ITEM 18403.128201 M - SUPERPAVE HMA, SHOULDER COURSE 12.5 mm
ITEM 18403.128210 M - PLANT PRODUCTION QUALITY ADJUSTMENT to 18403.128201 M
ITEM 18403.958201 M - SUPERPAVE HMA, SHOULDER COURSE 9.5 mm
ITEM 18403.958210 M - PLANT PRODUCTION QUALITY ADJUSTMENT to 18403.958201 M

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

DESCRIPTION

This work shall consist of developing Hot Mix Asphalt pavement courses using the *SUPERPAVE* Mix Design procedure detailed in Materials Method 5.16, "*SUPERPAVE* Hot Mix Asphalt Mixture Design and Mixture Verification Procedures," 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 are available from the Regional Materials Engineer or the Director, Materials Bureau.

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 Materials Engineer, a *SUPERPAVE* Mix Design that satisfies the design control points listed in Table 2 - Design Control Points and does not pass through the restricted zone listed in Table 3 - Restricted Zone of Materials Method 5.16, based on the specified nominal maximum aggregate size.

If for any reason, a change in gradation or materials occurs, 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 Contractor but within the mixing and compaction range of 120°C and 175°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 at the plant. The pavement courses will be accepted after all paving operations are completed.

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

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"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 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."

CONSTRUCTION DETAILS

The details of §401-3 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. Gyratory Compactor - A power driven gyratory compactor capable of maintaining an angle of gyration of 1.25° ± 0.02°, a speed of gyration of 30.0 rpm ± 0.5 rpm, and a consolidation pressure of 600 k Pa ± 10% for gyrations zero to five and ± 3% for gyrations six and greater. The make and model of the gyratory compactor supplied must be approved by the Director, Materials Bureau.

Z. Gyratory 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. Gyratory Specimen Extractor - A simple means of specimen extraction from the gyratory 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* Gyratory Compactor mold assemblies and asphalt mix samples. The oven shall have a controlled temperature range up to 190°C with a ± 3°C accuracy throughout the range.

CC. Kraft Paper - 23 kg medium weight, 915 mm width.

DD. Sheet Rock Taping Knives (minimum 2) - 254 mm length.

EE. Aging Pans (minimum 4) - 457 mm x 457 mm x 38 mm H galvanized iron pans.

FF. Miscellaneous Pans (minimum 4) - 394 mm x 280 mm x 51 mm H aluminum pans.

GG. Screen trays (1 each) - 457 mm x 660 mm to include the following: 2.36 mm, 1.18 mm, 0.60 mm,

0.30 mm, 0.15 mm, 0.075 mm."

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

"**Test Section**. Prior to paving operations for this item, construct a test section on the project site at a location approved by the Engineer, using the same equipment and procedures to be used in the construction of the remainder of the course being laid.

The amount of mixture prepared according to the job mix formula should be sufficient to construct a test section 500 meters long on the mainline and shall be the same depth specified for the construction of the course which it represents. Routine paving operations may begin immediately following the construction of the test section once a PTD has been determined to the satisfaction of the Engineer based the evaluation of density readings. The test section is for the purpose of determining the PTD for this item. Construction of the test section will not begin unless both an operator and a nuclear density gauge are present.

Use the first 150 linear meters of the test section to stabilize the paving operation. The remainder of the length will be used to determine the PTD. Once a sufficient amount of material has been placed in the remaining 350 linear meters of the test section compact the pavement with 2 machine passes of the breakdown roller. Perform density readings at three sites, randomly selected by the Engineer in accordance with Materials Procedure 96-01M, "Nuclear Gauge Density Data Collection and Determination of Pavement Core Locations for Rut Avoidance Asphalt Concrete." A nuclear density reading at each location will be the average of the four measurements taken at 90˚. Mark these sites so that subsequent density readings can be performed at the same locations. Make additional machine passes using either the intermediate or finish roller and perform additional density readings at the three previously selected sites until the increase in density is less than 32.0 kg/m^3, or until the Engineer stops further compaction because the pavement shows signs of distress.

The Engineer will immediately determine the average of the final density measurements at the three test locations. This average density will be the PTD. Once a PTD has been established routine paving operations may begin.

Only gauge(s) calibrated during the construction of the test section will be allowed to be used during normal paving operations."

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 hot mix asphalt (HMA) has been spread, struck off and surface irregularities adjusted, compact the mix by rolling thoroughly and uniformly. 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 the low edge and working toward the super-elevated edge. The types of rollers used, the number of

rollers used, and the number of roller passes made will be at your discretion.

Use a nuclear density gauge to monitor and record the pavement density in accordance with this section and Materials Procedure 96-01M, Nuclear Gauge Density Data Collection and Determination of Pavement Core Locations for Rut Avoidance Asphalt Concrete." The nuclear density gauge should consist of a radioactive source, scaler and other basic components housed in a single backscatter unit. The gauge must be operated by personnel trained in the principles of nuclear testing and safety practices. Only gauge(s) calibrated during the construction of the test section will be used during normal paving operation. If another nuclear gauge is to be used, a new test section must be constructed to calibrate that gauge and to establish a new PTD.

Compact the pavement sufficiently to achieve a minimum density of 96% of the PTD in a single test location and 98% of the PTD calculated as a moving average of the last 10 test locations as determined by a nuclear density gauge. Take nuclear gauge readings at each site, randomly selected by the Engineer, approximately every 60 meters along the length of the pavement for each pass of the paver and record them on a BR340M.

If the average of 4 nuclear density gauge measurements taken at 90° angles over two consecutive locations falls below 96% of the PTD or if the moving average of the last 10 nuclear gauge test sites falls below 98% of the PTD, stop routine paving operations and construct a new test section. Normal production will only resume after establishing a new PTD.

Placement and compaction on shoulders, ramps, maintenance widenings, crossovers, and bridges will be deemed satisfactory by the Engineer when the procedures used in these areas are the same as those used on the mainline pavement sections. If shoulders show signs of distress at this level of compaction decrease the compactive effort until no damage occurs to the shoulder or subbase. Nuclear gauge(s) used to monitor the mainline paving should be used to monitor the above referenced areas.

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

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 where 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.

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.

When multiple paving operations are utilized with material production from a single plant each paving operation will be evaluated separately.

Routine paving operations will not begin unless both a project calibrated nuclear density gauge and an operator are present."

METHOD OF MEASUREMENT

The provisions of §401-4, §402-4 and §403-4, Method of Measurement shall apply.

BASIS OF PAYMENT

The provisions of subsection 403-5 Basis of Payment shall apply including the following::

"The unit bid price also includes the cost of all necessary equipment, labor and materials required in construction of the test sections, and routine nuclear density testing.

Payment will be made under:

ITEM NO.	ITEM	PAY UNIT
18403.128201 M	*SUPERPAVE* HMA, Shoulder Course 12.5 mm	Metric Ton
18403.128210 M	PLANT PRODUCTION QUALITY ADJUSTMENT to 18403.128201 M	Quality Unit
18403.958201 M	*SUPERPAVE* HMA, Shoulder Course 9.5 mm	Metric Ton
18403.958210 M	PLANT PRODUCTION QUALITY ADJUSTMENT to 18403.958201 M	Quality Unit"