

# Maine DOT Policies and Procedures for HMA Sampling and Testing

April 10, 2007

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# Maine DOT Policy

## RANDOM NUMBER POLICY

March 14, 2007

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### I. Methods

Random numbers for use on Maine DOT projects must be generated by one of the following methods:

1. Using a computer program or spreadsheet designed specifically to generate random numbers or locations for material sampling
2. Using a hand held calculator with a random number generating function.
3. Manually, per ASTM D3665

### I. Utilization and Documentation

Random numbers are generated to determine the test location or sample tonnage (Mg) in a stratified manner. Random numbers are to be applied to the subplot sizes outlined in the most current 401 Specification, for volumetric and density testing.

An alternative method, such as testing by area using a stratified random station and offset process, may be utilized to determine random sampling locations if the Department and Contractor agree at the preconstruction or pre-pave meeting.

Immediately after the numbers have been generated, they shall be recorded in their entirety. This recordation shall include the numbers, date generated, method used, signature of the individual that generated the numbers, and the Maine DOT project number they have been generated for.

Maine DOT and the Contractor will have the random numbers to be used on the project generated prior to the pre-paving meeting. The Contractor shall notify the Resident of their proposed acceptance Lot size, in writing, a minimum of one week prior to the pre-pave meeting. Both parties will have the random numbers generated and the Contractor shall present the quality control random numbers to the Resident, or his representative, unless the Contractor elects to have the Department generate the random numbers to be used for the Contractors quality control.

If the Contractor elects to have the Department generate the random numbers for quality control, he/she must notify the Project Manager, or Resident, in writing, a minimum of one week prior to the pre-pave meeting. The Contractor's copy of the quality control numbers will be presented to the Contractor at the pre-pave meeting. Once the Contractor elects to have the random numbers generated by the Maine DOT, they will be required to use those numbers generated for their quality control.

The random numbers generated by Maine DOT for acceptance testing will be kept in a secure location acceptable to the Resident. At no time will the random numbers generated for acceptance testing be available to the Contractor prior to testing. Specific random numbers and locations may be viewed by the Contractor only once the random number or location represented by the specific random number has been tested.

## II. Availability of Numbers

Upon completion of the item MDOT random numbers shall be supplied to the contractor in the same format QC random numbers were supplied to MDOT at the prepaving conference. Under no circumstances will MDOT Acceptance random numbers be supplied to the contractor prior to completion of the item.

## III. Termination of Lots

In the event the Department determines that it is necessary to terminate a lot, new random numbers will be generated for the remaining material, which will be divided into sublots as circumstances allow. If the terminated lot is too small to make up its own lot, it shall be rolled into the previous lot and all the tests for the prior lot combined with the terminated lot shall be used to determine a pay factor.



# Maine DOT Policy

## HMA MIX DESIGNS

February 15, 2007

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### A. HMA SUPPLIERS' MIX DESIGN SUBMITTALS

The HMA supplier shall design HMA in accordance with the process described in AASHTO M 323.

The HMA supplier shall provide the following information with the mix design submittal:

1. Properly completed Job Mix Formula (JMF) indicating all mix properties ( $G_{mm}$ , VMA, VFB, etc.)
2. Stockpile gradation summary
3. Design aggregate structure consensus property summary
4. Design aggregate structure trial blend gradation plots (.45 power chart)
5. Trial blend (lab or plant) test results for at least 3 different asphalt contents
6. Specific gravity and temperature/viscosity charts for the Performance Graded Asphalt Binder (PGAB) to be used
7. Recommended mixing and compaction temperatures from the PGAB supplier
8. Material Safety Data Sheets (MSDSs) for PGABs (unless Maine DOT already has one on file)
9. "Asphalt Content vs. Air Voids" trial blend curve
10. Sample weight for  $G_{mb}$  samples in grams that Contractor uses for 115 mm height at  $N_{design}$

With the trial batch verification sample, the HMA supplier shall also provide a formal test report indicating the results of testing on their split of the sample. Maine DOT verification testing will not proceed until this report is received, and it indicates that all requirements were met.

## **B. MIX DESIGN VERIFICATION PROCESS**

### **1. Review of HMA Supplier's Documentation**

The Maine DOT will review the documentation provided by the HMA supplier to ensure that the proper mix design procedure was used, that the proposed JMF meets all Maine DOT requirements, and that all required documentation was submitted. No HMA mix design will be approved for use if there is a deficiency in *any* of these criteria.

