

**DATE: 02/11/2002**

**SUBJECT: Hot Mix Asphalt (HMA)**

Section 403, Hot Bituminous Pavement, of the 1990 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is deleted in toto and replaced as follows:

**SECTION 907-403 - HOT MIX ASPHALT PAVEMENT**

**907-403.01--Description.** This work consists of constructing one or more lifts of HMA pavement meeting the requirements of Section 907-401 on a prepared surface in accordance with the requirements of this section and in reasonably close conformity with the lines, grades, thicknesses, and typical cross sections shown on the plans or established by the Engineer. This work shall also include applicable in-grade preparation of the underlying course in accordance with Section 321.

**907-403.02--Material Requirements.** Materials and their use shall conform to the applicable requirements of 907-401.02.

**907-403.03--Construction Requirements.**

**907-403.03.1--General.** Construction requirements shall be as specified in 907-401.03 except as otherwise indicated in this section or applicable special provisions.

**907-403.03.2--Smoothness Tolerances.** Except as noted herein, the finished smoothness of each lift shall conform to the designated grade and cross section within the following tolerances from grade stakes or other grade reference points set at 25 foot intervals:

	Lower* & Leveling Lifts	Lower* Intermediate Lift	Top Intermediate Lift	Surface Lift
Max. deviation from grade and cross sec- tion at any point .....	1/2"	3/8"	1/4"	1/4"
Max. deviation from a 10 foot straight edge .....	3/8"	1/4"	1/8"	1/8"
Profile Index (PI) (inches/mile) .....	-	-	45.0	30.0

Note: Where more than four (4) lifts of HMA are required, all lifts, excluding the top three (3) lifts, shall meet the requirements of the lower lift.

Where only one intermediate lift is required, it shall meet the smoothness requirements for lower intermediate lifts and shall have a Profile Index of not more than 60.0 inches per mile. The surface lift shall have a Profile Index of not more than 30.0 inches per mile.

Where only a leveling lift and a surface lift are required, the surface lift shall meet the smoothness requirements for lower intermediate lifts, and shall have a Profile Index of not more than 60.0 inches per mile.

Where only a surface lift is required, the Contractor shall determine the existing surface profile index at no additional cost to the State. The finished surface lift shall have a profile index of sixty percent (60%) of the profile index of the existing surface or 60.0 inches per mile, whichever is greater.

Where milling is required to remove undesirable material and/or correction of the cross-slope and only one (1) lift is required, the lift shall have a Profile Index of not more than 45.0 inches per mile.

Where milling is required to remove undesirable material and/or correction of the cross-slope and a leveling lift and a surface lift are required, the surface lift shall have a Profile Index of not more than 45.0 inches per mile.

Where milling is required to remove undesirable material and/or correction of the cross-slope and two (2) lifts are required, the lower lift shall have a Profile Index of not more than 45.0 inches per mile and the surface lift shall have a Profile Index of not more than 30.0 inches per mile.

Grade stakes or other grade reference points set at 25-foot intervals and maximum deviation from grade and cross section will not be required provided an approved profile averaging device is furnished and properly used for the four conditions set forth herein; however, all other surface requirements are applicable.

- (a) Overlays with one overall lift.
- (b) Overlays with two or more overall lifts -- for each lift above the first overall lift provided each underlying overall lift is within the allowable tolerances.
- (c) Surface lift of new construction provided the underlying lift is within the allowable tolerances.
- (d) Full-depth asphalt construction for lifts above the lower lift provided the lower lift is within the specified tolerances for the lower intermediate lift.

Approved contacting type profile averaging devices are those devices capable of working in conjunction with a taut string or wire set to grade, or ski-type device with extreme contact points with the surface at least 30 feet apart. Approved non-contacting type profile averaging devices are laser type ski devices with at least four referencing mobile stations at a minimum length of 24 feet, or an approved equal.

During the finishing and compacting of pavement lifts, it shall be the responsibility of the Contractor to check the surface and joints for progress toward conformance to surface requirements set forth herein. Variations from surface requirements exceeding the allowable tolerances shall be corrected at the Contractor's expense.

When a portland cement concrete pavement is to be placed on a HMA lift, the finished top of the HMA lift shall meet the requirements of Sections 321 and 501.

