FLORIDA DEPARTMENT OF TRANSPORTATION
State Materials Office
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Florida Method of Test for Sampling Bituminous Paving Mixtures

Designation: FM 1-T 168

1. SCOPE

This method covers the procedure for sampling bituminous asphalt mixtures at the asphalt plant and roadway.

2. SIZE OF SAMPLE

The composite sample shall be of sufficient size to provide the correct number of samples for the testing required.

3. SAMPLING BITUMINOUS MIXTURES AT THE ASPHALT PLANT

3.1 Dense-Graded Mixtures (SP-9.5, SP-12.5, SP-19.0, FC-9.5, FC-12.5, B-12.5)

3.1.1 Using a square-tipped shovel, obtain approximately equal portions from at least three well-separated locations in the truck immediately after the truck completes loading and moves to an accessible position. Samples shall be taken from a depth of approximately 12 in. or greater below the surface. Take care to avoid contamination and segregation. Samples shall be shoveled from the truck directly into a metal bucket of approximately three gallons in size. The asphalt mix shall be transported back to the laboratory in the bucket.

3.1.2 Reduce the asphalt mix to the required amount for testing using the following method and fill storage boxes as necessary for additional testing.

Note 1: In lieu of filling storage boxes in the laboratory, storage boxes may be filled directly at the truck sampling location. Each storage box shall contain equal portions from the three or more well-separated sampling locations in the truck. This note does not apply to open-graded mixtures.

Note 2: Silicone coated non-stick boxes must be used for all polymer modified mixtures.

Note 3: The scoop used during the quartering/reducing process shall be of medium (3” wide x 5” long) or large (5” wide x 8” long) size and shall be round or flat sided. Trowels are not allowed.

3.1.2.1 Place the sample on either brown butcher paper or silicone coated non-stick paper. Silicone coated non-stick paper must be used for all polymer modified mixtures. Recombine by rolling to reduce segregation. Mix the material thoroughly by turning the entire sample over a minimum of four times with a scoop and/or by alternately lifting each corner or side of the paper and pulling it over the sample toward the opposite corner or side causing the material to be rolled. Create a conical pile.

3.1.2.2 With the scoop on the paper, begin at the edge of the pile and scoop the correct mass needed for the first Superpave Gyratory Compactor (SGC) specimen. Scoop straight through the center of the pile until the desired amount of mix is obtained.

3.1.2.3 Recombine the remainder of the mix and repeat the above procedure to obtain the number of SGC specimens needed.

3.1.2.4 Recombine the remainder of the mix and insert the metal quartering device into the mix. With the scoop on the paper, scoop the correct mass needed for the maximum specific gravity test from opposite quarters. Scoop straight towards the center of the pile and obtain approximately equal amounts from both quarters.

3.1.2.5 With the scoop on the paper, scoop the correct mass needed for the extraction/gradation test from the remaining two quarters. Scoop straight towards the center of the pile and obtain approximately equal amounts from both quarters. The sample can be scooped directly into the tared ignition oven basket or scale pan.

3.1.2.6 Retain the remainder of the mix until testing is complete. In the event of an equipment or testing malfunction in the lab and with the Engineer's approval, this remaining material can be used to test as the QC sample to replace the material in the malfunctioned test.

3.1.3 Obtain representative samples from the remaining buckets for the VT and RT box samples. Label each box and store in a secure location, climate controlled to the extent necessary to prevent overheating of the sample.

3.2 Open-Graded Mixtures (FC-5, Asphalt Treated Permeable Base)

3.2.1 Obtain the composite sample as described in 3.1.1. The bucket may be lined with silicone coated non-stick paper to keep from having to clean the bucket, if desired. The asphalt mix shall be transported back to the laboratory in the bucket.

Note 4: In lieu of a metal bucket, a single silicone coated non-stick sampling container of sufficient size may be used to transport the mix from the sampling location to the laboratory.

3.2.2 Reduce the asphalt mix to the required amount for testing and fill silicone coated non-stick storage boxes as necessary for additional testing as discussed in the following steps.

Note 5: Silicone coated non-stick paper must be used for the quartering/reducing process. Wax paper is not an allowable substitute for silicone coated non-stick paper. Silicone coated non-stick boxes must be used for sample storage.

3.2.2.1 Empty the bucket or sampling container by flipping it over and straight down onto a clean sheet of silicone coated non-stick paper of sufficient size. See **Figure 1**. Do not pour the material out of the bucket or sampling container onto the paper. Do not roll the sample material. Manipulate the material on the paper only enough to form a rounded pile. Insert a metal quartering device with the center of the device in the center of the pile. **See Figure 2**.

Figure 1. Emptying the sample bucket.

Figure 2. Rounded pile and metal quartering device.

3.2.2.2 **QC sample.** With the scoop on the paper, scoop the correct mass required for the extraction/gradation test from Quarters 1 and 4. **See Figure 3**. Place the material from Quarter 1 directly into the bottom basket used in the ignition furnace. Place the material from Quarter 4 directly into the top basket.

Figure 3. QC sample- bottom basket from Quarter 1 and top basket from Quarter 4.

