MATTEST
Engineering Services

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Aggregate Testing

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CONTENTS

BULK DENSITY OF AGGREGATE

IS: 2386 (PART 3) -1996 (RA 2011)

- This standard covers the method of test deals with the procedure for determining unit weight or bulk density of aggregates.

APPARATUS/EQUIPMENT

1. Balance sensitive to 0.5% of the wt. of Sample to be weighed.
2. Cylinder Metal Measure of capacity 3 lit. for FA and 30lit. & 15 lit. for Coarse Aggregate.
3. Tamping rod of 16mm dia. with 60 cm long rounded at one end.

PROCEDURE

- Take representative sample of aggregate as required for the test according to maximum size of aggregate and the container required from Table below.
- Determine the empty weight (M_1) and the volume (V) of the cylinder at27^0C.

SIZE OF CONTAINERS FOR BULK DENSITY

Size of largest particle in mm	Nominal capacity (liters)	Inside diameter cms	Inside Height cms	Thickness of metal in mm
Under 4.75	3	15	17	3.15
Over 4.75 to 40	15	25	30	4.00
Over 40	30	35	31	5.00

COMPACTED WEIGHT

- Fill the container in three equal layers, each layer being subjected to 25 strokes with the rounded end of the tamping rod.
- Struck off the surplus aggregate using the tamping rod as a straight edge and weigh (M_2).

LOOSE WEIGHT

- Over flow the container by pouring the material from a height of not exceeding 5 cms above the top of the cylinder.
- Struck off the surplus aggregate using the tamping rod as a straight edge and weigh (M_3).

CALCULATIONS

- Bulk Density (Compacted), $= \frac{M_2 - M_1}{V}$ Kg/ lit or grams/cc.

- Bulk Density (Loose), $= \frac{M_3 - M_1}{V}$ Kg / lit or grams /cc.

REPORT

- Report the bulk density in Kg/lit or grams/cc to the nearest second decimal.

FLAKINESS AND ELONGATION INDEX TEST

STANDARD: IS: 2386 (Part 1) -1996 (RA 2011)

- This standard covers the method of test lays down the procedure for determining the flakiness index of coarse aggregate.

DEFINITION

- The Flakiness Index of aggregates is the percentage by weight of particles whose least dimension (thickness) is less than 0.6 times their mean dimension.
- The Elongation Index of aggregates is the percentage by weight of particles whose greatest dimension (length) is greater than 1.8 times their mean dimension.

APPARTUS

- Standard thickness gauge.
- Standard length gauge.
- IS sieves 63mm, 50mm, 40mm, 25mm, 20mm, 16mm, 12.50mm,10mm and 6.30mm.
- Balance of capacity 15 kg and sensitivity 1 gram.
- Thermostatically oven controlled with capacity upto250^{0}C.

PROCEDURE

- Take representative sample of aggregates from the stock pile.
- Dry the whole sample in the oven to a constant weight at a temperature of 105 to 110^{0}C and cooling room temperature.
- Sieve the whole sample through the sieves mentioned in the columns (1) and (2) of the Table

FLAKINESS INDEX

- Take minimum of 200 pieces from each fraction and weigh (A).
- Separate flaky material from each fraction by gauging through the standard thickness gauge.
- Weigh the flaky material passing through the specified gauge from each fraction $c_1+c_2+ c_3+ c_4+ c_5+\ldots\ldots\ldots= C$.

CALCULATIONS

- Flakiness index, % = (C / A) X 100

ELONGATION INDEX

- Take minimum of 200 pieces from each fraction and weigh (F).
- Separate the elongated material from each fraction by gauging through the standard length gauge.
- Weigh the elongated material passing through the specified gauge from each fraction $e_1+e_2+e_3+e_4+e_5+\ldots\ldots\ldots=E$.

CALCULATIONS

- Elongation index, % = (E /F) X 100

REPORT

- Report the result obtained to the nearest second decimal.

