

# ALABAMA DEPARTMENT OF TRANSPORTATION

General Application Special Provision

DATE: September 8, 2022

GASP No. 22-GA0008

EFFECTIVE DATE: May 1, 2023

SUBJECT: Asphalt Pavement

Alabama Standard Specifications, 2022 Edition, SECTION 106, SECTION 401, SECTION 410, SECTION 420, SECTION 423, SECTION 424, and SECTION 804 shall be revised as follows:

## SECTION 106 CONTROL OF MATERIALS

### 106.09 Quality Control and Quality Assurance (QC/QA) Requirements for Hot Mix Asphalt (HMA) Pavement.

#### (b) Quality control.

*The following note shall be added after Table I and will apply to all types of asphalt mixes.*

Note: For asphalt paving jobs that are 1000 feet or less in length, such as those at bridge or culvert replacements, the Contractor, as part of his QC plan, shall establish a rolling pattern using the nondestructive testing devices approved in Section 306 of the Specifications. The device shall either be calibrated to roadway cores or gage counts and shall be used to determine the rolling pattern producing maximum density. Contractor QC personnel shall be on site throughout each day to perform periodic checks and verify that the rolling pattern continually produces the maximum density that is achievable.

#### (c) Quality Assurance.

##### 4. Testing and Lot Verification.

*Item 106.09(c)4 shall be replaced by the following:*

##### 4. Testing and Lot Verification.

Air voids shall be computed on the Contractor's sample by using the running average of the Contractor's last four maximum specific gravities and the individual bulk specific gravity. If slag is used as an aggregate in the mixture, the running average of the Contractor's four most recent determinations for the bulk specific gravity of the compacted mixture shall be used in the computation of the air voids for the Contractor's sample. The calculation of the running averages of both maximum specific gravity and bulk specific gravity shall start with the first LOT. The test strip is independent of the LOTs. Air voids shall be computed on the Department's sample by using the Department's individual maximum specific gravity and individual bulk specific gravity. The Department and the Contractor shall compare test results with each other for the above mentioned testing increments. If there are no differences or if the differences are within the tolerances listed in Tables V or VI, Section 410, for each parameter, no further testing and analysis will be necessary and the Contractor's test values will be used in the computation of the appropriate LOT pay factor.

If the Contractor's air voids do not compare with the Department's test results, the Contractor shall re-compute test results using the individual maximum specific gravity and the individual bulk specific gravity for that particular testing increment and re-compare with the verification test result. If the results compare within the tolerances in Table V, Section 410, using the individual maximum

specific gravities and the individual bulk specific gravity, no further testing will be required and the Contractor's running average of the last four maximum specific gravities and the last four maximum specific gravities and individual bulk specific gravities will be used to compute air voids for pay factor determination.

Also, if the Contractor's air voids do not compare with the Department's test results, and the Contractor is using slag as an aggregate, the Contractor shall re-compute test results using the individual bulk specific gravity for that particular testing increment and the running average of the Contractor's last four maximum specific gravities and re-compare with the verification test result. If the results compare within the tolerances in Table V, Section 410, using the individual bulk specific gravity, no further testing will be required and the Contractor's running average of the last four bulk specific gravities and the last four maximum specific gravities will be used to compute air voids for pay factor determination.

If the results of the Department's verification test and the Contractor's test do not compare within the tolerances in Tables V or VI, Section 410, but yield the same pay factor for the LOT when the Department's result is substituted for the Contractor's result, no further testing will be required. Where the Contractor's test results and the Department's test results do not compare and cannot be resolved by the above mentioned methods but the pay factor dispute is between 1.00 and 1.02 the Contractor may elect to accept the 1.00 pay factor and waive referee testing.

When differences between test results of the verification samples are not within the tolerances listed in Tables V or VI, Section 410, and cannot be resolved by the above mentioned methods, referee testing will be required.

All referee samples will be tested by the Bureau of Materials and Tests, Central Laboratory, 3704 Fairground Road, Montgomery, AL 36110. The Bureau of Materials and Tests Central Laboratory is an AASHTO accredited laboratory (see AASHTO R 18, Recommended Practice for Establishing and Implementing a Quality System for Construction Materials Testing Laboratories).

