

Volume II

Section 3.4

Asphalt Emulsion

3.4.1 PURPOSE

This procedure provides instructions for material approval, as well as guidance for the development and implementation of the Quality Control (QC) Program for the manufacture, testing, storage, and transportation of asphalt emulsion.

3.4.2 AUTHORITY

334.044(2), 334.044(10) (a), and 334.048 Florida Statutes

3.4.3 REFERENCES

Code of Federal Regulations (CFR), Federal-Aid Policy Guide (FAPG), Construction Inspection and Approval, Subpart B – Quality Assurance Procedures for Construction

Florida Department of Transportation Standard Specifications for Road and Bridge Construction (Specifications)

American Society for Testing and Materials (ASTM) Standard Test Methods and Specifications, Philadelphia, Pennsylvania

American Association of State Highway and Transportation Officials (AASHTO), Part I Specifications, and Part II Tests, Washington, D.C

Approved Products List (APL)

Florida Sampling and Testing Methods (FSTM)

3.4.4 SCOPE

This procedure is to be used by asphalt emulsion suppliers (Suppliers). These requirements and activities pertain to material approval for addition to the

Florida Department of Transportation (Department) **APL**, QC Plan approval, required testing procedures and frequencies, and the Department's on-site inspections.

3.4.5 GENERAL INFORMATION

Suppliers are responsible for the production, sampling, testing, storage, and maintenance of records of sales of asphalt emulsion at each of their supply locations from which material is sold (Terminals). The Supplier's operations and materials must meet the requirements of the **Specifications** and the Supplier's approved QC Plan. The Supplier shall have an approved QC Plan for each Terminal.

3.4.6 MATERIAL APPROVAL PROCESS

3.4.6.1 General

For any asphalt emulsion material supplied to the Department, a sample must be submitted for **APL** approval from each Terminal. Send a sample of the material to the State Materials Office (SMO) for testing. Submit a QC Plan for the Terminal to the SMO. These steps are described in detail below.

3.4.6.2 Laboratory Testing

Submit Specification Compliance (SC) test results from the Supplier's lab or an independent lab indicating the sample has passed all testing requirements. If the material is an existing grade, it will be tested according to the requirements in **Specifications Section 916**. If the material is a new grade, the testing requirements must be approved by the SMO prior to laboratory testing.

3.4.6.3 SMO Testing

Submit a 1-gallon sample representative of the material to the SMO for SC testing in accordance with **Specifications Section 916**. Samples for this purpose shall be from the same batch of material being used for the test section.

If the material is intended for use as tack coat material and is a new asphalt emulsion grade for the Supplier, testing will include a laboratory evaluation for re-emulsification in accordance with FM 5-624. In addition, the material will need to be applied on a Department project that meets the requirements of **Section 3.4.6.3.1** described below.

If the material is intended for use as a prime coat material and is a new asphalt emulsion grade, the material will need to be applied on a Department project that meets the requirements of **Section 3.4.6.3.2**.

If the SC testing and the field evaluation (if applicable) proves satisfactory, an **APL** number will be assigned to the material by the Product Evaluation Office.

3.4.6.3.1 Field Evaluation for Asphalt Emulsions for Use as Tack Coat

A material being evaluated for use as a tack coat will need to be applied between a recently paved asphalt structural layer and another dense graded asphalt structural layer or dense graded friction course layer. An SMO representative (or delegate) must be present for the field test section to visually confirm the material's tracking properties (except for tack coats approved for use with spray pavers). The Department will direct the Contractor to obtain five 6-inch diameter roadway cores from the field test section for testing at the SMO for bond strength in accordance with **Florida Sampling and Test Method Determining the Interlayer Bond Strength Between Asphalt Pavement Layers**. The material must show little to no tracking (not applicable for tack coats approved for use with spray pavers) and have a minimum bond strength value of 100 psi for each individual core for approval.

3.4.6.3.2 Field Evaluation for Asphalt Emulsions for Use as Prime Coat

A material being evaluated for use as a prime coat will need to be applied on a granular base course. An SMO representative (or delegate) must be present for the field test section. The material must not track or pull up when trafficked by construction vehicles. The Department will direct the Contractor to obtain five 6-inch diameter roadway cores from the field test section. Base material shall be adhered to the bottom of each core indicating bonding between the base and the asphalt layers.

