

# **IA Checklist AASHTO T 90 DETERMINING THE PLASTIC LIMIT AND PLASTICITY INDEX OF SOIL**

Procedure		P	F	NA
1	Determine and record the mass of the moisture content container.			
2	Take a quantity of soil with a mass of about 20 g from the thoroughly mixed portion of the material passing the 0.425-mm (No. 40) sieve, obtained in accordance with R 58. Place the air-dried soil in a mixing dish and thoroughly mix with distilled or demineralized water (see <b>T 90 Note 2</b> for use of Tap Water) until the mass becomes plastic enough to be easily shaped into a ball.			
3	Take a portion of this ball with a mass of about 10 g for the test sample. Select a 1.5- to 2.0-g portion from the 10-g mass of soil prepared. Form the selected portion into an ellipsoidal mass. Use one of the following methods to roll the soil mass into a 3-mm-diameter thread at a rate of 80 to 90 strokes per minute, counting a stroke as one complete motion of the hand forward and back to the starting position again.			
4	<i>Hand Rolling Method</i> - Roll the mass between the palm or fingers and the ground-glass plate or unglazed paper with just sufficient pressure to roll the mass into a thread of uniform diameter throughout its length. Deform the thread further on each stroke until its diameter reaches 3 mm. Take no more than 2 min to roll the soil mass to the 3-mm diameter. <i>Alternate Procedure, Plastic Limit Device Method</i> - See <b>T 90 Sec. 6.3.2</b> .			
5	When the diameter of the thread reaches 3 mm, squeeze the thread between the thumbs and fingers and form the mass back into a roughly ellipsoidal shape. Repeat the rolling process as described in <b>Sec. 6.3</b> until the soil can no longer be rolled into a thread and begins to crumble. The crumbling may occur when the thread has a diameter greater than 3 mm, provided the soil has been previously rolled into a thread 3 mm in diameter. This is considered a satisfactory end point. If unsure a satisfactory end point has been reached, verify by attempting to reform the soil into an ellipsoidal mass and, if possible, repeat the rolling process until the soil can no longer hold a thread shape when a slight amount of pressure is applied to the ellipsoidal mass. Do not attempt to produce failure at an exact 3-mm diameter by purposely reducing the rate of rolling or the hand pressure, or both ( <b>Note 7</b> ).			
6	Gather the portions of the crumbled soil together and place in the moisture content container. Immediately cover the container with a close-fitting lid to prevent additional loss of moisture. Repeat the operations until the entire 10-g specimen is tested. Place all of the crumbled portions into the same moisture content container. Determine the moisture content of the soil in the container in accordance with T 265, and record the results.			
Equipment		P	F	NA
1	<i>Dish</i> —A porcelain evaporating dish or similar mixing dish about 115 mm in diameter.			
2	<i>Spatula</i> —A spatula or pill knife having a blade about 75 mm in length and about 20 mm in width.			
3	<i>Balance</i> —A class G1 balance (Readability 0.01g) meeting the accuracy requirements of <b>M 231</b> .			

4	<i>Surface for Rolling</i> —Shall consist of one of the following: A ground glass plate or piece of smooth, unglazed paper on which to roll the sample. Paper, if used, shall not add foreign matter (fibers, paper fragments, etc.) to the soil during the rolling process and shall lay flat on a smooth horizontal surface.			
5	<i>Oven</i> —Thermostatically controlled and capable of maintaining temperatures of $110 \pm 5^{\circ}\text{C}$ for drying samples.			
6	<i>Moisture Content Container</i> —Made of material resistant to corrosion and not subject to change in mass or disintegration on repeated heating and cooling. The container shall have a close-fitting lid to prevent loss of moisture from samples before initial mass determination and to prevent absorption of moisture from the atmosphere following drying and before final mass determination. One container is needed for each moisture content determination.			

**Remarks:**