Pickering, John

From: Purvis, Keith
Sent: Wednesday, August 12, 1998 11:20 AM
To: Ruff, Wendel; McMahen, Steve; West, Tom; Boyd, Barry; Turner, Mitch; Dixon, Chris; Cross, Alan; Schaub, Ed; Ruff, Wilson; Dickerson, Randy; Brumfield, Jimmy; Russell, Buddy; Crisco, Leroy; Crawley, Alfred B.; Pickering, John; Balentine, Ray; Reese, John; Lowe, Greg; Kidd, Jim; Whitfield, Robert; McCorkle, Jerry; Pittman, Richard; Reeves, Steve
Subject: Revised "MDOT Pavement Design Current Policies"

Attached is a revised list of pavement design policies.

This document was revised in accordance with the revised hot mix asphalt specifications.

POLICY.DOC

POLYMER.DOC

Keith Purvis
Roadway Design Division
Email: kpurvis@mdot.state.ms.us

MDOT PAVEMENT DESIGN CURRENT POLICIES:

(Revised: 07/14/98)
(Revised: 08/12/98 – Item #2)

ITEM #1

Contained within this document is an up-to-date list of current MDOT policies regarding pavement design. When changes occur, this document will be revised and forwarded to the Assistant Chief Engineers, District Materials Engineers, the Construction Division, the Materials Division, the Research Division, and the Roadway Design Division.

POLICIES:

Concrete pavement will be designed on a 35-year design life. All asphalt pavement will be designed based on the following design life:

Interstate	20 Years
Bridge Approaches (100 feet from bridge end)	20 years
Urban projects	20 years
Temporary connections/detours	projected life, not less than 1 year
All other locations	10 years

ITEM #2

On January 23, 1997, the map titled "Routes Designated for High Type and Polymer Modified High Type Asphaltic Mixtures" was distributed to you. It should be used to determine what type mix (ST, MT, or HT) should be used on a particular project. The following guidelines were used in developing the map:

Number of ESAL's in the Ten-year Design Life	**Type**
< 1 million	ST
1 million to 3 million	MT
> 3 million	HT*

* Polymer modification required on a portion of the roadway (See polymer.doc for details)

Only one mix type (ST, MT, or HT) should be used on each project

---

ITEM #3

On September 11, 1997, it was decided to require all lifts of HMA (12.5 mm MIXTURE) to be 2 inches (50 mm). This decision was based on the performance of this material placed in 1.5 inch (40 mm) lifts, at

several locations. It is MDOT's opinion that the thicker lifts will enhance the possibility of achieving proper densities. Any HMA (12.5 mm MIXTURE) included in projects let in October 97 or after (with a few specific exceptions) will be placed in 2 inch (50 mm) lifts.

MDOT PAVEMENT DESIGN CURRENT POLICIES (2 of 4):

ITEM #4

On October 27, 1997, it was decided to follow the following guidelines:

- Multiple lifts of 9.5 mm HMA should be avoided;
- More than 2 lifts of 12.5 mm HMA should be avoided if possible. Exceptions to this include a low volume route where the use of the larger mixes would result in an excessive amount of pavement, or where traffic is to be placed on an intermediate lift for more than one year;
- All permanent pavement designs should include at least one lift of either 19 mm HMA or 25 mm HMA. In addition, at least one lift of each mix designation (19 mm and 25 mm) should be included unless it results in an excessively overdesigned pavement structure. The requirement of having one lift of 25 mm HMA may be waived if a lime fly-ash or other alternate base course is included in the pavement structure. For the purpose of this requirement, untreated granular material is not considered to be an alternate base course.

ITEM #5

On November 11, 1997 it was decided to increase the maximum allowable drop-off across a longitudinal construction joint that traffic is expected to temporarily cross, from 1.5 inches (40 mm) to 2.25 inches (55 mm).

ITEM #6

Previously, the Department routinely allowed traffic to be temporarily placed on new pavement structures, prior to the time that the final lift was placed. This procedure, which was used primarily on projects where parallel lanes are paved, was reviewed in November of 1997. At that time, it was decided that when future pavement designs were reviewed, the following procedure would be followed:

- If traffic is to be placed on a new structure for one year or less, the final lift may be left off, while traffic utilizes the pavement structure. When traffic is shifted back to the existing lanes, the final lift will be placed;
- If traffic is to be placed on the new structure for more than one year, the full structure will be placed prior to allowing traffic to utilize the lanes. When the traffic is shifted back to the existing lanes, an "additional" lift will be placed.