Dimension of Thickness and Length Gauges			
Size of Aggregate		Thickness Gauge * (mm)	Length Gauge ↑ (mm)
Passing Through IS Sieve	Retained on IS Sieve		
(1)	(2)	(3)	(4)
63 mm	50 mm	33.90	--
50 mm	40 mm	27.00	81.0
40 mm	31.5 mm	21.5	64.4
31.5 mm	25 mm	16.95	--
25 mm	20 mm	13.50	40.5
20 mm	16 mm	10.80	32.4
16 mm	12.5 mm	8.55	25.6
12.5 mm	10 mm	6.75	20.2
10 mm	6.3 mm	4.89	14.7
* This dimension is equal to 0.6 times the mean sieve size ↑ This dimension is equal to 1.8 times the mean sieve size			

COMBINED FLAKINESS AND ELONGATION INDEX

- Take minimum of 200 pieces from each fraction and weigh (A).
- Separate flaky material from each fraction by gauging through the standard thickness gauge.
- Weigh the material retained and passed through the specified gauge from each fraction $b_1+b_2+b_3+b_4+b_5+\ldots\ldots\ldots=B$ and $c_1+c_2+c_3+c_4+c_5+\ldots\ldots\ldots=C$ respectively.
- Take the material retained on the thickness gauge (Non flaky material) and separate the elongated material from each fraction by gauging through the standard length gauge.
- Weigh the material retained on the length gauge from each fraction $d_1+d_2+d_3+d_4+d_5+..=D$.

CALCULATIONS

- Flakiness index (FI),% = (C /A) x100
- Elongation index (EI), %=(D /B)x100
- Combined flakiness and Elongation Index=FI+EI.

REPORT

- Report the result obtained to the nearest second decimal.

PRECAUTIONS

- Take care while taking sample.
- Do not collect selected pieces.
- Collect pieces by only random sampling.

NOTE:

- Flakiness and Elongation test is not applicable for aggregate sizes less than 6.3 mm.

AGGREGATE IMPACT VALUE

STANDARD: 2386 (Part 4) -1996] (RA 2011)

- This standard covers the method for the determining the aggregate impact value of coarse aggregates.

DEFINITION

- Aggregate Impact value is the ratio between the weights of the fines passing 2.36 mm IS sieve and the total sample.

APPARATUS

- Standard Impact Testing Machine.
- Cylindrical steel cup 6.3 mm thick and having internal diameter of 102 mm and depth of 50 mm.
- A straight metal tamping rod of circular cross section 10mm diameter and 230mm long, rounded at one end.
- 12.5 mm, 10mm and 2.36 mm IS sieves.
- Balance of capacity 500gms and sensitivity 0.1 gram.
- Thermostatically controlled oven with capacity up to 250 ^{o}C.

PROCEDURE

- Take representative sample of aggregates passing 12.5 mm IS sieve & retained on 10 mm IS sieve.
- Keep the sample in the oven for a period of four hours till the time the weight becomes constant at a temperature of 105 to 110 ^{O}C and cool to room temperature.
- Fill the cup in three equal layers, each layer being subjected to 25 strokes with the rounded end of the tamping rod.
- Struck off the surplus aggregates using tamping rod as a straight edge.
- Determine the net weight (A) of the aggregate in the cup.
- Now transfer the material in to the cup of Impact machine, which is fixed firmly in position.
- Compact the material in the cup by a single tamping of 25 strokes with the tamping rod.
- Subject the test sample to a total of 15 blows by the hammer (weighing 13.50 Kg to 14Kg) of the Impact machine each being delivered at an interval of not less than one second and from a height of 380 $\pm$ 5 mm above the upper face of the aggregate.
- Remove the crushed aggregates from the cup and sieve the whole sample on the 2.36mm IS sieve till no further significant amount passes through the sieve in one minute & weigh (B).
- Weigh the material that has passed through the sieve (C).
- If the total weight (B+C) is less than the original weight (A) by more than one gram, discard the result and conduct a fresh test

CALCULATIONS

- Aggregate Impact Value, (%) = $\frac{C}{A} \times 100$

A = Original weight of the oven dried sample.