#### 5. Referee Testing

##### a. Laboratory:

***Subitem 106.09(c)5a shall be replaced by the following:***

##### a. Laboratory:

All testing increments of the referee samples for the entire LOT shall be tested in the Bureau of Materials and Tests Hot Mix Laboratory for the pay factor parameter(s) (liquid asphalt binder content, laboratory compacted air voids, or gradation) in question. The Contractor's results (using the individual air voids, individual bulk specific gravities and running average of maximum specific gravities) will be compared to the Bureau of Materials and Tests results (using Materials and Tests individual bulk and maximum specific gravities) for each testing increment in the LOT. When the Contractor's results and the Bureau of Materials and Tests results are within the tolerances listed in Tables V or VI, Section 410, the Contractor's results will be used. When the Contractor's results are not within the tolerances listed in Tables V or VI, Section 410, the Bureau of Materials and Tests Central Laboratory results will be used for final pay factors. The Bureau of Materials and Tests Central Laboratory will record the Contractor's field results and the Central Laboratory's results of the parameter(s) in question on form BMT-135.

For each testing increment these results, either the Contractor's or the Bureau of Materials and Tests', will be used in the computation of the appropriate LOT pay factor.

Should differences between test results, that are not within the tolerances listed in Table V or VI, Section 410, for liquid asphalt binder content, air voids, or gradation continue for two consecutive days, operations shall be halted until testing discrepancies can be resolved. The Bureau of Materials and Tests will monitor testing procedures by Department and Contractor technicians until consistent test results are achieved.

## SECTION 401 BITUMINOUS SURFACE TREATMENTS

### 401.01 Description.

#### (b) Bituminous Treatment Table.

*Article 401.01(b) shall be replaced with the following:*

#### (b) Bituminous Treatment Table.

The following table shows the amount of bituminous material and the size and amount of cover aggregate required for the various types of bituminous treatments. The types are designated in the table by letters of the alphabet such as A, B, C, D, etc. The proposal will designate in the pay item description which of the various types are to be used. The kind of bitumen may also be specified or, if none is specified, the Contractor may select one of the kinds, if not in conflict with other provisions of these Specifications, permitted by the table. All other requirements of the tabular line opposite the type designation shall apply.

(Example: A bituminous treatment Type AKG, specifies a prime coat with the quantities specified on line "A", covered by a single surface treatment with the quantities specified on line "K", covered in turn by a seal treatment with the quantities shown on line "G".)

Bituminous materials shall be placed within the tolerance specified by the table for the type treatment involved, unless otherwise ordered by the Engineer in writing. Any variation outside of the designated limits shall be cause for ordering the treatment to be removed and replaced or corrected as directed by the Engineer, all without additional cost to the Department.

The rate of aggregate coverage shown by the table is the approximate rate found to produce an acceptable coverage when properly applied. Regardless of the rate shown, the Contractor shall provide aggregate in sufficient quantities and so spread the aggregate that the bitumen is uniformly and evenly covered.

The Engineer will notify the Contractor in writing should it become advisable to change the amounts of any material from the limits specified in the table. In such event an adjustment in the contract unit price will be made as specified in Subarticle 401.06(a).

BITUMINOUS TREATMENT TABLE				SUBARTICLE 401.01(b)	
Designated Letter	Type Treatment	Aggregates ****		Gallons {Liters} of Bituminous Material per square yard {m <sup>2</sup> } of Treatment **	
		Size	cu. ft. / sq. yd. {m <sup>3</sup> /m <sup>2</sup> }	Liquid Asphalt Binder	Emulsified Petroleum Resin, Cutback or Emulsified Asphalt
A	Prime Coat				0.10 - 0.25* {0.45 - 1.13}*
B	Flush Coat "B"	Sand	0.15 {0.0051}		0.16 - 0.19 {0.72 - 0.86}
C	Flush Coat "C"	9	0.20 {0.0068}		0.16 - 0.19 {0.72 - 0.86}
D	Liquid Seal "D"	78 or 89	0.25 {0.0085}	0.18 - 0.21 {0.81-0.95}	0.20 - 0.23 {0.90 - 1.04}
E	Liquid Seal "E"	78	0.25 {0.0085}	0.22 - 0.25 {1.00-1.13}	0.25 - 0.28 {1.13 - 1.27}
F	Liquid Seal "F"	78	0.27 {0.0091}	0.26 - 0.29 {1.18-1.31}	0.31 - 0.34 {1.40 - 1.54}
G	Liquid Seal "G"	7 or 78	0.27 {0.0091}	0.31 - 0.34 {1.40-1.54}	0.35 - 0.38 {1.58 - 1.72}
H	Liquid Seal "H"	6	0.40 {0.0135}	0.31 - 0.34 {1.40-1.54}	0.35 - 0.38 {1.58 - 1.72}
J	Surface Treatment "J"	6	0.42 {0.0142}	0.33 - 0.36 {1.49-1.63}	0.38 - 0.41 {1.72 - 1.86}
K	Surface Treatment "K"	5	0.50 {0.0169}	0.35 - 0.38 {1.58-1.72}	0.40 - 0.43 {1.81 - 1.95}
L ***	Surface Treatment "L"				
	1st Application	4	0.9 {0.0305}	0.35 - 0.38 {1.58-1.72}	0.40 - 0.43 {1.81 - 1.95}
	Dry Choke	78	0.20 {0.0068}		
	2nd Application	78	0.25 {0.0085}	0.55 - 0.58 {2.49-2.63}	0.62 - 0.65 {2.81 - 2.94}