3.2.2.3 Discard the remainder of Quarters 1 and 4. A trowel can be used to remove this material. **See Figure 4**. At the Contractor's option, the material remaining in Quarters 1 and 4 can be placed in a silicone coated non-stick storage box as the Quality Control Backup sample. In the event of an equipment or testing malfunction in the lab and with the Engineer's approval, this material can be used to test as the QC sample to replace the material from the malfunctioned test.

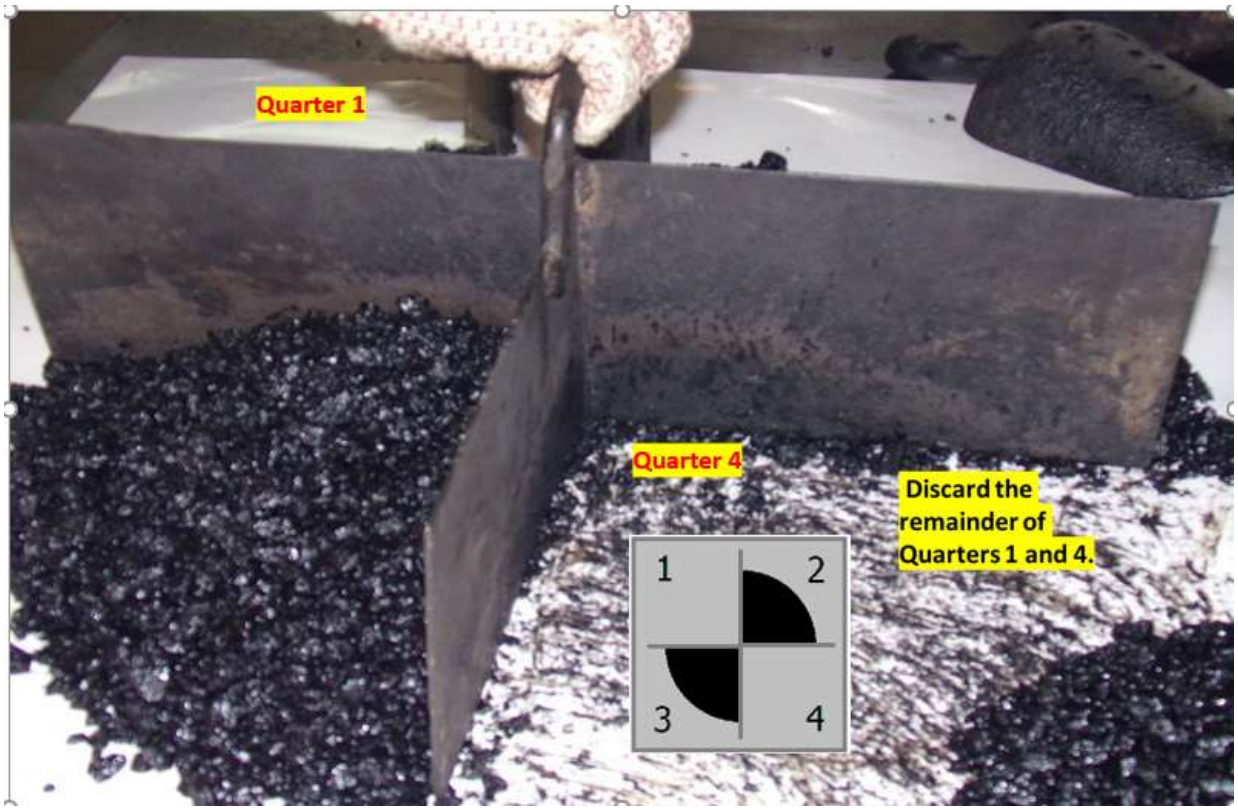

Figure 4. Discarding the remainder of Quarters 1 and 4.

3.2.2.4 Raise the quartering device and rotate approximately one-eighth turn (45 degrees). Insert the metal quartering device to divide the two remaining quarters into four sections of near equal size. **See Figure 5**.

Figure 5. Raising and rotating the quartering device.

3.2.2.5 **VT sample.** Scoop the correct mass required from opposite Quarters 2a and 3a. **See Figure 6**. Place into a silicone coated non-stick storage box. Obtain approximately one-half the total mass required for the extraction/gradation test from Quarter 2a and one-half the total mass required from Quarter 3a. Keep each quarter separated in the box with silicone coated non-stick paper.

3.2.2.6 **RT sample.** Scoop the correct mass required from opposite Quarters 2b and 3b. **See Figure 6**. Place into a silicone coated non-stick storage box. Obtain approximately one-half the total mass required for the extraction/gradation test from Quarter 2b and one-half the total mass required from Quarter 3b. Keep each quarter separated in the box with silicone coated non-stick paper.