### **2. Verification Testing of Hot Mix**

Although it is the Department's responsibility to obtain HMA samples for mix verification testing, the supplier may obtain these provided that the Northern or Southern Quality Acceptance Supervisor, whoever has jurisdiction, is notified at least 24 hours in advance of the trial batch, and indicates to the supplier the inability of the Department to have a representative present for sampling.

The Maine DOT will perform laboratory verification testing of new HMA designs on samples of the mix trial batched by the supplier according to the proposed JMF at the designated plant. This verification testing will be performed at the Bangor central laboratory, the Freeport regional laboratory, or the Presque Isle regional laboratory, the location being determined by which laboratory will likely be performing Acceptance testing during production. To avoid re-sampling delays following failing verification testing, the HMA supplier may submit up to three samples of the same mix design from different batches at any one time to the appropriate laboratory, provided they are accompanied with an indication of the preferred order of testing.

The following process shall be observed for performing mix verification testing:

- a. The HMA supplier shall submit all documentation directly to the Bangor Central Laboratory, attention Rollan Walker, HMA Lab Supervisor
- b. Verification testing performed at the Freeport and Presque Isle regional laboratories shall not proceed until authorization has been received from the HMA Lab Supervisor
- c. The Freeport and Presque Isle regional laboratories shall communicate verification testing results directly to the HMA Lab Supervisor and not to the HMA supplier or others.

### 3. Verification Testing of Aggregate Consensus Qualities

As indicated in Section 401 of the Maine Standard Specifications, it is the Department's responsibility to obtain samples of HMA aggregate materials for the purpose of mix design verification testing. Such samples obtained by the supplier without prior approval of the Department will not be tested.

The HMA supplier shall have aggregate stockpiles of the following minimum sizes available for sampling at the plant site at the time of job mix submittal:

- Crushed Stone 150 Mg
- Sand 75 Mg
- Blend Sand 50 Mg

### 4. Verification Criteria

The Maine DOT will use the criteria given in Section 401 of the Maine Standard Specifications to evaluate the aggregate consensus quality testing and the following criteria to evaluate proposed mix designs:

- a. % Voids at  $N_{des}$ : *Design value  $\pm 1.5\%$*
- b. VMA: *ref. Table 1 of Section 401 for minimum values for various nominal maximum aggregate sizes; max. value shall be 2% greater than design target value*
- c. VFB: *ref. Table 1 of Section 401 for minimum values*
- d. Fines to Effective Binder: *0.6 to 1.2*
- e. Binder content: *Aim  $\pm 0.4\%$*
- f. Gradation:
  - Passing 4.75 mm and larger sieves: *Target  $\pm 7\%$*
  - Passing 2.36 mm to 1.18 mm sieve: *Target  $\pm 4\%$*
  - Passing 0.60 mm: *Target  $\pm 3\%$*
  - Passing 0.30 mm to 0.075 mm sieve: *Target  $\pm 2\%$*

*The 19.0 mm, 12.5 mm, and 9.5 mm sieves have a 90 value in the "Max" column for a control point (See Table 3 of AASHTO M 323). Mixes will be considered unacceptable if the resulting gradation for that size mix is 90 or greater.*

- g. Aggregate Gsb: *Tolerance of  $\pm 0.020$*
- h. Gmm: *Tolerance of  $\pm 0.020$*

## **C. MIX DESIGN APPROVAL**

### **1. New Designs**

Approval of the proposed HMA mix design shall require each of the following:

- a. Receipt of all required information with the JMF indicating compliance with all requirements.
- b. Acceptable aggregate properties (including consensus qualities, gradation, Gsb, etc.).
- c. Acceptable test results on the trial batch verification sample (including volumetrics, asphalt content, Gmm, etc.).
- d. Acceptable PGAB properties.
- e. Changes to the design target percentages may be allowed if submitted to the project manager within 24 hours of the reporting of the first Acceptance test for the specific JMF.

### **2. Extended (Long-Term) Designs**

The Maine DOT will accept requests for the extension of HMA mix designs which were approved within the previous two years. Such requests shall be made in writing at the beginning of the construction season, and shall be submitted to the supervisor of the Maine DOT HMA laboratory. The supplier shall, for each design, identify the company name, plant location, mix type, and mix design number. The decision of whether or not to approve such a request will be based on the most recent past performance of the mix as determined by the results of Acceptance testing. Laboratory verification testing will not be required. If approved, the supplier will receive written approval to provide mix produced in accordance with the particular mix designs. A copy of the previously approved mix design documentation will also be provided. The maximum duration of a JMF approval shall be three years.

