PENGARUH GRADASI TERHADAP NILAI CBR MATERIAL *CRUSHED LIMESTONE*

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ABSTRAK

Lonjakan pertumbuhan lalu lintas pada suatu daerah yang melebihi kriteria desain pada suatu konstruksi jalan akan memperpendek umur rencana dari perkerasan jalan. Keadaan ini berdampak pada kenaikan biaya perawatan jalan yang dikeluarkan. Salah satu cara untuk menurunkan biaya tersebut maka diupayakan adanya efesiensi dan *quality control* dari berbagai komponen pembangunan konstruksi jalan. Salah satu komponen *quality control* tersebut adalah tinjauan terhadap kualitas material yang akan digunakan sebagai material pada *subgrade, subbase,* dan *base* dari suatu desain perkerasan jalan.

Penelitian ini bertujuan untuk mengkaji pengaruh gradasi material *crushed limestone* terhadap nilai CBR (*California Bearing Ratio*). Material *limestone* yang digunakan pada penelitian ini berasal dari dua daerah yaitu; Padalarang dan Sukabumi, Jawa Barat. Jenis Gradasi yang akan dikaji adalah *poorly graded*/gradasi buruk (material Padalarang, *dmax* = 4,75mm) dan *well graded*/gradasi baik (material Sukabumi, *dmax* = 4,75mm). Metode uji CBR yang dilakukan adalah uji CBR laboratorium yang mengacu pada standar ASTM D-1883-99. Pengujian CBR laboratorium untuk material *crushed limestone poorly graded* menggunakan metode variasi kadar air, *w* (*range of water content*), sementara untuk material *crushed limestone well graded* dilakukan hanya dalam kondisi kadar air, *w* = 0,1%. Untuk kedua jenis gradasi, jumlah tumbukan perlapis (*blows per layer*) yang digunakan adalah 25 *blows per layer* dan 56 *blows per layer*.

Hasil penelitian untuk material *crushed limestone poorly graded* diperoleh nilai CBR tertinggi = 26,25%, pada kondisi; energi kompaksi 56 *blows perlayer*, kadar air, w = 0,088% dan nilai *dry density*, γ_{dry} = 1,594gr/cm^3, sementara untuk material *crushed limestone well graded* diperoleh nilai CBR tertinggi = 27,54%, pada kondisi; energi kompaksi 56 *blows perlayer*, kadar air, w = 0,11% dan nilai *dry density*, γ_{dry} = 1,768gr/cm^3. Pengaruh perubahan kondisi gradasi material *crushed limestone* dari *poorly graded* ke *well graded* dengan energi kompaksi 56 *blows per layer* hanya mengalami kenaikan nilai CBR sebesar 4,9%. Klasifikasi lapisan konstruksi jalan berdasarkan kurva *stress-penetration* (Porter. O.J., 1942) untuk material *crushed limestone* baik pada gradasi material *poorly graded* dan *well graded,* termasuk kedalam klasifikasi *good subgrade.*

Kata Kunci: *Crushed Limestone,* CBR, *Poorly Graded, Well Graded.*

GRADATION EFFECT FOR CBR VALUE OF MATERIAL CRUSHED LIMESTONE

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ABSTRACT

The surge in traffic growth in an area that exceeds the design criteria on a road construction would shorten the design life of the pavement. This situation resulted in increased road maintenance costs incurred. One way to reduce these costs then attempted control their efficiency and quality of the various components of road construction. One component of the quality control is a review of the quality of the materials to be used as the material on the subgrade, subbase and base of a road pavement design.

This study aimed to assess the effect of graded crushed limestone material to the value of CBR (California Bearing Ratio). Limestone material used in this study came from two areas, namely; Padalarang and Sukabumi, West Java. Gradient type that will be studied is poorly graded (Padalarang material, dmax = 4,75mm) and well graded (material Sukabumi, dmax = 4,75mm). The test method conducted CBR CBR is testing laboratory which refers to the standard ASTM D-1883-99. CBR testing laboratory for material crushed limestone poorly graded using the method of variation of moisture content, w (range of water content), while for the material well graded crushed limestone done only under conditions of water content, w = 0,1%. For both types of gradation, the number of collisions (blows per layer) used is 25 blows per layer and 56 blows per layer.

Results of research for the material poorly graded crushed limestone obtained the highest CBR value = 26,25%, on the condition; 56 blows perlayer energy compaction, moisture content, w = 0,088% and a dry density value, $\gamma dry = 1{,}594 gr/cm^3$, while the material is well graded crushed limestone obtained the highest CBR value = 27,54%, on the condition; 56 blows perlayer energy compaction, moisture content, w = 0,11% and a dry density value, $\gamma dry = 1{,}768 gr/cm^3$. Effect of changes in material conditions gradation of poorly graded crushed limestone to well graded with energy compaction 56 blows per layer only increased the CBR value of 4,9%. Classification of road construction layers based stress-penetration curve (Porter. O.J., 1942) for both the material crushed limestone material gradation poorly graded and well graded, including classification into good subgrade.

***Keywords**: Crushed Limestone,* CBR, *Poorly Graded, Well Graded.*

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C_u	Koefisien keseragaman (*coefficient of uniformity*)
C_c	Koefisien gradasi (*coefficient of gradation*)
$CBR_{0,1"}$	Nilai CBR saat penetrasi 0,1*inch*
$CBR_{0,2"}$	Nilai CBR saat penetrasi 0,2*inch*
dmax	Ukuran butir maksimum
D_{60}	Diameter ukuran butir yang berkenaan dengan 60% lebih halus
D_{30}	Diameter ukuran butir yang berkenaan dengan 30% lebih halus
D_{10}	Diameter ukuran butir yang berkenaan dengan 10% lebih halus
G_s	Berat jenis tanah
w	Kadar air (%)
γ_{dry}	Berat isi kering (gr/cm^3)

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