

ABSTRAK

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PENGARUH LIMBAH KALSIMUM KARBIT, ABU SEKAM PADI, DAN BAKTERI *Bacillus cereus* TERHADAP KUAT GESER TANAH GAMBUT
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Tanah gambut mempunyai kuat geser yang rendah. Oleh karena itu, butuh dilakukan stabilisasi tanah. Pada penelitian ini, metode stabilisasi yang dilakukan metode stabilisasi *grouting*. Bahan stabilisasi *grouting* adalah limbah kalsium karbit sebagai sumber kalsium dan abu sekam padi sebagai sumber silika. Kalsium dan silika kemudian akan membentuk C-S-H. Lalu, selain stabilisasi *grouting*, stabilisasi *biogrouting* juga dilakukan pada sebagian sampel tanah. Stabilisasi *biogrouting* merupakan metode pemanfaatan bakteri untuk mempresipitasi CaCO_3 . Bakteri yang digunakan adalah *Bacillus cereus* yang diperoleh dari tanah Cikarang. Penambahan bakteri dilakukan 30 hari setelah stabilisasi *grouting*. Setelah penambahan bahan stabilisasi *grouting* selama 30 hari, nilai kohesi tanah meningkat sebesar 124,62% dan sudut geser dalam tanah meningkat menjadi 5° dibandingkan dengan tanah tanpa stabilisasi. Setelah 60 hari stabilisasi *grouting*, nilai kohesi tanah meningkat sebesar 137,58% dan sudut geser dalam tanah meningkat menjadi 7° . Kemudian, setelah masa pemeliharaan 90 hari, nilai kohesi meningkat sebesar 148,13%. Dibandingkan dengan hanya stabilisasi *grouting*, kohesi pada tanah dengan *Bacillus cereus* memiliki peningkatan yang lebih baik. Penambahan *Bacillus cereus* selama 30 hari memiliki nilai kohesi yang lebih besar 115,73% dibanding tanah *grouting* 60 hari dan sudut geser dalam tanah sebesar 2° . Kohesi tanah *biogrouting* 60 hari meningkat sebesar 151,03% dibanding dengan tanah 30 hari dan sudut geser dalam tanah sebesar 3° . Kemudian, kohesi tanah *biogrouting* 112 meningkat sebesar 32,83% dibanding tanah 60 hari dan sudut geser dalam tanah sebesar 4° . Jadi, setelah 142 hari, kohesi tanah meningkat sebesar 1609,01% dibanding tanah tanpa stabilisasi.

Kata Kunci : tanah gambut, limbah kalsium karbit, abu sekam padi, *Bacillus cereus*

Referensi : 38 (1981 – 2020)

ABSTRACT

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THE EFFECT OF CALCIUM CARBIDE RESIDUE, RICE HUSK ASH, AND *Bacillus cereus* ON PEAT SOIL SHEAR STRENGTH

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Peat soil has low shear strength. Therefore, it needs to be stabilized. In this study, the stabilization is done by grouting stabilization method. The grouting stabilizing agent are calcium carbide residue (CCR) as source of calcium and rice husk ash (RHA) as source of silica. Calcium and silica then forming C-S-H. Then, in addition to grouting stabilization, biogrouting stabilization also done to some soil sample. Biogrouting stabilization is conducted by using bacteria to precipitate CaCO_3 . The bacteria used for this study is *Bacillus cereus* which is obtained from soil in Cikarang. Bacteria addition is done 30 days after grouting stabilization. After adding grouting stabilizing agent for 30 days, soil cohesion was increased by 124,62% and soil internal friction was increased to 5° compared with soil without treatment. After 60 days maintenance period, soil cohesion was increased by 137,58% and soil internal friction was increased to 7°. Then, after 90 days maintenance period, soil cohesion was increased by 148,13%. Compared with only grouting stabilization soil, cohesion on soil with *Bacillus cereus* has better improvement. 30 days biogrouting soil had 115,73% higher cohesion than 60 days grouting soil and the soil internal friction was 2°. The cohesion on 60 days biogrouting soil was increased by 151,03% compare with 30 days biogrouting soil and the soil internal friction was 3°. Then, the cohesion on 112 days biogrouting soil was increased by 32,83% compare with 60 days biogrouting soil and the soil internal friction was 4°. So, after 142 days, soil cohesion was increased by 1609,01% compared with soil without any treatment.

Keywords : Peat soil, Calcium Carbide Residue, Rice Husk Ash, *Bacillus cereus*

References : 38 (1981 – 2020)