

ALDOT-243-84 ACCEPTANCE PROGRAM FOR ASPHALT MATERIALS

1. Scope

- 1.1. The purpose of this procedure is to establish a uniform set of guidelines for acceptance by the Department and quality control by a supplier of asphalt materials. The procedure outlines methods to be followed by the Project Engineer, Prime Contractor, and Supplier. This procedure applies to all suppliers of asphalt materials for projects in Alabama. Participation in the AASHTO RE:SOURCE Proficiency Sampling Program with periodic inspection by ALDOT personnel is required and will enhance a laboratory's ability to meet the requirements described herein.

2. Definitions

- 2.1. Asphalt Materials - performance graded asphalt binders, asphalt cements, cutback asphalts, and asphalt emulsions. Modified asphalt products where additives, polymers, and related products are added at the supplier's facility will also be considered under this term.
- 2.2. Liquid Asphalt Binder -Performance Graded Asphalt Binders.
- 2.3. Department - Alabama Department of Transportation (ALDOT).
- 2.4. Bureau - Bureau of Materials and Tests.
- 2.5. Materials and Tests Engineer - The Chief of the Bureau of Materials and Tests.
- 2.6. Supplier - This term includes individual refineries and terminals supplying asphalt materials for ALDOT projects. Each facility will be treated as a separate entity even when owned by the same parent company. There are two levels of supplier: (1) Refinery (or Manufacturer) and (2) Terminal (a storage/shipping and/or pass through point.) It is possible for a single supplier to be both a refinery and a terminal as defined in paragraph 2.7 and 2.8.
- 2.7. Refinery - An industrial facility that refines asphalt petroleum crudes to produce liquid asphalt binders, or for the purposes of this procedure, a facility that manufactures a product (i.e., asphalt emulsions, asphalt cutbacks) by blending or milling of liquid asphalt binder will be considered a refinery. A facility that modifies asphalt products (liquid asphalt binders, cut-backs, emulsions) by the addition of polymers, or other additives other than liquid anti-strip, or creates a third liquid asphalt binder by blending two (2) other liquid asphalt binders, is included as this level of supplier.

- 2.8. Terminal - A facility that is used primarily for the storage of and shipping point for asphalt materials. The addition of an anti-stripping agent is the only modification allowed at a terminal. Terminals owned by an approved parent company or refinery are considered subsidiary laboratories.
- 2.9. BMT -164 - "Participation Agreement" form. Executed between ALDOT and suppliers of asphalt materials. Supplier agrees to abide by Departmental requirements and ALDOT in turn allows the supplier to sell products for Department projects.
- 2.10. BMT -146 - "Asphalt Material Certificate of Compliance" form. Supplier executes this form with each shipment slated for Department projects verifying compliance with Department specifications and procedures. This form serves as a project acceptance certificate.
- 2.11. BMT -168 - "Notification to Suspend Shipment of Asphalt Material." ALDOT will execute this form when asphalt materials fail to meet Department specifications and/or supplier fails to follow Department specifications and/or procedures.
- 2.12. IAS&T-D - Independent Assurance Sampling and Testing-Division function. It is an internal, independent check on ALDOT's sampling, testing, and acceptance programs.
- 2.13. AASHTO RE:SOURCE - AASHTO's Materials Reference Laboratory (AMRL) proficiency testing program allows individual laboratories to compare their results to a national average to determine if potential problems exist in their operation.
- 2.14. AASHTO R18 - Procedure for Establishing and Implementing a Quality System for Construction Materials Testing Laboratories.
- 2.15. BBR - Bending Beam Rheometer - Determines the flexural creep stiffness of asphalt binders.
- 2.16. DSR - Dynamic Shear Rheometer - Determines the linear viscoelastic properties of asphalt binders.
- 2.17. PAV - Pressure Aging Vessel - Accelerates aging of asphalt binders.
- 2.18. DT - Direct Tension- Determines fracture properties of asphalt binders.
- 2.19. RTFO - Rolling Thin Film Oven - Measures the effect of heat and air on a moving film of semi-solid asphaltic material.
- 2.20. FTIR – Fourier Transform Infrared Spectrophotometer
- 2.21. Central Laboratory - The liquid asphalt laboratory of the Bureau of Materials and Tests located at 3704 Fairground Road, Montgomery, AL 36110.

- 2.22. Subsidiary Laboratory - A laboratory located at a terminal owned by an approved parent company or refinery.

