

**ITEM 18403.2551 M - SUPERPAVE HOT MIX ASPHALT, 25.0 mm NOMINAL MAX. SIZE**  
**ITEM 18403.1251 M - SUPERPAVE HOT MIX ASPHALT, 12.5 mm FX NOMINAL MAX. SIZE**  
**ITEM 18403.9551 M - SUPERPAVE HOT MIX ASPHALT, 9.5 mm FX NOMINAL MAX. SIZE**

The requirements of Section 403 - Hot Mix Asphalt Concrete Pavement shall apply except as modified and/or revised below.

This  
Specification

**DESCRIPTION**

This work shall consist of developing Hot Mix Asphalt pavement courses using the *SUPERPAVE* Mix Design procedure in accordance with these specifications and in reasonable close conformity with the required lines, grades, thicknesses, and typical sections shown on the plans or established by the Engineer. This is a performance based specification in which the Contractor is responsible for compacting the pavement within a specified density range. Written instructions for determining pavement density and quantity adjustment factors are available from the Regional Materials Engineer or the Director, Materials Bureau.

has been  
Disapproved  
as a result of  
the issuance of  
EI 98-041

**MATERIALS**

The materials and composition for these mixtures shall meet the requirements specified in Subsection 403-2 Materials, except as noted herein. The specific Performance Graded Binder and the Design Estimated Traffic in 80 kN ESALs will be specified by a special note in the Contract Proposal.

Subsection 401-2.02 Composition of Mixtures shall be deleted and replaced with the following:

“Formulate and submit to the Regional Director, a *SUPERPAVE* Mix Design that satisfies the design control points listed in Table 1 and does not pass through the restricted zone listed in Table 2 based on the specified nominal maximum aggregate size.

If for any reason, a change in gradation or materials occurs or is contemplated, prepare a separate job mix formula and *SUPERPAVE* mixture design to fit each change in material or gradation. Changes in Performance Graded Binder content can be made by the Regional Director or his representative providing the resultant mixture has properties within the specified mechanical and volumetric properties.

The mixtures shall be produced, delivered to the work site, and incorporated into the work within 10°C of the temperature specified by the Engineer but within the mixing and compaction range of 120°C and 165°C. Additionally, the Performance Graded Binder shall be introduced into the pugmill at a temperature compatible with that of the aggregate as determined by the Regional Director or his representative, between the limits of 110°C and 175°C.

The aggregates shall be those approved for use by the approved job mix formula and will be accepted at the plant site. The Performance Graded Binder will be conditionally accepted at the supplier's source and at the plant on the basis of certification. Samples taken at the plant will be tested by the Department to determine specification compliance. The gradation of the plant mixed material will be tested to determine compliance with the job mix formula during the production of the material. The plant mixed material will be accepted after blending and mixing

**ITEM 18403.2551 M - SUPERPAVE HOT MIX ASPHALT, 25.0 mm NOMINAL MAX. SIZE**  
**ITEM 18403.1251 M - SUPERPAVE HOT MIX ASPHALT, 12.5 mm FX NOMINAL MAX. SIZE**  
**ITEM 18403.9551 M - SUPERPAVE HOT MIX ASPHALT, 9.5 mm FX NOMINAL MAX. SIZE**

at the plant. The pavement courses will be accepted after all paving operations are completed.

This  
Specification

Percent Passing Criteria (*Control Points*)

Nominal Maximum Aggregate Size

| Standard Sieves, mm | Percent Passing Criteria ( <i>Control Points</i> ) |       |         |       |        |       |
|---------------------|--|-------|---------|-------|--------|-------|
|                     | Nominal Maximum Aggregate Size                     |       |         |       |        |       |
|                     | 25.0 mm  |       | 12.5 mm |       | 9.5 mm |       |
|                     | Max  | Min   | Max     | Min   | Max    | Min   |
| 50.0                |  |       |         |       |        |       |
| 37.5                |  | 100.0 |         |       |        |       |
| 25.0                | 100.0  | 90.0  |         |       |        |       |
| 19.0                | 90.0   |       |         | 100.0 |        |       |
| 12.5                |  |       | 100.0   | 90.0  |        | 100.0 |
| 9.5                 |  |       | 90.0    |       | 100.0  | 90.0  |
| 4.75                |  |       |         |       | 90.0   |       |
| 2.36                | 45.0   | 19.0  | 58.0    | 28.0  | 67.0   | 32.0  |
| 0.075               | 7.0  | 1.0   | 10.0    | 2.0   | 10.0   | 2.0   |

