Standard Method of Test for

Reducing Samples of Hot Mix Asphalt to Testing Size

AASHTO Designation: T 328-05

American Association of State Highway and Transportation Officials
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1. SCOPE

1.1. This practice outlines methods for the reduction of large samples of hot mix asphalt (HMA) to the appropriate size for testing, employing techniques that are intended to minimize variations in the measured characteristics between the test samples so selected and the large sample.

Comment [dab1]: All my changes, I don't think there were any others.

1.2. The values stated in SI units are to be regarded as standard.

1.3. *This standard does not purport to address all of the safety problems, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. REFERENCED DOCUMENTS

2.1. *AASHTO Standards*:

- T 168, Sampling Bituminous Paving Mixtures
- T 248, Reducing Samples of Aggregate to Testing Size

2.2. *ASTM Standards:*

- C 702, Practice for Reducing Samples of Aggregate to Testing Size
- D 979, Standard Practice for Sampling Bituminous Paving Mixtures
- D 8, Standard Terminology Relating to Materials for Roads and Pavements

3. TERMINOLOGY

3.1. *mastic*—a mixture of asphalt binder and fine mineral material.

4. SIGNIFICANCE AND USE

4.1. Specifications for hot mix asphalt mixtures require sampling portions of the material for testing. Other factors being equal, larger samples will tend to be more representative of the total supply. This method provides procedures for reducing the large sample obtained in the field or produced in the laboratory to a convenient size for conducting a number of tests to describe the material and measure its quality in a manner that the smaller test sample portion is most likely to be a representation of the larger sample, and thus of the total supply. The individual test methods provide the minimum quantity of material necessary.

5. SELECTION OF METHOD

5.1. The selection of a particular method to reduce the large sample to test size depends largely on the amount of the large sample. It is recommended that for a large amount of material a mechanical splitter be employed whenever possible, reducing the time needed for reduction and to minimize the loss of temperature. To further reduce the sample size, a quartering method can be utilized.

6. SAMPLING

6.1. Obtain samples of HMA according to T 168 or as required by individual test methods. When additional tests are to be conducted, the user shall be satisfied that the initial size of the field sample is adequate to accomplish all intended tests. Use similar procedures for HMA produced in the laboratory.

7. MECHANICAL SPLITTER METHOD

7.1. *Apparatus*:

7.2. *Mechanical Splitter A*—The splitter shall have four equal width chutes, which will discharge the material into four appropriate size containers. The splitter shall be designed with a receiving hopper that will hold the HMA field sample until a handle releases the material to fall through a divider and is distributed into four equal portions. The splitter shall be designed so that the HMA field sample will flow smoothly and freely through the divider without loss of materials (See Figures 1 to 3.).