\* Appropriate rate will be set by engineer within the maximum and minimum range

\*\* For shoulders, different amounts of aggregate and bitumen may be shown on plans or in the proposal.

\*\*\* Aggregate for this treatment shall be crushed aggregate.

\*\*\*\* Approximate rate of application for uniform coverage. Minor adjustments to these rates may be ordered by the Engineer to fit the physical properties of aggregates furnished for use.

Multipurpose and Cationic Emulsified Asphalts shall be in the same quantities as shown above for Emulsified Asphalt. Conversion of aggregate volume to weight {mass}, when required, shall be in accordance with AASHTO T 19.

The application rates of Bituminous Materials shown above are based on the material being at 60 °F {16 °C}.

### 401.03 Construction Requirements.

#### (a) Equipment.

2. Pressure Distributor.

***Item 401.03(a)2 shall be replaced by the following:***

2. Pressure Distributor.

A pressure distributor shall be required and shall be so designed and operated that it will distribute the contents in a uniform spray for the full width of the treatment area without

atomization, at the rate and within the limits specified. Heating equipment shall be provided. Distributors shall be capable of circulating or agitating the bitumen throughout the heating process providing a uniform temperature, with the ranges specified herein, and suitable means shall be provided for determining such temperatures. Suitable measuring equipment for accurately measuring the volume of the contents shall be provided. The distributor shall be equipped with a spray bar of adjustable height, hand hose, and nozzle.

Heating equipment will not be required for the application of Emulsified Petroleum Resin prime.

## SECTION 410 ASPHALT PAVEMENTS

### 410.01 Description.

*Article 410.01 shall be replaced by the following:*

### 410.01 Description.

The work under this Section covers the general requirements that are applicable to all types of hot and warm mix asphalt pavements of the plant mix type. Deviations from these general requirements will be indicated in the specific requirements for various types of mixes noted in the following sections of these Specifications.

This work shall consist of one or more courses of hot and warm mix asphalt plant mix constructed in accordance with these specifications and the specific requirements of the type of mixture required and in reasonably close conformity with the lines, grades, thicknesses, and typical cross sections shown on the plans or established by the Engineer. The Contractor may use either hot mix or warm mix for all Superpave ESAL Range mixes in Sections 420, 423, and 424. Warm mix asphalt shall be defined as the use of an approved warm mix technology in the plant mix at the time of production.

This work shall also include the preparation of the underlying surface on which the plant mix is to be placed, including patching and/or leveling as shown on the plans or directed by the Engineer.

In addition, this work shall also include the placing of widening at locations shown on the plans and/or directed by the Engineer. In general, widening shall consist of (1) narrow width build-ups, three feet or less {one meter or less}, required for widening existing pavement, (2) paving for turn-outs beyond three feet {one meter} from the edge of pavement, (3) pavement crossovers, and (4) turning lanes of less than 200 feet {60 m} for crossovers. Paving used on turn-outs for intersecting paved roads and shoulder paving will not be considered as widening unless shown on the plans.

Surface layers and wearing layers are defined as those layers where the pay item contains the wording "Wearing Surface".

All ALDOT procedures referenced are applicable to both hot and warm mix asphalt.

