Plasticity Index

2026

Proficiency Pack

Date: _____

Name: _____

Employer: _____

MoDOT TM 79: Preparing Aggregate Base Prep to Determine the Plasticity Index
Plastic Limit Tests
PROFICIENCY CHECKLIST

Applicant: _____

Employer: _____

Trial#	1	2
1. Reduced sample to required size.		
2. Sieved sample over a #40 sieve. The minus #40 is Part 1 of final sample.		
3. The plus #40 material was covered in water, scrubbed, washed over a #40 sieve and wash water retained and saved for part 3.		
4. The plus #40 material dried in 140ºF oven, or air dried, then shaken over a #40 sieve. The minus #40 is Part 2 of final sample.		
5. Allowed the particles in wash water to settle, decant off water, and dried in a 140ºF oven, or air dried. This is Part 3 of final sample.		
6. Combined the 3 minus #40 components to create the final sample. Part 1: Minus #40 material when first sieved. Part 2: Minus #40 material dry sieved off the scrubbed and dried plus #40. Part 3: Minus #40 material retrieved from the was waster.		
	PASS	PASS
	FAIL	FAIL

Examiner: _____Date:_____

AASHTO T 90: Determining the Plastic Limit & Plasticity Index of Soils
PROFICIENCY CHECKLIST

Applicant: _____

Employer: _____

Trial#	1	2
1. Obtained 20 g of minus #40 material obtained by AASHTO R58 or by MoDOT TM79, or used 10 g of liquid limit material		
2. If used 20-g sample of dry material - a. Mixed with distilled or demineralized water in mixing dish b. Approximately 10 g ball obtained		
3. From the 10-g ball, form a 1.5 to 2 g ellipsoidal mass		
4. Mass rolled between fingers or palm on a glass plate or paper (or between top and bottom plate of rolling device) to form 1/8" diameter thread		
5. Rate of rolling between 80-90 strokes per minute (a stroke is one complete motion of hand forward and back to the starting position)		
6. Mass rolled for no more than 2 minutes to obtain thread diameter of 1/8"		
NOTES: * If the thread crumbled on the 1st rolling of sample, water added, remixed, and rolled again * If the thread crumbled on the 2nd rolling before reaching ⅛", rolling stopped * Failure not forced when rolling to ⅛"		
7. Pieces squeezed back together into an ellipsoidal mass		
8. Steps 4 through 7 repeated until thread crumbled, and soil can no longer be rolled into a thread		
9. Crumbled pieces placed in pre-weighed container and container immediately covered		
10. Steps 3 through 9 repeated until the 10-g specimen is completely tested (5 or more times)		
11. Mass of specimen and container determined to 0.01 g		
12. Specimen dried, and water content determined according to AASHTO T 265		
13. Plastic Limit calculated from: $PL = \frac{\text{mass of water}}{\text{mass of oven dry soil}} \times 100$		
14. Plastic Limit reported to the nearest whole number		
15. Plasticity index calculated: PI = Liquid Limit – Plastic Limit		
	PASS	PASS
	FAIL	FAIL

Examiner:_____Date:_____

AASHTO T 89: Determining the Liquid Limit of Soils
PROFICIENCY CHECKLIST

Applicant: _____

Employer: _____

Sample Preparation Trial#	1	2
1. Sample obtained by AASHTO T 87 or MoDOT TM 79		
2. Sample consists of about 50-100-g of soil passing #40 sieve		
3. Soil mixed with about 15-20-ml of distilled or demineralized water in mixing dish (other than brass cup) **Note:** Tap water may be used if comparative tests indicate no difference in results using tap and distilled water		
4. Mixing completed by stirring, kneading and chopping with spatula		
5. Additional increments of water added (1-3 ml) until mass is uniform and correct consistency reached		
6. No additional dry material added to wet sample once test was started		
7. If too wet, sample either discarded or mixed to evaporate water		
Procedure		
1. Grooving tool checked and Liquid Limit device previously inspected for wear and height of cup drop checked		
2. Part of mixture put in cup and spread with spatula until 10 mm deep at maximum thickness		
3. As few strokes of spatula as possible used		
4. Care taken to avoid entrapment of air bubbles		
5. Excess soil returned to mixing dish		
6. Unused wet soil in storage dish covered during test		
7. (Using curved grooved tool): Material in dish divided through centerline of follower with no more than 6 strokes of curved tool and only last stroke of grooving tool scrapes bottom of cup		
8. Tearing along groove and slippage of specimen avoided		
9. Cup lifted and dropped twice per second until bottom of groove closes about 0.5" (13 mm) in 22-28 blows		
10. Material in cup immediately returned to mixing dish with no additional water added		
11. Steps 2 through 9 repeated		
12. Closure in 22 to 28 blows		
13. Number of blows recorded for second closure		
14. Moisture specimen is taken after second groove closure (if closure is in acceptable range and within ± 2 blows of the first closure)		
15. Slice of specimen, width of spatula, extending across specimen at right angles to groove, including portion that flowed together, removed from dish and placed in pre-weighed container		

AASHTO T89: Determining the Liquid Limit of Soils
PROFICIENCY CHECKLIST
(continued)

Applicant: _____

Employer: _____

16. Container and material weighed to 0.01 g		
17. Percent moisture determined according to AASHTO T265		
18. Percent moisture calculated to nearest whole percent: % moisture = $\frac{\text{mass of water}}{\text{mass of oven dry material}}$ x 100		
19. Liquid limit calculated by Liquid Limit = Correction Factor for Blows x % Moisture		
	PASS	PASS
	FAIL	FAIL

Examiner:_____Date:_____