

DIVISION OF HIGHWAYS
CONTRACT ADMINISTRATION DIVISION

MATERIALS PROCEDURE

GUIDE FOR QUALITY CONTROL PLANS FOR HOT-MIX ASPHALT

1.0 PURPOSE

- 1.1 This procedure presents Quality Control guidelines which should be used when the Contractor (Producer) develops his Quality Control Plan. All items listed are believed necessary to assure adequate product Quality Control.

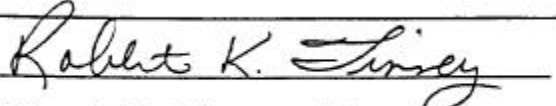
2.0 SCOPE

- 2.1 This procedure is applicable to hot-mix asphalt base, wearing, and patching-and-leveling courses.

3.0 GENERAL REQUIREMENTS

- 3.1 As stated in the specifications, a Quality Control Plan must be developed by the producer and submitted to the Engineer prior to construction. Acceptance of the Quality Control Plan by the Engineer will be contingent upon its concurrence with these guidelines. For this reason, the plan should clearly describe the methods by which the Quality Control Program will be conducted. For example, the items to be controlled, tests to be performed, testing frequencies, sampling locations and techniques all should be included and each item should be listed separately. Also, a detailed plan of action regarding disposition of non-specification material should be included. Such a plan should provide for immediate notification of all parties involved in the event non-conforming situations are detected. Attachment 1 may be used as an example Quality Control Plan for plant operations using all items that are applicable to the specific type of plant. Attachment 2 may be used as an example Quality Control Plan for field operations.

- 3.2 Inspection and testing records should be maintained, kept current, and made available for review by the Engineer throughout the life of the contract. All other documentation, such as date of inspections, tests performed, temperature measurements, and any accuracy, calibration, or re-calibration checks performed on production or testing equipment should be recorded.
- 3.3 The Contractor should maintain standard calibrated equipment and qualified personnel in accordance with contract and specification requirements for the item(s) being produced.
- 4.0 QUALITY CONTROL PLAN
- 4.1 The Contractor must submit the field Quality Control Plan yearly to each District in which their projects are located. The Contractor must also submit the plant Quality Control Plan yearly to the District in which the plant is located. Any modification to these plans for special conditions on a specific project will require the submittal of a revised Quality Control Plan which shall include all approved changes specific to that project. Distribution of the approved Quality Control Plan will be made by the Division.
- 5.0 HOT-MIX ASPHALT FOR MAINTENANCE
- 5.1 The provisions of this procedure will apply to hot-mix asphalt that is picked up at the plant by the Division's Maintenance forces. Exceptions to this are as specified in the purchase order.


Robert K. Tinney, Director
Contract Administration Division

Attachments

E X A M P L E

Mr. _____
West Virginia Division of Highways
District _____ Engineer
_____, West Virginia

Dear Mr. _____:

Subject: Hot-Mix Asphalt
Quality Control Plan
for Plant Operations

We are submitting our hot-mix asphalt Quality Control Plan, developed in accordance with Section 401 of the _____ Standard Specifications, the _____ Special Provisions, and MP 401.03.50.

1. Make of Plant Type Location

2. The Quality Control program is under the direction of _____, who can be contacted at _____, telephone number _____.
3. Sampling and testing will be the responsibility of _____, hot-mix asphalt technician number _____.
4. The types of asphalt paving materials to be used are:

 (a) _____, (d) _____
 (b) _____, (e) _____
 (c) _____, (f) _____
5. Prior to production of the items, we will submit (on Division Form T-400) our plant mix formula for each type of mix. Only approved materials will be incorporated in the mix.
6. During the production operations of the hot-mix asphalt we will perform at a minimum Quality Control tests in accordance with the attached schedule.

