

Soils Field Testing Technician

KT 10 Plasticity Tests (PL)

Revised September 2022

Two attempts may be made by the applicant. The applicant may stop themselves once and not have that count as one of the two attempts. If the applicant stops voluntarily, draw a line at that point and note that the applicant stopped themselves then restart at the top of the next attempt.

Applicant: _____

CIT #: _____

Employer: _____

		1st Test		Stopped Test		Re-Test	
	Sample Preparation						
1.	<u>The test is conducted using material finer than the No. 40 (425 µm) sieve. (6.2.)</u>	PASS	FAIL	PASS	FAIL	PASS	FAIL
	Procedure						
2.	Thoroughly mix the minus No. 40 (425 µm) material and place approximately 20 g in an evaporating dish. (6.3.1.)	PASS	FAIL	PASS	FAIL	PASS	FAIL
3.	Thoroughly mix with distilled or demineralized water until the mass becomes plastic enough to be easily shaped into a ball. Take a portion of this ball with a mass of about 10 g for the test sample. (6.3.2.)	PASS	FAIL	PASS	FAIL	PASS	FAIL
4.	Select 1.5 to 2.0 g of sample, form into an ellipsoidal mass. (6.3.4.)	PASS	FAIL	PASS	FAIL	PASS	FAIL
5.	Form the mass into a uniform 1/8 in (3 mm) diameter thread by rolling it at a rate between 80 and 90 strokes per minute between the palm or fingers and a ground-glass plate or paper laying on a smooth surface. (6.3.5.)	PASS	FAIL	PASS	FAIL	PASS	FAIL
6.	Reduce the diameter of the thread to 1/8 in (3 mm) taking no more than 2 min. (6.3.5.)	PASS	FAIL	PASS	FAIL	PASS	FAIL
7.	Quickly squeeze and reform the thread into an ellipsoidal shaped mass and re-roll. Continue this alternate reforming and re-rolling, until the thread crumbles under the pressure required for rolling and the material can no longer be rolled into a thread. (6.3.5.)	PASS	FAIL	PASS	FAIL	PASS	FAIL

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8.	The crumbling may occur when the thread is greater than 1/8 in (3 mm) in diameter. This shall be considered a satisfactory end point, provided the material has been rolled to a thread of 1/8 in (3 mm) during the previous rolling. (6.3.5.)	PASS	FAIL	PASS	FAIL	PASS	FAIL
9.	At no time shall the operator attempt to produce failure at exactly 1/8 in (3 mm) diameter by allowing the thread to reach 1/8 in (3 mm), then reducing the rate of rolling or the hand pressure or both, and continuing the rolling without further deformation until the thread falls apart. (6.3.5.)	PASS	FAIL	PASS	FAIL	PASS	FAIL
10.	Place the crumbled thread in a watch glass or other suitable container of known mass and close to prevent evaporation loss. (6.3.6.)	PASS	FAIL	PASS	FAIL	PASS	FAIL
11.	<u>Record the sample mass to the nearest 0.01 g. (6.3.7.)</u>	PASS	FAIL	PASS	FAIL	PASS	FAIL
12.	<u>The soil in the container shall be dried in accordance with KT-11, to determine the moisture content. The use of a lid for the container as stated in KT-11 is required. Record the results. (6.3.7.)</u>	PASS	FAIL	PASS	FAIL	PASS	FAIL
	Alternate procedure using the Plastic Limit Device						
13.	Attach smooth unglazed paper to both the bottom fixed plate and the top plate of the plastic limit device. (6.4.1.)	PASS	FAIL	PASS	FAIL	PASS	FAIL
14.	Split the 10 g test sample into four or five masses of 1.5 to 2.0 g each. Squeeze into an ellipsoidal-shape and place two to three masses on the bottom plate. (6.4.2.)	PASS	FAIL	PASS	FAIL	PASS	FAIL
15.	Place the top plate in contact with the soil masses. Simultaneously with a slight downward force, apply a back-and forth-rolling motion with the top plate until the top plate comes into contact with the 3.2 mm side rails, within two minutes. (6.4.2.)	PASS	FAIL	PASS	FAIL	PASS	FAIL

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16.	Do not allow the soil thread to come into contact with the side rails. (6.4.2.)	PASS	FAIL	PASS	FAIL	PASS	FAIL
	Calculations						
17.	<u>Calculate and record the percentage of moisture to the 0.1%, report the percentage of moisture to the nearest whole percent. (7.2.)</u>	PASS	FAIL	PASS	FAIL	PASS	FAIL
18.	<u>Calculate the plastic index as follows: Plastic Index= Liquid Limit – Plastic Limit (8.2)</u>	PASS	FAIL	PASS	FAIL	PASS	FAIL
	<u>Report to the nearest whole number. (8.3)</u>						

Overall Score

Circle One

1st Test

PASS

FAIL

Stopped Test

PASS

FAIL

Re-Test

PASS

FAIL

Witness Examiner:

(First Try)

Signature

Date

Witness Examiner:

(Stopped Try)

Signature

Date

Witness Examiner:

(Re-Test)

Signature

Date