zone. However, after 14 days of curing, the values of direct shear strength (τ) remained almost the same, with only a slight increase of 0.6% to 2% compared to the 7-day curing period. These results indicate that the shear strength of clayey soil tends to be more stable against changes in moisture content compared to compressive strength. This knowledge has significant implications for planning and construction, particularly in addressing landslide risks in tropical regions such as Indonesia.

Keywords: *clay soil, compressive strength, shear strength, moisture content, dry zone, wet zone.*