- 7. All testing and evaluation will be completed within 24 hours of sampling and all documentation will be completed and submitted to the Division on approved processing forms within 72 hours or production will be halted until these items are current.
- 8. Material found to be noncomplying shall not be incorporated into the roadway. In the event that nonspecification material is incorporated into the project, the Division of Highways District Materials Supervisor will be notified immediately.
- 9. We will notify all appropriate Division of Highways personnel at least 24 hours before the scheduled work is to begin.
- 10. (Statement of disposition of nonconforming material)

Very truly yours,

Company Representative

GUIDE FOR QUALITY CONTROL PLANS FOR ALL HOT-MIX ASPHALT

| TEST OR ACTION | FREQUENCY | TEST METHOD | METHOD OF DOCUMENTATION |
|---|--|----------------------------------|---------------------------------|
| Construction of stockpile to prevent segregation intermingling | Constant | Visual | Diary |
| Coarse aggregate unit weight | One test before start of operation | AASHTO T19 | T304 |
| Stockpile & cold bin gradations | Plant setup and as needed to control production | AASHTO T27 and T11 | T300 |
| Calculate % aggregate from each bin, calibration cold bin | Plant setup | | T415 |
| Check feeder gate output at gate setting to be used | Plant setup. If bins overflow or run dry. | | Plant Inspection Form and Diary |
| Select screen sizes | Plant setup | | Plant Inspection Form |
| Determine hot bin gradation, calculate combined gradations | Weekly during production | AASHTO T27 and T11 | T300 and T415 |
| Calibrate hot bins, select gate openings, and calculate batch weights | Plant setup and change in material source | | Plant Inspection Form and Diary |
| Check accuracy of scales | Plant setup and weekly accuracy checks. Zero balance and sensitivity each ½ day of operation | Construction Manual – 700 Series | Plant diary and T603 |
| Calibrate asphalt pump, calculate settings | Plant setup | | Plant Inspection Form |
| Check metering pump at setting to be used | Plant setup and monthly | | Plant Inspection Form and Diary |
| Reset metering pump to compensate for temperature change | Plant setup and each temperature change of 10 °F (6 °C) | | Plant Inspection Form and Diary |
| Adequate heated storage for liquid asphalt | Plant setup | | Plant Inspection Form |

GUIDE FOR QUALITY CONTROL PLANS FOR MARSHALL DESIGNED HOT-MIX ASPHALT

| TEST OR ACTION | FREQUENCY | TEST METHOD | METHOD OF DOCUMENTATION |
|---|---|---|--|
| Calculating mixing time | Plant setup and when paddle pitch or dam gate changed | | Plant Inspection Form and Diary |
| Ross Count (degree of coating) | Only if mixing time is less than 45 seconds | AASHTO T195 | Diary |
| Coarse aggregate face fracture (Gravel only) | One test before start of operation Every 10,000 ton (9,000 Mg) thereafter | MP 703.00.21 | T302 |
| Complete mix face fracture (When using gravel) | One per week | MP 703.00.21 | T302 |
| Check moisture content of aggregate | Plant setup and daily | | Diary |
| Temperature check | Minimum of one check of mix per hour at plant | | Plant Control Chart and Diary |
| Asphalt Content | Minimum of one sample per day up to 3000 tons. If over 3000 tons per day then one sample per half day's production. | AASHTO T164, T287, T308, or automated plant printout | T402, T403, T411, T417, or automated plant printout. Plus T423 |
| Aggregate Gradation (cold feed, hot bins, or completed mix) | Minimum of one sample per 5000 tons produced or one sample every three days of production, whichever occurs first. | AASHTO T27 plus T11 or AASHTO T30 | T300, T404, or T417 Plus T425 |
| Daily Mix Property Testing: Stability and Flow, % Air Voids, and % Voids-in-Mineral Aggregate (VMA) | Minimum of one sample per day up to 3000 tons. If over 3000 tons per day then one sample per half day's production. | AASHTO T245 or ASTM D5581, AASHTO T269, T166, T209, and MS-2 Manual | T406 and T423 |