3. Qualification Program for Supplier

- 3.1. ALDOT will maintain a list (I-4, "Materials, Sources, and Devices with Special Acceptance Requirements" manual) of suppliers presently complying with this procedure. Suppliers must be on this list in order to sell their product for Department projects.
- 3.2. Suppliers desiring to be placed on this list must submit a request along with any applicable fees, as outlined in the "Materials, Sources, and Devices with Special Acceptance Requirements" manual. ALDOT will make an initial inspection of the facility to determine compliance with the minimum standards as outlined in Department specifications and those listed in this procedure.
- 3.3. Suppliers must comply with the following in order to sell to Department projects.
 - 3.3.1. Each supplier shall execute a "Participation Agreement" form (BMT -164). This agreement must be executed by an officer of the company who has responsibility for the overall operation of the facility and/or selling of the product for Department projects.
 - 3.3.2. Each supplier must furnish, equip, and staff a laboratory meeting the requirements of Section 9 capable of testing, within precision statement tolerances as defined in applicable ASTM or AASHTO test procedures, all the required parameters listed in Table I for each different type of material supplied (i.e. performance graded asphalt binders, asphalt cements, asphalt emulsions, or cut-back asphalt) and furnish the Department with a written Quality Control Plan. An acceptable Quality Control Plan should include what steps will be taken in case of equipment problems, loss of certified technician, etc. Generally, the company will be allowed no more than 30 working days to overcome equipment and/or technician problems, however exceptions may be allowed, with approval of the Materials and Tests Engineer for research, experimental projects, equipment problems, FTIR testing, personnel problems, etc., on a case by case basis.
 - 3.3.3. All testing by the supplier must be performed by technicians that have been certified by the Department as described in ALDOT 463 or by technicians under the direct supervision of a Department certified technician. In addition, all testing must be done in a laboratory qualified by the Department, or the laboratory must maintain a current AASHTO accreditation. Any laboratory maintaining an AASHTO accreditation will not have to participate in the

Department's laboratory inspection process. The laboratory shall be located at the site of the facility. However, with written approval of the Materials and Tests Engineer, the testing laboratory may be located at a site other than the facility site. Note! All suppliers of asphalt materials that are participating in this program and not addressed in Section 3.4 must participate in the AASHTO RE:SOURCE Proficiency Sampling Program with periodic inspection of the facilities by Bureau personnel.

- 3.3.4. The supplier shall furnish the following documents and materials to the Department:
- 3.3.4.1. The supplier shall enter the original white copy of the BMT -146 into CAAMS on a weekly basis for each load of asphalt materials shipped.
 - 3.3.4.2. All shipments of asphalt materials to the project or contractor's plant shall be accompanied by a BMT -146 (yellow copy).
 - 3.3.4.3. A current full analysis (all required parameters), for each grade of asphalt materials shipped, shall be furnished to the Department's Central Laboratory each week.
 - 3.3.4.4. A full FTIR analysis shall be performed on all Polymer Modified Binders quarterly or upon request of the department in accordance with ALDOT 408.
 - 3.3.4.5. When a supplier ships to Department projects, one verification sample per grade, per week, shall be shipped to the Department Central Laboratory. These samples are to be obtained from the supplier's storage tank (See Table I).
 - 3.3.4.6. Supplier laboratories will submit a copy of all AASHTO RE:SOURCE proficiency reports to the Bureau for review.
- 3.3.5. All testing shall be in accordance with the current ASTM, AASHTO, or ALDOT procedures, as specified in the Department Specifications.

3.4. Special Exceptions for Terminal Suppliers

- 3.4.1. Any terminal receiving performance graded asphalt binder from an approved refinery shall perform high temperature tests which includes DSR, RTFO, Brookfield Viscometer and Cleveland Open Cup Flash Tests. Low and intermediate temperature testing which includes DSR, PAV, and BBR tests are also required; but may be performed at an off-site location.
- 3.4.2. Any terminal receiving asphalt materials from a refinery that is not approved by the Department, shall meet all refinery testing requirements.

- 3.5. The inspection by the supplier of transporting vehicles, tank cars, etc., shall be required as stated in the BMT -146. This inspection shall include all vehicles, tank cars, etc., whether owned by the suppliers, contractor, or common carrier.
- 3.6. Periodic and unannounced inspections will be made at the supplier's facility by Department inspectors. The supplier will allow the inspector free access to all test records, production, storage, testing facilities, and shipping documents showing quantities of asphalt and additives loaded on transports.

