

J. Pick

Zack Stewart
Northern District Commissioner

Wayne O. Burkes
Central District Commissioner

Ronnie Shows
Southern District Commissioner



Dr. Robert L. Robinson
Executive Director

James D. Quin
Deputy Executive Director/
Chief Engineer

Mississippi Department of Transportation / P.O. Box 1850 / Jackson, MS 39215-1850 / FAX (601) 359-7110

March 22, 1996

MEMORANDUM

TO: Chief Engineer
Assistant Chief Engineer-Operations
Assistant Chief Engineer-Preconstruction
District Engineers
Roadway Design Division Engineer
Research Division Engineer
State Materials Engineer
State Construction Engineer
Contract Administration Engineer
Maintenance Division Engineer
F.H.W.A.
Mississippi Roadbuilders Association
Mississippi Asphalt Pavement Association

FROM: Roadway Design Division
C. Keith Purvis *CKP*

RE: Interim Policy for Use of Polymer
Modified Hot Mix Asphalt

The "Interim Policy for Use of Polymer Modified Hot Mix Asphalt", distributed on March 6, 1996, states that it's use is warranted for high traffic loadings or slow moving channelized truck traffic. In an effort to establish a consistent interpretation of the policy, the attached table has been developed. Note that the use of polymer modified HMA is not restricted to the areas shown in the table, if the warrant of slow moving channelized truck traffic is met.

Attachment



CURRENT MDOT POLICY ON POLYMER MODIFIED\HIGH-TYPE HOT MIX ASPHALT (3/22/96)

RURAL

	Interstate	All Divided Highways With 6 or More Lanes	4-Lane Divided (>= 3 Million ESAL)	4-Lane Divided (< 3 Million ESAL)	Other Red-Line Routes	Other Black-Line Routes
Ramps	PMHTA	PMHTA	PMHTA	HTA	HTA	ST
Outside Shoulder	HTA	HTA	HTA	HTA	HTA	ST
Outside Lanes	PMHTA	PMHTA	PMHTA	HTA	HTA	ST
Other Lanes	HTA	PMHTA	HTA	HTA	HTA	ST
Inside Shoulder * (if paved <= 4 Ft.)	HTA	PMHTA	HTA	HTA	HTA	ST
Inside Shoulder (if paved > 4 Ft.)	HTA	HTA	HTA	HTA	HTA	ST

URBAN

	Interstate	All Divided Highways With 6 or More Lanes	4-Lane Divided (>= 3 Million ESAL)	4-Lane Divided (< 3 Million ESAL)	Other Red-Line Routes	Other Black-Line Routes
Ramps	PMHTA	PMHTA	PMHTA	HTA	HTA	ST
Outside Shoulder	HTA	HTA	HTA	HTA	HTA	ST
Outside Lanes	PMHTA	PMHTA	PMHTA	HTA	HTA	ST
Other Lanes	PMHTA	PMHTA	PMHTA	HTA	HTA	ST
Inside Shoulder * (if paved <= 4 Ft.)	PMHTA	PMHTA	PMHTA	HTA	HTA	ST
Inside Shoulder (if paved > 4 Ft.)	HTA	HTA	HTA	HTA	HTA	ST

* Based on constructibility

Note: Polymer modified HMA may also be used in areas of slow moving channelized truck traffic

The traffic loading requirement is based on a 10-year period REGARDLESS of pavement design life

ESAL refers to 80-kN (18-Kip) equivalent single-axle loadings

Red Line/Black Line distinction made based on map "Routes Designated for High-Type Asphaltic Mixtures published by the Planning Division

PMHTA = Polymer Modified High-Type Asphalt to be placed in surface course and top binder course (Other courses will be High-Type Asphalt)

HTA = High-Type Asphalt; ST = Standard Asphalt (Non-High-Type)

INTERIM POLICY
USE OF POLYMER MODIFIED HOT MIX ASPHALT
AND
COARSE AGGREGATE CRUSHING REQUIREMENTS
FOR
HOT MIX ASPHALT
BY
THE MISSISSIPPI DEPARTMENT OF TRANSPORTATION

