Colorado Procedure 55-24

Standard Method of Test for

Reducing Field Samples of Hot Mix Asphalt to Testing Size

(This procedure is based upon AASHTO T 248. AASHTO T 248 or any subsequent revision may not be used in place of this procedure.)

1. SCOPE

1.1 These methods cover the reduction of field samples of hot mix asphalt (HMA), having a nominal maximum size equal to or less than 1.5 in. (37.5 mm), to the appropriate size for testing, employing techniques that are intended to minimize variations in measured characteristics between the test samples so selected and the field sample.

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

2. REFERENCED DOCUMENTS

2.1 *Colorado Procedures:*

- CP 41 Sampling Hot Mix Asphalt

3. SIGNIFICANCE AND USE

3.1 The necessity for selecting representative samples and reducing them to test specimen size is emphasized in many test procedures. Using the proper equipment for the type of material to be reduced in size is important. However, unless used correctly, the final test specimen will not necessarily be representative of the total sample.

3.2 Specifications for HMA require sampling portions of the material for testing. Other factors being equal, larger samples will tend to be more representative of the total supply. These methods provide for reducing the large sample obtained in the field to a convenient size for conducting several tests to describe the material. The reduction is done in a manner such that the smaller portion is most likely to be a representation of the field sample, and thus of the total supply. The individual test methods provide for minimum weights of material to be tested.

4. SAMPLING

4.1 The field sample of HMA shall be taken per CP 41, or as required by individual test methods. The user shall satisfy himself that the initial size of the field sample is adequate to accomplish all the intended tests.

4.2 HMA/SMA field samples need to be heated to allow for easy separation of particles. Before sample reduction, field samples should be heated for a minimum of 1 hour and shall not exceed 4 hours at the compaction temperatures as specified in Table 1.

TABLE 1

Superpave Binder Grade	Lab Compaction Temp.
PG 58-28	280° F (138° C)
PG 58-34	280° F (138° C)
PG 64-22	300° F (149° C)
PG 64-28	300° F (149° C)
PG 70-28	300° F (149° C)
PG 76-28	300° F (149° C)

Note: The minimum 1-hour timeframe may include the transport of samples in a container that retains heat to the PC/OA Laboratory prior to reheating.

5. SAMPLE PREPARATION

HMA samples shall be prepared for the reduction required for Methods A, B, or D by using either Method 1 or 2.

5.1 Method 1

5.1.1 Apparatus

5.1.2 Apparatus shall consist of a small, flat, square-end scoop with sides and a large flat-bottomed mixing pan.

5.1.3 Procedure

5.1.4 Place the field sample of HMA into the mixing pan where there will be neither loss of material nor the accidental addition of foreign material. Mix the material thoroughly by turning the entire sample over three times. Flatten the sample in the pan to a uniform depth, which should be the same or lower than the sides of the scoop.

5.2 Method 2

5.2.1 Apparatus

5.2.2 Apparatus shall consist of a small, flat, square-end scoop with sides and a large flat-bottomed mixing pan.

5.2.3 Procedure

5.2.4 Place the can containing the field sample of HMA into the mixing pan with the opening of the can resting downwards on the bottom of the pan. Elevate the can approximately 1 inch above the pan bottom. Move the can in a circular motion allowing a thin, uniform layer to form a trail behind the can. Try to distribute the material into two or more layers. If visible areas of segregation exist, mix the material thoroughly by turning the entire sample over onto itself using the scoop.

METHOD A - SELECTION BY SCOOP

6. APPARATUS

6.1 Apparatus shall consist of a small, flat, square-end scoop with sides and a putty knife.

7. PROCEDURE

7.1 Prepare the sample for reduction per Subsection 5.1 or Subsection 5.2.

7.2 Obtain a sample for each test by selecting at least three increments of material at random locations, using a small, flat, and square-end scoop. Insert the scoop to the full depth of the material. Every attempt should be made to minimize the loss of particles, especially large aggregate particles, over the sides of the scoop. A putty knife may be used to separate the material in the scoop from the material in the pan and also to cut increments of material from the main body of material in the scoop. Do not shake the material in the scoop to add small, additional amounts of material to the specimen, as this may introduce segregated material to the specimen. Combine the portions to obtain a test specimen having the required weight. Save the remaining portion of the sample until the tests are completed.

7.3 This Method shall not be used for combining and splitting large samples for testing between two or more labs.

METHOD B - QUARTERING

8. APPARATUS

8.1 Apparatus shall consist of a small, flat, square-end scoop with sides and a putty knife.

9. PROCEDURE

9.1 This procedure may be used for combining and splitting large samples for testing between two or more labs.

9.2 Prepare the sample for reduction per Subsection 5.1 or Subsection 5.2.

9.3 Divide the mixture into four equal quarters with a square scoop and remove two diagonally opposite quarters, including all fine material. Successively mix and quarter the remaining material until the sample is reduced to the desired size. Save the remaining portion of the sample until tests are completed.