When the Profile Index for the final surface lift is less than or equal to twenty-two inches per mile (22.0 inches / mile), per segment, a unit price increase will be added. The following schedule lists the Profile Index range and the corresponding contract price adjustment:

Profile Index inches / mile / segment	Contract Price Adjustment percent of HMA unit bid price
less than 10.0	108
10.0 to 14.0	106
14.1 to 18.0	104
18.1 to 22.0	102
22.1 to 30.0	100
over 30.0	100 (with correction of $PI \leq 30.0$ )

Contract price adjustments for rideability shall only be applicable to the surface lift and furthermore to only the segment(s) or portions of the segments(s) of the surface lift that require smoothness be determined by using a profilograph and then only when the surface tolerance requirements include a profile index of 30.0 inches / mile.

Segment(s) or portions thereof representing areas excluded from a smoothness test with the profilograph shall also be excluded from consideration for a contract price adjustment for rideability.

Any contract price adjustment for rideability will be applied on a segment to segment basis to the pay tonnage, determined in accordance with Subsections 907-401.02.6.5 and 907-403.04, for the segment(s) or portions thereof for which an adjustment is warranted.

**907-403.03.3--Thickness Requirements.** Hot mix asphalt overlay lifts shall be constructed as nearly in accordance with the thickness shown on the plans as the underlying pavement and foundation will permit. Periodic and cumulative yield tests will be made to determine practicable conformity to the thickness of each lift. The Engineer may order modifications in placement thicknesses to prevent unwarranted variations in plan quantities.

When grade stakes are eliminated by Notice to Bidders or as outlined in 907-403.03.2(d) and where resulting in the placement of two (2) or more lifts, acceptance and payment will be determined on a lot to lot basis by cores taken from the completed pavement. Lots will be coincidental with acceptance lots for the surface lift as provided in 907-401.02.6.4, except that only lots resulting from the placement of mainline surface lift will be used for thickness assessment. One core will be obtained at random from each lot. Irregular areas will not be cored.

When the average thickness of all the cores from the lots representing a day's production (excluding any discarded by the Engineer for justifiable reason) is within  $3/8$  of an inch of the total pavement thickness shown on the plans, excluding lift(s) placed using an established grade line, corrective action will not be required and a price adjustment will not be made for non-conformity to specified thickness.

When the average thickness of all the cores from the lots representing a day's production is deficient in thickness by more than  $3/8$  of an inch of the total pavement thickness shown on the plans, excluding lift(s) placed using an established grade line, the deficiency shall be corrected by overlaying the entire length of the day's production. The thickness of the overlay shall be equal to the thickness deficiency but no less than the minimum single lift laying thickness for the specified mixture.

When the thickness of all the cores from the lots representing a day's production is more than  $3/8$  of an inch thicker than the total thickness shown on the plans, excluding lift(s) placed using an established grade line, a price adjustment will be made in accordance with 907-403.05.1.

The cores shall be cut and removed by the Contractor in the presence of the Engineer's representative and turned over to the Engineer's representative for further handling. The Contractor shall fill each core hole with surface lift mixture and compact to the satisfaction of the Engineer within 24 hours after coring.

**907-403.03.4--Lift Corrections.** Pavement exceeding the allowable surface tolerances shall be corrected at the Contractor's expense by the following methods:

Lower, Leveling and Lower Intermediate Lifts:

- (a) Removal or addition of mixture by skin patching, feather edging, wedge lift construction or full depth patching where appropriate and can be completed in a satisfactory manner.
- (b) Superimposing an additional layer which shall be an approved grade raise for the full roadway width and length of the area to be corrected.

Top Intermediate Lift:

- (a) Removal and the addition of sufficient mixture to provide the specified thickness. Corrections by this method shall be square or rectangular in shape and shall completely cover the area to be corrected.

pavement.

Surface Lift:

- (a) Removal and the addition of sufficient mixture to provide new material of at least minimum single lift laying thickness for full lane width of the area to be corrected. Transverse joints shall be perpendicular to the centerline of the lane.
- (b) Superimposing an additional layer (minimum lift thickness for mixture being used) which shall be an approved grade raise for full roadway width of the area to be corrected. Transverse joints shall be perpendicular to the centerline of the pavement.