**Table 1 - Design Control Points**

| Standard Sieves, mm | Percent Passing Criteria ( <i>Control Points</i> ) |      |         |      |        |      |
|---------------------|--|------|---------|------|--------|------|
|                     | Nominal Maximum Aggregate Size                     |      |         |      |        |      |
|                     | 25.0 mm  |      | 12.5 mm |      | 9.5 mm |      |
|                     | Max  | Min  | Max     | Min  | Max    | Min  |
| 4.75                | 39.5   | 39.5 |         |      |        |      |
| 2.36                | 30.8   | 26.8 | 39.1    | 39.1 | 47.2   | 47.2 |
| 1.18                | 24.1   | 18.1 | 31.6    | 25.6 | 37.6   | 31.6 |
| 0.600               | 17.6   | 13.6 | 23.1    | 19.1 | 27.5   | 23.5 |
| 0.300               | 11.4   | 11.4 | 15.5    | 15.5 | 18.7   | 18.7 |

**Table 2 - Restricted Zone**

**ITEM 18403.2551 M - SUPERPAVE HOT MIX ASPHALT, 25.0 mm NOMINAL MAX. SIZE**  
**ITEM 18403.1251 M - SUPERPAVE HOT MIX ASPHALT, 12.5 mm FX NOMINAL MAX. SIZE**  
**ITEM 18403.9551 M - SUPERPAVE HOT MIX ASPHALT, 9.5 mm FX NOMINAL MAX. SIZE**

The mixtures shall meet the volumetric and mechanical properties detailed in Tables 3 and 3.1.

This Specification has been Disapproved as a result of the issuance of EI 98-041

| Design Property                  | Criteria           |
|----------------------------------|--------------------|
| % Compaction at $N_{mit}$        | <89.0% of $G_{mm}$ |
| % Compaction at $N_{design}$     | =96.0% of $G_{mm}$ |
| % Compaction at $N_{max}$        | <98.0% of $G_{mm}$ |
| Voids in the Mineral Aggregate   | See Table 3.1      |
| Voids Filled with Asphalt        | See Table 3.1      |
| Fines to Effective Asphalt Ratio | See Table 3.1      |

**Table 3 - SUPERPAVE Design Criteria**

| Estimated Traffic,<br>Million<br>80 kN ESALs | Voids in the Mineral<br>Aggregate |        |        | Voids Filled with Binder |     | Fines to Effective<br>Asphalt Ratio |     |
|--|-----------------------------------|--------|--------|--------------------------|-----|-------------------------------------|-----|
|  | 9.5mm                             | 12.5mm | 25.0mm | Min                      | Max | Min                                 | Max |
|  | Minimum                           |        |        |                          |     |                                     |     |
| <0.3   | 15.0 %                            | 14.0 % | 12.0 % | 70                       | 80  | 0.6                                 | 1.2 |
| <1.0   |                                   |        |        | 65                       | 78  |                                     |     |
| <3.0   |                                   |        |        | 65                       | 78  |                                     |     |
| <10.0  |                                   |        |        | 65                       | 75  |                                     |     |
| <30.0  |                                   |        |        | 65                       | 75  |                                     |     |
| <100.0                                       |                                   |        |        | 65                       | 75  |                                     |     |
| >100.0                                       |                                   |        |        | 65                       | 75  |                                     |     |

**Table 3.1 SUPERPAVE Volumetric Design Criteria**

**Voids in the Mineral Aggregate.** The voids in the mineral aggregate are defined as the intergranular void space between the aggregate particles in a compacted paving mixture that includes the air voids and the effective binder content, expressed as a percent of total volume.

**Voids Filled with Binder.** The voids filled with binder are defined as the voids in the mineral aggregate that are filled with binder (excluding absorbed binder), expressed as a percent of the volume of the voids in the mineral aggregate.