Introduction

Rutting of hot mix asphalt (HMA) pavement continues to be a major concern for MDOT. Efforts to reduce rutting have included major revisions to the HMA specifications by the Materials Division that are embodied in the High Type HMA mixture specifications. Additionally, the Materials and Research Divisions have been active in validating the SuperPave[®] binder and mixture specifications that are products of the Strategic Highway Research Program (SHRP). MDOT Districts Two and Three have constructed trial sections of polymer modified HMA in efforts to reduce rutting at different locations that include areas of high volume, slow moving, channelized truck traffic and areas that have historically experienced rutting problems in HMA mixtures. With increasing interest in utilizing all available tools to provide the most serviceable, rut resistant HMA pavements at the lowest life cycle cost, it is appropriate to develop an interim policy concerning the use of polymers in HMA and coarse aggregate crushing requirements for HMA. This policy will help insure that use of polymer modified HMA follows a rational plan and will establish a feedback system to monitor performance of pavements where polymer modified HMA is placed.

This policy will be reviewed annually.

Asphalt Cement Specifications

Specification requirements for polymer modified asphalt cement will be in accordance with current AASHTO Standards for Performance Graded (PG) binders of the grade PG 76-22. At this time these AASHTO standards are classified as Provisional Standards, but this policy will also be applicable when these provisional standards become AASHTO standard specifications. The requirements of Special Provision No. 907-702.08.3 are not applicable. It is the express intent of this policy that a base asphalt cement with a SHRP binder grading of PG 64-22 or lower be modified by the addition of a polymer and not by some other refining technique.

Locations Requiring Polymer Modified HMA

This policy has two warrants for use of polymer modified HMA and these are related to traffic loading and slow moving channelized truck traffic. For routes where the design traffic loading is greater than or equal to 3 million 80 kN equivalent single axle loads (ESALs), and all interstate routes, polymer modified HMA will be required for the top

binder and surface courses. The design traffic loading will be based on a 10-year performance period. For 4-lane divided highways, polymer modified HMA will be required for the truck lane (outside lane) only in functional classes designated as rural, and for all lanes (excluding shoulders and non-trafficked areas) in functional classes designated as urban. Polymer modified HMA is not required on paved shoulders. In addition to design traffic loading criteria, polymer modified HMA will also be required at intersections, truck ramps to scale facilities and other locations that are subject to slow moving, channelized truck traffic of such volume that rutting is anticipated to occur or has occurred in the past.

Coarse Aggregate Crushing Requirements

All locations where polymer modified HMA is required will also require high type HMA mixture gradation as per existing policy. In addition to the high type mixture gradation specifications, specifications for the top binder course in locations requiring polymer modified HMA shall require at least 90% by weight of the combined mineral aggregate coarser than the No. 4 (4.75 mm) sieve to have two or more mechanically fractured faces. In functional classes designated as rural, this crushing requirement will apply to all lanes (excluding shoulders) and not just the truck lane (outside lane). For locations requiring polymer modified HMA where the existing pavement surface is portland cement concrete, the above requirement for at least 90% by weight of the combined mineral aggregate coarser than the No. 4 (4.75 mm) sieve to have two or more mechanically fractured faces shall apply to all binder courses. As noted below, control sections will be established that have these new crushing requirements but without polymer modification.

Performance Monitoring

A monitoring system will be established to track the performance of polymer modified HMA. The MDOT Pavement Management System (PMS) will be used for this performance tracking. Special coding instructions will be furnished to each District to identify homogeneous sections having polymer modified HMA when the annual PMS update is made.

Annual reports will be prepared by the Research Division detailing performance of the sections having polymer modified HMA. Parameters to be reported are age, traffic loading, pavement courses with polymer modified HMA, ride quality expressed in units of International Roughness Index (IRI), rutting from the South Dakota Profiler expressed in millimeters, distress rating and pavement condition rating. Comparative information for high type HMA with the new crushing requirement but without polymer modification is needed. The Research Engineer will coordinate the establishment of control sections in strategic locations for this purpose. The same monitoring information collected for polymer modified HMA will be collected for control sections and both will be reported annually.