Flakiness index lab report

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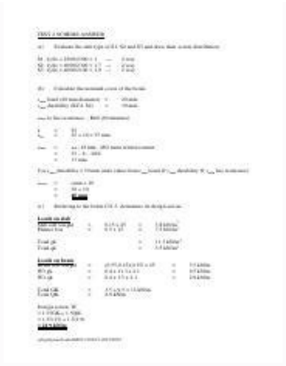

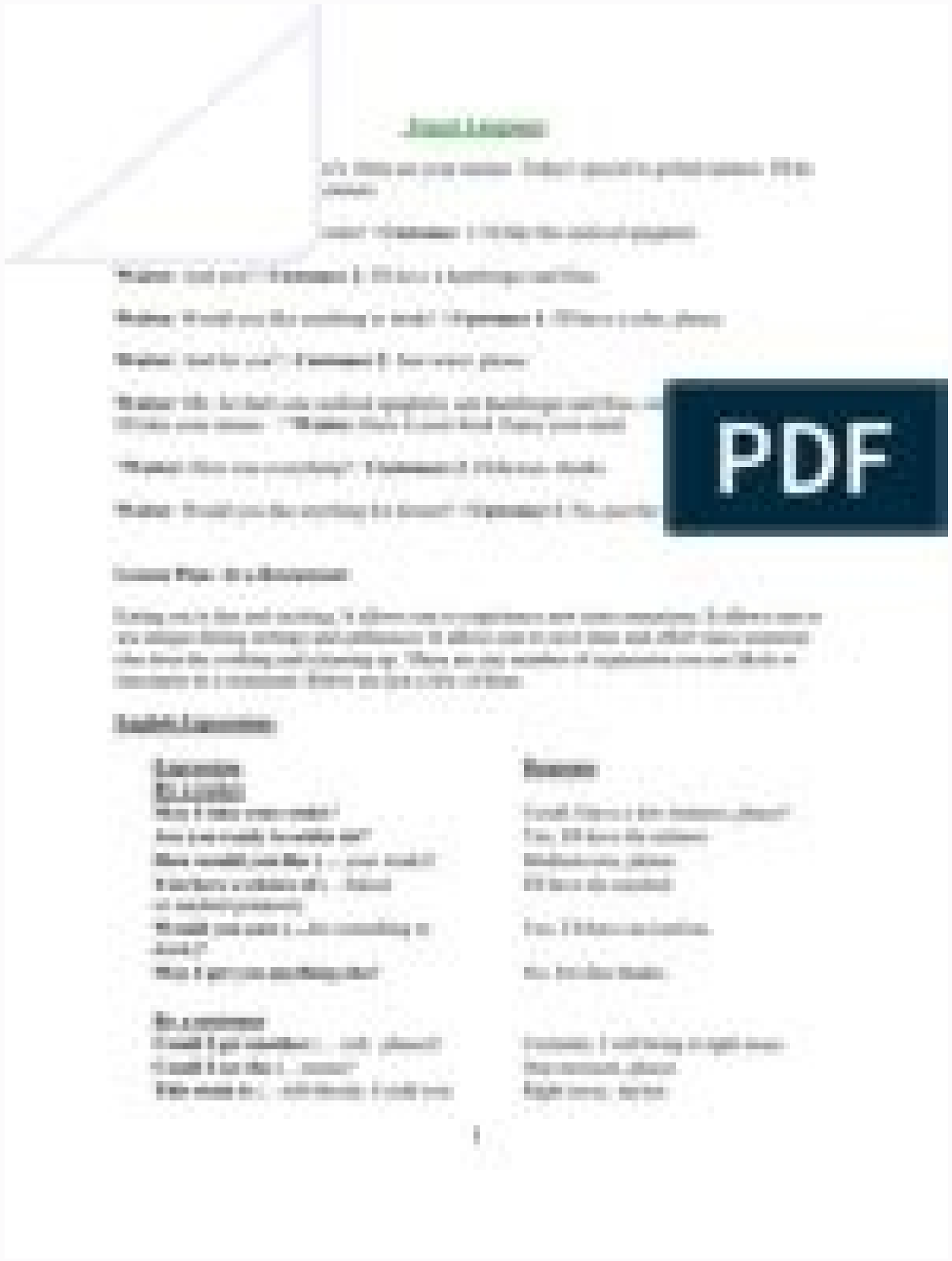

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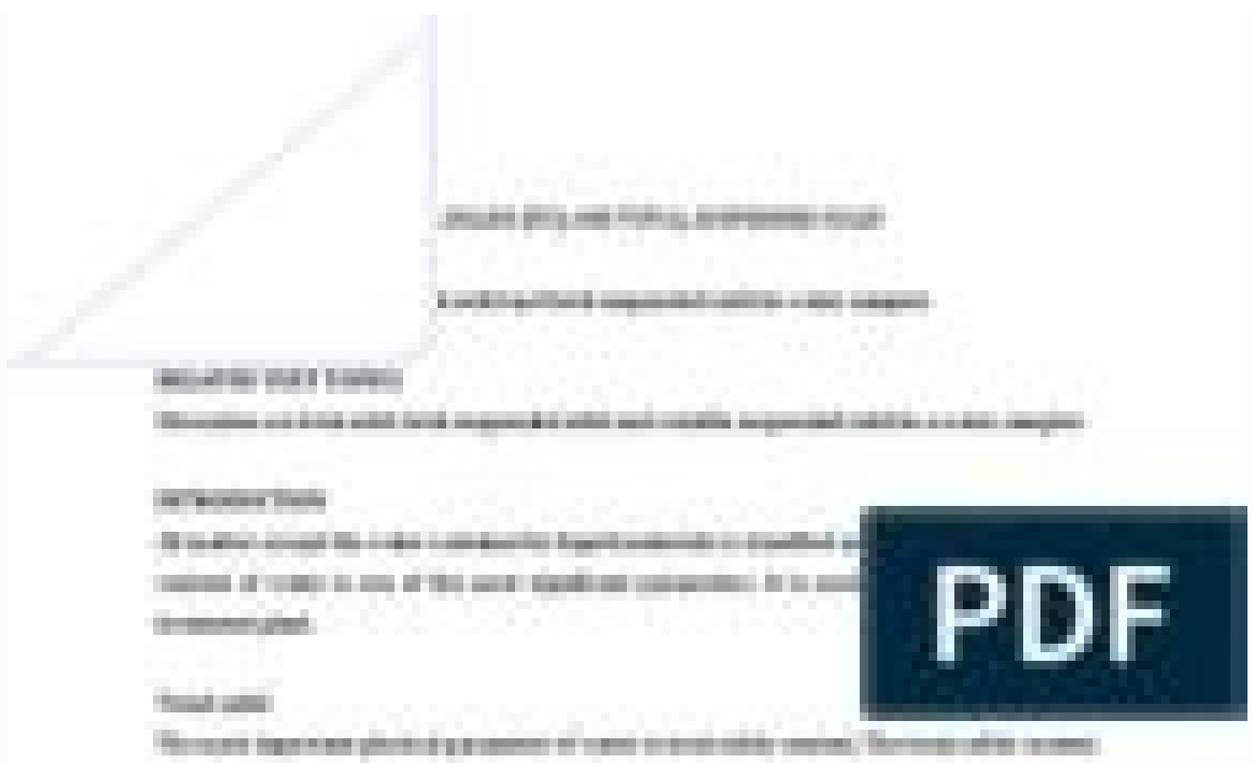
AGGREGATE SHAPE TEST
(FLAKINESS INDEX & ELONGATION INDEX)

1.0 INTRODUCTION

2.0 OBJECTIVE

3.0 FLAKINESS INDEX



Flakiness index and elongation index test lab report. Flakiness index test lab report pdf. Flakiness index test lab report pdf politeknik. Why flakiness index test is done. How to determine flakiness index. Flakiness index test result. Determination of flakiness index lab report. What is flakiness index test.