**Fines to Effective Asphalt Ratio.** The Fines to Effective Asphalt Ratio is defined as the ratio of the percent by weight of aggregate passing the 75  $\mu$ m sieve to the effective binder content expressed

**ITEM 18403.2551 M - SUPERPAVE HOT MIX ASPHALT, 25.0 mm NOMINAL MAX. SIZE**  
**ITEM 18403.1251 M - SUPERPAVE HOT MIX ASPHALT, 12.5 mm FX NOMINAL MAX. SIZE**  
**ITEM 18403.9551 M - SUPERPAVE HOT MIX ASPHALT, 9.5 mm FX NOMINAL MAX. SIZE**

as percent by weight of the total mix.

The *SUPERPAVE* specimens shall be prepared, mix properties determined, and completed mix design submitted in accordance with the procedures outlined by Department written instructions. The Design Number of Gyration shall be determined from Table 4 based on an estimation of the cumulative ESALs in the design lane over the design life.

| Estimated Traffic, Million 80 kN ESALs | <0.3 | <1.0 | <3.0 | <10.0 | <30.0 | <100.0 | >100.0 |
|--|------|------|------|-------|-------|--------|--------|
| N <sub>initial</sub>                   | 7    | 7    | 8    | 8     | 8     | 9      | 9      |
| N <sub>design</sub>                    | 68   | 76   | 86   | 96    | 109   | 126    | 142    |
| N <sub>maximum</sub>                   | 104  | 117  | 134  | 152   | 174   | 204    | 233    |

**Table 4 - Design Number of Gyration**

Once the target gradation is selected the following production tolerances listed in Table 5 shall be applied for control of the mixture through the plant. The production tolerance range will be permitted to exceed the control points and enter the restricted zone.

| Standard Sieves, mm | 37.5 | 25.0 | 19.0 | 12.5 | 9.5 | 4.75 | 2.36 | 1.18 | 0.600 | 0.300 | 0.150 | 0.075 |
|---------------------|------|------|------|------|-----|------|------|------|-------|-------|-------|-------|
| Tolerance           | ±5   | ±5   | ±5   | ±5   | ±5  | ±4   | ±4   | ±4   | ±3    | ±3    | ±3    | ±2    |

**Table 5- Production Tolerances**

The details of §401-2.03 Aggregates shall apply except as modified below:

In addition to the requirements detailed in §401-2.03 Aggregates, the aggregates utilized must conform to the following additional requirements based on the design traffic level and depth from the surface:

**ITEM 18403.2551 M - SUPERPAVE HOT MIX ASPHALT, 25.0 mm NOMINAL MAX. SIZE**  
**ITEM 18403.1251 M - SUPERPAVE HOT MIX ASPHALT, 12.5 mm FX NOMINAL MAX. SIZE**  
**ITEM 18403.9551 M - SUPERPAVE HOT MIX ASPHALT, 9.5 mm FX NOMINAL MAX. SIZE**

| Estimated Traffic, Million 80 kN ESALs | Coarse Aggregate Angularity (Minimum) |         | Uncompacted Void Content of Fine Aggregate (Minimum) |        | Flat and Elongated Particles (Maximum) | Sand Equivalent (Minimum) |
|--|---------------------------------------|---------|--|--------|--|---------------------------|
|  | Depth from Surface                    |         |  |        |  |                           |
|  | <100mm                                | >100mm  | <100mm   | >100mm |  |                           |
| <0.3                                   | 55/-                                  | -/-     | -  | -      | -                                      | 40                        |
| <1.0                                   | 65/-                                  | -/-     | 40   | 40     | -                                      | 40                        |
| <3.0                                   | 75/-                                  | 50/-    | 40   | 40     | 10                                     | 40                        |
| <10.0                                  | 85/80                                 | 60/-    | 45   | 40     | 10                                     | 45                        |
| <30.0                                  | 95/90                                 | 80/75   | 45   | 40     | 10                                     | 45                        |
| <100.0                                 | 100/100                               | 95/90   | 45   | 45     | 10                                     | 50                        |
| >100.0                                 | 100/100                               | 100/100 | 45   | 45     | 10                                     | 50                        |

**Table 6 - Additional Aggregate Criteria**

**Coarse Aggregate Angularity.** Coarse aggregate angularity is defined as the percent by weight of the aggregate particles larger than 4.75 mm with one or more fractured faces measured on the coarse particles of the blended aggregate by Pennsylvania Department of Transportation Test Method No. 621, *Determining the Percentage of Crushed Fragments in Gravel*. Note that “95/90” denotes that 95% of the coarse aggregate has one fractured face and 90% has two fractured faces. Note that the criteria is presented as the minimum percent of coarse aggregate with the required number of fractured faces.

