Design Standards Letter

Letter Number: **G-1998-06**

Letter Date: **05/20/1998**

Effective Date: **10/01/1998**

Section/Plan No.: **None**

Subject: **Superpave Implementation - 1999 and Beyond**

Body

As a result of favorable trials to date and in accordance with MoDOT's desire to further advance Superpave, following are updated instructions to be implemented immediately for all October, 1998 or later, Sec 403 asphalt paving jobs being let for the 1999 paving season. Also included is a best estimate of where MoDOT wishes to be for year 2000. However, please note that Superpave is still in the learning curve, and changes can be expected for the year 2000 jobs. This information is to assist you, as needed to proceed with various business decisions.

The Design Division will be updating the Policy, Procedures and Design Manual (PPDM) immediately to incorporate these changes.

1. Superpave mixtures shall be used on all Heavy Duty and Medium Duty pavements as defined in the PPDM and in accordance with attached Table 1. The latest version of MSP 95-03 will apply for Superpave specifications.

2. All Superpave jobs shall include the QC/QA provisions (MSP 96-01, 02) except not the experimental provisions (MSP 96-03). The incentive/disincentive sections will now apply.

3. For full depth asphalt sections, the Superpave cross-section consists of 45 mm SP125 surfacing over SP250 (75-100 mm) lifts as needed for total thickness. For overlays, the Superpave cross-section consists of 45 mm lifts of SP125 over SP190 (50-75 mm) lifts as needed for total thickness. Unless otherwise specifically approved, SP125 is to be considered the surface mixture. SP190 is the underlying mixture for overlays. SP250 is the underlying mixture for full depth. SP125LP should be substituted in lieu of SP125 as needed, where Sec 403 Type LP or LS mixtures would normally be utilized.

4. Superpave mixtures have different mix design requirements, depending upon the traffic loading. For ease of use, each mixture is further designated by a letter suffix (tied to the traffic corridor) that will need to be shown in the contract. Attached find Table 1 for determining the specific mixture to be specified. A revision will be incorporated into MSP

95-03 to designate mixture design application (Table 2).

5. MoDOT will continue to utilize and design Stone Mastic Asphalt (SMA) surface mixes under current criteria as specified in the PPDM. Note that any new underlying mixtures would be Superpave as specified herein.

6. Figure 6-03.14 of the PPDM will be modified to incorporate a slightly changed usage of PG asphalts. All overlays of Heavy and Medium Duty Pavements greater than 3-3/4" are to use PG 64-28 for all lifts. This will reduce some of the design and construction complexities caused for overlays by the previous requirement for additional mix designs due to use of additional grades.

Year 2000 and beyond:

1. MoDOT will be switching to QC/QA for SMA mixtures, to be designed by the contractor using SHRP gyratory compaction procedures, (possibly prior to 2000) pending ongoing research.

2. In addition to the above implementation, MoDOT will add use of Superpave mixtures with QC/QA to all Light Duty Pavements with ADT greater than 3500.

3. The department anticipates upgrading Sec 401 mix design requirements slightly and increasing it's traffic usage up to 3500 ADT (remaining estimated 74% of system lane miles), thus eliminating Type I-C and I-B mixes and reducing the number of mix designs necessary. Plant mix bituminous base (Sec 301) mixtures would continue to be utilized under the Sec 401 mixtures.

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Attachment

TABLE 1

Designer determination of which mixture to specify:

		Type of Corridor	
Location of Mixtures	**Heavy Duty**	**Medium Duty**	**Light Duty**
Surface	SP125HC or SP125HCLP[1]	SP125MD or SP125MDLP[1]	SP125LE or SP125LELP[1]

Underlying	SP190HB[2] or SP250HB[3]	SP190MC[2] or SP250MC[3]	SP190LE[2] or SP250LE[3]

[1] Use SP125xxLP where Sec 403 LP or LS mixtures would otherwise be utilized.

[2] Use SP190xx for all overlays and for full depth pavements with a total thickness of 7" or less.

[3] Use SP250xx for full depth pavements with total thicknesses greater than 7".

Note 1: The mixture names have a technical background and will provide for easier historical comparisons, as well as easier updates or changes if needed. For example, in the mixture, "SP"125"M"D"LP": "SP" is a Superpave mixture designation, "125" is the nominal mixture aggregate size in millimeters (i.e. 12.5 mm), "M" is the type of corridor, "D" describes mixture criteria that have to be used during the design process (see Table 2 below), and "LP" (if used) designates a particular Superpave mixture with certain aggregate requirements. In the case of "LP", it requires a minimum of 50% crushed prophyry.

Note 2: Users will note that the design traffic ESALs appears to vary, e.g. both "C" and "B" are used for a heavy duty corridor. These have been predetermined as applicable for specific life cycle designs. The SP125xx surfacing is anticipated to be replaced at a 15 year life ("C") for various reasons, while the underlying mixtures are anticipated to remain in place for 35 years of traffic ("B").

TABLE 2

Typical job special provision to be included in MSP 95-03:

The bituminous Superpave mixtures in this contract are designated by a number and letter system to indicate specific aggregate size of mixtures, as well as the specific bituminous design required for contract compliance, such as SP125HC, SP190MC, etc., where the "SP125" indicates the specific mixture size and the trailing letter "C" indicates the bituminous mixture design criteria below. The following cumulative ESALs shall be utilized for the specified design, for Superpave mix design purposes:

Design	Designed Traffic ESALs
A	= > 100,000,000
B	30,000,000 to < 100,000,000

C	10,000,000 to < 30,000,000
D	3,000,000 to < 10,000,000
E	1,000,000 to < 3,000,000