

INTISARI

Kebutuhan material agregat dalam jumlah yang sangat besar pada pembangunan infrastruktur jalan di Provinsi Papua dan Papua Barat harus diantisipasi dengan mencari material alternatif yang ditinjau dari sisi teknis maupun sisi ekonomi mampu menggantikan ketergantungan pada agregat sebagai material utama konstruksi jalan. Penelitian ini dilakukan untuk mengetahui potensi pemanfaatan tanah kapur yang berasal dari Kampung Maruni di Kabupaten Manokwari sebagai material alternatif lapis pondasi jalan.

Beberapa pengujian dilakukan pada tanah kapur maupun campuran semen dan tanah kapur untuk mendapatkan hasil pengujian yang sesuai dengan spesifikasi lapis pondasi jalan. Pengujian awal yaitu dengan melakukan analisis saringan, kemudian dilanjutkan dengan pengujian terhadap karakteristik kapur, uji pemadatan (*compaction test*), uji CBR (*California Bearing Ratio*) dan uji kuat tekan bebas (*unconfined compression test*).

Berdasarkan pengujian pada campuran semen dan tanah kapur didapatkan hasil pengujian pada kadar semen 3%, nilai berat isi kering maksimum sebesar 1,785 gram/cm³, kadar air optimum sebesar 14,80%, nilai CBR sebesar 134,90% dan nilai uji kuat tekan sebesar 22,474%. Pada kadar semen 5%, nilai berat isi kering maksimum sebesar 1,790 gram/cm³, kadar air optimum sebesar 14,40%, nilai CBR sebesar 190,00% dan nilai uji kuat tekan bebas sebesar 28,326%. Pada kadar semen 7%, nilai berat isi kering maksimum sebesar 1,790 gram/cm³, kadar air optimum sebesar 14,00%, nilai CBR sebesar 197,60% dan nilai uji kuat tekan bebas sebesar 28,393%. Pada kadar semen 9%, nilai berat isi kering maksimum sebesar 1,790 gram/cm³, kadar air optimum sebesar 14,00%, nilai CBR sebesar 235,60% dan nilai uji kuat tekan bebas sebesar 32,658%. Besarnya penghematan anggaran biaya yang diperoleh jika menggunakan campuran semen dan kapur sebagai lapis pondasi jalan dibandingkan jika menggunakan material agregat adalah sebesar Rp. 993.714.000,00 (sembilan ratus sembilan puluh tiga juta tujuh ratus empat belas ribu rupiah) atau efisiensi biaya yang didapat sebesar 44,61% untuk panjang jalan 1,00 km.

Kata kunci : lapis pondasi semen-kapur, kadar air optimum, berat isi kering maksimum, CBR (*California Bearing Ratio*), kuat tekan

ABSTRACT

The demand for enormous amount of aggregate material in road infrastructure development in Papua and West Papua should be anticipated by finding alternative materials, reviewed in terms of technical and economic aspect. Which could replace the dependency on aggregate as the main material in road construction. The objective of the study was to determine the potential use of limestone originated from Maruni in Manokwari Regency as an alternative material of base course.

Several tests had been done on limestone soil and on a mixture of cement and limestone soil to get the compatible test result along with the base course spesification. Preliminary test had been done by using grain size analysis, continued with limestone characteristics test, compaction test, California Bearing Ratio test (CBR test) and unconfined compression test.

Based on the test on cement and limestone soil mixture, the results showed that at the 3% cement content, the maximum dry unit weight was 1,785 gram/cm³, optimum water content was 14.80%, CBR value was 134.90% and compressive strength value was 22.474%. While at the 5% cement content, maximum dry unit weight was 1.790 gram/cm³, optimum water content was 14.40%, CBR value was 190.00% and compressive strength value was 28.326%. At the 7% cement content, maximum dry unit weight was 1.790 gram/cm³, optimum water content was 14.00%, CBR value was 197.60% and the compressive strength value was 28.393%. In addition, at the 9% cement content, maximum dry unit weight was 1.790 gram/cm³, optimum water content was 14.00%, CBR value is 235.60% and compressive strength value was 32.658%. The amount of cost savings on budgeting obtained when using a mixture of cement and limestone as road subgrade layer in comparison with using aggregate material was Rp. 993,714,000.00 (nine hundred and ninety-three million seven hundred and fourteen thousand rupiah) or a total cost efficiency of 44.61% for 1.00 km road length.

Keywords : base course of cement-limestone, optimum water content, maximum dry unit weight, CBR (California Bearing Ratio), compressive strength