**Fine Aggregate Angularity.** Fine aggregate angularity is defined as the percent of air voids present in loosely compacted aggregate that passes the 2.36 mm sieve measured on the fine aggregate portion of the blended aggregate by AASHTO Standard Method of Test TP33, *Uncompacted Void Content of Fine Aggregate*. Note that the criteria is presented as the minimum percent air voids required in loosely compacted fine aggregate.

**Flat and Elongated Particles.** Flat and elongated particles are defined as the coarse aggregate particles which have a ratio of maximum to minimum dimensions greater than five (5). The percentage of flat and elongated particles is measured on the portion of the blended aggregate retained on the 9.5 mm sieve by ASTM Standard Method of Test D 4791-95, *Flat Particles, Elongated Particles, or Flat and Elongated Particles in Coarse Aggregate*. Note that the criteria is presented as the maximum percent allowed by weight of flat and elongated particles.

**Sand Equivalent.** Sand equivalent is defined as the percent of the sand reading to the clay reading measured on the portion of aggregate that passes the 4.75 mm sieve by AASHTO Standard Method of Test T 176, *Plastic Fines in Graded Aggregates and Soils by Use of the Sand Equivalent Test*. Note that the criteria is presented as the minimum percent sand equivalent required in the fine aggregate.

**ITEM 18403.2551 M - SUPERPAVE HOT MIX ASPHALT, 25.0 mm NOMINAL MAX. SIZE**  
**ITEM 18403.1251 M - SUPERPAVE HOT MIX ASPHALT, 12.5 mm FX NOMINAL MAX. SIZE**  
**ITEM 18403.9551 M - SUPERPAVE HOT MIX ASPHALT, 9.5 mm FX NOMINAL MAX. SIZE**

Subsection 401-2.03A. Coarse Aggregate and 401-2.03B. Blending shall be deleted and replaced with the following:

“A. **COARSE AGGREGATES.** The coarse aggregates used in 12.5 mm FX and 9.5 mm FX top course HMA mixtures shall be from approved sources and meet one of the following requirements:

1. Coarse aggregates shall be crushed limestone having an acid insoluble residue content of not less than 20%, excluding particles of chert and similar siliceous rocks.
2. Coarse aggregates shall be crushed dolomite having an acid insoluble residue content of not less than 17%, excluding particles of chert and similar siliceous rocks.
3. Coarse aggregates shall be crushed sandstone, granite, chert, traprock, ore tailings, slag or other similar non-carbonate materials. Non-carbonate particles are defined as those having an acid insoluble residue content not less than 80%.
4. Coarse aggregates shall be crushed gravel or blends of two or more of the following types of materials; crushed gravel, limestone, dolomite, sandstone, granite, chert, traprock, ore tailings, slag or other similar materials. These aggregates must meet the following requirements:

12.5 mm Nominal Maximum Size Aggregate Mixes - Not less than 20% (by weight with adjustments to equivalent volumes for materials of different specific gravities) of the total coarse aggregate particles (plus 4.75 mm material) shall be non-carbonate. In addition, not less than 20% of the plus 9.5 mm particles shall be non-carbonate.

9.5 mm Nominal Maximum Size Aggregate Mixes - Not less than 20% (by weight with adjustments to equivalent volumes for materials of different specific gravities) of the total coarse aggregate particles (plus 4.75 mm material) shall be non-carbonate.

Non-carbonate particles are defined as those having an acid insoluble content not less than 80%.

B. **BLENDING.** Where coarse aggregates for these mixes are from more than one source or of more than one type of material, they shall be proportioned and blended to provide a uniform mixture.”

Subsection 401-2.05 Bituminous Materials shall be deleted and replaced with the following:

“The Performance Graded Binder (PGB) used in the production of these mixes shall be defined by AASHTO Provisional Standard MP1 - Standard Specification for Performance Graded Asphalt Binder.