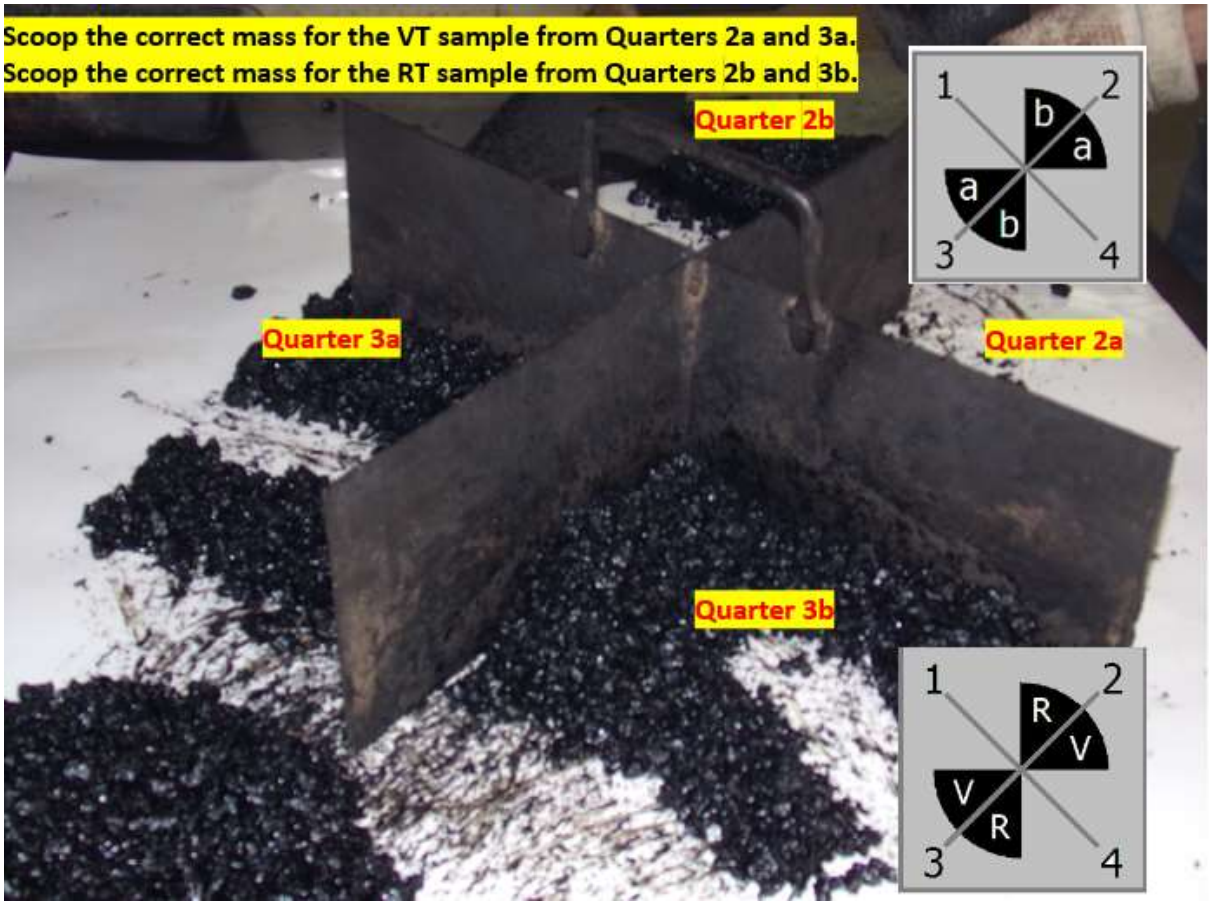

Figure 6. VT sample from Quarters 2a and 3a. RT sample from Quarters 2b and 3b.

Note 6: By keeping the VT and RT samples boxed and stored in the manner described in 3.2.2.5 and 3.2.2.6, the ignition oven samples will not have to be reheated prior to testing.

Note 7: The sampling and splitting process should be accomplished as quickly as possible to reduce loss of temperature and minimize binder drain down.

Note 8: The quartering device and scoop shall be heated prior to use to reduce adherence of binder and fines and to prevent material buildup. The bucket, quartering device and scoop shall be cleaned after every sampling event.

4. SAMPLING BITUMINOUS MIXTURES FROM THE ROADWAY

The following describes the procedure for sampling the bituminous paving mixture from the roadway. The size of sample depends upon the purpose for which the sample is being obtained and test(s) required.

4.1 FINISHED PAVEMENT

4.1.1 Apparatus

4.1.1.1 Diamond bit core drill, concrete saw, or another suitable device.

4.1.2 Procedure

4.1.2.1 Allow the pavement to cool sufficiently to permit coring or sawing without damage to the specimen. Ice may be placed on the surface of the pavement to expedite cooling.

4.1.2.2 Obtain the sample from the pavement by cutting with a diamond bit core drill or by a concrete saw.

4.1.2.3 If a density determination is to be made, the sample shall be transported in an appropriate manner to prevent damage. Do not submerge the specimen in an ice or water bath during transport or storage, unless the specimen is enclosed in a plastic bag or other means to prevent the specimen from being exposed to direct contact with water or ice. This will prevent absorption of water into the specimen prior to testing, which would adversely affect the density determination of the specimen.

4.1.2.4 When obtaining cores for bond strength testing, align the core barrel perpendicular to the surface of the pavement. Mark the direction of traffic on top of the core prior to coring. Use a core barrel with a diameter that produces a core diameter between 5.9 and 6.0 inches.