C = Weight of the material passing through IS sieve 2.36mm.

REPORT

- Report the individual and the mean results to the nearest second decimal.

PRECAUTION

- Care shall be taken that the Impact machine shall rest without wedging or packing upon the level plate, block or floor, so that it is rigid and the hammer guide collars are vertical.

ABRASION VALUE TEST OF AGGREGATE

STANDARD: 2386 (Part 4) -1996] (RA 2011)

- This standard covers the method for the determining the aggregate abrasion value of coarse aggregates.

APPARATUS

- Abrasion Testing Machine
- Abrasion charge of dia approximately 48 mm and weight (390 – 445) gm.

PROCEDURE

- The Aggregate shall be taken as per the grading of Table 2 in IS: 2386 Part – IV Clause 5.3.3. and kept in oven for 24 hours and weighed (A)
- The sample to be tested shall be put in Abrasion Testing Machine and the number of abrasive charge shall be put according to the grading requirement of the aggregate
- The machine shall be allowed to rotate for 500 revolutions for grading A, B, C, D and 1000 revolutions for grading E, F and G
- After the completion of the test, the sample shall be taken out of the machine and sieved thro' 1.7 mm sieve (B).

CALCULATIONS

- Aggregate Abrasion Value, (%) = $\frac{B}{A} \times 100$

AGGREGATE CRUSHING VALUE

STANDARD: 2386 (Part 4) -1996] (RA 2011)

- This standard covers the method for the determining the aggregate crushing value of coarse aggregates.

APPRATUS

- Compression Testing Machine
- Calibrated Sieves of size 12.5mm ; 10mm ; 2.36mm
- Balance readable to an accuracy of 1 gm
- Measuring cylinder of dia 11.5 cm and ht 18 cm
- Tamping Rod of 16mm dia and 45 to 60 cm long

TEST SAMPLE

1. Take approximately 6.5 kg of sample which is passing through 12.5 mm and retained in 10mm sieve
2. Now fill the sample in the measuring cylinder in three layers, each layer being tamped 25 times
3. Now level the sample in the measuring cylinder
4. Note down the weight of the Sample (A)

PROCEDURE

1. Fix the Crushing Cylinder in the base plate and put the weighed sample in the mould in 3 layers and tamp for 25 strokes in each layer.
2. Keep the plunger in position on top of the aggregate.

3. Place the sample in Compression Testing Machine, Centre it and apply a uniform load of 40T reached in 10 minutes.
4. Release the load. Take the sample out of the mould and sieve through 2.36mm.
5. The fraction passing through 2.36mm sieve shall be noted down (B).
6. Calculate the crushing value of the Aggregate by using the formulae
$$\frac{B}{A} \times 100$$
7. Two trials shall be done and the mean value to be reported.

SPECIFIC GRAVITY AND WATER ABSORPTION OF AGGREGATE

STANDARD: 2386 (Part 3) -1996] (RA 2011)

- This standard covers the method for the determining the specific gravity, apparent specific gravity and water absorption of aggregates.

DEFINITION

- Specific gravity is the ratio of the mass of a given volume of the substance to the mass of an equal volume of water.