### 410.03 Construction Requirements.

#### (c) Preparation of Underlying Surface.

##### 3. Leveling.

*Item 410.03(c)3 shall be replaced by the following:*

##### 3. Leveling.

When leveling of an existing pavement or base is provided by the plans, the surface shall be brought to required grade and cross section with plant mix material. The surface to be treated shall be prepared as noted herein and approved before placing the new material. The plant mix material shall be spread in accordance with the provisions of Item 410.03(f)2 and shall be compacted in accordance with section 410.03(g).

Leveling shall include the placement of asphalt plant mix layers to correct superelevation when directed.

## SECTION 420 POLYMER MODIFIED OPEN GRADED FRICTION COURSE

### 420.02 Materials.

#### (e) Tack Coat Materials

*Subarticle 420.02(e) shall be replaced by the following:*

#### (e) Tack Coat Materials

Tack coat materials shall either be a CQS-1hp asphalt emulsion used in conjunction with the spray paver equipment as required in Subarticle 420.04 (d) or "PG Asphalt for Trackless Tack" including DOTC-10, eTac HB, or Ultrafuse with conventional paving equipment. All tack coat materials shall meet the requirements given in Section 804 except as modified by the requirements given herein. The CQS-1hp shall be smooth and homogeneous and shall meet the requirements shown in the following table:

CQS-1hp MODIFIED ASPHALT EMULSION			
TEST OF EMULSION			
Parameter	Test Method	Value	
Viscosity @ 77° F, SF	AASHTO T 59	20 Min.	150 Max.
Sieve Test, %	AASHTO T 59	-	0.1 Max. <sup>1</sup>
24-Hour Storage Stability, %	AASHTO T 59	-	1.0 Max. <sup>2</sup>
Residue By Distillation	AASHTO T 59	60 Min.	-
Oil Distillate, by Volume of Emulsion, %	AASHTO T 59	-	-
Particle Charge	AASHTO T 59	Positive <sup>3</sup>	
TEST OF RESIDUE FROM EMULSION			
Solubility in TCE, %	AASHTO T 44 <sup>4</sup>	97.5 Min.	-
Elastic Recovery @ 50 °F	AASHTO T 301	60.0 Min.	-
Penetration @ 77 °F	AASHTO T 49	60 Min.	110 Max.
Ductility @ 77.0 °F	AASHTO T 51	40 Min.	-
1. Sieve test may be waived based on successful application in the field.			
2. After standing undisturbed for 24 hours, the surface shall show no white, milky-colored substance, but shall be a smooth homogeneous color throughout the sample.			
3. If the Particle Charge Test is inconclusive, a pH test (AASHTO T 200) shall be used with a maximum of 6.7 allowable.			
4. ASTM D 5546 may be used when polymers block the filter during the test.			

The original "PG Asphalt for Trackless Tack" (no RTFO or PAV testing) shall conform to the physical requirements shown in the following table:

SPECIFICATIONS FOR PG ASPHALT FOR TRACKLESS TACK		
Parameter	Specification	Test Method
Rotational Viscosity	Maximum 3 Pa•s @ 135 °C	AASHTO T 316
Penetration	Maximum 25 @ 77 °F {25 °C}, 100 g. 5s	AASHTO T49
Softening Point (°C)	Minimum 70	AASHTO T 53
Dynamic Shear, G*/sin δ	Minimum 1.0 kPa @ 82 °C	AASHTO T 315

## SECTION 423 STONE MATRIX ASPHALT (SMA) (FIBER STABILIZED ASPHALT CONCRETE)

### 423.02 Materials.

#### (c) Blend of Aggregates.

*In Subarticle 423.02(c) the table “Allowable Carbonate Stone Criteria for SMA” shall be replaced by the following:*

ALLOWABLE CARBONATE STONE CRITERIA FOR SMA	
BPN 9 Value of Aggregate Source *	Maximum Allowable Percentage Of Carbonate Stone
≤ 20	Not Allowed
21 through 25	30
26 through 28	35
29 through 31	40
32 through 34	45
≥ 35	50
<small>* This value, BPN 9, is made using the British Pendulum Tester on aggregate source specimen polished for 9 hours on an accelerated polishing machine known as the British Wheel as per ASTM D 3319, ASTM E 303 and BMTP-382.</small>	

## SECTION 424 SUPERPAVE BITUMINOUS CONCRETE BASE, BINDER, AND WEARING SURFACE LAYERS

### 424.02 Materials.

#### (c) Blend of Aggregates.

4. Restrictions in the use of Carbonate Stone for blend of Aggregates.

***Item 424.02(c)4 shall be replaced by the following:***

4. Restrictions in the use of Carbonate Stone for blend of Aggregates.

The restrictions for the use of carbonate stone are given in the following table. These restrictions do not apply to widening as defined in Article 410. 01, shoulder paving, underlying layers, and layers that are to be covered by Polymer Modified Open Graded Friction Course (Section 420) mix in this contract.

