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**Test Procedure for****ASPHALT BINDER QUALITY PROGRAM****TxDOT Designation: Tex-545-C****Effective Dates: January 2010–January 2017.**

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**1. SCOPE**

- 1.1 The Asphalt Binder Quality Program (ABQP) provides the requirements and procedures for the Construction Division, Materials and Pavements Section (CST/M&P) to inspect and approve asphalt binders and related products at the source of manufacture.
- 1.1.1 Use this procedure for approval of the following types of material, as specified in Item 300, “Asphalts, Oils, and Emulsions,” of the Department’s Standard Specifications and in Departmental Materials Specification DMS-6310, “Joint Sealants and Fillers”:
- Asphalt cement (AC)
  - Cutback asphalt
  - Asphalt emulsion
  - Performance graded (PG) binder
  - Asphalt recycling agent
  - Polymer modified emulsion crack sealer
  - Emulsified joint sealant (Classes 9 and 10)
  - Other specialty materials addressed by Item 300.
- 1.1.2 The binder supplier must opt for one of three approaches described in Sections 6–8 of this procedure:
- Seek approval for individual tanks or batches of finished binders, as described in Section 6;
  - Operate under an ongoing quality program and seek approval to supply binders for a specific time period, as described in Section 7; or
  - Blend binders on-site at the point of consumption, with no intermediate storage, and seek approval as the material is consumed, as described in Section 8.
- 1.1.3 Sections 2–5 of this procedure apply to all three of these approaches.
- 1.1.4 Other acceptance methods may be required by the plans and specifications for individual projects or materials.
- 1.2 The term “supplier” refers to the entity that provides approved materials addressed by this test procedure to a Department project.

- 1.2.1 Off-site facilities such as refineries and blending plants are the primary suppliers.
- 1.2.2 Terminals or storage facilities are considered the suppliers of all materials they ship to Department projects, even if the binders are originally from other approved sources.
- 1.2.3 Contractors who blend materials, add modifiers, or otherwise process binders on-site are considered the suppliers of those finished products.
- 1.3 The term “Asphalt Laboratory” in this procedure refers to the Asphalt Binder Laboratory of the Asphalt, Chemical, and Calibration Branch of CST/M&P. The Asphalt Laboratory is responsible for administration of this program.
- 1.4 The Department reserves the right to sample and test materials at any time and to reject material that does not meet the contract requirements.
- 1.5 The values given in parentheses (if provided) are not standard and may not be exact mathematical conversions. Use each system of units separately. Combining values from the two systems may result in nonconformance with the standard.

**2. SAMPLE SUBMISSIONS**

- 2.1 Conduct all sampling in accordance with Tex-500-C, with witness by the Engineer if the samples are to be submitted to CST/M&P for testing.
  - 2.1.1 The Department will assign an inspector to witness sampling and deliver the samples to CST/M&P whenever practical.
  - 2.1.2 Contact the Asphalt Laboratory for instructions if no inspector is available.
- 2.2 Provide a certificate of analysis (COA) with all samples submitted for approval.
  - 2.2.1 The COA must represent a sample taken from the same product stream or tank within one day of submission of the sample.
  - 2.2.2 The COA must clearly show:
    - The name, location, and contact information for the material supplier,
    - The dates of sampling and testing,
    - The name and contact information of the laboratory performing the analysis if an outside laboratory is used, and
    - Test results demonstrating that the material meets the specifications for the intended grade.

**3. GENERAL APPROVAL PROCESS**

- 3.1 Unless other specific arrangements have been made with either CST/M&P or the Engineer, do not deliver material to Department projects until a test report with a sample

identification number indicating approval, (referred to as a “lab number”), is issued by CST/M&P.

- 3.1.1 The Asphalt Laboratory will distribute test reports by fax or email.
- 3.1.2 The test report will include:
  - The date the report is issued,
  - The name and location of the supplier,
  - The grade of material,
  - The period of approval or quantity of material approved, and
  - The lab number.
- 3.1.3 The Asphalt Laboratory will issue test reports for failing samples. These reports will not include a lab number and do not indicate approval of the material.
- 3.2 Approval granted by any test report will expire at the end of the period or quantity shown on the test report. In addition, all test reports and approval granted through them expire after:
  - 60 days for AC and PG binders or
  - 30 days for emulsions and cutbacks.
- 3.3 Resolve any discrepancies or referee testing, if allowed, before delivering material to Department projects.
- 3.4 Include the following information on the invoice or loading certificate for each shipment of binder:
  - Supplier’s name and location;
  - Consignee and destination;
  - Type and grade asphalt;
  - Tank and seal numbers for material approved by tank;
  - Batch number for material approved by batch;
  - Period of approval for materials under approved quality plans;
  - Temperature, date, and time of loading;
  - Lab number;
  - Highway project number and/or requisition number, if applicable;
  - Specific gravity at 77°F (25°C) for AC and PG binders, or at 60°F (15.5°C) for cutbacks and emulsions;
  - Penetration at 77°F (25°C) for AC; and
  - Net weight.
- 3.4.1 Incorrectly identified materials will not be accepted.