Table I

SAMPLES AND TESTS PROVIDED TO ALDOT BY EACH SUPPLIER UNDER NORMAL CONTROL						
	Manufacturer or Refinery (Complete Analysis)			Shipping Facility (Terminal) (Surveillance)		
	Forward sample and attach certificate of its analysis as given below.			Forward sample with its test results on appropriate BMT form. Results are to be placed in REMARKS area of form.		
Material	Tests	Size of Sample	Frequency	Tests	Size of Sample	Frequency
Performance Graded Asphalt Binder	Flash Point, (COC) °C	Submit 1 liter (1qt.)	One per week representing each grade of material shipped	Flash Point, (COC) °C	Submit 1 liter (1qt.)	One per week representing each grade of material shipped
	Viscosity (Brookfield Thermosel Apparatus)	Submit BMT-7 (Analysis)		Dynamic Shear Rheometer (original binder)	Submit BMT-7	
	Dynamic Shear Rheometer (original binder)			RTFO		
	RTFO			Dynamic Shear Rheometer (RTFO aged binder)		
	Dynamic Shear Rheometer (RTFO aged binder)			Loss on Heating		
	PAV Dynamic Shear Rheometer (PAV aged binder)			*Any binder material not received from an approved source must be tested the same as a refinery.		
Flexural Creep Stiffness (BBR)						

	Loss on Heating Direct Tension Elastic Recovery			Low temperature testing (DSR and BBR on PAV aged material) shall be performed monthly.		
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Table I (Continued)

SAMPLES AND TESTS PROVIDED TO ALDOT BY EACH SUPPLIER UNDER NORMAL CONTROL						
	Manufacturer or Refinery (Complete Analysis)			Shipping Facility (Terminal) (Surveillance)		
	Forward sample and attach certificate of its analysis as given below.			Forward sample with its test results on appropriate BMT form. Results are to be placed in REMARKS area of form.		
Material	Tests	Size of Sample	Frequency	Tests	Size of Sample	Frequency
Cationic Emulsion	Viscosity, Saybolt-Furol at 25°C, s	Submit 4 liters (1gal.)	One per week representing each grade of material shipped			
	Viscosity, Saybolt-Furol at 50°C, s	Submit BMT-8 (Analysis)				
	Storage Stability Test, 24-hr, %					
	Demulsibility, 35ml 0.8% Sodium Dioctyl Sulfosuccinate, %					

	Classification Test, % Particle Charge Test Sieve Test, % Distillation: Oil Distillate by Volume of Emulsion,% Residue,% Tests on Residue from Distillation Test: Penetration, 25°C, 100g, 5 s, mm Ductility, 25°C 5cm/min. cm Solubility in Trichlorethylene, %			
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Table I (continued)

SAMPLES AND TESTS PROVIDED TO ALDOT BY EACH SUPPLIER UNDER NORMAL CONTROL						
	Manufacturer or Refinery (Complete Analysis)			Shipping Facility (Terminal) (Surveillance)		
	Forward sample and attach certificate of its analysis as given below.			Forward sample with its test results on appropriate BMT form. Results are to be placed in REMARKS area of form.		
Material	Tests	Size of Sample	Frequency	Tests	Size of Sample	Frequency
Cutback Asphalt	Kinematic Viscosity at 60°C Flash point (Tag, open-cup), °C Water, Percent Specific Gravity Distillation Test: Distillate, Percentage by Volume of Total Distillate to 360°C, %	Submit 1 Liter (1qt.) Submit BMT-31 (Analysis)	One per week representing each grade of material shipped			

	<p>Residue from Distillation to 360°C</p> <p>Volume Percentage of Sample by Difference, %</p> <p>Tests on Residue from Distillation: Absolute Viscosity at 60°C, Poises Ductility, 5 cm./min. at 25°C, cm Solubility Percent</p>			
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4. Field Sampling and Testing

- 4.1. The Project Engineer shall consult the Department's Testing Manual for current information concerning field sampling of asphalt materials.
 - 4.1.1. The Project Engineer, Division Materials Engineer, or their representative, shall check shipments and verify that the materials are not contaminated and that they comply with the information shown on the BMT-146.
 - 4.1.2. Any shipments that are contaminated, or suspect, should be sampled in accordance with 4.1.4. Such shipments should not be allowed to unload unless the Prime Contractor is willing to execute a Material Guaranty (BMT-73).
 - 4.1.3. Shipments that obviously contain a product not shown on the accompanying BMT-146 shall be rejected.
 - 4.1.4. Any field sampling of asphalt materials shall be done in accordance with AASHTO R 66. Samples shall be shipped to the Central Laboratory in the type container prescribed in the Testing Manual.
- 4.2. Independent assurance samples shall be taken at the frequency set forth in the Testing Manual IAS & T Section 401. These samples shall be taken from the contractor's storage tank unless otherwise directed by the engineer. Samples shall be taken in accordance with AASHTO R 66. Samples shall be taken by the contractor's representative in the presence of the ALDOT representative to ensure the liquid asphalt that is sampled is being used on the job, the proper tank was sampled, and to ensure that the sample valve was purged prior to the sample being taken to ensure non-contamination. The sample card (BMT-1) is to be filled in and signed by the division personnel, and also signed the Contractor's representative. Independent assurance samples will be tested at the Central Laboratory.