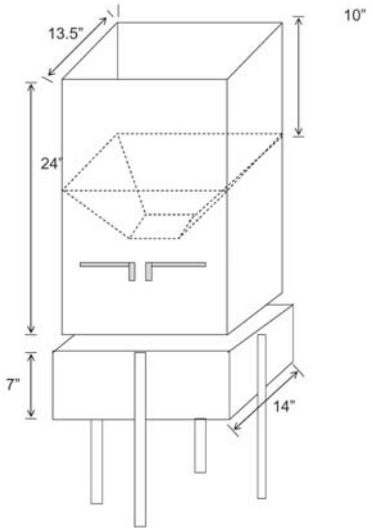

Figure 1—Mechanical Splitter

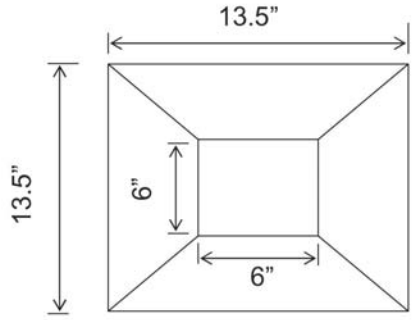

Figure 2—Plan View of Splitter

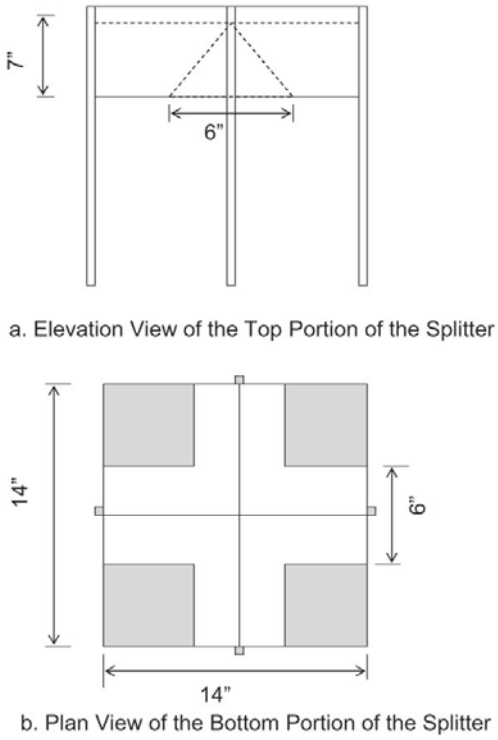

Figure 3—Elevation and Plan View of Bottom Portion of Splitter

7.3. *Mechanical Splitter B*—Sample splitters shall have an even number of equal width chutes, but not less than a total of eight, which discharge alternately to each side of the splitter. The minimum width of the individual chutes shall be approximately 50 percent larger than the largest particle to be split. The splitter shall be equipped with two receptacles to hold the two halves of the sample following splitting. It shall also be equipped with a hopper or straight edged pan, which has a

width equal to or slightly less than the overall width of the assembly of chutes, by which the sample may be fed at a controlled rate to the chutes. The splitter and accessory equipment shall be so designed that the sample will flow smoothly without restriction or loss of material.

8. PROCEDURE

8.1. The splitter and accessory equipment may be heated, not to exceed 230°F, as determined by a non-contact temperature device. Surfaces of the mechanical splitter that will come in contact with the HMA may be lightly coated with an approved release agent to prevent a build up and loss of asphalt binder and fines. The release agent shall not contain any solvents or petroleum based products that could affect asphalt binder properties.

8.2. *Mechanical Splitter A*: Place the field or laboratory prepared HMA into the mechanical splitter hopper and position four sample receptacles to receive the reduced portions of the original sample. Fill the hopper in such a manner as to avoid segregation of the HMA. Release the handle to drop the HMA through the dividers into the sample receptacles. Reintroduce selected receptacles from opposite corners into the splitter hopper as many times as necessary to further reduce the HMA sample to the size specified for the intended test.

8.3. *Mechanical Splitter B:* Place the field or laboratory prepared HMA into the sample splitter pan or hopper and uniformly distribute it from edge to edge, so that when it is introduced into the chutes, approximately equal amounts will flow through each chute. The rate at which the sample is introduced shall be such as to allow free flow through the chutes into the receptacles below. Entire sample may be mixed by repeated use of the riffle splitter. Reintroduce the portion of the sample in one of the receptacles into the splitter as many times as necessary to reduce the sample to the size necessary for the intended test. The portion of the material collected in the other receptacle may be reserved for reduction in size for other tests.

9. QUARTERING METHOD

9.1. *Apparatus*:

9.2. *Quartering Template*—A quartering template manufactured from a suitable metal that would withstand heat and use without deforming is recommended. The template should be configured in the form of a cross with equal length sides of sufficient length to be 1.1 times the diameter of a flattened cone of the HMA sample to be quartered. The height of the sides should be sufficient to extend above the thickness of the flattened cone of HMA sample to be quartered. The sides shall form a 90 degree angle at their juncture (See Figure 4.).

