

R & R Experiment Organization, Inc.

160 Kendal Avenue

Toronto, Ont. M5R 1M3

January 27, 2017

Mr. Hamdy Elarabi,

Southwest Aggregate Supply Ltd.

56729 Third Line

Markham, Ont. L2P 7B9

Dear Mr. Elarabi,

Grain Size Distribution and Sieve Analysis

On January 20, 2017, a sieve analysis was performed in the laboratory to explore the different mass retains of sand for each sieve size. This examination took place in order to compare our final total mass of sand to our initial mass by calculating the percentage passing.

Yours sincerely,

Youssef Chokre

Laboratory Technician

Signature 

Lab Report

Grain Size Distribution and Sieve Analysis

Specification:

According to the textbook “Highway Materials, Soils and Concrete” written by Harold N. Atkins, there is a specification for this lab on page 139-142.

Textbook description: 4th edition. New Jersey: Pearson Education, 2003. Print.

Procedure:

- Put ourselves into a group of 5 laboratory technicians
- Collected a sample of sand with a bowl and used a scale to weigh it's mass (509.1 g)
- Acquired different sieve sizes and cleaned them with the appropriate brush
- Poured our collected sample of sand into our different sieve sizes
- Placed our sieves in a shaker and set the intensity on high for 5 minutes then removed them from the shaker
- Went through each different sieve size individually and collected there remaining sum of sand then weighed it's mass on a scale using a bowl
- Took notes of all results and compared our total mass of sand to our original mass

Sample Description:

The examined sample of sand had an initial mass of 509.100g. The sample of sand had various different colours including white, grey and a primary colour of light brown. The shape of the grains were not very angular but mostly rounded and had a rough texture. The grains were uniform graded. The sample of sand had no hardness to it and would be classified as a #1 in the Moh's scale chart.

Data and Calculations:

Below are the five formulas that were used in this sieve analysis:

- Mass Retained (g) = Sum of the masses weighed from each sieve size
Total Mass Retained = 508.13g
- Percentage Retained (%) = $\frac{\text{Mass Retained}}{\text{Original Mass}} \times 100$
- Cumulative Mass Retained (g) = It's mass retained + the above
- Cumulative Percent Retained (%) = $\frac{\text{Cumulative Mass Retained}}{\text{Original Mass}} \times 100$
- Percentage Passing (%) = 100 – Cumulative Percent Retained

Results:

The results for this lab were very positive. Our group only had a mass loss of 0.97g which is very accurate. Below are the full results for this lab.

- Original Mass = 509.1g
- Mass Lost = 0.97g
- Error = 0.19%
- Mass Retained = 508.13g

Recommendation:

The recommendation for this lab would be to advise the future laboratory technicians to use cleaner sieves since the sieves used for this lab had some aggregates stuck in its mesh. This would allow them to obtain better and more accurate results.

Conclusion:

In conclusion, our group successfully completed our task and established good results with a mass loss of only 0.97g. All in all, our group met the criteria of below 1% error and achieved 0.19% error only.

Appendix

In Lab Data Sheet

Lab Technicians: Youssef Chokre

Ryan Ruassel

Froncwon Prei

Jida Wong

Date: Fri, Jan 20th, 2017

Lab Section: NJJ

Laboratory Dry Sieve Analysis					
Sieve Opening (mm)	Mass Retained (g)	Percentage Retained (%)	Cumulative Mass Retained (g)	Cumulative Percentage Retained (%)	Percentage passing (%)
9.500	0	0	0	0	100
4.750	0	0	0	0	100
2.360	0	0	0	0	100
1.180	21.04	4.13	21.04	4.13	95.87
0.600	198.67	39.02	219.71	43.16	56.85
0.300	228.41	44.87	448.12	88.02	11.98
0.150	53.73	10.55	501.85	98.58	1.43
0.075	4.59	0.90	506.44	99.48	0.53
-	1.69	0.33	508.13	99.81	-

Notes: Original Mass = 509.1g

Mass Retrieved = 508.13g