APPARATUS

1. Balance of capacity not less than 3 kg with accuracy of 0.5 gm
2. Oven to maintain a temperature of 100 to 110^{o}C
3. Pycnometer of about 1 L capacity
4. Tray for drying the sample

PROCEDURE

1. Keep the sample to be tested in water for 24 ± ½ hour and remove the entrapped air by gentle agitation
2. After 24 hours drain the water and being the sample to saturated surface dry condition
3. Take about 1 kg of sample and note down the weight (A)
4. Place the aggregate in the Pycnometer and fill it with distilled water and entrapped air shall be eliminated by gently rotating the Pycnometer
5. The Pycnometer shall be topped with distilled water till the water in the hole is flat

6. Note down the weight (B)
7. The contents in the Pycnometer shall be emptied and the samples transferred to a metal tray. Care should be taken that there should not be any wastage of sample while transferring.
8. The contents in the Pycnometer shall be emptied and the samples transferred to a metal tray. Care should be taken that there should not be any wastage of sample while transferring
9. The Pycnometer shall now filled with distilled water as before fill the water in the hole is flat.
10. Note down the weight (C)
11. The sample kept in the tray should be kept in oven for 24 ± ½ hour at 110°C
12. Take the sample from the oven and cool it to room temperature
13. Note down the weight of aggregate (D).

CALCULATIONS

- Now calculate the Specific gravity and Water absorption from the formulae given below:

$$\text{Specific gravity} = \frac{D}{A - (B-C)} \qquad \text{Water Absorption (\% of dry weight)} = \frac{A - D}{D} \times 100$$

REPORT

- Report the individual and the mean results to the nearest second decimal.

PRECAUTION

- The difference in temperature of the water in the pyconometer during the first and second weighing shall not exceed 2 ^{0}C.

SOUNDNESS OF AGGREGATES

STANDARD: IS: 2386 (Part 1) -1996 (RA 2011)

- This standard covers the method of test deals with the procedure for determining the soundness of aggregates.

APPARATUS

- Sieves of size 80mm, 63mm, 50mm, 40mm, 31.50mm, 25mm, 20mm, 16mm, 12.50mm, 10mm, 8mm, 4.75mm, 4mm, 2.36mm, 1.18mm, 600microns, 300microns and 150 microns with square openings conforming to IS:460-1962.
- Containers for immersing the samples shall be perforated so as to permit free access of the solution from the sample and drainage of the solution from the sample without loss of aggregate.
- Arrangements shall also be available to ensure that the volume of the solution in which samples are to be immersed shall be at least five times the volume of the sample immersed at any one time.
- Balance of capacity 500 gm sensitivity to 0.01 gm
- Balance of capacity 10 kg sensitivity to 1 gm.
- Thermostatically controlled oven capable of being maintained at 105^0 to 110^0C.
- The rate of evaporation, at this range of temperature shall be at least 25gm/hour for four hours which period the doors of the oven kept closed.

SODIUM SULPHATE SOLUTION

- Prepare saturated solution of sodium sulphate technical grade, conforming to IS:255- 1950 or an equivalent grade of the salt of either the a hydrous (Na2SO4) or the crystalline (Na2SO4.10 H2O) form in water at temperature of 25 to 30^0C.
- For making of the solution, 420gms of a hydrous salt or 1300 gm of decahydrate salt per liter of water are sufficient for saturation at 28^0C.
- The mixer shall be thoroughly stirred during the addition of salt and the solution shall be stirred at frequent intervals until used.

- The solution shall be cooled to a temperature of 27 ± 2^0C and maintained at that temperature for at least 48 hours before use.
- Salt cakes if any shall be broken and specific gravity of the solution shall be determined.
- When used, the solution shall have specific gravity of 1.151 to1.174.
- Discoloured solution shall be discarded, or filtered and checked again for specific gravity.

Fine Aggregates

- ❖ An aggregate passing 4.75 mm IS Sieve shall be considered as fine aggregates.
- ❖ Sample shall be of such size that it will yield not less than 100 gm of each of the sizes shown in Table 6.7.1.

Coarse Aggregates

- ❖ Aggregates of size more than 4.75mm shall be considered as coarse aggregates.
- ❖ Sample shall be of such size that it will yield not less than following amounts of different sizes, mentioned in Table below which shall be available in amounts of 5% or more.