HomeAggregatesFlakiness Index and Elongation Index Test on Coarse Aggregate, Shape Test of Aggregate The flakiness index of aggregate is defined as the percentage by mass of particles (stones) in it whose least dimension (thickness) is less than three-fifths of their average dimension. The elongation index of aggregate is defined as the percentage by mass of particles (stones) in it whose greatest dimension (thickness) is greater than one and four-fifths of their average dimension. Why is Flakiness and Elongation Index Test on Aggregate Done? Flakiness index of aggregate test is conducted on coarse aggregates sample to estimate the shape of aggregates. For cement concrete types and base coarse and bituminous-construction, the presentence of flaky and elongated aggregate particles are considered undesirable as they may cause inherent weakness with possibility of breaking down under heavy loads. Thus, evaluation of shape of the aggregate particles, particularly with reference to flakiness and elongation is necessary. The flakiness index of an aggregate sample is found by separating the flaky aggregates by sieving. Flakiness index is expressed as their weight as a percentage of the weight of the sample tested. The Elongation index of an aggregate sample is found by separating the elongated aggregates by sieving. Elongation index is expressed as their weight as a percentage of the weight of the sample tested. The test flakiness index of aggregate is not applicable to the materials passing through the 6.30 mm IS test sieve or retained on the 63.00 mm IS test sieve while the test elongation index of aggregate is measured on particles passing through IS sieve size of 63mm and retained on IS sieve size of 6.3 mm. Hi friends, you are welcomed in the world of Civil Allied Gyan. Here I have explained about the flakiness and elongation index test of coarse aggregate. Read definition, apparatus, IS code, procedure, observations, formula, result, lab report about flakiness and elongation index test of coarse aggregate. Save in pdf. Thickness gauge Length Gauge Weighing balance Gauging trowel Sieves IS: 2386 (Part 1)–1963, Method of test of aggregates for formation of concrete IS: 383–1970, Specification for coarse and fine aggregate from natural source for formation of concrete Sieve the aggregate sample with sieves specified in Table 1. Take sufficient quantity of aggregate to provide the minimum number of 200 pieces of any fraction to be tested. Then to separate the flaky materials, gauge each fraction for thickness on a thickness gauge of the pattern shown in Fig 1 or in bulk on sieves having elongated slots. The width of the slot used in the thickness gauge or sieve should be of the dimensions specified in column 4 of Table 1 for the appropriate size of material. Weigh the total amount of flaky material passing the gauge to an accuracy of at least 0.1 percent of the weight of the test sample. Sieve the aggregate sample with sieves specified in the given Table 2. Take sufficient quantity of aggregate to provide the minimum number of 200 pieces of any fraction to be tested. Then to separate the elongated materials, gauge each fraction in tum for length on a length gauge of the pattern shown in Fig 2 or in bulk on sieves having flaky slots. The length gauge, used in the test, should be of the dimensions specified in column 4 of Table 2 for the appropriate size of material. Weigh the total amount of elongated aggregate retained by the length gauge to an accuracy of at least 0.1 percent of the weight of the test sample. Calculations and Observations:- Formula for flakiness index of aggregate: X = The weight of material passing through the various thickness gauges and W = The weight of aggregate passing and retained on the specified sieves. Formula for elongation index of aggregate: Y = The weight of materials retained on specified length gauges and W = The weight of aggregate passing and retained on the specified sieves. Table 1: Dimensions of Thickness gauge Table 2: Dimensions of Length gauge Surface texture and aggregate shape influence the properties of freshly mixed concrete more than the properties of hardened concrete. Rough-textured, angular