CRITERIA FOR THE USE OF CARBONATE STONE IN SUPERPAVE	
BPN 9 Value Of Aggregate Source *	Maximum Allowable Percentage Of Carbonate Stone
$\leq 20$	Not Allowed
21 through 25	30
26 through 28	35
29 through 31	40
32 through 34	45
$\geq 35$	50
* This value, BPN 9, is made using the British Pendulum Tester on aggregate source specimen polished for 9 hours on an accelerated polishing machine known as the British Wheel as per ASTM D 3319, ASTM E 303 and ALDOT-382.	

In no case shall the total amount of virgin carbonate stone in the combined mixture used as actual wearing surface layers that are exposed to traffic exceed the percentage shown in the above table. When parts of the carbonate stone used in the mix are from differing strata of material or coming from multiple sources that are represented by different BPN 9 values, the lowest BPN 9 value will be used.



## SECTION 804 ASPHALT MATERIALS

### 804.07 Tables of Asphalt Materials.

*Article 804.07 shall be replaced by the following:*

### 804.07 Tables of Asphalt Materials.

#### (a) Asphalt Materials Table Number 1, Grade PG 58-22.

<b>ASPHALT MATERIALS TABLE NO. 1</b>		
<b>SPECIFICATIONS FOR PERFORMANCE GRADED ASPHALT BINDER</b>		
Property	<b>Grade PG 58-22</b>	
	Specification	Test Method
<i>Original Binder</i>		
Flash Point Temperature	Minimum 230 °C	AASHTO T 48
Rotational Viscosity	Maximum 3 Pa•s @ 135 °C	AASHTO T 316
Dynamic Shear, $G^*/\sin \delta$	Minimum 1.00 kPa @ 58 °C	AASHTO T 315
<i>Rolling Thin Film Oven Residue (AASHTO T 240)</i>		
Mass Loss (RTFO)	Maximum 1.00 %	AASHTO T 240
Dynamic Shear, $G^*/\sin \delta$	Minimum 2.20 kPa @ 58 °C	AASHTO T 315
<i>Pressure Aging Vessel Residue (AASHTO R 28)</i>		
Dynamic Shear, $G^* \cdot \sin \delta$	Maximum 6000 kPa @ 22 °C	AASHTO T 315
Phase Angle, $\delta$	Minimum 42° @ 22°C	AASHTO T315
Creep Stiffness, S	Maximum 300 MPa @ -12 °C	AASHTO T 313
m-value	Minimum 0.300 @ -12 °C	AASHTO T 313

#### (b) Asphalt Materials Table Number 2, Grade PG 64-22.

<b>ASPHALT MATERIALS TABLE NO. 2</b>		
<b>SPECIFICATIONS FOR PERFORMANCE GRADED ASPHALT BINDER</b>		
Property	<b>Grade PG 64-22</b>	
	Specification	Test Method
<i>Original Binder</i>		
Flash Point Temperature	Minimum 230 °C	AASHTO T 48
Rotational Viscosity	Maximum 3 Pa•s @ 135 °C	AASHTO T 316
Dynamic Shear, $G^*/\sin \delta$	Minimum 1.00 kPa @ 64°C	AASHTO T 315
<i>Rolling Thin Film Oven Residue (AASHTO T 240)</i>		
Mass Loss (RTFO)	Maximum 1.00 %	AASHTO T 240
Dynamic Shear, $G^*/\sin \delta$	Minimum 2.20 kPa @ 64 °C	AASHTO T 315
<i>Pressure Aging Vessel Residue (AASHTO R 28)</i>		

Dynamic Shear, $G^* \cdot \sin \delta$	Maximum 6000 kPa @ 25 °C	AASHTO T 315
Phase Angle, $\delta$	Minimum 42° @ 25°C	AASHTO T315
Creep Stiffness, S	Maximum 300 MPa @ -12 °C	AASHTO T 313
m-value	Minimum 0.300 @ -12 °C	AASHTO T 313

The binder shown in Table No. 2 shall be made by adding polymer to a refined grade of PG 58-22 or shall be blended from PG 76-22 using an ALDOT approved blending procedure at the refinery. Air blown and oxidized asphalt shall not be used.

