

**State Discussion Topics – 2003**  
**New Mexico Department of Transportation**

1. What is the status of Superpave implementation for both binder and mixtures?

**RESPONSE:** NMDOT requires the use of AASHTO M 320 performance graded binders on all maintenance and construction related hot mix asphalt projects. As for the mixtures, over 94% of all maintenance and construction tonnage has met Superpave gradation and design requirements. The remainder tonnage meets our Marshall gradation and design requirements. It is anticipated that the use of the Marshall design procedure will be completely phased-out by the 2005 construction season and only Superpave based procedures will be specified.

2. What are the primary PG binder grades being used? Does your state use any SHRP plus tests and the reason for their use? Do you have any plans to implement AASHTO MP1a?

**RESPONSE:** The primary PG grades being used by NMDOT are PG 64-22, PG 64-28, PG 70-16, PG 70-22, and a PG 76-22. NMDOT requires the PG binders to meet AASHTO M 320 requirements, including direct tension, and does not have the additional plus tests. NMDOT is just beginning to consider the impacts of AASHTO MP1a and will not make a decision on its implementation until 2005 or 2006.

3. There has been much recent discussion on the affects of acid modification of binders. Is your state concerned with the issue of chemical modification? Does your state have any specifications to address chemical modification of PG binders?

**RESPONSE:** NMDOT presently does not have any strong concerns on the affects of acid or chemical modification of binders. As long as the specified PG asphalt binder meets the full requirements of AASHTO M 320, we will accept it for use on our projects.

4. There has been a concern that Superpave mixtures may be over compacted, resulting in low binder contents and reduced durability and fatigue life. Is your state doing any testing, other than gyratory compaction, do determine if the mixture has adequate binder? Has your state taken any action or modified the Superpave procedures to insure adequate binder in the mixture?

**RESPONSE:** NMDOT has not seen this to be a problem on our projects. However, we have modified our HMA design requirements such that the design must comply with the design parameters below:

**Superpave PMBP Design Requirements for Aggregates with Less Than 3.0% Absorption**

20-Year Design ESALs (Millions)	N <sub>initial</sub>	N <sub>design</sub> (Note 1)	N <sub>maximum</sub>	Voids in the Mineral Aggregate (VMA), Percent						Voids Filled with Asphalt (VFA) Range, Percent (Note 2)		Dust-to-Binder Ratio Range	
				Nominal Maximum Aggregate Size, mm						Min	Max	Min	Max
				25.0 (SP-II)		19.0 (SP-III)		12.5 (SP-IV)					
Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max		
< 0.3	≤ 91.5	96.0	≤ 98.0	12.5	14.0	13.5	15.0	14.5	16.0	72.0	80.0	0.6	1.4
0.3 to < 3.0	≤ 90.5									68.0	78.0		
> 3.0	≤ 89.0									68.0	75.0		

**Superpave PMBP Design Requirements for Aggregates with 3.0% or Greater Absorption**

20-Year Design ESALs (Millions)	N <sub>initial</sub>	N <sub>design</sub> (Note 3)	N <sub>maximum</sub>	Voids in the Mineral Aggregate (VMA), Percent						Voids Filled with Asphalt (VFA) Range, Percent (Note 2)		Dust-to-Binder Ratio Range	
				Nominal Maximum Aggregate Size, mm						Min	Max	Min	Max
				25.0 (SP-II)		19.0 (SP-III)		12.5 (SP-IV)					
Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max		
< 0.3	≤ 91.5	96.5	≤ 98.0	12.0	14.0	13.0	15.0	14.0	16.0	70.0	80.0	0.6	1.4
0.3 to < 3.0	≤ 90.5									65.0	78.0		
> 3.0	≤ 89.0									65.0	75.0		

**NOTE 1:** Design Air Void Content of 4.0%

**NOTE 2:** For 25.0 mm nominal maximum size mixtures, the specified lower limit of the VFA shall be 70 percent for the design traffic level < 0.3 million ESALs.

**NOTE 3:** Design Air Void Content of 3.5%

- What procedure does your state use to specify aggregate durability for HMA (sodium sulfate, magnesium sulfate, freeze thaw, or other)? Have you done any research with Micro Deval and do you have any plans to replace your present specifications with Micro Deval?

**RESPONSE:** NMDOT requires that aggregate source must meet a minimum “aggregate index” property of 25 or less. The “aggregate index” is calculated using the following formula:

$$A.I. = [(L.A. \times 100)^{2.2} + (S.L. \times 100)^{3.0} + (A \times 100)^{4.0}]^{0.5} \div 3.0$$

Where:

L.A. = L.A. Wear, the percent wear of the aggregate at 500 revolutions, when tested in accordance with AASHTO T 96;

S. L. = The Soundness Loss of the sample when tested in accordance with AASHTO T 104 using magnesium sulfate, with a test duration of 5 cycles, and a standard gradation;

A = Absorption, the amount of moisture retained when tested in accordance with AASHTO T 85.

NMDOT is continuing its evaluation and development of its Micro Deval procedure and should have a procedure for use developed in time for the 2005 construction season.

- Does your state routinely specify Stone Mastic Asphalt (SMA) mixtures? Approximately how many tons of SMA is placed each year? Do you use AASHTO MP2 and PP41 for specifications and design or what significant modification to these

have you made? Do you have any construction quality issues and how are SMA mixture performing?

**RESPONSE:** NMDOT has minimal SMA tonnage placed throughout the State. We do not routinely specify its use because of the additional associated cost and our present opinion that it probably provides equal service life as compared to our constructed Superpave projects.

7. Has the performance of longitudinal joints been an issue? What type of joint is required or generally constructed by contractors? Do you require any QC or QA procedures such as density or permeability at the joint?

**RESPONSE:** NMDOT does have a concern that the performance of longitudinal joints may be a long term problem. We require that transverse joints have a minimum taper of 3 feet but in no case do we allow this taper to be steeper than 24:1. Our longitudinal joints have a minimum taper of 1.0 foot but in no case do we allow this taper to be steeper than 6:1. NMDOT does not presently have any QC or QA joint procedures but we are evaluating our constructed joints to then consider the development of such a procedure for the future.

8. Do you regularly see paver related segregation (linear streaks either at or just below the mat surface) and do you have a specification to address it? Do feel temperature segregation is a problem and do you have a specification to address it?

**RESPONSE:** NMDOT has not investigated either of these concerns and has no comments.

9. Are there any recent or pending rule changes by your state EPA that may impact specifications or changes to products? Has there been any recent legislation that will impact the refining or HMA paving industries?

**RESPONSE:** NMDOT is not aware of any proposed changes.

10. What is the single most concerning issue with the quality of HMA in your state?

**RESPONSE:** NMDOT believes that the single most concerning issue is related to designed low asphalt content in HMA mixes where the asphalt binder is not paid for as a separate bid item. This was the driving concern that we hope the table presented in Question 4 will correct.