Table 6.7.1

Passing IS sieve	Retained on IS sieve
600 microns	300 microns
1.18 mm	600 microns
2.36 mm	1.18 mm
4.75 mm	2.36 mm

Table 6.7.2

10 mm to 4.75 mm	300 gm
20 mm to 10 mm	1000gms
12.5 mm to 10 mm	33%
20 mm to 12.5 mm	67%
40 mm to 20 mm	1500 gm

25 mm to 20 mm	33%
40 mm to 25 mm	67%
63 mm to 40 mm	3000 gm
50 mm to 40 mm	50 %
63 mm to 50 mm	50 %
80mm and larger sizes by 20mm spread in sieve size, each fraction	3000 gm

All in Aggregates

- Separate all in aggregates in to two major fractions such as smaller than 4.75 and coarser than 4.75.
- The former shall be dealt as fine aggregates and the latter as coarse aggregates.

Preparation of Test Sample Fine Aggregates

- Thoroughly, wash fine aggregates on 300 micron IS sieve and dry to constant weight at 105^0 to 110^0C & separate in to different sizes through the sieves mention in Table 6.7.1

Coarse Aggregates

- Thoroughly wash and dry aggregates to a constant weight in an oven at a temperature of 105^0 to 110^0 C.
- Separate in to desired fraction by sieving through the sieves mention in Table: 7.5.2.
- Weigh the required size of fraction and place in to separate containers.
- In the case of fraction coarser than 20 mm the number of particles shall also be counted.

PROCEDURE

Storage of Sample in Solution

- Immerse the samples in the prepared solution of sodium sulphate for not less than 16hrs not more than 18hrs in such a manner that solution covers the sample to a depth of at least 15 mm.

- Cover the containers to reduce the evaporation & to prevent accidental condition of extraneous substances.
- The temperature in the solution shall be maintained within 27 $\pm$ 1^{0}C throughout the immersion period.
- After the immersion period remove the aggregates from the solution and permit to drain for 15 $\pm$ 5 minutes and place in the oven at a temperature of 105 to 110^{0}C until it attains a constant weight.
- During this period remove the aggregates from the oven cool to room temperature and weigh at intervals not less than 4 hours not more than 18hours.
- Constant weight may consider to have been achieved when two successive weights for any one sample shall not differ by more than 0.1gram for fine aggregates and 1gram for coarse aggregates.
- After the constant weight has been achieved remove the aggregates from the oven and cool to room temperature.
- Again immerse the aggregates in solution for next cycle and repeat the same procedure as described above.
- The number of cycles to be conducted shall be as per specifications.
- After the completion of the final cycle cool the sample and wash the sample free from sulphate.
- This may be determined when there is no more reaction of the washed water with barium chloride. (When there is no white precipitation when barium chloride is added to washed water, it can be said that there is no sulphate with washed water)
- Dry each faction of sample in an oven at a temperature of 105 to 110^{0}C to constant weight and weigh.
- Sieve the fine aggregates over the same sieve on which it was retained before the test.
- Sieve the coarse aggregates over the sieves of sizes shown in Table 7.4.3 for appropriate size of particle.

Table 6.7.3

Size of aggregates	Sieve Size used to determine loss
63 to 40 mm	31.50 mm

40 to 20mm	16 mm
20 to 10mm	8 mm
10 to 4.75 mm	4 mm

- Examine visually each size of aggregates to see if there is any evidence of excessive splitting, crumbling or disintegration of the grains.
- Conduct a combined sieve analysis of all the material subject to the above test to note the variation from the original grain size analysis of the sample.

REPORT

Report the following particulars in the test result

1. Type of solution used.
2. Weight of each fraction of sample before test.
3. Material from each fraction of the sample finer than the sieve on which the fraction was retained before test, expressed as a percentage by weight of fraction.

SILT CONTENT (FINE AGGREGATE)

STANDARD: IS: 2386 (Part 1) -1996 (RA 2011)

- This standard covers the method of test deals with the procedure for determining the total quantity of material finer than 75-micron IS sieve in aggregates by washing.