All mixtures used in the correction of unacceptable pavement shall be approved by the Engineer prior to use.

**907-403.03.5--Overlays or Widening and Overlays.** In addition to the requirements of 907-403.03.1 through 907-403.03.4, the following requirements will be applicable when an existing pavement is to be overlaid or widened and overlaid.

**907-403.03.5.1--Blank.**

**907-403.03.5.2--Sequence of Operations.** In order to expedite the safe movement of traffic and to protect each phase of the work as it is performed, a firm sequence of operations is essential. Unless otherwise provided in the traffic control plan and/or the contract, the following appropriate items of work shall be begun and continually prosecuted in the order listed:

- (a) In sections designated by the Engineer, trim the shoulders along the pavement edges to provide drainage from the pavement.
- (b) Perform prerolling to locate areas of pavement with excessive movement (Section 411).
- (c) Perform selective undercutting and patching as directed (Subsection 907-403.03.5.4).
- (d) Perform pressure grouting as specified (Section 412).
- (e) Clean and seal joints (Section 413).
- (f) Complete preparation on one side of roadway to be widened and place widening materials.
- (g) Reconstruct shoulders to elevation necessary to assure traffic safety.
- (h) Open the widened section to traffic.

- (k) Apply interlayer as specified.
- (l) Place the first overall leveling lift.
- (m) After the first overall leveling lift, reconstruct shoulders as necessary to eliminate vertical differentials which may be hazardous to traffic.
- (n) Place first intermediate lift.
- (o) Construct shoulders to the contiguous elevation of the first intermediate lift.
- (p) Place remaining intermediate lift (if required).
- (q) Place surface lift.
- (r) Complete construction of shoulders.
- (s) Apply permanent traffic marking.
- (t) Final cleanup.

The above operations shall be performed in such a manner that traffic will be maintained on a paved surface at all times. Two-lane, two-way highways should not be restricted to a single lane in excess of a 3,000 foot section.

**907-403.03.5.3--Widening of Pavement** The foundation for widening shall be formed by trenching or excavating to the required depth and constructing a smooth, firm and compacted foundation. It shall have sufficient density and stability to withstand the placement and compaction of subsequent lifts. Soft, yielding and other unsuitable material which the Engineer determines will not compact readily shall be removed and backfilled with granular material or hot mix asphalt as directed.

Except as provided herein, excavation for widening, undercutting or other required excavation shall be spread along the edge of the shoulders, foreslopes or other adjacent areas as directed and will be an absorbed item. When the quantity is in excess of what may be used satisfactorily on adjacent areas, the Engineer may direct that the material be loaded, hauled and spread uniformly on other designated areas. In this case, compensation for handling surplus material will be in accordance with the appropriate pay items as provided in the contract or as extra work.

If the plans require widening of the shoulders or embankment with contractor furnished material, all suitable material obtained from widening excavation may be used and will be measured and paid for as Contractor furnished materials. No measurement for payment of haul will be made.

Removal and disposal of old stakes, forms and other debris encountered in excavating shall be in accordance with Section 201 and shall be considered as incidental to and included in the unit prices bid for other items. No separate measurement will be made therefor. Pavement

unyielding foundation in accordance with the typical section. Density of the granular material shall be as specified.

Hot mix asphalt for widening, including trench widening, shall meet the applicable requirements of this section and Section 401 and shall be placed in one or more layers as shown on the plans or directed. The surface of the mixture shall be finished as a continuation of the adjacent pavement slope.

Trench rollers or other compaction equipment shall be used to compact the foundation, granular material and bituminous mixtures for widening when standard width rolling equipment cannot be used.

**907-403.03.5.4--Patching.** Existing pavement which has failed or unsatisfactorily stabilized shall be removed as directed. Removal of pavement will be measured and paid for under the appropriate pay items as provided in the contract.

Backfill shall consist of hot mix asphalt or a combination of compacted layers of granular material and hot mix asphalt. Unless otherwise specified, the Engineer will make this determination based on depth and field conditions.