Acceptance of the PGB is based on the primary source appearing on the Department’s Approved List for Bituminous Material Primary Sources, A. Asphalt Cements for Paving. Acceptance of the PGB is contingent upon satisfactory test results from samples taken, as required by the Department’s procedural directives, at the location where the material is

**ITEM 18403.2551 M - SUPERPAVE HOT MIX ASPHALT, 25.0 mm NOMINAL MAX. SIZE**  
**ITEM 18403.1251 M - SUPERPAVE HOT MIX ASPHALT, 12.5 mm FX NOMINAL MAX. SIZE**  
**ITEM 18403.9551 M - SUPERPAVE HOT MIX ASPHALT, 9.5 mm FX NOMINAL MAX. SIZE**

incorporated into the work. A primary source is defined as a firm that samples, tests, and certifies by Production Lot that the PGB is in conformance with the specifications. The procedural directives for sampling, testing, and certifying the PGB, and for achieving and maintaining approved list status, are available from the Materials Bureau.

The PGB shall not be delivered to the HMA Production Facility at a temperature in excess of 175°C.”

Subsection 401-2.06 Reclaimed Asphalt Pavement shall be deleted.

**CONSTRUCTION DETAILS**

The details of §403-3 Construction Details shall apply except as modified below:

Add the following to the end of Subsection 401-3.02 Bituminous Mixing Plant A. Requirements for All Plants No. 11:

“Y. Gyrotory Compactor - A power driven gyrotory compactor capable of maintaining an angle of gyration of  $1.25^{\circ} \pm 0.02^{\circ}$ , a speed of gyration of 30.0 rpm  $\pm 0.5$  rpm, and a consolidation pressure of 600 k Pa  $\pm 10\%$  for gyrations zero to five and  $\pm 3\%$  for gyrations six and greater. The make and model of the gyrotory compactor supplied must be approved by the Director, Materials Bureau.

Z. Gyrotory Specimen Mold Assembly - The specimen mold assembly consisting of the mold 150.00 mm + 0.00 mm and - 0.01 mm, base plate and top plate (if required). The minimum height of the mold is 250.00 mm. A minimum of 4 mold assemblies and an adequate supply of 150.00 mm paper discs shall be provided.

AA. Gyrotory Specimen Extractor - A simple means of specimen extraction from the gyrotory molds shall be supplied.

BB. Oven - A thermostatically controlled convection type oven having a minimum capacity of 0.15 cubic meters shall be supplied to preheat the *SUPERPAVE* Gyrotory Compactor mold assemblies and asphalt mix samples. The oven shall have a controlled temperature range up to 190°C with a  $\pm 3^{\circ}\text{C}$  accuracy throughout the range.”

Add the following to the end of Subsection 401-3.06 Rollers.

“The compaction equipment shall conform to the requirements of this Subsection. Control the operation of the rollers during the placement of these items including the speed, the amplitude settings, the vibration frequency, and the weight of the rollers.”

Subsection 401-3.12 Compaction shall be deleted and replaced with the following:

“Immediately after the HMA mixture has been spread, struck off and surface irregularities adjusted, thoroughly and uniformly compact by rolling. Roll the surface when the mixture is in the proper condition and when the rolling does not cause undue displacement, cracking or shoving. Initially roll the pavement with the roller traveling parallel to the centerline of the pavement beginning at each edge and working toward

**ITEM 18403.2551 M - SUPERPAVE HOT MIX ASPHALT, 25.0 mm NOMINAL MAX. SIZE**  
**ITEM 18403.1251 M - SUPERPAVE HOT MIX ASPHALT, 12.5 mm FX NOMINAL MAX. SIZE**  
**ITEM 18403.9551 M - SUPERPAVE HOT MIX ASPHALT, 9.5 mm FX NOMINAL MAX. SIZE**

the super-elevated edge.

Compact the pavement sufficiently to achieve densities, expressed as a percentage of the mixture's average daily maximum theoretical density (%MADMTD), in a range of 92% to 97%. Pavement cores and mix samples will be tested and analyzed by the Department in accordance with Materials Procedure 96-4, Asphalt Concrete Statistical Pavement Density Determination, to determine the loose mix sample MADMTD, pavement core bulk density, and the resultant pavement core percent of the MADMTD.