and elongated aggregates require more water to produce workable concrete than smooth, rounded compact aggregates. Consequently, the cement contents must also be increased to maintain the water-cement (W/C) ratio. Generally, flat and elongated aggregate particles are avoided or are limited to about 15 % by weight of the total aggregate. Recommended Values of Flakiness Index and Elongation Index The aggregate shape tests give only a rough idea of the relative shapes of aggregates. Flaky aggregate particles and elongated aggregate particles should be avoided in pavement construction, particularly in surface course. If the flaky aggregate particles and elongated aggregate particles are present in appreciable proportions, then the strength of pavement construction’s layer would be adversely affected due to probability of breaking down under heavy loads. Workability of cement concrete is reduced. IRC recommendations for maximum limits of flakiness index are as given below. Sl. No: Type of pavement Maximum limits of flakiness index, (%) 1 Bituminous carpet 30 2 (i) Bituminous / Asphaltic concrete 25 (ii) Bituminous Penetration macadam (iii) Bituminous surface dressing (single coat, double coats and precoated) (iv) Built up spray grout 15 3 (i) Bituminous macadam Angularity number test of coarse aggregate (shape test of aggregate) Significance of flakiness index and elongation index test of aggregate Thanks for reading this article. Please, don’t forget to share it. Full PDF PackageDownload Full PDF PackageThis PaperA short summary of this paper18 Full PDFs related to this paperDownloadPDF Pack You're Reading a Free Preview Pages 5 to 8 are not shown in this preview. 1. Page | 1 CIVIL ENGINEERING DEPARMENT DCC 3122 HIGHWAY LAB REPORT TITLE DETERMINATION OF ELONGATION INDEXVALUE COURSE / SESSION DCC 3122 – GEOTECHNIC AND HIGHWAY LABORATORY PREPARE BY GROUP GROUP A GROUP MEMBERS 1. AINUNYASMINE BINTI HASLAN 03DKA16F2023 2. MOHD IQBAL NAQIUDDIN BIN ZULKIPLI 03DKA16F2018 3. MOHAMAD AMIR SAIF BIN ABDUL HAMID 03DKA16F1130 4. MUHAMMAD AIZAT BIN ABD RASHID 03DKA16F2021 LECTURER’S NAME 1. PUAN SALMA BINTI YAHYA 2. EN. AHMAD TAZRI BIN AZIZ 3. CIK FAIZAH BINTI HJ. ZAINAL ABIDIN PRACTICAL DATE DECEMBER 12, 2017 SUBMISSION DATE DECEMBER 19, 2017 2. Page | 2 Table of Contents OBJECTIVES .....1 INTRODUCTION ..... 1 THEORY .....1 APPARATUS .....2 PROCEDURE..... 3 RESULT / DATA .....4 CALCULATIONS .....4 DISCUSSION ..... 5 CONCLUSION..... 6 REFFERENCES ..... 7 3. Page | 3 OBJECTIVE To determine the flakiness and elongation indices of the given aggregate sample. INTRODUCTION The particles shape of aggregates is determined by the percentages of flaky and elongation particles. Flaky and elongation particles are considered undesirable as they cause weakness of the pavement. Rounded aggregates are preferred in cement concrete pavements as the workability of concrete improves. Regular shapes of particles are desirable for granular base course due to increased stability desired from better interlocking. When the shape of aggregates deviates more from the spherical shape, as in the case of angular, flaky and elongation aggregate the void content increase and hence the grain size distribution of the aggregates has to be suitable altered in order to obtain minimum voids in the dry mix on the maximum density. THEORY Flakiness index Aggregate particles are classified as flaky when they have a thickness (smallest dimension) of less than 0.6 of their mean sieve size. The flakiness index of an aggregate sample is found by separating the flaky particles and expressing their mass as a percentage of the mass of the sample tested. This test is not applicable to aggregate passing 6.30mm sieve and retained as 63.0mm sieve. Elongation index Aggregate particles are classified as elongation when they have a length (greatest dimension) of more than 1.8 of their mean sieve size. The elongation index is found by separating the elongation particles and expressing their mess as a percentage of the mass of sample tested. The test is not applicable to material passing 6.30 mm sieve or retained on 50 mm sieve. 