GUIDE FOR QUALITY CONTROL PLANS FOR SUPERPAVE DESIGNED HOT-MIX ASPHALT

| TEST OR ACTION | FREQUENCY | TEST METHOD | METHOD OF DOCUMENTATION |
|--|---|-----------------------------|---------------------------------|
| Calculating mixing time | Plant setup and when paddle pitch or dam gate changed | | Plant Inspection Form and Diary |
| Ross Count (degree of coating) | Only if mixing time is less than 45 seconds | AASHTO T195 | Diary |
| Coarse aggregate face fracture (Gravel only) | One test before start of operation Every 10,000 ton (9,000 Mg) thereafter | ASTM D5821 | T302 |
| Complete mix face fracture (When using gravel) | One per week | ASTM D5821 | T302 |
| Check moisture content of aggregate | Plant setup and daily | | Diary |
| Temperature check | Minimum of one check of mix per hour at plant | | Plant Control Chart and Diary |
| Gyratory Compaction | One test for production periods of six hours or less. One test for each half day for production periods of greater than six hours. When production exceeds twelve hours a third sample shall be tested. | AASHTO TP4 | T419 |
| Aggregate Gradation | | AASHTO T30 | T417 and T425 |
| Asphalt Content | | AASHTO T308 (Method A) | T417 and Control Charts |
| Percent Air Voids | | AASHTO T166, T209, and T269 | T419 and Control Charts |
| Percent Voids in Mineral Aggregate (VMA) | | AASHTO PP-28 | |
| Percent Voids Filled With Asphalt (VFA) | | AASHTO PP-28 | |

E X A M P L E

Mr. _____
West Virginia Division of Highways
District _____ Engineer
_____, West Virginia

Dear Mr. _____:

Subject: Hot-Mix Asphalt
Quality Control Plan
for Field Operations

We are submitting our hot-mix asphalt Quality Control Plan for field control, developed in accordance with Section 401 of the _____ Standard Specifications, the _____ Special Provisions, and MP 401.03.50.

1. The field operation is under the direction of _____, who can be contacted at _____, telephone number _____.
2. _____ will be responsible for insuring that all items of work will comply with Division specifications.
3. During the placement operation of the hot-mix asphalt pavement we will perform, at a minimum, Quality Control tests as per attached schedule. Sampling and testing will be the responsibility of _____, compaction technician number _____.
4. All sampling and testing will be completed within the time limits specified by the Division or work will be halted.
5. Material found to be non-complying shall not be incorporated into the roadway. In the event that non-specification material is incorporated into the project, the Division representative will be notified immediately.
6. We will notify all appropriate Division personnel at least 24 hours before work is scheduled to begin.

Very truly yours,

Company Representative

STANDARD SCREED CONTROL

| TEST OR ACTION | FREQUENCY | TEST METHOD | METHOD OF DOCUMENTATION |
|------------------------------|---|--|--------------------------------|
| Temperature of mix | 1 per hour | Section 401 of Standard Specifications | Diary |
| Temperature of base | 1 per hour | Section 401 of Standard Specifications | Diary |
| Temperature of mat | 1 test per hour of placement | Section 401 of Standard Specifications | T401 |
| Density | 5 tests per 1000 feet (300 meters) of paving width or rollerpass when applicable. | Section 401 of Standard Specifications | T401 or T407 |
| Tack/Prime | Each load or per ½ day of operation whichever occurs first | Section 408/409 of Standard Specifications | Diary |
| Pavement application rate | Application rate will be checked every _____ | Section 401 of Standard Specifications | Diary |
| Calibration of Nuclear Gauge | As per MP 717.04.21 | As per MP 717.04.21 | Factory Data Sheet |
| Distribution of Test Data | Within 24 hours of completion of testing of a Lot | As per MP 717.04.21 | As per MP 717.04.21 |

AUTOMATIC SCREED CONTROL

| TEST OR ACTION | FREQUENCY | TEST METHOD | METHOD OF DOCUMENTATION |
|--|---|--|--------------------------------|
| Temperature of mix | 1 per hour | Section 401 of Standard Specifications | Diary |
| Temperature of base | 1 per hour | Section 401 of Standard Specifications | Diary |
| Temperature of mat | 1 test per hour of placement | Section 401 of Standard Specifications | T401 |
| Density | 5 tests per 1000 feet (300 meters) of paving width or rollerpass when applicable. | Section 401 of Standard Specifications | T401 or T407 |
| Tack/Prime | Each load or per ½ day of operation whichever occurs first | Section 408/409 of Standard Specifications | Diary |
| Pavement application rate (automatic screed) | A paver with calibrated and properly operated automatic screed control will be used. The screed control will be checked every _____ | Section 401 of Standard Specifications | Diary |
| Calibration of Nuclear Gauge | As per MP 717.04.21 | As per MP 717.04.21 | Factory Data Sheet |
| Distribution of Test Data | Within 24 hours of completion of testing of a Lot | As per MP 717.04.21 | As per MP 717.04.21 |