If consecutive lots are found to have a Quantity Adjustment Factor equal to or below 85%, paving operations for this item will be stopped and a new Test Section, constructed as described later in this section, will be required. Paving operations for this item will not be permitted until a new test section meets the acceptance criteria, a minimum Quantity Adjustment Factor of 100%.

The Quantity Adjustment Factor will not be applied to material placed on ramps with a uniform full width section of less than 400 meters in length, shoulders, maintenance widenings and crossovers, and bridges. Payment for these areas will be based on satisfactory placement and compaction as determined by the Engineer. Placement and compaction procedures will be deemed satisfactory by the Engineer when the procedures used in these areas are the same as those used on the main line pavement sections. Also, if a nuclear gauge(s) is used to monitor the main-line paving then the same gauge(s) should be used to monitor the above referenced areas to insure that the pavement density is between 92% to 97% of the MADMTD.

When the rolling operation is complete there should be no visible shallow ruts, ridges, other irregularities, or roller marks in the pavement. If these imperfections are present, correct the imperfections or relay the pavement at no additional cost to the Department as ordered by the Engineer.

Correct at once any displacement occurring as a result of reversing the direction of the roller, or from other causes, by the use of rakes and addition of fresh mixture as required. Exercise care in rolling not to displace the line and grade of the edges of the bituminous mixture. To prevent adhesion of the mixture to the drum(s) of the roller, properly moisten the drum(s) with water, or water mixed with small quantities of detergent or other Department approved asphalt release compounds. If a pneumatic tire roller is used, the pneumatic drive wheels may be coated with a fine mist spray of fuel oil or other similar materials to prevent pneumatic tire pickup. In all instances, protect the surface of the pavement from drippings of fuel oil or any other solvents used in paving, compaction or cleaning operations.

Unless otherwise directed by the Engineer, compact the longitudinal joint by using one of the pneumatic drive wheels to overlap the joint in two (2) passes with the drum operating static, when vibratory rollers having pneumatic drive wheels are used. If dual vibrating drum rollers are used compact the joint by overlapping the joints in two (2) passes with both drums operating static.

Along forms, curbs, headers, walls and other areas not accessible to the rollers, compact the mix thoroughly with mechanical tampers as directed by the Engineer. On depressed areas, a trench roller or small vibratory roller approved by the Engineer may be used. Cleated compression strips also may be used under the roller to transmit compression to the depressed area.

Remove any mixture that becomes loose and broken, mixed with dirt, or is in any way defective and replace with fresh hot mixture and compact to conform with the surrounding area. Correct any area showing an excess or deficiency of bituminous materials to the satisfaction of the Engineer.

**ITEM 18403.2551 M - SUPERPAVE HOT MIX ASPHALT, 25.0 mm NOMINAL MAX. SIZE**  
**ITEM 18403.1251 M - SUPERPAVE HOT MIX ASPHALT, 12.5 mm FX NOMINAL MAX. SIZE**  
**ITEM 18403.9551 M - SUPERPAVE HOT MIX ASPHALT, 9.5 mm FX NOMINAL MAX. SIZE**

If vibratory compaction equipment is used, the Contractor assumes full responsibility for the cost repairing all damage which may occur to highway components and adjacent property including buried utility and service facilities.

Multiple plant production shall not be allowed unless each plant supplies material to a separate paving operation. When multiple paving operations are utilized with material production from a single plant each paving operation will be evaluated as individual paving lots.

Add the following to the end of §401-3 Construction Details.

**“Sampling.** Take four loose mix samples in accordance with AASHTO T168-91, Standard Test Method for Sampling Bituminous Paving Mixtures. The samples should be taken periodically throughout the day so as to represent the entire days production. When operational conditions cause production to be terminated before the specified number of samples have been taken the following procedures will be used:

- 1) If only three samples are taken, the loose mix MADMTD will be based on the average of the three samples taken.
- 2) If only one or two samples are taken, the days production will be added to the next days production and sublots determined based on the total quantity placed during the two days. Therefore a maximum of six loose mix samples may be used to determine the loose mix MADMTD.