- 3.4.2 Provide copies of invoices or loading certificates to the Asphalt Laboratory; or if approved by the Asphalt Laboratory, provide a monthly summary of shipments.

**4. TESTING CHARGES**

- 4.1 The Department does not charge for testing of passing samples.
- 4.2 The Department will assess a charge for failing samples, as required by Title 43 of the Texas Administrative Code (Title 43, Part I, Rule 13.8, “Testing Asphalt”).
- 4.2.1 CST/M&P may allow the supplier to submit a second sample for retesting.
- 4.2.2 If the second sample passes, there will be no charge for either sample.
- 4.2.3 Additional samples after a retest will be treated as new submissions.
- 4.2.4 Contact the Asphalt Laboratory for a schedule of test charges.
- 4.3 Do not submit samples for purposes other than approval for use on Department projects, except by special arrangement.

**5. ADVANCED ACCEPTANCE**

- 5.1 In some cases, to avoid delays in material supply, CST/M&P may approve materials before testing is complete.
- 5.1.1 The decision to allow or deny advanced acceptance is at the discretion of CST/M&P and is based on the performance history of the supplier for the grade in question.
- 5.1.2 As a minimum, the three most recent submissions of that grade from the supplier must meet the specifications.
- 5.1.3 Results submitted in a COA should provide reasonable assurance that the sample will pass when tested by the Asphalt Laboratory. (The results are not “borderline.”)
- 5.2 Contact the Asphalt Laboratory to request advanced acceptance.
- 5.2.1 Perform testing on the material no more than one day prior to the request.
- 5.2.2 Provide a COA for the material by fax or email prior to the request.
- 5.2.3 Sample the material and submit to CST/M&P on the day of the request.
- 5.3 If advanced acceptance is granted, the Asphalt Laboratory will immediately issue a preliminary test report with a lab number.
- 5.3.1 CST/M&P will withdraw approval and rescind the lab number if:
- The sample is not received by the Asphalt Lab within 5 business days or

- The sample does not pass all specifications when tested by the Asphalt Lab.

5.3.2 The material supplier accepts all risk up to and including nonpayment for shipments and removal and replacement of material if approval of the material is withdrawn.

## 6. INSPECTION BY TANK OR BATCH

6.1 Use this method only when material is approved based on discrete quantities of finished product or blend stocks stored in tanks.

6.1.1 Provide covered tanks of a size commensurate with the quantity of material produced so that excessive sampling will not be required.

6.1.2 Set storage and loading temperatures as desired, as long as they are within the limits shown in the current Department specifications.

6.1.3 Provide a satisfactory means of effectively sealing the inlet or fill line.

6.1.4 Equip tanks with convenient sampling ports at least 3 ft. above the bottom of the tank. AASHTO T40 shows recommended designs for sampling valves.

6.1.5 For blended materials, provide convenient sampling ports at the loading facilities.

6.1.6 Provide clear, unique identifying numbers for each tank.

6.1.7 Provide a map of the facility showing:

- All tanks, with the tank numbers and expected grades to be stored in each one,
- All loading and unloading facilities,
- Any sampling points that are not at the tanks or loading facilities, and
- Important structures, such as the laboratory, control room, roads, scales, or main office.

6.2 When the material in a finished product tank is ready for shipment, submit a sample from the tank as described in Section 2.

6.2.1 At the time of sampling, with witness by the Engineer, seal the inlet or fill line of the tank with a numbered railroad type seal.

6.2.2 Include the tank number, seal number, and the volume of material in the tank on all documentation relating to the sample.

6.2.3 Approval of the material, if granted, is for the volume of material in the tank at the time of sampling. Approval of the material expires when:

- The approved volume is consumed,
- The seal on the tank is broken or removed, or
- Any material is added to the tank.

- 6.3 When the supplier is ready to blend specification grade materials from blend stocks using an inline mixer, obtain a sample from a trial blend or from the first load and submit the sample as described in Section 2.
- 6.3.1 At the time of sampling, seal the inlet lines of the blending stock tanks with numbered railroad type seals and report the volume of blending stocks on hand.
- 6.3.2 Assign a unique batch number to the sample.
- 6.3.3 Include the batch number and seal numbers on all documentation relating to the sample.
- 6.3.4 Submit a sample, with a unique batch number, for each grade to be produced from the same blending stocks.
- 6.3.5 Approval of the materials, if granted, is for shipments of the sampled grades made from the blending stocks on hand at the time of sampling. Approval of these materials expires when:
  - The seal on either blend stock tank is broken or
  - Material is added to either blend stock tank.
- 6.4 The Department may collect random check samples from tanks, loading facilities, or transports.
  - 6.4.1 The material supplier may capture the check samples with witness by the inspector.
  - 6.4.2 No COA is required with random samples.