### **3. Withdrawal of Mix Design Approval**

Approval of a mix design may be withdrawn and its use terminated when any of the following occur:

- a. The maximum specific gravity of the mix as indicated by testing of acceptance samples varies from the design value by more than 0.030.
- b. Maine DOT testing indicates unacceptable material qualities or mix properties.
- c. Maine DOT approves an updated design for the same mix.
- d. The average of gradation sieve results from Acceptance testing are outside of the mix designs's aggregate gradation control points as stated in AASHTO M 323, Table 3.

- e. Design is not used in production (i.e. absence of test results in TIMS database) during one paving season.
- f. Combined Aggregate Specific Gravities based on belt sampling vary by more than 0.030% from design submittal.

**D. PRODUCTION MONITORING**

In addition to those tests performed during mix design verification, aggregate consensus qualities will be tested during production on samples taken at approximately 15,000 Mg intervals. The percentage of fractured particles will be determined from a mix sample following testing in the ignition oven. Other quality tests will be performed on aggregate samples taken from the belt.

The following procedure shall be observed in the event of failing aggregate quality tests during production:

- a. The HMA supplier shall be notified of the failing test and shall investigate to determine the cause.
- b. Within 24 hours of the initial failing test a second sample shall be obtained and split between the Maine DOT and the HMA supplier. If Maine DOT testing indicates that the same qualities are failing, the supplier shall be required to shut down production and make the necessary changes to address the problem. Maine DOT will permit the supplier to produce mix again when satisfied that the supplier has properly addressed the problem.
- c. After changes have been made and production resumes, a third sample shall be taken and tested by Maine DOT. If this sample also fails to meet the aggregate consensus quality requirements, the current mix design shall be discontinued, and the HMA supplier shall be required to submit a new HMA design for approval.



**E. CHANGES IN COMBINED AGGREGATE SPECIFIC GRAVITIES**

The Contractor will be allowed one change in aggregate specific gravities without re-submitting a new JMF. The change, if verified, will be retroactive to the time when the change was identified by the Contractor.

For the change in Combined Aggregate Gsb's to take effect the following must occur:

- a. The Central Laboratory HMA Lab shall be notified in writing that a change has occurred, in excess of 0.020, with a copy of the notification being provided to any affected Resident Engineers. Likewise, a change of Combined Aggregate Gsb identified by the Department may be initiated by written notice to the Contractor, with a copy to any affected Resident Engineers.
- b. The Department shall sample, as soon as practical, the material that has changed and it shall be tested for Aggregate Gsb.
- c. If the Department verifies within 0.020 that the change is at least 0.020, but no more than 0.040 the change will be allowed retroactively to the date the Department was notified. If the change exceeds 0.040, a new design will be required. If neither condition is met, the existing design shall stand.



# Maine DOT Policy

## HMA FIELD SAMPLING POLICY

March 14, 2007

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### Sampling Equipment

Square ended shovel ( side extensions recommended; if available)  
HMA mix thermometer 50 - 500 deg F (10 - 260 °C)  
4 - 14 to 16 quart galvanized metal pails  
4 - 12 - 15,000g boxes  
Quartermaster or equivalent splitter

**Note:** Sampling shovel should be clean and free from any contaminants that may compromise the HMA sample. If cleaned or coated with release agent, allow excess to drain off and work back and forth through clean sand or mix prior to sampling. The use of fuel oil to clean the sampling tools will not be permitted onsite.

### Procedure: Sampling from Paver hopper

- Random samples shall be determined by station and offset, or by tonnage.  
The Department and the Contractor shall agree as to the method of random number generation. ( i.e.: area or tonnage)
- All random sample locations are to be determined prior to HMA production and placement.
- The procedure for notifying the Contractors representative of “intent to sample” should be discussed at the pre-paving meeting.
- Verify the random location or tonnage is approaching.
- Notify the Contractors representative of the intent to sample, making sure that the haul truck is on-site prior to notification.