The Engineer will select one pavement core location for each subplot in accordance with Materials Procedure 96-4, Asphalt Concrete Statistical Pavement Density Determination to represent each paving subplot. The Department’s representative shall define a total of four 150 mm diameter coring locations using an appropriate method. The Department’s pavement core samples must come from within the 150 mm diameter circles outlined. Under no circumstances will the Department’s representative designate the coring locations before the rolling operation is complete. The rolling operation will be considered complete when all compaction equipment has moved off the lane to be cored. Obtain the four 150 mm diameter pavement core samples no later than the day following the lot's placement. If coring is performed the same day as placement, cool the pavement so that the core sample is not damaged during coring. Backfill the core holes, with a similar HMA material as was cored, as soon as possible after coring, using a procedure approved by the Engineer.

After procuring the four paving lot cores, secure them in accordance with Materials Procedure 96-4, Asphalt Concrete Statistical Pavement Density Determination for transport to the appropriate Regional Laboratory. Cores arriving at the Regional Laboratory for testing with a damaged or missing security seal will not be tested and new cores will be required from the same locations as the original cores. Take care to insure that the loose mix samples and cores are in an acceptable test condition when delivered to the Regional Laboratory. Damaged cores will require resampling. The Engineer will select the core locations in the same general vicinity,  $\pm 0.5$  meter of the damaged core. Do not intentionally separate the pavement core course from the underlying material if the course does not debond during coring. The Department will separate the pavement core course, required for testing from the remainder of the core by sawing if necessary. Deliver the pavement core samples and the loose mix samples to the Department Regional Laboratory no later than the day following the lot's placement. If, for any reason, a delay occurs in the delivery of the lot samples for three consecutive lots, paving operations for this item will not be permitted to continue until the samples are delivered and tested.

**ITEM 18403.2551 M - SUPERPAVE HOT MIX ASPHALT, 25.0 mm NOMINAL MAX. SIZE**  
**ITEM 18403.1251 M - SUPERPAVE HOT MIX ASPHALT, 12.5 mm FX NOMINAL MAX. SIZE**  
**ITEM 18403.9551 M - SUPERPAVE HOT MIX ASPHALT, 9.5 mm FX NOMINAL MAX. SIZE**

A paving lot is defined as a days production providing a minimum of 1,200 lane-meters or 400 metric tons, whichever is less, are placed (a lane is defined as a travel lane, with a nominal width of 3.6 meters). When paving is continuous within a 24 hour period a new lot will result when a change occurs in the paving crew. If less than the minimum quantity is placed in any day, its placement will be combined with the next paving day to constitute a paving lot. If less than the minimum quantity is placed on the final paving day, the final day shall be evaluated as a paving lot regardless of size. Each paving lot will be equally divided into four sublots in accordance with Materials Procedure 96-4, Asphalt Concrete Statistical Pavement Density Determination.

**Test Section.** Prior to paving operations for this item, construct a test section on the project site at a location approved by the Engineer. The amount of mixture prepared according to the job mix formula should be sufficient to construct a test section at least 50 meters long and full width of pavement and shall be of the same depth specified for the construction of the course which it represents. The maximum test section length is 500 centerline-meters long on roadways subject to Quantity Adjustment Factors, otherwise there is no maximum length. Use equipment in the construction of the test section that is of the same type and weight to be used on the remainder of the course represented by the test section. If the test section is located on a roadway subject to Quantity Adjustment Factors Table 3 - Quantity Schedule shall apply. The test section will be paid for at 1.5 times the actual quantity paved, up to 200 actual paved metric tons per test section, for no more than two test sections for each item. The 1.5 Test Section Adjustment does not apply to any additional required test sections.

Testing as described above will be performed on the test section to determine if it meets the mat acceptance criteria. Paving operations for this item will not be permitted until a test section meets the mat acceptance criteria, a minimum Quantity Adjustment Factor of 100%. Only one test section per item per day may be placed.

If the Quantity Adjustment Factor for a test section is less than 100%, make the necessary adjustments to the mix design, plant operation, and/or rolling procedures. Construct an additional test section as required above. This test section will be evaluated to determine if the mat acceptance criteria is met.”

**METHOD OF MEASUREMENT**

Subsection 403-4 Method of Measurement shall be deleted and replaced with the following:

“The pavement course shall be measured by the number of adjusted metric tons of compacted material placed in the accepted work.

Each delivery vehicle supplying Hot Mix Asphalt shall be accompanied by a delivery ticket indicating the metric tons of mixture being delivered to the work site. The tonnage on the ticket shall be determined either by:

- A. Recorded batch weights,
- B. Theoretical weights or
- C. Truck scale weights.