3.4.6.4 Submission of QC Plan

Submit a QC Plan that includes quality control procedures for the grade of asphalt emulsion. The QC Plan must meet the requirements of **Section 3.4.7.2**.

3.4.6.5 Material Approval

Upon the satisfactory testing of the material by the SMO and the Department's satisfactory review of the proposed QC Plan, the QC Plan will be approved and the SMO will recommend that the material be added to the **APL** by the PEO. Once the PEO adds the material to the **APL**, the material will be approved at that location for use on Department projects.

The Department reserves the right to remove a material from the **APL** or a Terminal from the Department's **Production Facility Listing** due to inadequate quality, failure to comply with the **Specifications** or **Materials Manual Section 3.4**, failure to follow the Supplier's QC Plan, or disregard to State or Federal Law.

3.4.7 QC Program

3.4.7.1 QC Program requirements

The most recently approved QC plan shall be available to the Terminal personnel at all times. Each Supplier will be responsible for maintaining a current and updated profile in the Department's Materials and Certification system (MAC) database. The information shall include:

- (A) Contact information for each supply location, including its technical and Terminal personnel.
- (B) Updated list of materials being supplied at each supply location with their **APL** number.
- (C) Current list of tests and qualifications (if applicable) performed by each location's laboratory.

Each Supplier shall ensure that the **FHWA-1022 Form** will be posted in the offices where the records will be kept, as well as in the laboratories where

any material is tested.

3.4.7.2 QC Plan

The QC Plans shall outline the procedures used to produce asphalt emulsions in conformance with the **Specifications**. Submit a QC Plan to the SMO. The QC Plan shall include, but is not limited to, the following:

- (A) For each asphalt emulsion product, provide the limits for the SC requirements listed in **Specification Section 916** and any additional tests needed for the product.
- (B) Indicate if the testing will be performed on-site or at another location. List an alternate testing laboratory for situations where the primary lab is not operational.
- (C) The tank identification numbers with the corresponding volumes (in gallons).
- (D) The sampling and testing procedures for QC and SC testing.
- (E) Indicate the course of action to be taken in the event material not meeting **Specification** requirements is shipped.
- (F) Outline the procedure to be followed for checking transport vehicles before loading to prevent contamination of shipments. The outline shall include a statement that the transport vehicle inspection report, signed by the responsible inspector, shall be maintained in the Supplier's records and will be made available to the Department upon request.
- (G) Indicate all items that will be furnished on the Bill of Lading (BOL) as required in **Section 3.4.8.3.1**

MAC must be updated each time a material is added to a Terminal. Any changes in the Department database to existing materials at a Terminal must also be approved by the Department and may require the re-approval of the QC Plan.

3.4.8 FUNCTIONS AND RESPONSIBILITIES OF SUPPLIERS

3.4.8.1 General

The Supplier is responsible for the quality of the asphalt emulsion. Provide Terminals and QC personnel with the tools necessary to perform specified tests and maintain an acceptable QC program and produce a material that conforms to the requirements of **Specifications Section 916**. Maintain proper documentation of all required paperwork.

3.4.8.2 Asphalt Emulsion Production and Storage

Ensure that the Terminal is equipped to properly proportion and blend the components into a uniform material. Ensure that the storage tanks can accurately maintain the appropriate temperatures and circulate material if necessary. Ensure that the materials are sampled and tested per the Terminals' approved QC Plan. Retain a 1-gallon split sample of each material for SC and QC testing. Ensure that all equipment used to perform testing is properly maintained and calibrated.

3.4.8.2.1 Sampling and Testing

Sample the material once per month for SC testing according to the criteria for that material grade outlined in **Specifications Section 916**. Testing for re-emulsification, in accordance with FM 5-624, shall be performed for every sixth monthly SC test. The material must also be sampled for SC testing whenever there is a change in raw materials. SC testing shall be conducted by a testing laboratory that participates at least annually in the **AASHTO Materials Reference Laboratory (AMRL)** Proficiency Sample Program for asphalt emulsion. Acceptable performance in the **AMRL** Proficiency Sample Program shall be a minimum score of 3 for each test. A rating of less than 3 shall require identification of appropriate action on the part of the Supplier and be acceptable to the SMO. Results from SC testing shall be available within five working days of sampling.