- Identify the haul unit to be sampled from. Note: If sampling by tonnage, the randomly chosen tonnage is to be used only to identify the haul unit to be sampled, and does not imply that the sample should include material from that exact tonnage figure. In cases where a portion of a sampled load is not used on the project, or is used but not paid for, the sample obtained will still be used in determining payment as long as the material in the paver hopper at the time of sampling is placed on the roadway. If the material is later removed due to poor workmanship or rideability, the sample shall still be considered to represent the subplot for which it was sampled.
- Notify the Contractor's QC person of the intent to take a sample off the haul unit.
- Insert thermometer into haul unit (or in HMA material if already in hopper.)
- Record slip number, time of sampling, temperature of mix, and station/lane.
- Discharge the HMA pavement so the material flows into the hopper in one continuous mass. The Contractor should control the discharge of material into the paver hopper.
- The sample should be taken from the center of the overall load. (middle 1/3)
- Make sure the hopper is full of mix at time of sampling.
- Have the Contractor lower the truck body in a manner to minimize spillage.
- Have the truck move out and away from the hopper. The truck should be moved away a minimum of 30 feet (10 M) and parked. Have the driver shut down the engine as a safety concern.
- Have the paver stop, apply brakes, and /or shut down engine.
- For safety, the Contractor's person controlling the truck should remain in full view of the driver to ensure that the truck does not back towards the paver while others are sampling.
- When all equipment is secured, the sampling process can progress.
- Remove the top 6-10" (150-250mm) of mix across the center of the paver hopper, being careful not to sample within 1.5 feet (.5M) of the hopper sides. (see p. 13)
- Trim the front of the area to be sampled to form an 8" (200mm) vertical face.
- Obtain a sample by digging into the vertical face horizontally until the shovel is full, being careful not to overfill the shovel.
- If, in the opinion of the NETTCP certified and trained personnel present at the time of sampling, the sample, or sampling procedure, has been compromised, the sampled material will be discarded and a new representative sample taken from the same haul unit.
- Once the sample has been taken and placed in the sample container, samples will not be discarded.
- Split and fill the sample containers using the MDOT accepted method, being

careful to minimize spillage. (Page 14)

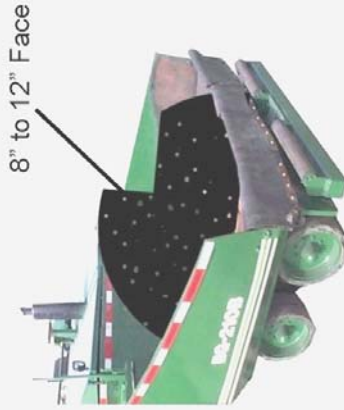
- Insert / attach the completed sampling paperwork (Id tag) into the sample container, with a number from the security tape recorded in the comments section. Finally, secure the cover.
- Record the required information on the front side of the sample container (Ref. #, etc.). Be certain to place the security tape on the front of the box as shown in the illustration.
- All samples should be secured immediately in the transport vehicle and transported directly to the acceptance labs. If immediate transport is not possible, all samples should be stored in a secure, dry location, such as the project field office, until transport to the lab is available.

# SAMPLING HMA FROM A PAVER HOPPER



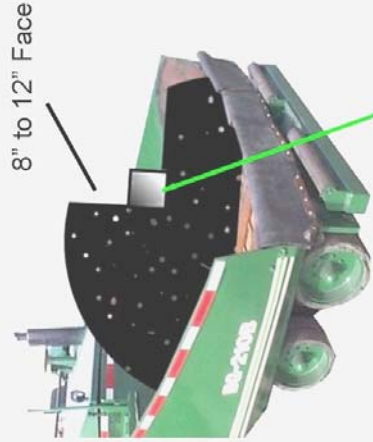
Mix Hump in  
Charged Paver Hopper

Random number is selected, in Megagrams or Tons or by Area and applied to the proper truck load.



Cut Away  
Side View

Shovel down into the mix 10" to 12" leaving a flat surface 3' to 4' wide.



Sample Area

Then cut in the same distance, leaving a "shelf". Filled the needed number of buckets.



Cut-away, front view. Ready to begin sampling.



Sampling from prepared area.



