# Colorado Procedure 41-23

*Standard Practice for*

# Sampling Hot Mix Asphalt

(This procedure is based upon AASHTO R 97-19. AASHTO R 97-19 or any subsequent revisions may not be used in place of this procedure.)

## 1. SCOPE

1.1 This procedure covers the sampling of hot mix asphalt (HMA) at points of manufacture, storage, or delivery.

1.1.1 Samples obtained by this procedure may be used for acceptance and quality control of hot mix asphalt (HMA).

1.2 This Standard may involve hazardous materials, operations, and equipment. This Standard does not purport to address all of the safety problems 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 before use.

1.3 The values stated in acceptable English units are to be regarded as the standard. The values in parentheses are provided for information purposes only.

## 2. REFERENCED DOCUMENTS

2.1 *Colorado Procedures:*

- CP 75 Stratified Random Sampling of Materials

## 3. SIGNIFICANCE AND USE

3.1 *General:*

3.1.1 Sampling is equally as important as the testing, and the sampler shall use every precaution to obtain samples that will yield an acceptable estimate of the nature and conditions of the materials which they represent.

3.1.2 Care shall be taken in sampling to avoid segregation of the material being sampled. Care shall be taken also to prevent contamination by dust or other foreign matter.

3.1.3 Samples to be used for acceptance or assurance testing shall be taken by the contractor or his representative. An authorized representative of the Colorado Department of Transportation shall be present during the sampling procedure. The CDOT Representative present shall take immediate possession of all samples taken. CDOT reserves the right to designate the method and location of material to be sampled.

**4. PROCEDURE, GENERAL**

4.1 *Sampling Equipment* - The contractor shall provide the equipment needed for safe and appropriate sampling.

4.2 *Sample Handling* - Combine all sample increments. Place sample in a container with 3 to 4-gallon capacity, made of at least 30 gauge non-galvanized metal, having a "bail" type handle and a tight-fitting lid.

4.3 *Sampling* - The procedures for selecting samples are described in CP 75. The material shall be sampled using stratified random sampling from all of the material delivered to the job site.

Note: CP 75 applies only to OA testing and that PC testing needs only to meet or exceed the minimum frequencies that are specified in Table 106-1 of the CDOT Standard Specification for Road and Bridge Construction.

**METHOD A - TUBE SAMPLER**

**5. APPARATUS**

5.1 Tube sampler, with a minimum of 2-7/8 in. (73 mm) inside diameter, 16 gauge minimum thickness, and a length and diameter that are variable with desired test specimen size.

5.2 Tube sampler holder with a metal collar into which the sampler fits, with a 3 ft. (1 m) handle or a tube sampler holder with suitable arm arrangement to hold two tube samplers, which can be positioned directly beneath the discharge opening.

5.3 Containers for transporting samples shall have 3 to 4-gallon capacity, be made of at least 30 gauge non-galvanized metal, have a "bail" type handle, and a tight-fitting lid.

**6. PROCEDURE**

6.1 Batch Plant and Storage Silos - Insert one or two tube samplers into the sampler holder arm while the arm is swung away from the discharge. Obtain one or more samples from the material being loaded into a single truck using one of the following methods: (1) during discharge of mixture, swing the arm holding the tube(s) through the discharge stream at a rate fast enough to obtain a representative sample filling the tube(s) or (2) before the discharge, center the sampling tube(s) directly under the discharge flow. After the mixture has been discharged, return the apparatus to the storage position away from the point of discharge and remove the tube(s). Strike off any material above the top rim of the tube sampler.

## METHOD B - POINT OF DELIVERY

### 7. APPARATUS

7.1 Small flat scoop with vertical sides or square-ended shovel.

7.2 Container for transporting samples shall have 3 to 4-gallon capacity, be made of at least 30 gauge non-galvanized metal, have a “bail” type handle, and a tight-fitting lid.

### 8. PROCEDURE

8.1 *Sampling from the Windrow Before Laydown* - Select three or more locations at random from the windrow. Samples of the windrow shall be secured at each location by removing material from one side of the Windrow through the full depth to expose a face. Using the flat scoop, or a square shovel with sides, trench the exposed face from bottom to top, taking care to avoid segregation of particle sizes. Combine the samples from the different locations to obtain the required sample size as specified in Section 11.

8.2 *Sampling from Paving Machine Augers* - While the paver is in motion, observe the operation of the augers, which transport the mixture from the slat feeders to either side of the paver. These augers should be operating eighty percent or more of the time and be at least two-thirds covered with the mixture, if this is not the case, samples taken from the screws may be segregated and this method of sampling should not be used.

