

Experiment no.3 : Quartering Dividing Method for Aggregate.

Purpose of Experiment: reduction the size sample to provide a laboratory sample from the bulk sample.

Specifications: Iraqi Specifications (IQS No.29/1987). (Method for Sampling Aggregate Fillers and Rock Used in Construction)

Equipment and Materials:

1. Scoop (Shovel)
2. Materials (sand or gravel)
3. plastic sheet

Test Procedure:

1. Mix the main sample on plane surface by using a scoop , in the case of the fine aggregate, dampened in order to avoid segregation.
2. The main sample formed into a cone and then turned over to form a new cone, this is repeated three.
3. The material deposited at apex of the cone so as to evenly distributed round the circumference of cone
4. The final cone is flattened by pressing with scoop and divided into approximately equal quarters
5. One pair of diagonally opposite quarters is discarded, and the remainder forms the sample for testing.
6. If the sample still too large, The process can then be repeated to further reduce the sample size.

Experiment no.4 : Riffling Dividing Method for Aggregate.

Purpose of Experiment: reduction the size sample to provide a laboratory sample from the bulk sample.

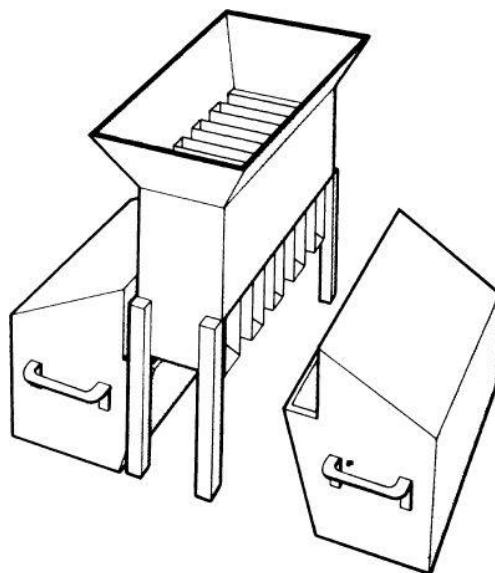
Specifications: Iraqi Specifications (IQS No.29/1987). (Method for Sampling Aggregate Fillers and Rock Used in Construction).

Equipment and Materials:

1. Scoop (Shovel)
2. Riffler (box with a number of parallel vertical divisions , alternate ones discharging to the left and to the right)
3. Materials (sand or gravel)

Test Procedure:

1. Mix the main sample thoroughly on plane surface by using a shovel, in the case of the fine aggregate, must be surface dry.
2. The main sample is discharged into riffler over its full width .
3. The two halves are collected in two boxes at the bottom of the chutes on each side .
4. On half is discarded , and riffling of the other half is repeated until the sample is reduced to the desired size.



Experiment no.5 : Sieve Analysis of fine Aggregates.

Purpose of Experiment: Determination of the particle size distribution of fine aggregates by sieving.

Specifications: Iraqi Specifications (IQS No.30/1984).
(Determination of Particle Size and of fine Aggregates). **ASTM C33**

Sieve Size (mm)	Grading zone 1	Grading zone 2	Grading zone 3	Grading zone 4
10 mm	100	100	100	100
4.75 mm (No.4)	90-100	90-100	90-100	95-100
2.36 mm (No.8)	60-95	75-100	85-100	95-100
1.18 mm (No.16)	30-70	55-90	75-100	90-100
600 µm (No.30)	15-34	35-59	60-79	80-100
300 µm (No. 50)	5-20	8-30	12-40	15-50
150 µm (No.100)	0-10	0-10	0-10	0-15

Equipment and Materials:

1. Weight instrument
2. Standard sieves for grading of fine aggregates (10 mm, 4.75mm, 2.36mm, 1.18mm, 600 µm, 300 µm, 150 µm and pan).
4. Vibrating sieving machine.
5. Drying oven (100-110)
6. 500 g fine aggregate.

Test Procedure:

1. Reduction the size sample of aggregate by quartering or riffing method, the aggregate should be surface dry.
2. Arrange the sieves (the larger at top and the finer in the bottom).
3. Put the test sample on the larger sieve and then put the sieves on sieving machine and starting the sieving process.
4. Compute the percent of material retained on each sieve and the percent of material that passes through each sieve size as below table(fine aggregate Sieve Analysis for example) .

Example of Sieve Analysis

Sieve size	Wt. retained	% retained	% Accumulative retained	% Accumulative passing
10mm	0	0	0	100
5mm	6	$(6/307)*100=2$	2	$100-2=98$
2.36mm	31	10.1	12	88
1.18mm	30	9.8	22	78
0.6mm	59	19.2	41	59
0.3mm	107	34.9	76	24
0.15mm	53	17.3	93	7
0.075mm	21	6.8	---	
	Total= 307		Total=246 Fineness Modulus=2.46	

Fineness Modulus:

The sum of the Accumulative percentages retained on the sieves of standard series (150, 300,600, 1.18, 2.36. 5 and up to largest sieve) used divided by 100.