# Maine DOT Policy

## HMA SAMPLING FIELD SPLITTING PROCEDURE March 14, 2007

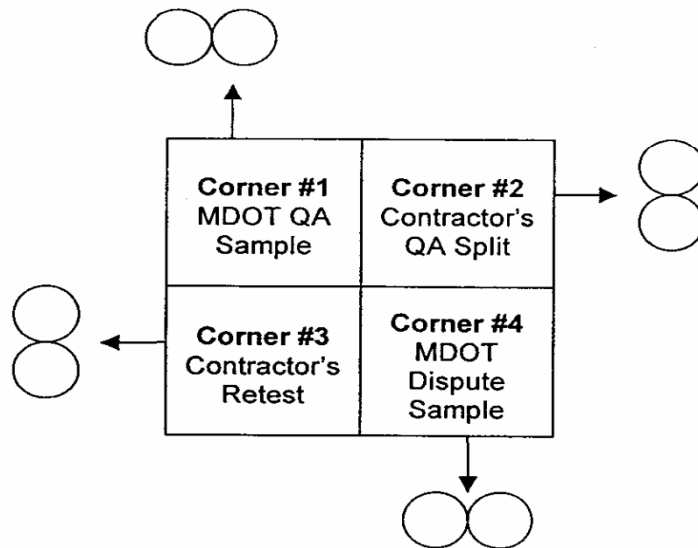
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The current policy requires the use of the Gilson Quartermaster splitter, or approved equivalent, to split all mix samples down to sample proportions in the field prior to being transported to the designated Acceptance Lab.

- Determine the number of boxes required. Method A, B and C testing requires a minimum of 4 sample containers, and Method D requires a minimum of 2 sample containers.
- Place the mix sampled from the designated haul unit or paver hopper into the galvanized pails, being careful not to overfill the shovel.
- Transport pails to the approved splitter that has been properly leveled onsite.
- Mark the sample boxes so the split samples can be identified, and place them under the splitter to receive mix.
- Check to assure that the bottom splitter chute gate is closed and secured.
- Transfer the mix from the pails into the splitter hopper from opposite sides of the splitter, and in a continuous motion to minimize segregation.
- Trip the chute gate and “tap” the hopper sides lightly, if necessary, to help the material flow through the splitter evenly.
- Remove the boxes from under the splitter and prepare them for transport to the Acceptance Lab.
- Continue the procedure to fill all the required sample boxes.

### Sample Splitting Details

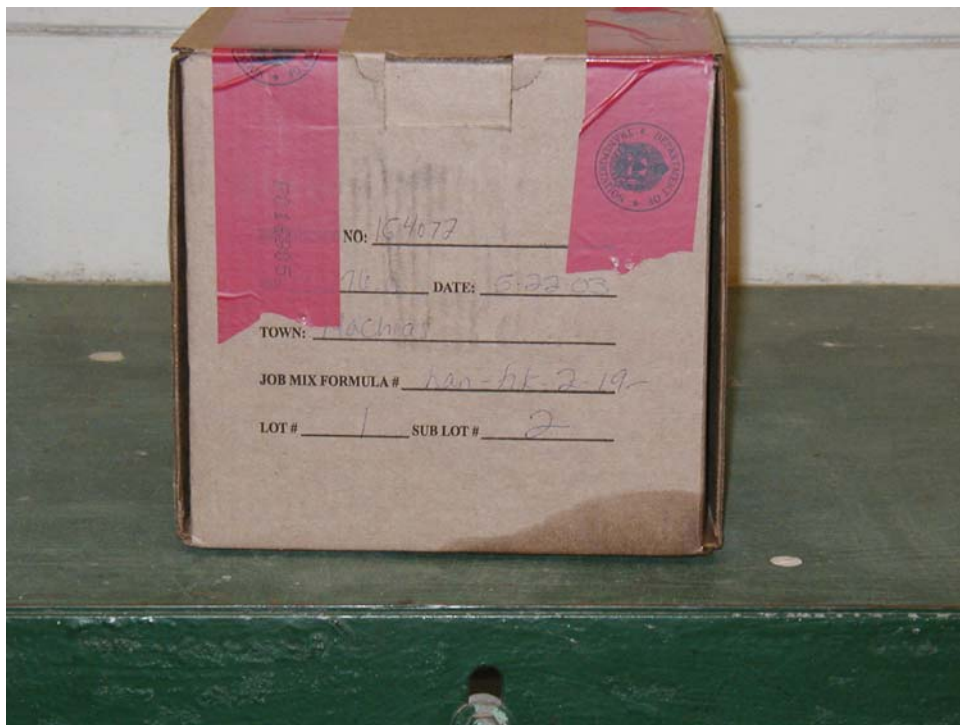
- 1.) Label the quarters of the splitter from #1 thru #4.
- 2.) Label 4 sample containers from #1 thru #4 and place them under the corresponding splitter corner.
- 3.) Place 2 -12 quart buckets of mix in the splitter hopper and split the mix into the 4 containers.
- 4.) Remove the full containers of mix from the splitter and place an additional 4 containers, which have been numbered from #1 thru #4 under the splitter.
- 5.) Place the remaining 2 -12 quart buckets of mix into the splitter hopper and split into the 4 containers.
- 6.) At this point there should be 8 containers of mix: two labeled #1, two labeled #2, two labeled #3, and two labeled #4.
- 7.) Pair the same numbered containers together and distribute as follows:
  - a. Sample #1 to the MDOT as QA test.
  - b. Sample #2 to the contractors as QA split.
  - c. Sample # 3 to the contractor as retest sample.
  - d. Sample # 4 to the MDOT as dispute sample.
- 8.) The two corresponding sample containers will be combined together in the labs so that the test sample will have a portion from each split.