5. Acceptance and Final Certification of Asphalt Materials

- 5.1. Materials may be accepted on the job site when accompanied by the yellow copy or a signed duplicate issued by the Testing Engineer, of an "Asphalt Material Certificate of Compliance" (BMT -146), from an approved supplier. These compliance forms will be used in lieu of test reports.

6. Further Requirements of Suppliers

- 6.1. No supplier shall issue any "Asphalt Material Certificate of Compliance" (BMT -146) forms, unless the material is in full compliance with all requirements of the Department. Anti-Stripping Agents and other additives shall be added only at the rates prescribed by the Department.

7. Failing Verification Test Results

- 7.1. In the event that Department test results fail to verify those results reported by the supplier, the Department will initiate an investigation to determine cause as follows:
 - 7.1.1. Department personnel will review the supplier's weekly test results.
 - 7.1.2. Department personnel will review IAS&T-D test results.
 - 7.1.3. If necessary, Department personnel will obtain samples from the contractor's storage tank, perform all required tests at the Central Laboratory and compare test results.
 - 7.1.4. If test results from IAS&TD samples and/or contractor storage tank test results fail to verify the supplier's test results, samples will be obtained by Department personnel from the appropriate storage tank at the refinery and/or the terminal.
 - 7.1.5. Evaluate all test results.
 - 7.1.6. If the investigation indicates that a product fails to meet the appropriate specifications, the materials fall under section 8 Noncompliance of this procedure.

8. Noncompliance

- 8.1. Suppliers presently on List I-4, "Materials, Sources, and Devices with Special Acceptance Requirements" manual, who fail to comply with the above requirements, frequently fail to meet specifications, or fail to immediately correct faulty material in their tank, will be removed from said approved List I-4 for the grade and product type in question. Supplier will be notified of removal from List I-4 by BMT -168, "Notification to Suspend Shipments of Asphalt Materials on BMT -146." In addition, the Department may take action under the provisions of Section 105 of the ALDOT Standard Specifications for Highway Constuction. Reinstatement of authority to ship by certification will occur after investigation by the Department at the supplier's facility indicates noncompliance has been resolved.

9. Laboratory Qualification

- 9.1. All suppliers of asphalt materials that wish to sell their products for use on ALDOT projects with the exception of terminal suppliers addressed in Section 3.4 must participate in the AASHTO RE:SOURCE Proficiency Sampling Program with periodic inspections by ALDOT personnel. Copies of all AASHTO RE:SOURCE proficiency reports must be submitted to the Bureau for review. All suppliers of asphalt materials who are AASHTO accredited must pay an annual submittal fee listed in ALDOT-355 and submit proof of accreditation status. All suppliers of asphalt materials who are **not** AASHTO accredited must pay an annual laboratory inspection

fee and an annual submittal fee as outlined in ALDOT-355 and submit AASHTO RE:SOURCE Proficiency Sample results.

9.1.1 Inactivity, or non shipment of Liquid Asphalt to projects in the State for a period of three (3) years will constitute removal from the “Materials, Sources, and Devices with Special Acceptance Requirements” I-4 List.

- 9.2. Asphalt testing laboratories are required to have all necessary equipment to perform required tests. All test equipment must be checked, verified, and/or calibrated at the frequency prescribed in AASHTO R18.
- 9.3. Bureau personnel will inspect and qualify all asphalt materials laboratories, including subsidiary laboratories.
- 9.4. Supplier laboratories that have subsidiary laboratories are required to develop a program to qualify their subsidiary laboratories. As a minimum, the following must be addressed.
 - 9.4.1. Proficiency sample testing must be performed quarterly between the supplier laboratory and the subsidiary laboratories. The results must be forwarded to the Bureau.
 - 9.4.2. Develop a formal training program and training outlines for all new hires.
 - 9.4.3. Develop a competency evaluation program for all technicians.
 - 9.4.4. Develop equipment calibration/verification policies and procedures.
 - 9.4.5. All documentation must be retained and updated for inspection by Bureau personnel.
- 9.5. A written plan to qualify subsidiary laboratories must be submitted to the Bureau for approval prior to implementation. Equipment in subsidiary laboratories will be checked by Bureau personnel at the time technicians are certified. Once approved, any changes made to the qualification plan must be approved by the Bureau.
- 9.6. A copy of the report of the subsidiary laboratory inspection shall be provided to the Bureau.