EVALUASI GRADASI MATERIAL *CRUSHED LIMESTONE WELL GRADED* SAAT PRA KOMPAKSI DAN PASCA KOMPAKSI

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ABSTRAK

Limestone atau batu gamping merupakan batuan dengan keragaman penggunaan yang sangat besar. Sebagian besar batu gamping dibuat menjadi batu pecah yang dapat digunakan sebagai material konstruksi seperti: landasan jalan dan kereta api serta agregat dalam beton. Evaluasi gradasi pra kompaksi dan pasca kompaksi dimaksudkan untuk mengetahui tingkat kehancuran material setelah melalui proses kompaksi. Untuk mendapatkan gradasi ukuran butir material tersebut dilakukan uji *sieve analysis* di laboratorium terlebih dahulu.

Tujuan penelitian ini adalah mengevaluasi gradasi material *crushed limestone* bergradasi baik (*well graded*) saat pra kompaksi dan pasca kompaksi. Sebagai material yang dapat dipakai dalam timbunan pada perkerasan jalan, tentunya harus melalui proses *sieve analysis* atau analisis ukuran butir. Material yang digunakan untuk sampel uji adalah *crushed limestone well graded* yang berasal dari daerah Sukabumi, Jawa Barat dengan pendesainan material secara manual. Uji *sieve analysis* yang dilakukan menggunakan standar ASTM D 2487.

Hasil penelitian material *crushed limestone well graded* uji 1 pasca kompaksi dengan kadar air (*w*) *w1* = 0,23% di bawah kadar air optimum *w2* (w_{opt}) = 1,67%, nilai *coefficient of uniformity* (C_u) dan *coefficient of gradation* (C_c) turun antara lain: C_u = 17,65 C_c = 1,59, dan C_u = 16,59 C_c = 1,44 dengan klasifikasi gradasi tetap *well graded*, tidak ada perubahan gradasi dari pra kompaksi. Sedangkan *w3* = 3,34%, *w4* = 4,91% dan *w5* = 6,23% di atas *w2*, nilai C_u dan C_c tidak diketahui sehingga klasifikasi gradasi material dengan penambahan kadar air diatas *w2* pasca kompaksi tidak dapat diklasifikasikan (*unclassified*). Nilai *percent fines* pra kompaksi terhadap pasca kompaksi mengalami kenaikan maksimum sebesar 19,132% dan minimum sebesar 8,256%. Untuk material *crushed limestone well graded* uji 2, kadar air *w1* = 0,08% di bawah kadar air optimum *w2* (w_{opt}) = 1,73%, nilai C_u dan C_c naik antara lain: C_u = 11,74 dan C_u = 12,97 sedangkan nilai C_c turun antara lain: C_c = 1,45 dan *Cc* = 1,28 dengan klasifikasi gradasi tetap *well graded*, tidak ada perubahan gradasi dari pra kompaksi. Sedangkan *w3* = 3,27%, *w4* = 5,22% dan *w5* = 6,25% di atas *w2*, nilai C_u dan C_c tidak dapat diketahui sehingga klasifikasi gradasi material dengan penambahan kadar air diatas *w2* pasca kompaksi adalah *unclassified*. Nilai *percent fines* pra kompaksi terhadap pasca kompaksi mengalami kenaikan maksimum sebesar 13,198% dan minimum sebesar 6,016%.

Kata kunci: *Limestone, Crushed Limestone, Well Graded, Sieve Analysis, Coefficient of Uniformity, Coefficient of Gradation, Percent Finer*.

Evaluation the Gradation of Well Graded Crushed Limestone Material During Pre-Compaction and Post-Compaction

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ABSTRACT

Limestone commonly known as limestone is a rock with a huge diversity of use. Most limestone made into crushed stone that can be used as a construction material such as: runway, road and rail as well as aggregate in concrete. Evaluation of pre and post compacting gradation is intended to determine the level of destruction of the material after the process of compacting. To get a gradation in grain size of the material tested in the laboratory sieve analysis beforehand.

The purpose of this study was to evaluate the gradation of crushed limestone material well graded either during pre and post-compacting. As the material that can be used in a pile on the sidewalk, of course, have to go through a sieve analysis or grain size analysis. The material used for the test sample is well graded crushed limestone that comes from Sukabumi, West Java, by designating the manual materials. To test sieve analysis is performed using the standard are: ASTM D 2487.

The results of the study material is well graded crushed limestone 1 post-compaction test with a water content (w) w1 = 0.23% below the optimum moisture content w2 (wopt) = 1.67%, the value of the coefficient of uniformity (Cu) and the coefficient of gradation (cc) down, among others: Cu = 17.65 cc = 1.59, and Cu = 16.59 cc = 1.44 with grading classification remains well graded, there is no change in gradation of pre-compaction. While w3 = 3.34%, w4 and w5 = 4.91% = 6.23% above w2, Cu and Cc values are unknown so the classification gradation material with moisture content above w2 addition of post-compaction is not classifiable (unclassified). PercentValue pre-compacting fines against post-compaction increased to a maximum of 19.132% and a minimum of 8.256%. For material well graded crushed limestone second test, the water content w1 = 0.08% below the optimum moisture content w2 (wopt) = 1.73%, Cu and Cc values rise, among others: Cu = 11.74 and Cu = 12, 97 while the value of Cc down among others: and Cc Cc = 1.45 = 1.28 with grading classification remains well graded, there is no change in gradation of pre-compaction. While w3 = 3.27%, w4 and w5 = 5.22% = 6.25% above w2, Cu and Cc values can not be known so that the classification gradation material with moisture content above w2 addition of post-compaction is unclassified. Percent Value fines pre-compaction of the post-compacting increased to a maximum of 13.198% and a minimum of 6,016%.

***Keywords**: Limestone, Crushed Limestone, Well Graded, Sieve Analysis, Coefficient of Uniformity, Coefficient of Gradation, Percent Finer.*

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C_u	Koefisien keseragaman (*coefficient of uniformity*)
C_c	Koefisien gradasi (*coefficient of gradation*)
D_{60}	Diameter yang bersesuaian dengan 60% lolos ayakan yang ditentukan dari kurva distribusi ukuran butiran
D_{30}	Diameter yang bersesuaian dengan 30% lolos ayakan
D_{10}	Diameter dalam kurva distribusi ukuran butiran yang bersesuaian dengan 10% yang lebih halus (lolos ayakan) di definisikan sebagai ukuran efektif
Gs	Berat jenis tanah (gr/cm^3)
P_4R_{10}	Material lolos saringan No. 4 tertahan di saringan No. 10
$P_{10}R_{20}$	Material lolos saringan No. 10 tertahan di saringan No. 20
$P_{20}R_{40}$	Material lolos saringan No. 20 tertahan di saringan No. 40
$P_{40}R_{50}$	Material lolos saringan No. 40 tertahan di saringan No. 50
$P_{50}R_{100}$	Material lolos saringan No. 50 tertahan di saringan No. 100
$P_{100}R_{200}$	Material lolos saringan No. 100 tertahan di saringan No. 200
w_{opt}	Kadar air optimum (%)
γ_{dry}	Berat isi kering (ton/m^3)

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