Perform QC testing for each calendar week that the material is shipped. QC testing shall consist of Sieve, Saybolt Furol Viscosity, and Residue Percentage testing. Results from QC testing shall be available within 24 hours of sampling.

In the event that a SC test is outside specification requirements or a QC test is outside limits established by the supplier as part of their QC Plan, shipments of that product to Department projects will cease immediately and the Contractor and the SMO will be notified and the product retested for specification compliance (re-sampling as appropriate). Resume shipment of the product when the retest for specification compliance meets all requirements and with the approval of the SMO.

The Department may sample and test emulsified asphalt from the supplier's storage tank and/or delivery vehicle to verify and determine specification compliance. Where these tests identify material outside specification requirements, the State Materials Engineer may require the supplier to cease shipment of that emulsified asphalt product. Further shipment of that emulsified asphalt product to Department projects may remain suspended until the cause of the problem is evaluated and corrected by the supplier as necessary to the satisfaction of the Director, Office of Materials, or designee.

3.4.8.2.2 Handling and Storage

Obtain a 1-gallon split sample of each material obtained for SC or QC testing. Retain the split samples at the supply location for at least 30 days from the date of sampling. Ensure that the tank number, Supplier's LOT number, material grade, and sample date is clearly labeled on the containers. Store the samples in a location such that the materials and labels will not be damaged by weathering.

3.4.8.2.3 Calibration of Equipment

Ensure that all testing equipment is calibrated and maintained in accordance with the appropriate **ASTM**, **AASHTO**, or **FSTM** test method(s). Maintain calibration records that include the date, time, and the technician that performed the calibration.

3.4.8.3 Shipments and Record Keeping

Issue a Bill of Lading (BOL) for each sale of asphalt emulsion. Maintain a monthly sales log of all shipments to contractors that have Department approved asphalt plants, and retain all required documentation.

3.4.8.3.1 Bill of Ladings

Furnish a BOL for each outgoing shipment of asphalt emulsion. The BOL shall include all of the following items:

- (A) Material grade and APL number
- (B) Quantity of material (in Gallons)
- (C) Date and time of shipment
- (D) BOL number
- (E) Supplier's LOT number
- (F) Customer name
- (G) Statement that the material meets **Specifications Section 916** and the Supplier's QC Plan
- (H) Signed statement from the driver of the delivery vehicle that verifies the previous material that was hauled and further stating that the delivery vehicle is clear of contaminants.

3.4.8.3.2 Sales Log

The monthly sales log shall indicate the material grade, outgoing gallons, Supplier's LOT number, tank number, BOL number, date, time, and customer. The sales log must be readily available at the Terminal location.

3.4.8.3.3 Documentation

Maintain all documentation for no less than three years from the date of issue. The documentation shall at a minimum include the following items:

- (A) A copy of each QC Plan approved by the SMO.
- (B) Sales log of all outgoing shipments.

- (C) Bill of Ladings for all outgoing shipments.
- (D) Signed COAs for all SC reports.
- (E) Raw data for all testing performed.
- (F) Equipment calibration records.
- (G) QC Program Inspection Reports from previous Department inspections and all correspondence relating to material deficiencies.

3.4.9 Terminal Inspections

3.4.9.1 General

The Department will perform initial and annual unannounced Quality Assurance Reviews (QAR) at each Terminal location.

3.4.9.2 Terminal Review

The Department will perform a scheduled initial QAR at every Terminal after the first QC Plan has been approved. A QAR may also be performed, but not limited to, the following reasons: 1) a Terminal begins to supply material after a period of inactivity 2) a Terminal has undergone new management, or 3) deficiencies have been noted during previous inspections.

The Supplier shall allow the Department to inspect the facility and the Supplier shall provide answers to questions relating to production, handling, storage, and testing of materials. Provide all requested documentation to the Department and make copies of any documentation upon request. Collect three 1-gallon samples as directed. One sample shall be retained on-site, another sample shall be tested for SC by the Supplier, and one sample shall be tested by the Department. Enter the results into MAC. Within 20 calendar days of the inspection, the Department will issue a QC Program Inspection Report and send it to the Supplier. Any issues that require responses will be identified in the report. Provide responses to issues found in the report within 20 calendar days from the receipt of the report.

The Department may perform unannounced QAR inspections at any Terminal that has materials listed on the **APL**.

3.4.10 TRAINING

None required.

3.4.11 FORMS

None required.