All PG 64-22 shall contain a minimum of 1.5 %, by weight, polymer solids.

A sample and infrared scan (Fourier Transform Infrared, FTIR) using the ALDOT 408 test method to determine the styrene and butadiene peaks and polymer percentage at the appropriate polymer loading shall be submitted to the Materials and Tests Engineer for laboratory evaluation prior to use.

All polymers shall conform to Section 811 for polymer additives.

All Polymer Modified Asphalt Binder manufacturers shall submit the information required in Article 811.01 annually or upon request by the Department.

**(c) Asphalt Materials Table Number 3, Grade PG 67-22.**

<b>ASPHALT MATERIALS TABLE NO. 3</b>		
<b>SPECIFICATIONS FOR PERFORMANCE GRADED ASPHALT BINDERS (NOT SHOWN IN AASHTO M-320)</b>		
Property	<b>Grade PG 67-22</b>	
	Specification	Test Method
<i>Original Binder</i>		
Flash Point Temperature	Minimum 230 °C	AASHTO T 48
Rotational Viscosity	Maximum 3 Pa•s @ 135 °C	AASHTO T 316
Dynamic Shear, $G^*/\sin \delta$	Minimum 1.00 kPa @ 67 °C	AASHTO T 315
<i>Rolling Thin Film Oven Residue (AASHTO T 240)</i>		
Mass Loss (RTFO)	Maximum 1.00 %	AASHTO T 240
Dynamic Shear, $G^*/\sin \delta$	Minimum 2.20 kPa @ 67 °C	AASHTO T 315
<i>Pressure Aging Vessel Residue (AASHTO R 28)</i>		
Dynamic Shear, $G^* \cdot \sin \delta$	Maximum 6000 kPa @ 26.5 °C	AASHTO T 315
Phase Angle, $\delta$	Minimum 42° @ 26.5°C	AASHTO T315
Creep Stiffness, S	Maximum 300 MPa @ -12 °C	AASHTO T 313
m-value	Minimum 0.300 @ -12 °C	AASHTO T 313

(d) Asphalt Materials Table Number 4, Grade PG 76-22.

<b>ASPHALT MATERIALS TABLE NO. 4</b>		
<b>SPECIFICATIONS FOR PERFORMANCE GRADED ASPHALT BINDER</b>		
Property	<b>Grade PG 76-22</b>	
	Specification	Test Method
<i>Original Binder</i>		
Flash Point Temperature	Minimum 230 °C	AASHTO T 48
Rotational Viscosity	Maximum 3 Pa•s @ 135 °C	AASHTO T 316
Dynamic Shear, G*/sin δ	Minimum 1.00 kPa @ 76°C	AASHTO T 315
<i>Rolling Thin Film Oven Residue (AASHTO T 240)</i>		
Mass Loss (RTFO)	Maximum 1.00 %	AASHTO T 240
Dynamic Shear, G*/sin δ	Minimum 2.20 kPa @ 76 °C	AASHTO T 315
Elastic Recovery	Minimum 50 % @ 10°C	AASHTO T 301 <sup>1</sup>
<i>Pressure Aging Vessel Residue (AASHTO R 28)</i>		
Dynamic Shear, G*•sin δ	Maximum 6000 kPa @ 26.5 °C	AASHTO T 315
Phase Angle, δ	Minimum 42° @ 31°C	AASHTO T315
Creep Stiffness, S	Maximum 300 MPa @ -12 °C	AASHTO T 313
m-value	Minimum 0.300 @ -12 °C	AASHTO T 313
<sup>1</sup> The following exceptions shall be made to the requirements given in AASHTO T 301: The statement given in Section 4.5 that reads "Attach the clips to the pins or hooks of the force adapter and the testing machine..." shall be disregarded. The mold shall be in accordance with the requirements given in ASTM D 6084 with dimensions noted in this method. All Elastic Recovery failures will be subject to FTIR scans for acceptability.		

All binders used in Table 4 shall be made by the addition of polymer to refined grades of PG 67-22 without using air blown or oxidized asphalt.

All PG 76-22 shall contain a minimum of 2.5 %, by weight, polymer solids.

