Aggregate Splitting

WYDOT MTM No.805.0 (AASHTO T 248 (Wyoming Modified))

	1st Try	2nd Try

1. Check the condition of the equipment:
   a. Spacing of splitter rods; levelness; spacing of splitter; ect.
   b. Minimum width: 50% larger than the largest particle.

   Fine aggregate must be drier then saturated surface dry condition.

2. Pour entire sample in the splitter, without overloading; distribute the sample evenly without using hands.

3. Pull handle and run the material through the splitter at the minimum speed providing a continuous flow.

4. Pour material into two separate pans (Pan A Pan B); replace the splitter pans.

5. Pour Pan A back in to splitter; distribute the sample without using hands. Split sample at a minimum speed providing continuous flow.

6. Swap pans on bottom of splitter.

7. Pour Pan B in splitter distribute the sample without using hands. Split sample at a minimum speed providing continuous flow.

8. Continue splitting the material to desired test size (If needed)

Circle One	Pass	Pass
	Fail	Fail

Student Name _____ Examiner Initials _____

Liquid Limit Test

WYDOT MTM No. 812.0 (AASHTO T 89)

	1st Try	2nd Try

1. Check Equipment:
   a. Mixing dish (porcelain casserole), spatula, graduated cylinder, liquid limit device, grooving tool/gauge, containers, balance, and oven meeting the requirements in MTM 812.0 & AASHTO T 89.
   b. Liquid limit device checked for excessive wear and adjusted in accordance with MTM 812.0.

2. A representative, 100 gram sample, will be taken from the dry material prepared in accordance with MTM 802.0 (AASHTO T 87) using a No. 10 and No. 40 sieve.

3. The sample will be placed in the casserole and thoroughly mixed with 15 to 20 ml of water; further additions of water will be made in increments of 1 to 3 ml and mixed thoroughly.

4. With a spatula, level and trim the sample to a depth of 10mm at the point of maximum thickness; the material in the cup will then be divided down the middle with the grooving tool using a maximum of six strokes (one stroke being the movement of the grooving tool from front-to-back or back-to-front) in order to avoid tearing the sides of the groove, or having the sample slip to the back of the cup. The final stroke will be the only one scraping the bottom of the cup.

5. Turn the crank at a rate of 2 revolutions per second until the two sides of the sample come in contact at the bottom of the groove for a distance of 0.5 inch using from 16 to 36 shocks. The base of the machine will not be held with the free hand while the crank is turned. If the groove closes before 16 shocks, the sample contains too much water and must be discarded (start over with Step 2). If the groove doesn't close in 36 shocks or less, more water must be added to the sample.

6. When the material closes the required distance within the 16 to 36 shocks, a moisture sample will be taken. The moisture sample will consist of a slice of material from the cup, approximately 0.75 inch wide, taken perpendicular to the groove so the sample includes the material from the area where the groove closed. Place the moisture sample in a container and dry to constant mass without burning the sample.

7. Calculation: $\frac{\text{(Wt. wet material and tin) – (Wt. dry material and tin) (100)}}{\text{(Wt. dry material and tin) – (Tare of tin)}}$ = % Moisture

   % Moisture in sample **X** Correction Factor (MTM 812.0, page 4) = Liquid Limit

Circle One	Pass	Pass
	Fail	Fail

Student's Name _____ Examiner's Initials _____

Plastic limit Test & Plastic Index

WYDOT MTM No. 813.0 (AASHTO T 90)

	1st Try	2nd Try

1. Check Equipment:
   a. Mixing dish (porcelain casserole), spatula, graduated cylinder, ground glass plate, containers, balance, and oven meeting the requirements in MTM 812.0 & AASHTO T 90.

2. The material to be used for this test can be taken from any stage of the mixing operation for the Liquid Limit Test it can be a representative,20 gram sample of dry material, prepared in accordance with MTM 802.0 (AASHTO T-90 – Wyoming Modified) and to which, sufficient water has been added and mixed thoroughly. Either way, the material will be plastic enough to be easily shaped into a ball without sticking to the fingers.

3. Obtain a 1.5 – 2.0 gram sample from the 8 gram of material (the quantity obtained should be enough to produce a thread 1/8 inch in diameter and 6 inches long). Form the sample into an ellipsoidal ball and roll the sample between the fingers and the ground glass plate, with enough pressure to produce a thread of uniform diameter. The rate of rolling will be between 80 and 90 strokes per minute (a stroke is considered to be one complete motion of the hand, forward and back to the starting position).

