

**ATT-25/95, Part II, PIT RUN CONTAMINATION
Minus 5 000 Fm Sieve Analysis**

1.0 SCOPE

This method describes the procedure for determining the percentage of -5 000 Fm aggregate in screened pit run aggregate prior to crushing.

2.0 EQUIPMENT

Sieves: 40 000 μm , 16 000 μm , 5 000 μm

1 – electronic balance

Assorted mixing pans or metal pails

1 - large drying pan

Data Sheet: Pit Run Aggregate Contamination Sieve Analysis, MAT 6-93

3.0 PROCEDURE

3.1 Sampling

The required **minimum sample size** is **100 kg**. However a smaller sample weight may be used if the criterion for acceptance or rejection of the material is based on a day's average results of several samples. In this case, the total weight of the averaged samples must be greater than 100 kg, and the minimum frequency must be maintained. Sample size is restricted, as shown in Table 1.


AGGREGATE TOPSIZE (mm)	MINIMUM SAMPLE SIZE (kg)
< 80 mm	35
> 80 mm and < 150 mm	50
> 150 mm	100

TABLE 1

1. Tare as many pails or large mixing pans as required to obtain an aggregate sample of at least 100 kg. Record this on "Total Weight of Tares" on line "B" of the data sheet, as shown in Figure 1.
2. After all screening operations have taken place to remove the -5 000 Fm material from the pit run, obtain a representative sample of pit run aggregate from the conveyor belt carrying the screened material. Sample as directed in ATT-38, SAMPLING, Gravel and Sand, Section 3.4, Conveyors.

3.2 Unwashed Sieve Analysis

1. Weigh the material in each tared container. Calculate the "Total Weight of Wet Sample + Tares" and record it in line "A".
2. Calculate the "Total Weight of Wet Sample" and record in line "C".
3. Remove any visually large rocks (+ 50 000 Fm), and place them into the container reserved for the + 40 000 Fm material.
4. Separate the rest of the material on the 40 000 Fm, 16 000 Fm and the 5 000 Fm sieves, and place each size into its respective container. Place the - 5 000 Fm material in a tared container (line "E").

 MAT 6-93/13		PIT RUN AGGREGATE CONTAMINATION Minus 5000 µm Sieve Analysis Field Test Procedure ATT-25 Part II				
DATE	CONTRACT NO.	PROJECT NO.	FROM	E. of Jct. Hwy. 415	PIT NAME	PIT LOCATION
January 1, 2013	12354	Hwy 1:22	TO	E. of Irvine	Rockbuster	NE 10-012-04-04

UNWASHED SAMPLE WEIGHTS			MOISTURE CONTENT - 5 000 µm AGGREGATE		
A	TOTAL WEIGHT OF WET SAMPLE + TARE(S)	112,569 g	K	WEIGHT OF WET SAMPLE + PAN	1,877.6 g
B	TARE(S)	10,456 g	L	WEIGHT OF DRY SAMPLE + PAN	1,813.4 g
C	TOTAL WEIGHT OF WET SAMPLE (A-B)	102,113 g	M	WEIGHT OF WATER (K-L)	64.2 g
D	WET WEIGHT PASSING 5 000 µm + TARE	6,226 g	N	WEIGHT OF PAN	1,132.4 g
E	TARE	2,813 g	O	WEIGHT OF DRY SAMPLE (L-N)	681.0 g
F	WET WEIGHT PASSING 5 000 µm (D-E)	3,413 g	P	MOISTURE CONTENT (100M/O)	9.4 %
G	UNWASHED WEIGHT RETAINED ON 5 000 µm (C-F)	98,700 g			

WASHED SAMPLE WEIGHTS			UNWASHED DRY PERCENT CONTAMINATION		
H	TOTAL DRY WEIGHT RETAINED ON 5 000 µm + TARE(S)	108,178 g	Q	UNWASHED DRY WEIGHT PASSING 5 000 µm (100F/100+F)	3,119 g
I	TARE(S)	10,456 g	R	TOTAL UNWASHED DRY WEIGHT (G+Q)	101,819 g
J	TOTAL DRY WEIGHT RETAINED ON 5 000 µm	97,722 g	S	UNWASHED DRY PERCENT PASSING 5 000 µm (100Q/R)	3.1 %
NOTE: LINE 'G' WEIGHT IS ASSUMED TO BE DRY					