**7. INSPECTION BY APPROVED QUALITY PLAN**

- 7.1 Use this method only when material is approved for specific time intervals based on a quality plan that has been approved by CST/M&P.
- 7.2 Material suppliers wishing to operate under this method must submit a quality plan to the Asphalt Lab for approval. The quality plan must include the following for each facility addressed:
  - A description of the facility type and operation, including address, contact information, and proposed products;
  - A site map showing locations of tanks, loading racks, rail lines, buildings, and other major features;
  - Organizational chart and biographical information and qualifications for key personnel;
  - Training and calibration procedures that will be used (and records kept) to assure that technicians perform tests according to correct procedures and that equipment is maintained and calibrated;
  - Name, location, and qualifications of any off-site laboratories that provide testing service;

- Daily quality control (QC) tests for all products;
- Frequency of full specification testing for all products;
- Frequency of independent sampling by CST/M&P;
- Description of methods for monitoring and analyzing test results;
- Monthly reporting of supplier test results to the Asphalt Laboratory;
- Procedures for addressing failing test results; and
- Transport inspection and loading procedures to ensure proper material handling and shipment of the correct materials.

- 7.2.1 CST/M&P will review the plan upon submittal and may ask for revisions.
- 7.2.2 The material supplier may begin operation under the plan once the Department has granted approval.
- 7.2.3 CST/M&P may require more frequent independent sampling and testing during initial implementation of the plan.
- 7.3 CST/M&P will grant approval for each grade for a specific period.
- 7.3.1 Approval will be based on the review of supplier test data and the Asphalt Laboratory's quality assurance (QA) testing.
- 7.3.2 Approval of the material, if granted, is for the period and grade shown on the Asphalt Lab's test report.
- 7.4 Submit samples as described in Section 2.
- 7.4.1 Submit samples before the beginning of the normal approval period (maximum 15 days early) to avoid lapse of approval.
- 7.4.2 Include the approval period on all documentation related to the sample.
- 7.5 The Department may collect random check samples from tanks, loading facilities, or transports.
- 7.5.1 The material supplier may capture the check samples with witness by the inspector.
- 7.5.2 No COA is required with random samples.

## **8. APPROVAL AT THE POINT OF CONSUMPTION**

- 8.1 Use this methodology only when binders are blended or processed at or near the point of use and consumed immediately.
- 8.1.1 Examples include blending of polymers or tire rubber at mix plants, on-site blending of tire rubber for seal coats, or injection of modifiers through inline blending systems.

- 8.1.2 Addition of antistrip at the mix plant is not deemed a modification of the binder and does not require approval by this method.
- 8.1.3 Suppliers who blend binders on-site on an ongoing basis may alternatively elect to develop a quality plan and operate under the system described in Section 7.
- 8.2 Obtain approval from the Engineer prior to beginning production.
  - 8.2.1 Provide the Engineer with a 1 qt. (1 L) sample of the proposed binder with a COA as described in Section 2. Include a description of the proposed process for producing the finished binder.
  - 8.2.2 The Engineer will forward the sample and COA to the Asphalt Laboratory for quality assurance (QA) testing.
  - 8.2.3 Begin production only after the Engineer has approved the process and the QA test results.
- 8.3 Collect a sample of the finished binder each production day, at a time determined by the Engineer.
  - 8.3.1 Provide a sampling port, on either a tank or pipeline, which will allow sampling of the binder downstream of any blending or other processing. AASHTO T40 shows recommended designs for sampling valves.
  - 8.3.2 Provide clean, round, 1 gal. (4 L) cans and clean, round, double friction top, 1 qt. (1 L) cans for samples.
  - 8.3.3 Sample in accordance with Tex-500-C, with witness by the Engineer.
  - 8.3.4 Collect the sample in a 1 gal. (4 L) can. Immediately stir the sample and fill three 1 qt. (1 L) sample cans. The Engineer will choose one of the three sample cans for testing and retain others until testing is complete. If the original sample is lost or damaged, use a retained sample for testing.
- 8.4 The Engineer will forward a sample from the first day's production and at least one sample randomly selected from every nine daily binder samples (or a minimum of one sample per project after the first day) to the Asphalt Laboratory for QA testing.
- 8.5 The Asphalt Laboratory will conduct all QA testing, including the preconstruction sample, within 10 working days after receipt of the sample.
- 8.6 For QA testing that fails to confirm specification compliance, review the manufacturing process to locate the source of the problem.
  - 8.6.1 The Engineer may stop production until the producer can show that the next binder produced will meet the specifications.
  - 8.6.2 The Engineer may require materials not meeting the specification requirements to be removed and replaced at the supplier's expense.



**9. ADDITIONAL INFORMATION**

- 9.1 For more information on this subject and on related materials, contact the Asphalt Laboratory of CST/M&P by voice at (512) 506-5820, by fax at (512) 506-5825, or by email at CST\_AspphaltLab@txdot.gov.

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