Hot mix asphalt used for backfilling will be measured and paid for at the contract unit price for the mixture designated on the plans as the lowest lift. Granular material will be measured and paid for under the appropriate pay item as provided in the contract or as extra work.

**907-403.03.5.5--Preliminary Leveling.** All irregularities of the existing pavement that result in a thickness greater than approximately two and one-half inches for the first overall leveling lift shall be corrected by skin patching, feather edging or a wedge lift and shall be approved by the Engineer in advance of placing the first overall lift.

**907-403.03.5.6--Placement of Lifts.** The leveling lift shall be placed in a layer (or layers) not exceeding approximately two and one-half inches compacted thickness.

When single lane construction is required, placement of a lift on the adjacent lane may be performed by an approved profile averaging device provided the lane previously placed is within the allowable tolerances for all surface requirements. When any of the tolerances are exceeded, the contractor shall reestablish the control stringline for laying the adjacent lane should he elect to perform this work prior to correcting the deficiencies of the lane previously placed. In no case shall a "matching shoe" be used to control the grade of an adjacent lane.

In instances where there are only minor deviations from the allowable tolerances in the first overall lift, the Engineer may permit the Contractor to place the next higher lift by graded stringline in lieu of making the corrections.

Single lane placement of leveling, intermediate and surface lifts shall be limited to the distance covered in one and one-half days in advance of that placed in the adjacent lane.

**907-403.03.5.7--Protection of Pavement.** The pavement shall be protected and properly maintained until it has been compacted and cooled sufficiently for use by traffic.

Unless shown as a separate pay item, the furnishing and application of the tack coat will not be measured for payment. When payment is provided, tack coat will be measured as set out in 407.04.

The quantity of bituminous mixture required to correct the work, when made at the expense of the Contractor, will not be measured for payment.

Any trenching required for widening will not be measured for payment; the cost thereof shall be included in other items of work.

Undercut required by the Engineer will be measured for payment under the appropriate excavation item as provided in the contract or as extra work. Pavement removal and any required trenching will not be included in the measurement for undercut.

**907-403.05--Basis of Payment.** Subject to the adjustments set out in 907-401.02.6.3, 907-401.02.6.4, 907-401.02.6.5 & 907-403.03.2, hot mix asphalt pavement, complete-in-place, accepted, and measured as prescribed above, will be paid for at the contract unit price per ton for each lift of pavement specified in the bid schedule and shall be full compensation for completing the work.

**907-403.05.1--Price Adjustment for Thickness Requirement.** When grade stakes are eliminated as provided in 907-403.03.3 and the average thickness of all cores from lots representing a day's production is more than 3/8 inch thicker than the total specified thickness of the pavement, excluding lift(s) placed using an established grade line, a lump sum reduction in payment for the surface lift of lots representing a day's production will be made as follows:

$$\text{Individual Day's L.S. Reduction} = \frac{\text{Monetary Value of the Day's Surface Lift Production}}{\text{Surface Lift Production}} \times \frac{(D - 3/8)}{ST}$$

Where:

D = The day's average deviation from total pavement thickness shown on the plans, excluding lift(s) placed using an established grade line.

ST = Specified thickness for surface lift.

The total L.S. reduction for the project is the summation of the individual day's reductions in payment.

**907-403.05.2--Pay Items.**

Payment will be made under:

907-403-A: Hot Mix Asphalt,  $\frac{(1)}{\text{Type}}$ ,  $\frac{(2)}{\text{Mixture}}$  - per ton

907-403-C: Hot Mix Asphalt,  $\frac{(1)}{\text{Type}}$ ,  $\frac{(4)}{\text{Mixture}}$ , Trench Widening - per ton

907-403-D: Hot Mix Asphalt, HT,  $\frac{(3)}{\text{Mixture}}$ , Polymer Modified - per ton

907-403-E: Hot Mix Asphalt, HT,  $\frac{(3)}{\text{Mixture}}$ , Polymer Modified, Leveling - per ton

(1) ST, MT or HT

(2) 9.5-mm mixture, 12.5-mm mixture, 19-mm mixture or 25-mm mixture

(3) 9.5-mm mixture, 12.5-mm mixture or 19-mm mixture

(4) 19-mm mixture or 25-mm mixture