

Determining In-Place Flow of Cold Recycled Asphalt Using the Marshall Hammer

1. SCOPE

- 1.1 This procedure provides a quick evaluation of flow characteristics of cold recycled asphalt, whether cold in-place recycled or cold central plant recycled, to determine appropriate hold time for cold recycling mixes before finishing compactive efforts and releasing to traffic.
- 1.2 This test method may involve hazardous material, operations, or equipment. This test method does not purport to address all of the safety concerns associated with its use. It is the responsibility of the user to consult and establish appropriate safety and health practices and determine the applicability of any regulatory limitations prior to use.

2. APPARATUS

- 2.1 Marshall Hammer - A Marshall compaction hammer meeting the dimensional requirements of Arizona Test Method 410.
- 2.2 Caliper or Tape Measure – Capable of measuring depth and measuring in millimeters.

3. PROCEDURE

- 3.1 This test is to be performed on an initially compacted cold recycled mat.
- 3.2 Place the Marshall hammer with its head flat on the mat. Do not move the hammer or rock the head.
- 3.3 Pick up the sliding weight until it reaches the upper stop. Drop the weight. Repeat 50 times. The operator shall hold the handle by one hand so that the axis of the compaction hammer is as nearly perpendicular to the base of the mold assembly as possible while compaction is accomplished. Care shall be taken not to add body weight to the hammer by leaning or pressing down on the hammer. No mechanical device of any kind is to be used to restrict movement of the handle during compaction. Compaction shall be performed at a minimum rate

of 40 blows per minute. The compaction hammer shall apply only one blow with each fall, that is, there shall not be a rebound impact.

3.4 All measurements are from the level of the undisturbed mat.

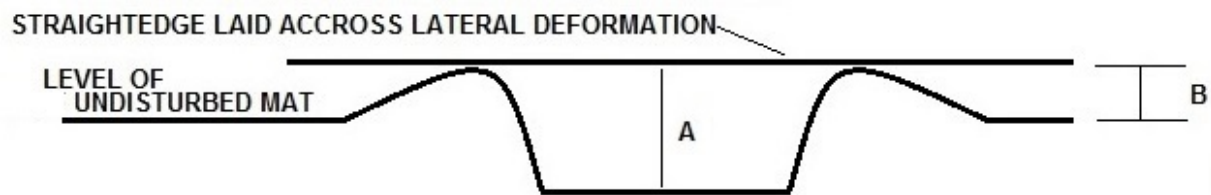


FIGURE 1

3.4.1 Measure the depth of the depression made by the hammer, in mm. The depth is determined by the following equation.

$$\text{Depth of Depression} = A - B$$

Where: A = Distance between Straightedge and Bottom of Depression
B = Distance between Straightedge and Undisturbed Mat

3.4.2 Measure the height of lateral deformation, if any, in mm. The height of lateral deformation, measured from the level of the undisturbed mat, is represented as "B" in Figure 1.

3.5 Determine the moisture condition of the mat; whether there is water bleeding from the mat, or if it is dry. Visible water on the surface of the mat, which is not from rolling operations, may indicate possible bleeding from the mat.

3.6 Determine temperature of the mat to the nearest 1 degree F.

4. REPORT

4.1 Record the following information:

4.1.1 Time and date of the test

4.1.2 Depth of depression, in mm.

4.1.3 Height of lateral deformation, in mm.

4.1.4 Mat temperature

4.1.5 Location of the test including stationing and offset