METHOD C – MECHANICAL SPLITTER

10. APPARATUS

10.1 *Sample Splitter* - Sample splitters shall have an even number of equal width chutes, but not less than a total of eight for coarse aggregate, or twelve for fine-aggregate, which discharges alternatively to each side of the splitter. For HMA samples, the minimum width of the individual chutes shall be approximately 50 percent larger than the largest particles in the sample to be split (Note 1). The splitter shall be equipped with a minimum of two collection pans, having a width equal to or slightly less than the overall assembly of chutes in the splitter to hold the two halves of the sample following splitting. It shall also be equipped with a hopper, a flat scoop, putty knife, 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 into the chutes. The splitter and accessory equipment shall be so designed that the sample will flow smoothly without restriction or loss of material. A splitter brush should be used to clean the chutes of adhering fines.

NOTE 1: Mechanical splitters are commonly available in sizes adequate for coarse aggregate having the largest particle not over 1½ in. (37.5 mm).

11. PROCEDURE

11.1 The riffle splitter must be clean and dry before use. Place the material into a large, flat-bottomed mixing pan. Mix the material thoroughly. Using a flat scoop equal in width to the overall length of the riffles, remove material from the pan and slowly pour the material into the riffle splitter, first from one side and then the other. Alternatively, use a flat, square-end scoop to load the sample from the mixing pan into two extra splitter pans placed side-by-side. Slowly pour approximately half of the sample in the pan from one side and then reverse the ends of the pan and pour the remainder from the other side. A slight jarring action by the pan against the splitter helps keep the riffles from clogging. Uniformly distribute the sample 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. Do not allow any of the riffles to become plugged since this will divert material to the two adjacent riffles and send too much material to the opposite receiving pan.

11.2 Reintroduce the portion of the sample from alternating receptacles into the splitter as many times as necessary to reduce the sample to the size specified for the intended test. Retain the portion of the material collected in the other receptacle at the last split until tests are completed.

NOTE 2: As an alternative to Subsection 11.2, further splitting to testing size can be achieved with Subsection 11.3.

11.3 After splitting the material into two or four equal measures (depending on the size of the field sample), leave the divided sample in the splitter pans and place it in the oven. Use the flat, square-end scoop to obtain individual test samples of the required weight. Work from one end of the pan to the other. Insert the scoop to the full depth of the material. Every attempt should be made to minimize the loss of particles over the sides of the scoop. A putty knife may be used to separate the material in the scoop from the material in the pan and also to cut increments from the main body of material in the scoop. Do not shake the material in the scoop to add small, additional amounts to the specimen, as this may introduce segregated material to the specimen. Save the remaining portion of the sample until tests are completed.

11.4 This Method shall not be used for combining and splitting large samples for testing between two or more labs.

METHOD D - SELECTION BY CROSS-SECTION

12. APPARATUS

12.1 Apparatus shall consist of a small, flat, square-end scoop with square sides; a putty knife; and two slats having a height at least one inch taller than the sides of the splitting pan. The slats shall conform within one inch to the sides of the pan so that material cannot fall from the vertical face into the sample being separated.

13. PROCEDURE

13.1 Prepare the sample for reduction per Subsection 5.1 or Subsection 5.2.

13.2 Obtain a sample for each test by pushing a dividing slat vertically through the entire width of the sample until it contacts the bottom of the pan. Next, place a second slat parallel to the first and push it vertically to the bottom of the pan. Remove all of the material between the slats. Take care to include all fines from the pan, the slat sides, and the utensil in the sample. Obtain additional samples by pushing one of the slats vertically into the remaining material and repeating the process. Save the remaining portion of the sample until tests are completed.

13.3 This Method shall not be used for combining and splitting large samples for testing between two or more labs.

METHOD E - QUARTERMASTER MECHANICAL SPLITTER

14. APPARATUS

14.1 Apparatus shall consist of a Quartermaster mechanical splitter and a spatula.

15. PROCEDURE

15.1 This procedure may be used for combining and splitting large samples for testing between two or more labs.

15.2 The splitter shall be level. The splitter and accessory equipment shall be clean and heated to not exceed 110°C (230°F) by a non-contact temperature device.

15.3 Close the hopper doors. Place the mixture into the mechanical splitter hopper and position four receptacles to receive the reduced portions of the original sample. Avoid segregation by using a continuous or segmented pour from multiple directions around the hopper and level it out with a spatula. Release the handle to drop the mixture through the dividers into the sample receptacles. When combining and splitting more than one sample, rotate the sample receptacles in a clockwise direction after each split. Repeat Subsection 15.3 until the specified sample size is achieved.

15.4 This Method shall not be used for further reductions in sample size.