Paving Inspector loads the Quartermaster splitter.



Properly sealed sample arrives at Freeport Lab.



# Maine DOT Policy

## HMA CORE SAMPLING POLICY

March 14, 2007

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All cores are to be stored in the approved core transport container, secured, and protected from the weather and elements. Cores should never be stored where the ambient temperature exceeds 100 deg. F.

- Locate the random sample location as determined by approved procedure.
- Designate the core location by station and offset, and core / subplot number.
- The Contractor shall cut a 6" (150mm) core through the HMA course, at the location designated.
- The Contractor shall extract the core from the roadway using tools and methods that will not cause damage to the core integrity.
- Inspect the core for damage, and / or foreign material adhered to the bottom.
- The Department shall determine cooperatively, with the onsite Contractor representative, whether the core is acceptable, and whether the core needs to be trimmed. If the core is determined to be damaged, it can be re-cut within 3' (1M) at the same offset to centerline as the original core.
- If it is mutually determined that the core requires trimming, then the core shall be marked at the point of removal, and the core will be trimmed at the Acceptance Lab. Trimming of the core may be allowed by the Contractor on-site, providing the Contractor has the proper equipment available, and the MDOT representative is present.
- If the core is found to be acceptable, and, if necessary, marked for trimming, the core shall be immediately placed in an approved transport case.
- Insert the sampling paperwork along with each corresponding core sample (***Paperwork atop the core and not beneath***), then secure and lock the case for transport to the Acceptance Lab. Be certain to record the serial numbers from the locking plastic strips on one of the sample ID forms.



# Maine DOT Policy

%TMD POLICY

March 14, 2007

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## CALCULATION OF PERCENT COMPACTION FOR HMA PAY FACTORS

The percent compaction of HMA pavements will be calculated by dividing the bulk density of the cores in a subplot by the theoretical maximum density (TMD) of the mix in that subplot, as determined by the MDOT Acceptance test. Core samples will be identified as coming from a particular subplot by the Resident, based on the core's location relative to the location of the nearest mix sample. In the event that a subplot is partially completed at the end of a paving day, and a mix sample has not yet been obtained from the subplot, and further paving in the lot will not resume on the next working day, any cores obtained on the partially completed subplot will be calculated based on the TMD of the previous subplot unless otherwise agreed to in the field by the Resident or his Representative, and the QC Technician. In the event that no mix samples are taken during a day's production, the Resident may, at his discretion, obtain a mix sample to be tested for TMD only, on which to base that day's cores.



# Maine DOT Policy

## ACCEPTED SUPPLEMENTAL REQUIREMENTS

March, 14 2007

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**Bulk Specific Gravity (AASHTO T 166)**  
**Maximum Specific Gravity (AASHTO T 209)**  
**Superpave Gyratory Testing (AASHTO T 312)**  
**Asphalt Content by the Ignition Method (AASHTO T 308)**  
**General Laboratory Procedures**  
**Calibration of RAP mixes**

ACCEPTED SUPPLEMENTAL REQUIREMENTS

**Bulk Specific Gravity (AASHTO T 166)**

1. HMA pavement cores shall be tested in accordance with Method A (overnight method) and the initial oven-dry weight shall be taken within 16 hours of placement in the oven. A subsequent weighing after two additional hours shall be used to determine if the core achieved constant mass during the initial drying period. If the core did not achieve constant mass during the initial drying period, additional two-hour drying intervals may be necessary. In any case, the weight to be used to calculate the density shall be the first weight which is less than 0.05% greater than the subsequent weight taken two hours later.
2. The submerged weight of the core or compacted specimen shall be taken as nearly as possible at an elapsed time of 4 minutes.
3. Cores to be tested in the laboratory which require sawing shall be clearly marked to indicate the location of sawing. Because sawing of cores is to be agreed upon between the Resident or his representative and the QC Technician, no sawing in the laboratory shall be performed unless the core is thus marked.
4. When drying a core to the saturated-surface-dry condition, a damp cloth—one from which no moisture can be wrung—shall be used.
5. The wire/line used to suspend the core or compacted specimen in the water bath shall be of the smallest practicable size.