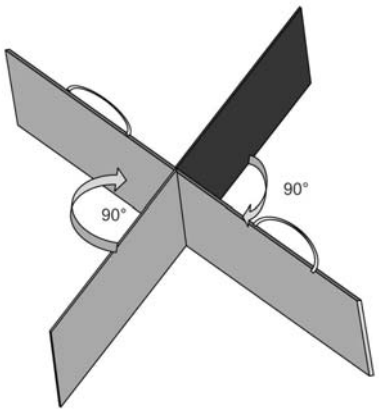

Figure 4—Quartering Device

9.3. *Flat Bottom Scoop*—A large straight-edged flat bottom scoop should be used to sample material. A square shovel or trowel will meet this requirement.

9.4. *Straight edge* – Large spatula, trowel, metal straightedge

10. PROCEDURE

10.1. Place the original sample on a hard, non-stick, clean, level surface where there will be neither a loss of material nor the accidental addition of foreign material. The surface can be made non-stick by the application of an approved asphalt release agent.

10.2. Mix the material thoroughly by turning the entire sample over a minimum of four times with a flat bottom scoop. With the last turning, scoop or shovel the entire sample into a conical pile by depositing each scoop or shovelful on top of the preceding one. Carefully flatten the conical pile to a uniform thickness and diameter by pressing down the apex with a shovel or large flat bottomed square scoop. The diameter should be approximately four to eight times the thickness.

10.3. Divide the flattened mass into four quarters by inserting the quartering template and pressing down until the template is in complete contact with the surface on which the sample is placed. Straight edges may be used in lieu of the quartering device to completely separate the material into approximately equal quarters.

10.4. Reduce the sample using one of the following procedures:

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10.4.1. Remove two diagonally opposite quarters, including all fine mastic material. Remove the quartering template. Successively mix and quarter the remaining material until the sample is reduced to the desired size.

10.4.2. Using a straightedge, slice through the quarter of the HMA from the center point to the outer edge of the quarter. Pull or drag the material from the quarter holding one edge of the straight edge in contact with the quartering device. Two straight edges may be used in lieu of the quartering device. Remove an equal portion from the opposite quarter.

11. INCREMENTAL METHOD

11.1. *Apparatus:*

11.2. Non-stick paper or heat-resistant plastic

11.3. Large spatulas, trowels, metal straightedge or 12 in. dry wall taping knife,

11.4. Miscellaneous equipment including trowel(s), spatula(s), hot plate, non-asbestos heat-resistant gloves or mittens, pans, buckets, and cans.

12. PROCEDURE

12.1. Place the sample on a surface where there will be neither loss of material nor the accidental addition of foreign material. The surface may be covered with a heavy paper, or other suitable material.

12.2. Mix the sample thoroughly by turning the entire sample over a minimum of four times. Alternately lift each corner of the paper and pull it over the sample diagonally toward the opposite corner causing the material to be rolled. With the last turning, lift both opposite corners to form a conical pile. Make a visual observation to determine that the material is homogenous.

12.3. Grasp the paper, roll the material into a cylindrical pile (loaf) and flatten the top.

12.4. Pull the paper so at least ¼ of the length of the loaf is off the edge of the counter. Allow this material to drop into a container or use a straightedge to slice off approximately ¼ of the length of the loaf and place in a container, and set aside.

12.5. Pull additional material off the edge of the counter and drop the appropriate size sample into a sample pan or container, or use a straightedge to slice off an appropriate size sample from the length of the loaf and place in a sample pan or container.

12.6. Repeat until the proper size sample has been acquired. Section 12.5 is repeated until all the samples for testing have been obtained.

Note 1 – When reducing the sample to test size it is advisable to take several small increments determining the mass each time until the proper minimum size is achieved. Unless the sample size is grossly in excess of the minimum or exceeds the maximum test size use the sample as reduced for the test.

13. KEYWORDS

13.1. Hot mix asphalt (HMA); sampling—hot mix asphalt; sample reduction.