APPARATUS/EQUIPMENT

- The apparatus required for the test is as follows:

1. The balance or scale shall be of sufficient capacity and sensitivity and shall have an accuracy of 0.1 percent of the weight of test sample.
2. Sieves-A nest of two sieves, the lower being 75-micron IS Sieve and the upper approximately 1.18 mm IS Sieve.
3. Container-A pan or vessel of a size sufficient to contain the sample covered with water and to permit of vigorous agitation without loss of any part of the sample of water.
4. Oven-An oven of sufficient size capable of maintaining a uniform temperature of 110°C ± 5°C.

TEST SAMPLE:

- The weight of sample available shall not be less than the weight.

Maximum Nominal Size of Aggregates (mm)	Approximate minimum weight of sample (gm)
4.75	500
10.0	2000
20.0	2500
40 or over	5000

PROCEDURE

1. The test sample shall be dried to constant weight at a temperature of 110°C±5°C and weighed to the nearest 0.1 percent.

2. The dried and weighed sample shall be placed in the container and sufficient water is added to cover it. Then the contents of the container are agitated vigorously.
3. The agitation shall be sufficiently vigorous such that the coarse particles are separated and the fine particles are brought into the suspension.
4. The water (mixed with fine particles) shall be poured over the nested sieves arranged with the coarser sieve at the top.
5. All materials retained on the both the sieves shall be container containing coarser particles.
6. Steps 3, 4 & 5 are repeated till the wash water looks clear. Care should be taken such that no materials retained on the sieve get lost.
7. The retained materials should be dried to a constant weight at a temperature not exceeding 110°C and weighed to the nearest 0.1 percent.

CALCULATION:

- The amount of material passing the 75-micron IS Sieve shall be calculated as follows:

$$A = \frac{(B-C)}{C} \times 100$$

Where A = percentage of material finer than 75-micron,

B = original dry weight, &

C = dry weight after washing

TEN PERCENT FINES VALUE OF FINE AGGREGATE

STANDARD: IS: 812 (Part 3) -1990

DEFINITION

- Ten percent fines value is defined as the load taken by the soaked sample at ten percent of fines.

APPARATUS

- Standard Compression Testing Machine.
- A cylindrical metal measure having an internal diameter of 57 $\pm$ 1 mm and an internal depth of 90 $\pm$ 1 mm.
- Steel cylinder open ended with plunger and base plate with a normal internal diameter of 75 mm.
- Straight steel rod of circular cross section 8mm diameter and 300mm long, one end shall be rounded.
- Balance of capacity 15Kg and sensitivity 1gram.
- 14 mm, 10 mm and 2.36 mm IS test sieves.
- Thermostatically controlled oven with capacity up to 250 ^{0}C

PROCEDURE

1. Take approximately 15kg of sample passing through 14mm and retained on 10mm sieves.
2. Place the test specimen in the wire basket and immerse it in the water with a cover of at least 50mm of water above the top of basket.
3. Immediately after immersion remove the entrapped air from the sample by lifting the basket 25mm above the base of container and allowing it to drop 25 times at the rate of one drop per second.
4. Keep the basket and aggregates completely immersed in water for a subsequent period of 24 $\pm$ 2 hours and the temperature of water maintained at 20 $\pm$ 5 ^{0}C.
5. Remove the specimen of aggregates from the basket after the specified period of soaking and blot the free water from the surface of the material with the absorbent cloths.
6. Immediately place the test specimen in to the cylinder in three layers

each layer being subjected to 25 blows from the tamping rod distributed evenly over the surface of the layer and dropped from a height of 50mm above the surface of aggregates.