A sample and infrared scan (Fourier Transform Infrared, FTIR) using the ALDOT 408 test method to determine the styrene and butadiene peaks along with the percentage of polymer added at the appropriate polymer loading shall be submitted to the Materials and Tests Engineer for laboratory evaluation prior to use. All polymers shall conform to Section 811 for polymer additives.

All Polymer Modified Asphalt Binder manufacturers shall submit the information required in Article 811.01 annually or upon request by the Department.

(e) Asphalt Materials Table Number 5, Emulsified Asphalts.

ASPHALT MATERIALS TABLE NO. 5 SPECIFICATIONS FOR EMULSIFIED ASPHALTS											
VISCOSITY GRADE											
	NTSS-1HM Min-Max	NTQS-1HL Min-Max	CMS-2, CMS-2hp, CSS-1, CSS-1h, CRS-2, CRS-2p* CRS-2l*	AE-P Min-Max	CMS-1hp Min-Max	CRS-1h Min-Max	CBC-1HT BC-1HT Min-Max	CRS-2h CRS-2hp* Min-Max	CQS-1h CQS-1hp* Min-Max	CNTT-1hs Min-Max	AASHTO TESTS
AASHTO M 208			Meet		50%						T 59
Elastic Recovery Minimum 50 % @ 50 °F [10 °C]	--		50 % for CRS-2p and CRS-2l	--		--	--	50% for CRS-2hp	50% for CQS-1hp	--	T 301 **
Viscosity, Saybolt Furol: @ 77 °F [25 °C], Sec @ 122 °F [50 °C], Sec	25 - 500	100	--	10 - 50	30 - 400	--	10 - 100	200 - 500	20 - 150	0 - 100	T 59 T 59 *See Note #4
Settlement, 5 days, %	-- 5		--	5	--	--	--	--	--	1.0	T 59
Storage Stability Test 24 hr., %	-- 1.0	-- 1.0	--	--	-- 1.0	-- 1.0	-- 1.0	-- 1.0	-- 1.0	1.0	T 59
Demulsibility, 35 m/0.8% Sod. Diocetyl Sulfosuccinate, %	--		--	--	--	--	--	60 --	--	--	T 59
Particle Charge	Negative	Non-ionic	Positive	--	Positive	Positive	Positive	Positive	Positive	Positive	T 59
Sieve Test, %	--	0.10	--	0.10	0.10	0.10	0.30	0.10	0.10	0.10	T 59
Oil Distillate or Naphtha, by Volume of Emulsion, %	-- 1.0	60 --	--	12	3.0	3.0	--	3.0	--	3.0	T 59
Residue by Distillation, %	50 --		--	45 --	50 --	55 --	50 --	65 --	60 --	50 --	T 59
Stone Coating Test, % Coated	--	--	--	--	--	--	--	--	--	--	See Note #1
Modified Sand Coating	--	--	--	--	--	--	--	--	--	--	See Note #2
Tests on Residue from Distillation: Float Test @ 140 °F [60 °C], Sec. Solubility in CLCH:CCL2, % Ductility @ 77 °F [25 °C], cm Ash, % by Mass Specific Gravity, 77 °F / 77 °F {25 °C / 25 °C} Softening Point Dynamic Shear@67 °C (G'/sinδ, 10rad/5), kPa MSCR@67 °C, J <sub>r</sub> @3.2/kPa	-- -- -- -- -- 65°C --	-- -- -- -- -- 60°C --	-- -- -- -- -- --	20 -- 97.5 -- -- -- -- --	45-90 -- -- -- -- 40 °C -	40-90 -- -- -- -- 49 °C --	2.0 -- -- -- -- --	70-100 -- -- -- -- -- --	60-110 -- -- -- -- -- --	40-90 -- -- -- -- -- 49 °C --	See Note #3 T 44 T 51 T 111 T 228 T 53 T 315 T 350 T 49
* All CRS-2p, CRS-2hp, CRS-2l, and CQS-1hp shall contain a minimum of 3.0 % polymer by volume. CRS-2p shall meet the requirements given in AASHTO M 316 with the exception of polymer content. All polymers shall conform to the requirements given in Section 811. All Elastic Recovery failures will be subject to FTIR scans for acceptability.											
** The following exceptions shall be made to the requirements given in AASHTO T 301: The statement given in Section 4.5 that reads "Attach the clips to the pins or hooks of the force adapter and the testing machine..." shall be disregarded. The mold shall be in accordance with the requirements given in ASTM D 6084 with dimensions noted in this method.											