This procedure was discussed with the Assistant Chief Engineers, Construction Division, Materials Division, Research Division, Roadway Design Division and all Districts.

ITEM #7

On January 2, 1998, the layer coefficient for HMA (**25**-mm MIXTURE) was increased from 0.34 to 0.44 per inch. The MDOT pavement design program was modified (version 8E/8M).

MDOT PAVEMENT DESIGN CURRENT POLICIES (3 of 4):

ITEM #8

Considering: A) the lift thickness requirements which were distributed on May 12, 1997; B) the 2.25 inch (55 mm) maximum allowable longitudinal drop-off; and C) the variable amount of material required to change a cross-slope from 1.5% to 2%, questions have arisen about the manner in which to revise the cross-slope. In particular, when a cross-slope is to be revised from 1.5 percent to 2 percent on a two-lane route (traffic expected to cross centerline during construction), a compromise of the lift thickness requirements must be made if the maximum allowable drop-off is not to be exceeded.

On January 26, 1998, it was decided that in these situations (two-lane routes where traffic is expected to cross centerline), the cross-slope would be revised in the following manner:

1. If milling is part of the contract, require all cross-slope correction to be done in milling.

2. If milling is not required and more than one lift of asphalt is needed, require the cross-slope correction to be done in the bottom lift. The cross-slope should be corrected by placing a lift of HMA (19 mm MIXTURE) 2.25 inches (55 mm) at the centerline, and 1.5 inches (40 mm) at the existing edge of pavement.

3. If milling is not required and only one lift of asphalt is needed, require the cross-slope correction to be done by placing one lift of HMA (12.5 mm MIXTURE) 2.25 inches (55 mm) at the centerline, and 1.5 inches (40 mm) at the existing edge of pavement.

ITEM #9

On May 27, 1998, it was determined that the minimum flexible pavement structure for a four-lane highway (AHEAD program), would consist of 6.5 inches (165 mm) of HMA over 6 inches (150 mm) of lime fly ash treated granular material.

ITEM #10

On June 9, 1998 it was decided that LFA would be required on all new construction, regardless of the amount of new construction. The previous policy stated that "jobs with minor amounts of paving, such as short bridge replacements, are exempt from this requirement".

This lime fly ash requirement will be exempted if a crushed stone base is included in the pavement design.

ITEM #11

On May 27, 1998, it was determined that one inch (25 mm) of untreated granular material will be required below all lime fly ash treated courses. The purpose of the untreated material is to insure that none of the subgrade is treated.

MDOT PAVEMENT DESIGN CURRENT POLICIES (4 of 4):

ITEM #12

On August 11, 1998, it was decided to modify the specifications for hot mix asphalt on all projects beginning with the September 1998 letting. Item #2 has been modified to describe the changes.

Attachment: Polymer.doc

pc: Assistant Chief Engineer-Preconstruction (Ruff)
Assistant Chief Engineer-Operations (McMahen)
District Materials Engineers
Materials Division (Brumfield)
Construction Division (Russell, Crisco)
Research Division (Crawley)
Roadway Deign Division (Pickering, Balentine, Section Engineers, Reeves, Purvis)

c:\msoffice\winword\keith\pment\misc\policy.doc

CURRENT MDOT POLICY ON POLYMER MODIFIED HIGH-TYPE HOT MIX ASPHALT (8/12/98)

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	HT	HT	HTA	MT	MT	ST
Outside Shoulder	HT	HT	HT	MT	MT	ST
Outside Lanes	PMHT	PMHT	PMHT	MT	MT	ST
Other Lanes	HT	PMHT	HT	MT	MT	ST
Inside Shoulder * (If paved < = 4 Ft.)	HT	PMHT	HT	MT	MT	ST
Inside Shoulder * (If paved > 4 Ft.)	HT	HT	HT	MT	MT	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	HT	HT	HT	MT	MT	ST
Outside Shoulder	HT	HT	HT	MT	MT	ST
Outside Lanes	PMHT	PMHT	PMHT	MT	MT	ST
Other Lanes	PMHT	PMHT	PMHT	MT	MT	ST
Inside Shoulder * (If paved < = 4 Ft.)	PMHT	PMHT	PMHT	MT	MT	ST
Inside Shoulder * (If paved > 4 Ft.)	HT	HT	HT	MT	MT	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
Only one mix type (ST, MT, or HT) should be used on each project;
PMHT = Polymer Modified High-Type Asphalt to be placed in top 2 courses (Other courses will be High-Type Asphalt)
HT = High-Type **MT = Medium Type** **ST = Standard Type** c:/msoffice/winword/keith/pment/misc/polymer.doc