

Report #4

Particle Size Analysis of Soils

Report by

[]

Experiment Date [- - 20]

Submission Due Date [- - 20]

[This report contains the following outlines

1. The title;
2. Measurements and calculations;
3. Discussion &
4. References]

[This work was supervised by

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Note for student: please do not write below this line

Report was marked by _____

Maximum attainable mark _____

Report's mark _____

Notes for student (if any):

Name..... Group No..... Date Time.....

Visual description of soil:

This test is conducted in accordance with **ASTM D 422** "Standard Test Method for Particle-Size Analysis of Soils".

1. General information

	Sample No.	
Are there any material excluded from the test specimen?	No/ Yes*	
Hydrometer type	151H or 152H	
For hydrometer analysis, separation was made on sieve No.	(4,10, 40 or 200)	
A mechanically operated or Air-Jet Dispersion apparatus used for dispersion		
Specific gravity		

2. Measurements and calculations

2.1 Sieve analysis

Total weight (g)	Sieve No. (mm)	Retained (g)	% Retaining	% Passing
	3-in. (75-mm)			
	1 1/2-in. (37.5)			
	1-in. (25.0)			
	3/4-in. (19.0)			
	3/8-in. (9.5)			
	4 (4.75)	4 (4.75)		
	8 (2.35)	10 (2.00)		
	16 (1.18)	20 (0.85)		
	30 (0.60)	40 (0.425)		
	50 (0.30)	60 (0.25)		
	100 (0.15)	140 (0.106)		
	200 (0.075)	200 (0.075)		
	Pan			



2.2 Hydrometer analysis

2.2.1 Determination of Composite Correction for Hydrometer Reading

Temp. <i>t</i> (°C)	Hydrometer reading <i>r</i>	<i>c</i> (H152)= <i>r</i> -0	<i>c</i> (H151)= <i>r</i> -1	Weight of oven-dry soil <i>w</i> (g)	α (Hydrometer 152H), Table 1 ASTM D422
<i>A</i>				<i>W</i> = <i>w</i> /% passing the separation sieve*100	<i>G</i> ₁ (Hydrometer 151H)
Composite correction (<i>c</i> = <i>A</i> * <i>t</i> + <i>B</i>)					
c values can be obtained directly from the composed correction graph					1

$$P\%_{152H} = (R \alpha / W) \times 100$$

$$P\%_{151H} = [100000 / W \times G / (G - G_1)] (R - G_1)$$

$$L(\text{cm})_{152H} = 16.3 - 0.164(R)$$

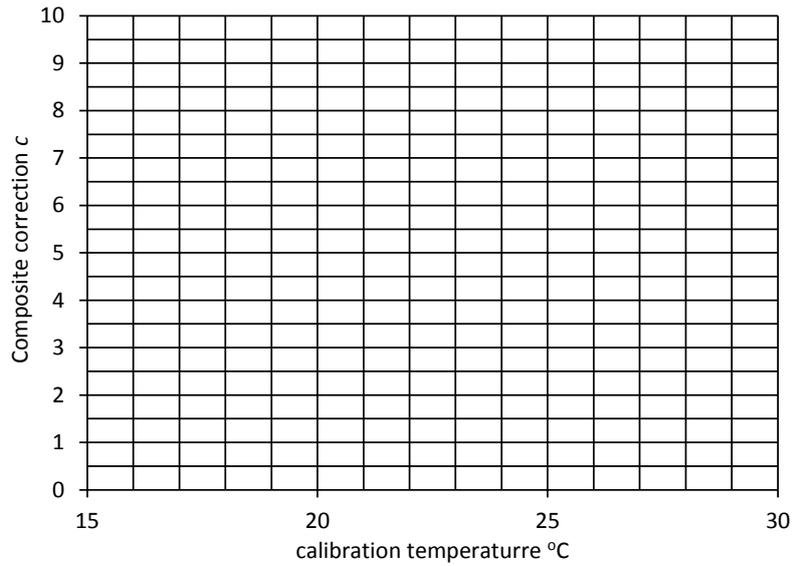
$$L(\text{cm})_{151H} = 16.3 - 264.5(R)$$

