

ABSTRAK

Tanah merupakan aspek yang sangat penting dalam setiap pekerjaan konstruksi, namun kondisi tanah tidak selalu dalam keadaan baik. Pada beberapa jenis tanah ada yang memiliki daya dukung rendah untuk dijadikan sebagai landasan konstruksi, salah satunya adalah tanah gambut.

Tahap penelitian terdiri dari 2 tahap. Tahap pertama diawali dengan pengujian pendahuluan yaitu pengujian fisik tanah yang meliputi : kadar air, berat volume, berat jenis dan proktor standar. Tahap kedua dilakukan pengujian mekanik dengan pengujian *CBR* (*California Bearing Ratio*) pada setiap variasi campuran tanah dengan kapur 5% dan variasi *fly ash* 0%, 5%, 15% dan 25% dengan pemeraman 0 hari, 3 hari dan 7 hari. Pengujian *CBR* dilakukan dengan tanpa rendaman (*unsoaked*) dan rendaman (*soaked*).

Hasil penelitian tanah gambut desa Asinan, kecamatan Bawen, kabupaten Semarang memiliki nilai kadar air 352,12%, berat volume 1,10 gr/cm³, berat jenis 1,45 gr/cm³ dan kadar air optimum sebesar 112,5%. Hasil pengujian *CBR* Laboratorium tanah asli tanpa rendaman (*unsoaked*) sebesar 3,72% sedangkan *CBR* rendaman (*soaked*) sebesar 3,42%. Nilai peningkatan *CBR* variasi Kapur 5% dan *fly ash* 0%, 5%, 15% dan 25% didapat peningkatan nilai *CBR* tanpa rendaman (*unsoaked*) berturut-turut pada pemeraman 0 hari sebesar 5,90%, 7,70%, 8,09% dan 9,72%. Peningkatan *CBR* tanpa rendaman (*unsoaked*) berturut-turut pada pemeraman 3 hari sebesar 7,26%, 9,30%, 9,90% dan 13,37%. Peningkatan *CBR* tanpa rendaman (*unsoaked*) berturut-turut pada pemeraman 7 hari sebesar 8,19%, 9,62%, 10,35% dan 14,39%. Nilai *CBR* rendaman (*soaked*) dengan dilakukan pemeraman 7 hari terlebih dahulu pada variasi optimum (kapur 5% + *fly ash* 25%) sebesar 14,96%, sedangkan pada variasi kapur tanpa *fly ash* (kapur 5% + *fly ash* 0%) sebesar 9,42%. Hasil pengujian pengembangan (*free swell*) sampai hari ke-4 pengujian pada tanah asli meningkat mencapai 10%, untuk variasi (kapur 5% + *fly ash* 0%) *swelling* turun menjadi 5% dan pada variasi (kapur 5% + *fly ash* 25%) turun drastis hingga 0,8%. Desain tebal lapis perkerasan Bina Marga 2013 semua variasi didapatkan tebal lapis perkerasan sama yaitu *AC WC* 4 cm; *AC BC* 15,5 cm; LPA 15 cm dan LPB 15 cm, namun hanya berbeda untuk rekomendasi tebal timbunan perbaikan saja. Hasil desain tebal lapis perkerasan menggunakan Bina Marga 2002 didapatkan tebal lapis perkerasan pada tanah asli (Laston 20 cm, LPA 15 cm, dan LPB 30 cm) pada variasi *CBR* dihasilkan tebal Laston dan LPA sama yaitu Laston 20 cm, LPA 7,5 cm (namun dipakai 15 cm) dan dihasilkan tebal LPB semakin mengecil yaitu 12,5 cm, 7,5 cm, 2,5 cm dan 0 cm (namun dipakai syarat minimum yaitu 15 cm), kecuali pada variasi *fly ash* 25% tidak membutuhkan LPB.

Kata kunci : gambut, *CBR*, Kapur, *fly ash*

ABSTRACT

Land is a very important aspect in any construction work, but the condition of the soil is not always in good condition. In some types of soil there is a low carrying capacity to serve as a foundation construction, one of which is peat soil

The research phase consists of 2 stages. The first phase begins with a preliminary examination of soil physical testing which includes: moisture content, volume weight, specific gravity and standard proctor. The second stage is mechanical testing with CBR (California Bearing Ratio) testing on each variation of soil mixture with 5% lime and fly ash variation 0%, 5%, 15% and 25% with 0 days, 3 days and 7 days curing. CBR testing is done with no immersion (unsoaked) and soaked (soaked).

Result of peat research of Asinan villages, Bawen sub-district, Semarang regency has value of moisture content 352,12%, weight of volume 1,10 gr / cm³, density 1,45 gr / cm³ and optimum water content equal to 112,5%. The result of CBR laboratory test of original soil without immersion (unsoaked) equal to 3,72% while CBR soaked (soaked) equal to 3,42%. The increase value of CBR variation of Lime 5% and fly ash 0%, 5%, 15% and 25% increase of CBR value without immersion (unsoaked) for 0 days at 5.90%, 7,70%, 8, 09% and 9.72%. Increased CBR without immersion (unsoaked) in a 3-day curing rate of 7.26%, 9.30%, 9.90% and 13.37%, respectively. Increased CBR without immersion (unsoaked) for 7 days at 8.19%, 9.62%, 10.35% and 14.39%, respectively. Soaked CBR value with 7 days curing at optimum variation (lime 5% + fly ash 25%) equal to 14,96%, while at lime variation without fly ash (lime 5% + fly ash 0%) equal to 9.42%. The results of the development test (free swell) until the 4th day of the test on the original soil increased to 10%, for variation (lime 5% + fly ash 0%) swelling down to 5% and on variation (lime 5% + fly ash 25%) fell drastically to 0.8%. Dense pavement thickness design of Bina Marga 2013 all variations are found in the same thickness of pavement layer ie AC WC 4 cm; AC BC 15.5 cm; LPA 15 cm and LPB 15 cm, but only different for the recommendation of thickness of heap repair only. The result of thickness of plywood design using Bina Marga 2002 was found thickness of powder layer on original soil (Laston 20 cm, LPA 15 cm, and LPB 30 cm) on the CBR variation of Laston and LPA thickness ie Laston 20 cm, LPA 7.5 cm (but it is used 15 cm) and the thickness of LPB is getting smaller that is 12,5 cm, 7,5 cm, 2,5 cm and 0 cm (but used minimum requirement that is 15 cm), except on fly ash variation 25% does not need LPB.

Keyword : peat, CBR, Limestone, fly ash

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