**ACCEPTED SUPPLEMENTAL REQUIREMENTS  
Maximum Specific Gravity (AASHTO T 209)**

1. The bowl (weighing in water) method shall be used to determine maximum specific gravity.
2. A vibrating table shall be used to agitate the maximum specific gravity sample instead of rapping the container with a mallet.
3. The required vacuum to which the sample in the container shall be subjected is 25.5 to 30.1 mm of Hg. This vacuum shall be verified with an in-line mercury manometer, or a vacuum gauge traceable to NIST as illustrated in Figure 1 of the AASHTO method.
4. Two maximum specific gravity tests shall be performed for each sample.
5. The maximum specific gravity specimen shall be agitated at vacuum for as close to 15 minutes as possible.
6. During testing, the sample and container shall be submerged in the water bath for as close to 10 minutes as possible.
7. The maximum specific gravity containers shall be calibrated weekly and the data recorded on a form.

**ACCEPTED SUPPLEMENTAL REQUIREMENTS  
Superpave Gyratory Testing (AASHTO T 312)**

1. All gyratory compactor settings (angle, ram pressure, speed of gyration) shall be verified once each month during production, and a detailed log shall be maintained in the lab, or electronically in the Compactor.
2. All gyratory compactors used for acceptance shall be calibrated/inspected by the manufacturer annually.
3. Compaction molds shall be maintained at compaction temperature during testing either by rotating two or more molds from the oven, or by re-heating a single mold between tests.
4. The mold shall be charged with material by dumping from a pan directly into the mold (using a funnel) in one lift without scraping the pan.
5. The DOT labs shall use gyro samples of the same mass used by the Contractor as indicated on the job mix submittal.
6. The temperature of each specimen shall be verified to be at compaction temperature while in the gyro mold prior to testing.
7. All gyratory compaction specimens shall be directly split to a mass as close as possible to the required testing size, and then adjusted to the testing size by the addition or removal of mix.

**ACCEPTED SUPPLEMENTAL REQUIREMENTS  
Asphalt Content by the Ignition Method (AASHTO T 308)**

1. The ignition method of determining asphalt content shall be used, exclusively.
2. Oven filters and ductwork shall be inspected regularly and cleaning/replacement performed in accordance with the manufacturer's recommendations.
3. Ignition oven calibration factors shall be determined and used for each mix for the particular oven in which it is to be tested.
4. The mass of the ignition oven sample shall be not less than the specified minimum sample size.
5. Initial and final sample weights shall be taken while the material is in the oven trays to avoid errors due to loss of material. The asphalt content shall be calculated from these weights, and not from weights indicated by the oven's display.

**ACCEPTED SUPPLEMENTAL REQUIREMENTS**  
**General**

1. Daily checks shall be performed to ensure that all lab balances are level, and that the water bath temperature is within the required range.
2. All test samples (except for gyratory compaction which requires some manipulation) shall be obtained from a direct split of the entire, recombined sample.
3. All HMA samples, with the single exception of those used for Contractors' quality control testing (but not when the Contractors' QC results are used for acceptance purposes) shall be heated in an oven at compaction temperature for two hours to remove moisture from the sample and bring it to constant mass. After the completion of the heating time, individual test specimens shall be obtained from the original sample by splitting in an approved splitter, or by the cone and quarter method. The two specimens for gyratory compaction shall be reheated to compaction temperature prior to testing.

Contractor quality control tests may use another method to obtain theoretical maximum density on hot HMA samples. A method shall be provided in the quality control plan and approved by the MDOT to monitor moisture and TMD variation. Because this method is not in compliance with the requirements of AASHTO T 209, any results obtained from such testing may not be used to dispute MDOT testing, support a claim against MDOT, calculate a pavement density, or to represent a mix design submittal, and shall be considered as informational to the Contractor only.

