

METHODS OF SAMPLING AND TESTING
MT 302-04
SAMPLING AND TESTING PROCEDURE FOR BITUMINOUS MATERIAL

1 Scope:

- 1.1 This procedure is to give instructions on the uniform practices for sampling and testing bituminous materials, submitting samples, retaining samples, precautions to be used during sampling, designating who is to take the sample and the recording of information pertinent to the acceptance of bituminous materials.
- 1.2 Sampling of asphalt cement for Quality Assurance Specification projects and for projects not under the Quality Assurance Specification is described in this procedure. See Special Provisions to determine whether the project is under the Quality Assurance Specification.
- 1.3 The following described procedures and practices shall also apply to shipments of bituminous materials to be used by Maintenance.

2 Details of Sampling Procedures: *WHEN, WHERE and FREQUENCY.*

- 2.1 Cut Back Asphalts, Emulsions and Asphalt Cement (not under Quality Assurance Specification).
- 2.1.1 *Cut-Back Asphalts and Asphalt Cement:* Sampling of shipments of less than 2,000 gallons is not required unless deemed necessary by the engineer. In this case, forward a copy of the certificate of compliance to the Materials Bureau. Obtain duplicate samples of bituminous material from each shipment in excess of 2,000 gallons delivered at the time of discharge into distributors or other conveyance or storage tanks on the project. Reference to a shipment of bituminous material includes the truck and trailer. Obtain the two samples from only one of the units. However, the duplicate samples represent no more than the amount of bituminous material in the shipment from which they are taken.
- 2.1.2 *For Maintenance:* Deliveries of less than 2,000 gallons will be permitted when discharged directly into Department of Transportation equipment, i.e., State distributors and "tar pots". Sampling of these deliveries is not required unless specifically requested by the Maintenance Engineer.
- 2.1.3 *Emulsions:* All emulsion shipments will be sampled, regardless of the size of the shipment, within a reasonable time **(within 24 hours) upon arrival**. Remix the material by agitation, circulation, or storage transfer, and re-sample when the material is stored without agitation for three or more days before use. Specifications allow storage instability, in terms of the settlement test, of 3% and 5% for anionic and cationic emulsions, respectively. Emulsions in compliance with the stability test can still separate into denser and lighter layers (without breaking) in a few days of dead storage so that the material will not be uniform and other tests such as viscosity and asphalt content may not be in compliance with the specifications. Acceptance will be based on the specification compliance of the material immediately prior to use.
- 2.2 *Asphalt Cement (under Quality Assurance Specification)* - Asphalt cement used in Plant Mix Bituminous Surfacing, Open Graded Friction Course, and Plant Mix Bituminous Base will be sampled for acceptance from the line conveying asphalt cement from the storage facilities to the mixing plant. Duplicate samples are not necessary for projects falling under the Quality Assurance Specification. Frequency will be as indicated in MT-601.

3 Supervision:

- 3.1 The Department reserves the right to witness the taking of any or all acceptance samples by the Contractor or designated personnel.

4 Actual Sampling:

4.1 *Importance of proper sampling.* Sampling is equally as important as the testing, and every precaution shall be taken to obtain samples that will show the true nature and condition of the materials they represent. Test results are valuable only when the tests are performed on a sample truly representative of the material under consideration. Take samples in accordance with the following described procedures, so there will be no question about them being valid from that standpoint. This can become very important in case of a test failure, which may be the basis for rejection of the material.

4.2 Cut-Back Asphalt, Asphalt Emulsions and Asphalt Cement (not under Quality Assurance Specification).

4.2.1 Take a minimum of two (duplicate) one-quart samples in containers furnished by the State. Do not use second-hand containers or any containers washed or rinsed with solvents. Refer to note.

NOTE: USE METAL CONTAINERS FOR CUT-BACK ASPHALT AND ASPHALT CEMENT. USE PLASTIC CONTAINERS FOR ASPHALT EMULSIONS ONLY.

4.2.2 Samples of asphalt emulsions shall be taken in clean, one-quart plastic jars.

4.2.3 When feasible, all truck tanks, trailer tanks, or other conveyances containing bituminous materials shall be equipped with a sampling valve not less than 3/8 inch or more than 3/4 inch in diameter. These valves may be installed either through the tank's bulkhead at centerline or on the discharge line between the truck unloading pipe and the hose. Sample the contents of railroad tank carts and truck transports, not equipped with a sampling valve, from the pressure side of the unloading pump. (See 4.2.4 below.)

4.2.4 Sample the full transport tank when sampling from the valve at the centerline of the tank's bulkhead. When sampling from the valve on the discharge line or from the pressure side of the unloading pump, sample after at least one-third of the tank has been discharged.