WEIGHT CALCULATIONS			WASHED DRY PERCENT CONTAMINATION		
Total Tares (Line 'B')	Total Sample Wt. (Line 'A')	Total Wt (+5000 µm) (Line 'H')	T	TOTAL WET WEIGHT PASSING 5 000 µm (C-J)	4,391 g
2,813	28,142	27,889	U	TOTAL DRY WEIGHT PASSING 5 000 µm (100T/100+F)	4,013 g
2,762	26,579	26,352	V	TOTAL DRY WEIGHT OF SAMPLE (J+U)	101,735 g
2,631	29,111	29,111	W	TOTAL DRY PERCENT PASSING 5 000 µm (100U/V)	3.9 %
2,250	28,737	24,826	PERCENT DIFFERENCE BETWEEN WASHED AND UNWASHED SAMPLE		
10,456	112,569	108,178	X	PERCENT DIFFERENCE (W-S)	0.8 %

VISUAL APPEARANCE	TECHNOLOGIST	REMARKS
<input checked="" type="checkbox"/> CLAY LUMPS <input checked="" type="checkbox"/> FINES COATING ROCKS <input type="checkbox"/> FROZEN LUMPS	B. Good	

FIGURE 1

5. Visually inspect the + 5 000 Fm samples for lumps of material that would normally pass the 5 000 Fm sieve when broken up, and for the amount of minus 5 000 Fm material clinging to the rock. If the sample appears to have a significant amount of this type of contamination, a washed sieve analysis is required.

NOTE: The sieving action should have shaken off most of the fines clinging to the rocks, and any left on the rocks should not be significant.

6. Weigh the - 5 000 Fm material and container and record it on line "D".
7. Calculate the "Wet Weight Passing the 5 000 Fm sieve", and record it on line "F".
8. Calculate the "Unwashed Weight Retained on 5 000 Fm sieve", and record it on line "G".
9. Take a moisture content sample from the - 5 000 Fm material, and process the sample, recording the weights and calculated values on lines "K" to "P".
10. Calculate the "Unwashed Dry Percent Contamination" as directed in lines "Q" to "S".
11. If the Percent Contamination is over 3%, the + 5 000 Fm material should be washed as directed in Section 3.3 below.

3.3 Washed Sieve Analysis

1. Remove any large rock which by visual inspection does not have any material coating the rock. Large rocks which have some coating, may be brushed to remove the material. Place these rocks in a container so that later they are weighed with the washed rock.

Progressively place each of the separated rock sizes into a metal pail and wash the aggregate until all lumps are broken down and no material remains clinging to the rocks.

2. Pour the wash water through a 5 000 Fm sieve and remove the large rock.
3. Continue washing the smaller + 5 000 Fm material until the wash water is clear and no material passes the 5 000 Fm sieve.
4. Once all the + 5 000 Fm material has been washed, place the material in tared container(s) (line "I").

5. Dry the washed aggregate. Weigh, and record as "Total Dry Weight Retained on 5 000 Fm + Tare(s)" on line "H".
6. Calculate the "Total Dry Weight Retained on the 5 000 Fm sieve" and record on line "J".
7. Calculate the "Total Wet Weight of material passing the 5 000 Fm sieve" and record on line "T".
8. Calculate the "Total Washed Dry Aggregate Percent Contamination" as directed in lines "U" to "W".
9. Calculate the "Percent Difference" on line "X", between the washed sample (line "W") and the unwashed sample (line "S").

NOTE: The washed sieve analysis must be performed for the first few sieves until sufficient washed and unwashed contamination percentages are obtained.

The average difference between the unwashed and washed percentages can be used as a guide on future sieve analysis to determine if washing may be necessary.

For example, if the % difference averages less than 2%, and the total dry washed percent passing averages less than 5%, then washing may not be necessary.

When making this judgement, ensure that the screening process has not changed, and is consistent.