$$D(\text{mm}) = K \sqrt{L/T}$$

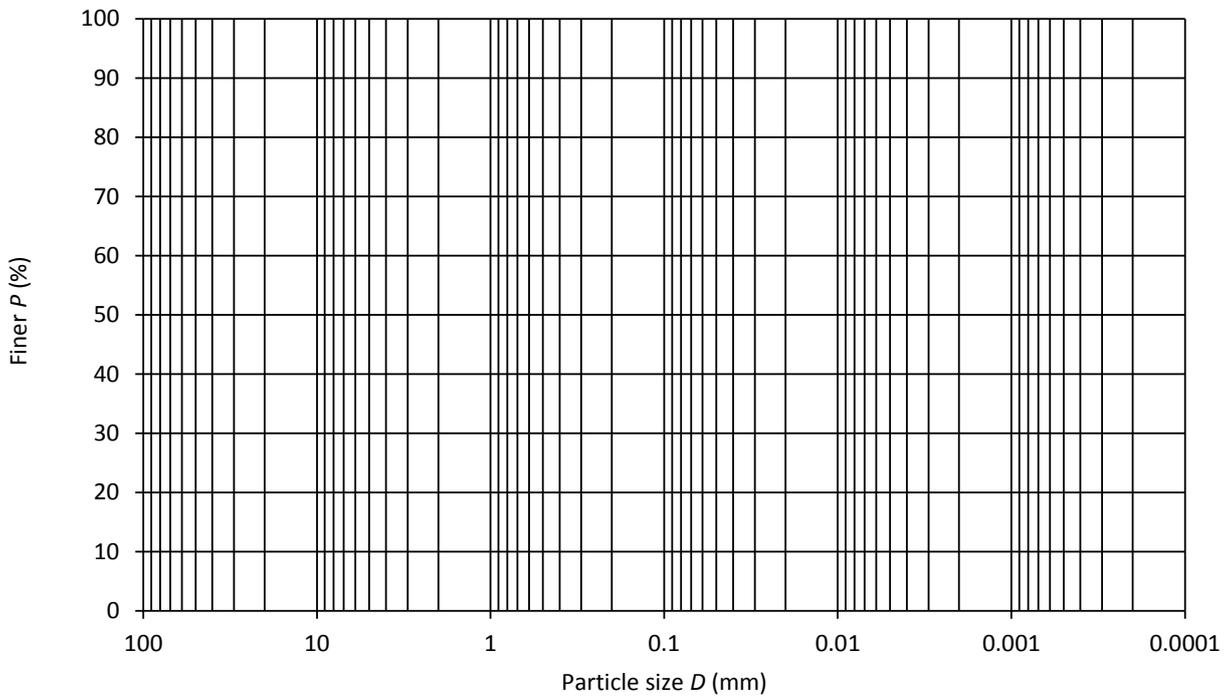
2.2.2 Hydrometer test

Time <i>T</i> (min)	Actual reading (<i>r</i>)	Temp. <i>t</i> (°C)	Corr. Reading <i>R</i> = <i>r</i> - <i>c</i>	<i>K</i> (Table 3)	<i>L</i> (cm)	<i>D</i> (mm)	<i>P</i> %
0.5							
1							
2							
5							
15							
30							
60							
250							
1440							

Composite correction



2.2.3 Gradation curve and soil constituents



Soil constituents	%	
1) Grave % (passing 3-in. and retained on No. 4 sieve).		%
(2) Sand % (passing No. 4 sieve and retained on No. 200 sieve).	(a) Coarse sand % (passing No. 4 sieve and retained on No. 10 sieve).	
	(b) Medium sand % (passing No. 10 sieve and retained on No. 40 sieve).	
	(c) Fine sand % (passing No. 40 sieve and retained on No. 200 sieve).	
(3) Silt size %, (0.074 to 0.005 mm).		
(4) Clay size % (smaller than 0.005 mm).		
Colloids% (smaller than 0.001 mm).		