4. When the diameter of the thread becomes ⅛ inch, the thread will be broken, the pieces gathered together and kneaded to re-form and ellipsoidal ball, and re-rolled. This alternate rolling, gathering, kneading, and re-rolling will continue until the thread crumbles under the pressure required for rolling and the material can no longer be rolled into a thread. Crumbling may occur when the thread has a diameter greater than ⅛ inch – this is considered a satisfactory end point provided the material has been previously rolled in a thread ⅛ inch in diameter.

5. As the material crumbles, place it in a container and dry to a constant mass without burning the sample.

6. Calculation:

$$\frac{\text{(Wt. wet material and tin) – (Wt. dry material and tin) (100)}}{\text{(Wt. dry material and tin) – (Tare of tin)}} = \text{\% Plastic Limit}$$

Plastic Index (PI) is the numerical difference between the Liquid Limit and the Plastic Limit

(Liquid Limit) – (Plastic Limit) = Plastic Index (rounded to nearest whole number)

Circle One	Pass	Pass
	Fail	Fail

Student's Name _____ Examiner's Initials _____

Dry Sieve Analysis Using Large Mechanical Shakers and Screens

WYDOT MTM No. 814.0 (AASHTO T 27)

	1st Try	2nd Try

1. Check equipment (machinery, screens, etc.) for condition, calibration, and cleanliness. Nest the required screens in the proper order.

2. Dry sample to constant mass. at 230° F ± 9° F

3. Determine test sample size. Generally, it is not necessary to reduce the sample weight to less than 30 lb when using the large mechanical sieve shaker. If it is necessary to reduce the sample size, follow WYDOT MTM Procedure 805.0 – Aggregate Splitting. Weigh the sample and record. Clamp down the sieve tray, Start shaker then slowly add sample (section 814.00 MTM)

4. Pour the material in the top of the mechanical shaker – run the shaker until no additional material is observed to be passing any screens (7 to 10 minutes).

5. Determine the weight of material retained on each screen and in the pan and record the nearest tenth (0.0).

6. Check the weight retained on each screen to determine if a screen was Over loaded – if over loaded, re-screen the material, half at a time.

7. Check the sum of the weight retained on each screen plus the pan is within 0.3% of the weight of the original sample.

8. Determine the percentage of plus No. 4 (4.75 mm) and minus No. 4 (4.75 mm).

	1st Try	2nd Try
Circle One	Pass	Pass
	Fail	Fail

Student's Name _____ Examiner's Initials _____

Wash Sieve Analysis

WYDOT MTM No. 814.0 (AASHTO T 11)

	1st Try	2nd Try

1. Check equipment (No. 8 (8.36 mm) screen nested over the No. 200 (75 µm) wash screen, water, scale).
2. Obtain a fine aggregate (minus No. 4 (minus 4.75 mm)) sample of 300 grams minimum after drying to constant weight.
3. Place the sample in a wash pan and add enough water to the sample container to cover the sample.
4. Agitate the sample to separate the fine particles.
5. Pour the wash water containing suspended fines over (No. 8 (8.36 mm) screen nested over the No. 200 (75 µm) sieve, avoiding decantation of coarse particles.
6. Add water, re-agitate and re-decant.
7. Repeat until water exiting the wash pan and below the No. 200 (75 µm) sieve is clear.
8. Return all material retained on the No. 200 (75 µm) sieve by flushing to the washed sample (flush with a minimal amount of water).
9. Dry the washed sample to constant weight in an oven at 230° F ± 9° F
10. Calculate the amount of material passing the No. 200 (75 µm) sieve by washing:

Starting sample wt. (oven dry)
(-) Sample wt. after wash (oven dry)

Material passing No. 200 (75 µm)

	1st Try	2nd Try
Circle One	Pass	Pass
	Fail	Fail

Student's Name _____ Examiner's Initials _____

Dry Sieve Analysis

WYDOT MTM No. 814.0 (AASHTO T 27)

	1st Try	2nd Try

1. Check all equipment (scales, sieves, brushes) for condition, calibration, and cleanliness. Nest the required sieves in the proper order.
2. Weigh the dry sample and record.
3. Pour material into the top of the nested sieves using brush to remove material from pan.
4. Turn the mechanical sieve shaker on and run for a sufficient period of time (as determined below).
5. Hand check, one sieve for sieve accuracy. Determine if the sample was shaken for a sufficient amount of time by removing the sieve with the greatest amount of material retained and hand shake to ensure no more than 0.5% by weight of the total sample will pass the sieve.
6. Determine the weight of material retained on each sieve and in the pan and record.
7. If there is more than 200 grams of material on an 8 inch sieve, add another sieve or hand sieve smaller amounts.
8. Check the sum of the weight retained on each screen. Also check the pan is within 0.3% of the weight of the original sample total.

Circle One	Pass	Pass
	Fail	Fail

Student's Name _____ Examiner's Initials _____

_____ Examiner's Initials _____