8.2.1 If the conditions of Subsection 8.2 are met, obtain at least three approximately equal increments of mixture ahead of the augers which transport the mixture from the slat feeders to either side of the Paver as follows: insert the flat scoop or shovel into the mixture and remove the portion with minimal loss of the larger particles.

8.3 *Sampling from a Conveyor Belt* --CDOT does not utilize this sampling technique.

## METHOD C - BEHIND PAVER

### 9. APPARATUS

9.1 Small flat scoop, square-ended shovel with vertical sides, or sampling device similar to Figure 41-1.

9.2 Container for transporting samples shall have 3 to 4-gallon capacity, be made of at least 30 gauge non-galvanized metal, have a “bail” type handle, and a tight-fitting lid.

### 10. PROCEDURE

10.1 *Sampling from the Roadway Before Compaction* - Obtain at least three approximately equal increments, at a longitudinal location selected at random using CP 75, and combine to form a field sample whose quantity equals or exceeds the minimum recommended in Section 11.

10.1.1 Obtain all increments from the roadway immediately behind the machine for the full depth of the material, taking care to exclude any underlying material. Locate the sampling position across the width of the roadway using CP 75. When necessary, place templates on the existing roadway to exclude any underlying material. Mark the specified area from which each increment or sample is to be removed. Templates, which are placed before the mixture is spread, will be a definite aid in securing approximately equal increment weights.

10.2 *Sampling from Roadway after Compaction* - Select the areas to be sampled using CP 75 from the material in place. Obtain at least three approximately equal increments selected from the area being sampled. Take all increments from the roadway through the full depth of the material, taking care to exclude any underlying material. Each increment shall be obtained by coring, sawing, or other methods in such a manner as to ensure a minimum disturbance of the material.

## 11. SIZE OF SAMPLE

11.1 *Number and Quantities of Field Samples:*

11.1.1 The number of field samples required is specified in the Schedule for Minimum Materials Sampling, Testing, and Inspection contained in the CDOT Field Materials Manual. The CDOT Field Materials Manual specifies the quantities of samples required for testing in the Central Laboratory and the Region Materials Laboratory. Project field tests will require a minimum sample size of 30 lbs (14 kg).

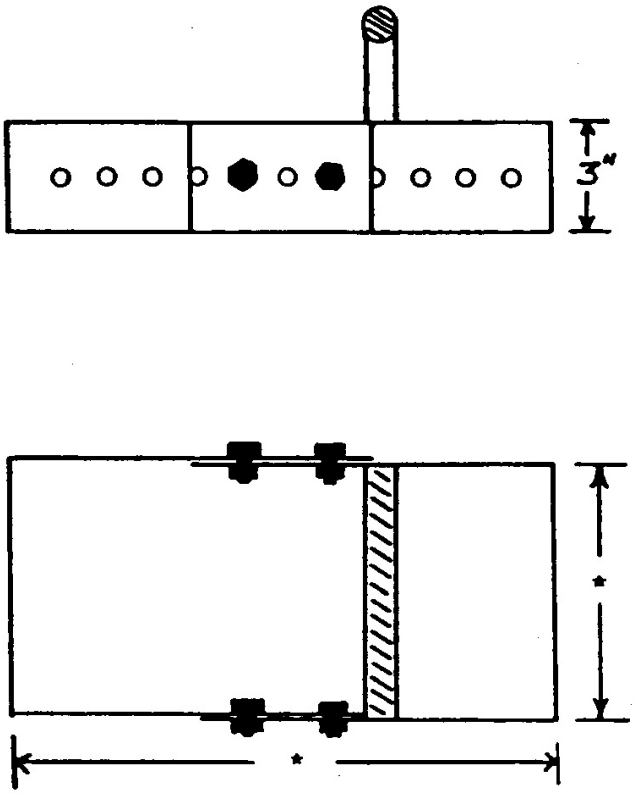
## 12. SHIPPING SAMPLES

12.1 Transport samples in a container with a 3 to 4-gallon capacity, made of at least 30 gauge non-galvanized metal, having a “bail” type handle and a tight-fitting lid so constructed as to preclude loss or contamination of any part of the sample or damage to the contents from mishandling during shipment.

12.2 Samples shall have individual identification attached providing the information required by the sample user. **Utilization of CDOT Form 633, Sample Tag (for Sacks), is required for all submitted samples.**

## 13. RECORD

13.1 Document information on CDOT Form 633 and CDOT Form 1304.
https://www.codot.gov/library/forms/form-numbers-broken-down




*Shape and area variable to accomodate sample size required.

Sampler is placed in the uncompacted lift directly behind paver and all material is removed.

**FIGURE 41-1**

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