7. Carefully level the surface of the aggregates and insert the plunger so that it rests horizontally on the surface.
8. Place the apparatus with the test specimen and plunger in position between the platens of the testing machine.
9. Apply load at a uniform rate to cause a total penetration of the plunger in 10 min $\pm$ 30 seconds and record the maximum load applied to produce the required penetration.
10. Replace the load and remove the crushed material by holding the cylinder over a clean tray.
11. Dry it in the oven at a temperature of 105 $\pm$ 5 0C either to constant mass or for a period of 24 + 1/2 hours.
12. After specified period of time remove the aggregates from the oven and allow the material to cool, weigh and record the mass of the aggregates (m1).
13. Sieve the whole of the specimen in the tray on the 2.36mm sieve until no further significant amount passes during a further period of 1min.
14. Weigh and record the masses of the fraction passing (m2) and retained (m3) on the sieve to the nearest gram.
15. The total mass (m2+m3) should not differ from the initial mass (m1) by more than 10 grams otherwise discard the test and start a fresh test.
16. Repeat the complete test procedure for other three or more samples with the same of the aggregates at different loads that gives a percentage fines value within the range of 7.50% to 12.50%.

CALCULATION:

- Percentage of material passing, $P = \frac{m_2}{m_1} \times 100$

REPORT

- Plot the graph representing load on Y-axis and percentage of fines on X-axis.
- Draw an average line through the plotted points.
- Record the load at ten percent fines from the graph.

PRECAUTION

- Care shall be taken to
- Ensure that the plunger does not jam in cylinder while applying load.

PARTICLE SIZE DISTRIBUTION (COURSE & FINE AGG)

STANDARD: IS: 2386 (Part 1) -1996 (RA 2011)

- This standard covers the procedure for the determination of Particle size distribution of Fine & Coarse and all-in-aggregates by sieving or screening.

APPARATUS/EQUIPMENT

1. Sieves- Sieves (Conforming to IS:460-1962) of size 40mm, 20mm, 12.5mm, 10mm, 4.75mm, 2.36mm, 1.18mm, 600 micron, 300 micron & 150 micron.
2. The balance or scale shall be such that it is readable and accurate to 0.1 percent of weight of the test sample.

TEST SAMPLE

- The weight of the sample available shall not be less than the weight given in the table below. The sample for sieving shall be prepared from the larger sample either by quartering or by means of sample divider.

Maximum Size present in Substantial proportions (mm)	Minimum weight of sample required for quartering (Kg)
20	25
10	6
6.3	3

- Minimum weight of sample required for Sieve analysis after Quartering shall be as follows.

Maximum Size present in Substantial proportions (mm)	**Minimum weight of sample required for Sieve analysis (Kg)**
20	2.0
10	0.5
4.75	0.2

PROCEDURE

1. Bring the sample to an air-dry condition before weighing and sieving.
2. Weigh the air-dry sample and sieve successfully on the appropriate sieves starting with the largest.
3. Each sieve shall be shaken separately over a clean tray until not more than a trace passes, but in any case for a period of not less than 2 minutes.
4. Shake with a varied motion so that the material is kept moving over sieve surface in frequently changing directions.
5. Light brushing of the underside of sieve with a soft brush may be used to clear the sieve openings.
6. On completion of sieving the material retained on each sieve together with any material cleaned from the mesh, shall be weighed.
7. Bring the sample to an air-dry condition before weighing and sieving.
8. Weigh the air-dry sample and sieve successfully on the appropriate sieves starting with the largest.
9. Each sieve shall be shaken separately over a clean tray until not more than a trace passes, but in any case for a period of not less than 2 minutes.
10. Shake with a varied motion so that the material is kept moving over sieve surface in frequently changing directions.
11. Light brushing of the underside of sieve with a soft brush may be used to clear the sieve openings.
12. On completion of sieving the material retained on each sieve together with any material cleaned from the mesh, shall be weighed.

RESULT

The results shall be calculated and reported as:

a) The cumulative percentage by weight of the total sample passing each of the sieves, to the nearest whole number or

b) The percentage by weight of the total sample passing one sieves and retained on the next smaller sieve, to the nearest 0.1 percent.