Colorado Procedure - Laboratory 3105-13

Standard Method of Test for

Grain Size Analysis of Soil for AASHTO Classification

(This procedure modifies Colorado Procedure 21. The current CP 21 is to be used with this procedure.)

1.   SCOPE

1.1   This method covers the determination of the particle size distribution of soil material for AASHTO classification.

2.   REFERENCED DOCUMENTS

2.1   *AASHTO Standards:*

   M 145 Classification of Soils and Soil-   Aggregate Mixtures for Highway   Construction Purposes
   T 265 Moisture Content of Soils
   T 311 Grain-Size Analysis of Granular   Soil Materials

2.2   *Colorado Procedures:*

   CP 20 Dry Preparation of Disturbed Soil Samples for Test
   CP 21 Mechanical Analysis of Soils

3.   APPARATUS

   Note: Colorado Procedure (CP) 21 shall be used to determine the sieve analysis of soils with the following exceptions:

3.4   *Sieves –* Sieves of the following sizes conforming to AASHTO M 92: 3-in. (75 mm), 1-in. (25.0 mm), 3/4-in. (19.0 mm), 3/8-in (9.5mm), No. 4, No. 10, No. 40, and No. 200.

3.4.1   The separation sieve shall be the #4 sieve.

5.   PROCEDURE

5.2.4   Weigh and record the material retained on the plus (+) #4 sieve cumulatively in pounds (lbs.).
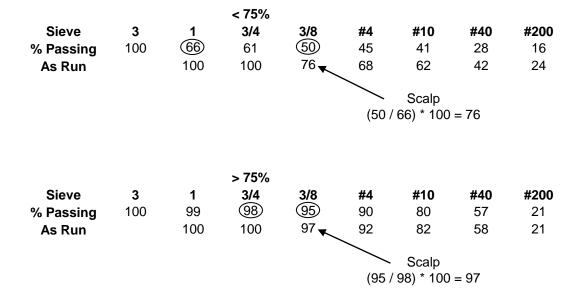
7.   RECORD

7.1   CDOT Form #1045, Gradation Work Sheet.

7.2   CDOT Form #555, Preliminary Soil Survey.

Mathematically Scalping a Gradation

(Instructions for when a Preliminary Soil Survey has been performed.)

When less than 75 percent is passing the 3/4 inch sieve, divide the 3/8 inch sieve percent by the 1 inch sieve percent and then multiply the quotient by 100. The result will yield the "as run" gradation reported on CDOT Form #555. Perform this calculation on each successive sieve. When more than 75 percent is passing the 3/4 inch sieve, use the 3/4 inch sieve percent as a divisor and then perform the same calculation on each successive sieve.

			< 75%					
Sieve	3	1	3/4	3/8	#4	#10	#40	#200
% Passing	100	(66)	61	(50)	45	41	28	16
As Run		100	100	76	68	62	42	24

Scalp
(50 / 66) * 100 = 76

			> 75%					
Sieve	3	1	3/4	3/8	#4	#10	#40	#200
% Passing	100	99	(98)	(95)	90	80	57	21
As Run		100	100	97	92	82	58	21

Scalp
(95 / 98) * 100 = 97

Cumulative Setup for a R-Value

			< 75%					
Sieve	3	1	3/4	3/8	#4	#10	#40	#200
% Passing	100	(66)	61	(50)	45	41	28	16
As Run		100	100	76	68	62	42	24

Scalp
(50 / 66) * 100 = 76

R-value Setup

	76	68
100	X	X
	12	12
+ 3/8	288	
+ #4	384	
- #4	1200	

(100-76) * 12 = 288
(100-68) * 12 = 384