**CALIBRATION OF RAP MIXES—Supplemental Requirements  
Ignition Oven Method (AASHTO T 308)**

GENERAL

All HMA samples shall be calibrated and tested in accordance with the requirements of AASHTO T 308, except that all 4 increments shall be used in the calculation of the JMF Correction Factor, and all burns will take place at 538 °C. This procedure is intended to provide additional clarification for the preparation and testing of calibration samples for mixes containing reclaimed asphalt pavement (RAP).

CALIBRATION SAMPLE PREPARATION

**1. Determining Aggregate and RAP proportions**

The mass of each aggregate component, including RAP, to be used in the calibration sample shall be determined by multiplying the design percentage of each component by the total mass of the aggregate portion of the sample being prepared. (The total mass of the sample must meet the minimum sample size requirements in T 308.) For example if the total mass of the aggregate portion of the sample being prepared is 2,000 grams, then the proportions would be as follows:

Component	Design Proportion	Mass
RAP	20%	400 g
19 mm	40%	800 g
Sand	25%	500 g
Dust	15%	300 g
TOTAL	100%	2,000 g

**2. Determining Amount of Virgin Asphalt Required**

The total percentage of asphalt in the calibration sample shall be equivalent to the design asphalt content of the mix. The total amount of asphalt in the sample includes both virgin asphalt added to the sample during preparation and “old” asphalt contained in the RAP component. The Contractor shall provide Maine DOT with the asphalt content of the RAP component. The mass of virgin asphalt required in the calibration sample is simply the difference between the total mass of asphalt required to achieve the design percentage, and the mass of asphalt in the RAP. For example, for a 20 % RAP mix, if the design asphalt content is 5 % and the Contractor indicates that the asphalt content of the RAP is 4.0 %, then the percentage of virgin asphalt required in the sample is 5 % minus twenty percent of 4.0 % (which is 0.8 %), or 4.2 %. The mass of virgin asphalt is then simply the percentage required, multiplied by the total mass of the aggregate portion of the sample.



### **3. Determining Calibration Factor**

After testing in the ignition oven, the calibration factor shall be determined on each calibration sample as the difference between the calculated asphalt content and the actual asphalt content. For example, if the actual asphalt content of the prepared calibration sample was 5.0 % and the calculated asphalt content of the sample following testing and weighing was 5.36 %, then the calibration factor for this particular sample would be 5.36 % minus 5.00 %, or 0.36 %. This value is what must be subtracted from the calculated asphalt content to account for material and testing variables to achieve the correct asphalt content. All other requirements in the method regarding determination of calibration factors (except number of samples and temperature) apply.



# Maine DOT Policy

POST PAVING CONFERENCE

March 2, 2006

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## **General:**

A Post-paving conference will be scheduled to take place, preferably onsite upon completion of all method A, B and C lots prior to project completion. The purpose of this meeting will be to discuss any quality issues that occurred during construction and to finalize pay quantities and price adjustments, subject to final review by the Contracts section.

The Contractor shall be represented by the Project Superintendant, the QC Plan Administrator or his designated representative and the direct supervisor of the paving, The QC Technician or PC Technician when appropriate.

The Department will be represented by The Project Resident, The QA Engineer or Manager or the Paving Manager and the Paving Inspector when appropriate. The Project Manager and Assistant Project Manager and the Construction Support Manager will also be notified.



# Maine DOT Policy

SMOOTHNESS TESTING

March 21, 2006

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## General:

When smoothness testing is required by the contract the Resident will notify Brian Marquis, Transportation Planning Specialist, within 1 week of completion of the mainline surface by phone (207-941-4067) or via Email ( [Brian.Marquis@maine.gov](mailto:Brian.Marquis@maine.gov) ) that the project is ready for smoothness testing and shall provide the following information;

- Contractors name
- Project begin and end station at the construction joints (should be marked on the roadway for the ARAN crew)
- Bridge deck locations (begin and end station for bridge joints)
- Limits of urban areas with speed limits less than 35 mph and/or manhole covers or obstructions in the roadway that will interfere with smoothness tests.
- Railroad crossing location(s)
- Mainline quantity of surface mix excluding shoulders, ramps, side streets and roads, acceleration and deceleration lanes
- Unit cost for surface mix.

The Department will be responsible for ensuring that the testing is performed prior to the Saturday following November 1<sup>st</sup> in Zone 1 and the Saturday following November 15<sup>th</sup> in Zone 2. In the event of a snow or sleet storm prior to testing it may be necessary to arrange for sweeping of the pavement prior to testing.

“Courtesy” testing of non-surface layers prior to Winter will no longer be performed by the Department, due to increased demands on the ARAN.