The method of payment shall be subject to the approval of the Regional Director. Other information such as tare weights, plant and mix identification, project identification, and time and date shall be provided on

**ITEM 18403.2551 M - SUPERPAVE HOT MIX ASPHALT, 25.0 mm NOMINAL MAX. SIZE**  
**ITEM 18403.1251 M - SUPERPAVE HOT MIX ASPHALT, 12.5 mm FX NOMINAL MAX. SIZE**  
**ITEM 18403.9551 M - SUPERPAVE HOT MIX ASPHALT, 9.5 mm FX NOMINAL MAX. SIZE**

the delivery tickets as directed by the Department. The Engineer or his representative shall be provided with the ticket prior to the spreading and finishing of the mixture.

The Department will determine the paving lot's Percent Within Limits (PWL) in accordance with Materials Procedure 96-4, Asphalt Concrete Statistical Pavement Density Determination. In order to receive 100% payment (minimum), paving cores representing the paving lot must achieve statistically a minimum of 94% of the lot within the prescribed limits. If the above requirement is not met, the lot's quantities will be adjusted in accordance with Table 7 - Quantity Schedule. The quantity of the lot subject to possible adjustment will be determined based on an estimate of tonnage placed, determined from the typical sections shown in the plans.

| Percent Within Limits (PWL) | Quantity Adjustment Factor (%) |
|-----------------------------|--------------------------------|
| 94-100                      | 0.833(PWL) + 21.7              |
| 5-93                        | 0.449(PWL) + 57.8              |
| <5                          | *                              |

\* The lot shall be removed and replaced to meet specification requirements as ordered by the Engineer.

**Table 7 - Quantity Schedule**

When the quantity Adjustment Factor is over 100%, the additional tonnage will be calculated and paid for on a daily basis.

The total tonnage paid for under this item will not exceed 105% of the actual metric tons of materials placed. The Quantity Adjustment Factor listed in Table 3 will be applied to each paving lot to determine the percentage of that production received at the unit bid price. The Quantity Adjustment Factor will not be applied to material placed on ramps with a uniform full width section of less than 400 meters in length, shoulders, maintenance widenings and crossovers, and bridges. Payment in these areas will be based on satisfactory placement and compaction as determined by the Engineer. Placement and compaction procedures will be deemed satisfactory by the Engineer when the procedures used in these areas are the same as those used on the main line pavement sections.”

**ITEM 18403.2551 M - SUPERPAVE HOT MIX ASPHALT, 25.0 mm NOMINAL MAX. SIZE**  
**ITEM 18403.1251 M - SUPERPAVE HOT MIX ASPHALT, 12.5 mm FX NOMINAL MAX. SIZE**  
**ITEM 18403.9551 M - SUPERPAVE HOT MIX ASPHALT, 9.5 mm FX NOMINAL MAX. SIZE**

**BASIS OF PAYMENT**

Subsection 403-5 Basis of Payment shall be deleted and replaced with the following:

“The unit bid price per metric ton for the pavement course shall include the cost of furnishing all materials including asphalt cement and all equipment and labor necessary to complete the work, including the cost of any cleaning and tack coat applied pursuant to §401-3.01. Also to be included in the unit bid price is the cost of all necessary equipment, labor and materials required in obtaining the pavement cores, filling all core holes with HMA and compacting these core holes satisfactorily to the Engineer.

Payment will be made under:

| <b><u>ITEM NO.</u></b> | <b><u>ITEM</u></b>   | <b><u>PAY UNIT</u></b> |
|------------------------|--|------------------------|
| 18403.2551M            | <i>SUPERPAVE</i> Hot Mix Asphalt, 25.0 mm Nominal Max. Size    | Metric Ton             |
| 18403.1251M            | <i>SUPERPAVE</i> Hot Mix Asphalt, 12.5 mm FX Nominal Max. Size | Metric Ton             |
| 18403.9551M            | <i>SUPERPAVE</i> Hot Mix Asphalt, 9.5 mm FX Nominal Max. Size  | Metric Ton”            |

This  
Specification  
has been  
Disapproved  
as a result of  
the issuance of  
El 98-041