4. Page | 4 APPARATUS 1. Metal thickness gauge 2. Test sieve size 63mm, 50mm, 37.5mm, 28mm, 20mm, 14mm, 10mm, 6.3mm 3. Digital balance 4. Aggregate sample 5. Page | 5 PROCEDURE 1. The sieve sample with sieves mentioned in Table 7.1. Weight each of the individual size fractions retained on these sieve, other than the 63.0 mm sieve and store them in separate trays marked with their size. 2. Gauge each fraction from the respective slots in the thickness gauge weigh pieces which pass through the slots. 3. Each sample is gauge in turn of thickness on metal gauge. 4. The passing material of each sample is weighed 6. Page | 6 DATA NOMINAL APERTURE SIZE THICKNESS GAUGE 100% PASSING 100% RETAINED MASS PASSING (g) M3 MASS RETAINED (g) 63.0mm 50.0mm 0 0 50.0mm 37.5mm 69.0 0 37.5mm 28.0mm 0 0 28.0mm 20.0mm 0 97.8 20.0mm 14.0mm 11.6 83.6 14.0mm 10.0mm 28 1465.1 10.0mm 6.3mm 54 281.8 TOTAL WEIGHT(g) 114g 1928.3g TOTAL OF ALL WEIGHT(g) M2 2042.3g CALCULATION Flakiness index (%) *MASS PASSING TOTAL WEIGHT X* 100 114 2042.3 *X* 100 = 5.6 % 7. Page | 7 DISCUSSION The Flakiness Index is the mass of particles in that aggregate expressed as a percentage of the total mass of that aggregate which will pass the slot or slots of specified width for the appropriate size fraction. While elongation index test is used to determine the quantity of aggregate particles that are elongated instead of cubicle in shape. In this experiment, flakiness index was used as independent variables and other properties such as gradation are kept constant as far as their properties met the specification required for the asphalt mixture. According to British Standard Institution (BSI-812, 1975)classifies aggregate into six classes that are rounded, irregular, angular, flaky and elongated and elongated. The rounded, irregular and angular for special purpose are group into the category an equidimensional or cuboidal. The aggregate are flaky, elongated, flaky and elongated or equal dimension are determined by the ratio of the shortest, the largest and average diameter of the particles. From the experiment, firstly we separate aggregate sample by sieving into different size fraction, each falling within a narrow size function is essentially a single-size aggregate. The sieve size rage are (20 ± 40) mm, (14 ± 10) mm and (10 ± 6.3) mm. From the data experiment, we made the calculation and discussed by the all group member. When this experiment is doing, we make some experimental error such as when sieving process is being take place. For examples, the aggregate may not trough sieve by machine and some of aggregate we shake manually by hand. Besides, the error do occur when the weighing the amount of aggregate that we need. The careless attitudes that we gauge the particles separating by hand. Maybe we pass the particles to the wrong gauge. It is because we have separate too many particles in the short time. 8. Page | 8 CONCLUSION The value that we get from this test is 5.6% for flakiness and not exceeds 20% the JKR requirement. Aggregate particles are classified as flaky when they have a thickness (smallest dimension) of less than 0.6 of their mean sieve size. The flakiness index of an aggregate sample is found by separating the flaky particles and expressing their mass as a percentage of the mass of the sample tested. As a conclusion, the sample that we tested are flaky, which is there are not suitable to use in parameter design. This will cause the increase of void in the mix. If we use in highway construction, we must doing more compaction to ensure that the void meet the prescribe specification 9. Page | 9 REFERENCE 1. Bambang I., Journal of the Eastern Asia Society for TransportationStudies, Vol. 6, pp. 1302 –1312. Workability and Resilient Modulus Of Asphalt Concrete Mixtures Containing Flaky Aggregates Shape ; 2005.Available from: URL: line/journal_06/1302.pdf 2. Muniandy R., Radin Umar Radin Sohadi. Highway Materials, A Guide Book For Beginners. University Putra Malaysia: Penerbit Universiti PutraMalaysia; 2010.c. 3. Paul H.W., Karen K.D. Highway Engineering [Seventh Edition] . USA:John Wiley & Son; 2003.d. 4. Construction Quality Assurance.Introduction.1(1): [8 screen]. Availablefrom: URL:

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