4.2.5 Discharge at least one gallon of the material through the valve prior to taking the samples. This procedure is very important to insure the taking of a representative and uniform sample.

4.2.6 Take the duplicate samples consecutively with a minimum lapse of time.

4.2.7 Leave the screw caps loose until the contents cool so the contraction of the asphalt will not collapse the containers. Remove any spillage on the outside of the container with a clean, dry cloth, cotton waste or paper towels. In no case should solvent (diesel fuel, gasoline, etc.) be used for this purpose. The fumes from a solvent will actually decrease the flash-point beyond the point of acceptance.

4.3 Asphalt Cement (under Quality Assurance Specification).

4.3.1 Sampling shall be done according to Section 4 – Actual Sampling, except that duplicate samples need not be taken and the contractor shall provide a device suitable for obtaining samples representative of the asphalt cement entering the mixing unit. A suitable in-line sampling device is shown in AASHTO T 40, Fig 5. Insert the sampling device into a rising section of the pipeline conveying asphalt cement from the storage facilities to the mixing plane or in a completely filled line in which gravity creates the materials flow. Turn the sampling device to face the flow of the liquid. The outlet valve may be in a horizontal or vertical position. The vertical position is preferred.

5 Submitting, Reporting and Testing of Samples:

5.1 Submitting:

5.1.1 When duplicate samples are taken, forward one of the samples (both samples in the case of asphalt emulsions), immediately to the Materials Bureau for testing. Retain the second sample for a later check test, in the event results on the first sample indicates noncompliance. This retained

5.1 Submitting: (continued)

sample should not be submitted unless requested by the Materials Bureau. Discard the retained sample after acceptable test results have been reported to the field.

5.2 Reporting:

5.2.1 Submit the samples with lab Form 101-C, Asphaltic Materials Report or CB57, Quality Assurance form. Use a separate form for each type or grade of asphalt used. Several samples of any one grade can be included on one form. The information to be included on the form is self-explanatory. The space for Date Received, Lab No., Viscosity, Penetration and Flash are to be left blank for use by the Materials Bureau.

5.2.2 Always note the last sample on any one grade as "Final" on the tag and Lab Form.

5.2.3 Place Lab Form 101-C in the plastic envelope with the samples in the shipping box.

5.2.4 Attach an identification tag, Form 91, to each sample. In addition, mark each sample container with a wax pencil, crayon or "Marxall" type of marking instrument in case the identification tag is lost through destruction, detachment or obliteration. Include the following information: Project No., Q.A. or Non-Q.A., Sample No. (see MT 610 about sampling numerical sequence), Gallons, Asphalt Type, Manufacturer, Invoice No., Specific Gravity, project Manager and Date. It is important that none of the information be omitted.

5.3 Testing:

5.3.1 The materials Bureau will make the identification tests (Flash Point and Viscosity) on each of the original samples. Complete tests for all specification requirements will be conducted, on samples selected at random for each project, by the Materials Bureau.

5.3.2 When the result of any one test on the first sample is not within the specification limits, without the application of any tolerance, the Materials Bureau will immediately notify the Prime Contractor and the Project Manager.

5.3.3 The material represented by the sample will be considered satisfactory and acceptable if the retained sample tests are satisfactory. If the retained sample also fails to meet the specification requirement, a schedule of tolerances may be applied to the specification requirement to determine whether the material may be acceptable for use without a reduction in price.

5.3.4 Upon completion of testing, the Materials Bureau will forward the results to the Engineering Project Manager by computer or on copies of Lab Form 101-C or CB57, Quality Assurance forms as submitted from the field. The laboratory will select at random the samples for complete testing and the complete test results will be reported to the field on the computer or Lab Form 101-B.

6 Certification of Shipments:

6.1 Suppliers of bituminous materials shall furnish the Project Manager, or his representative, one copy of the original bill of lading or invoice and a certificate of compliance, these documents are to accompany each tank car, truck-trailer tank, or other individual conveyance of bituminous materials shipped, or hauled to the project. This certificate, signed by a supplier's responsible representative, shall attest to the fact that the bituminous material complies with the Department of Transportation specifications for the type and grade of material represented and the conveyance was inspected and found to be free of contaminating material.

6.2 The certificate of compliance will be the basis for tentative acceptance and use of the material. In no instance may the shipment be tentatively accepted or incorporated in the work without the receipt of the certification. It may be included on the bill of lading or invoice or it may be a separate document attached to the bill of lading. The Project Manager will retain the certificate and bill of lading in the project files for record purposes.