ORIGINATION FORM
Proposed Revisions to the Specifications

(Please provide all information - incomplete forms will be returned)

Date: November 8, 2016

Specification Section: 916

Originator: Greg Sholar

Articles/Subarticles: 916-2.1, 916-2.1.1, 916-2.3

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Will the proposed revision involve Design Standard Index changes? Yes ○ No ●

Roadway Design staff contacted (name):

Structures Design staff contacted (name):

Will the proposed revision involve PPM changes? Yes ○ No ●

Roadway Design staff contacted (name):

Will the proposed revision involve CPAM changes? Yes ○ No ●

Construction staff contacted (name):

Will the proposed revision involve Pay Item changes? Yes ● No ○

Estimates staff contacted (name): Melissa Hollis

Will the proposed revision involve SDG changes? Yes ○ No ●

Structures staff contacted (name):

Will the proposed revision involve APL changes? Yes ● No ○

Product Evaluation staff contacted (name): Karen Byram

Will the proposed revision involve Material Manual changes? Yes ○ No ●

State Materials Office staff contacted (name):

Will this revision necessitate any of the following:

Design Bulletin ☐ **Construction Bulletin** ☐ **Estimates Bulletin** ☐ **Materials Bulletin** ☐

Are all references to external publications current? Yes ○ No ●

If not, what references need to be updated? (Please include changes in the redline document.)

Flexible Pavement Design manual will have to be updated for High Polymer as a standard binder in place of PG 82-22 (PMA). Rhonda Taylor has been notified.

Why does the existing language need to be changed?

To remove reference to PG 82-22 (PMA) binder and add High Polymer binder. To remove restrictions related to handling excess PG 76-22 (ARB).

Summary of the changes:

Removed reference to and requirements pertaining to PG 82-22 (PMA) binder and added reference to and requirements for High Polymer binder. Removed restrictions related to handling excess PG 76-22 (ARB) in contractors' storage tanks.

Are these changes applicable to all Department jobs? Yes ● No ○

If not, what are the restrictions?

Contact the State Specifications Office for assistance in completing this form.
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JIM BOXOLD
SECRETARY

M E M O R A N D U M

DATE: November 30, 2016

TO: Specification Review Distribution List

FROM: Dan Hurtado, P.E., State Specifications Engineer

SUBJECT: Proposed Specification: **9160201 Bituminous Materials.**

In accordance with Specification Development Procedures, we are sending you a copy of a proposed specification change.

This change was proposed by Greg Sholar of the State Materials Office (SMO) to update the language.

Please share this proposal with others within your responsibility. Review comments are due within four weeks and should be sent to Mail Station 75 or online at http://www2.dot.state.fl.us/ProgramManagement/Development/IndustryReview.aspx . Comments received after **December 28, 2016,** may not be considered. Your input is encouraged.

DH/dt
Attachment

BITUMINOUS MATERIALS.
(REV 11-10-16)

SUBARTICLE 916-2.1 is deleted and the following substituted:

916-2.1 Requirements: Superpave Performance Graded (PG) asphalt binders, identified as PG 52-28, PG 58-22, PG 67-22, polymer modified asphalt (PMA) binders, PG 76-22 (PMA) and ~~PG 82-22 (PMA)~~ High Polymer, and asphalt rubber binders (ARB), PG 76-22 (ARB), shall meet the requirements of 916-2 and AASHTO M 332-14. When the Contract Documents specify either a PG 76-22 (PMA), PG 76-22 (ARB), or PG 76-22 binder, either binder can be used interchangeably at no additional cost to the Department. All PG asphalt binders shall meet the following additional requirements:

1. The intermediate test temperature at 10 rad/sec. for the Dynamic Shear Rheometer (DSR) test (AASHTO T 315-12) shall be 26.5ºC for PG grades PG 67 and higher.

2. An additional high temperature grade of PG 67 is added for which the high test temperature at 10 rad/sec for the DSR test (AASHTO T 315-12) shall be 67ºC.

3. All PG asphalt binders having a high temperature designation of PG 67 or lower shall be prepared without modification.

4. All PMA binders having a high temperature designation higher than PG 67 shall only be produced with a styrene-butadiene-styrene (SBS) or styrene-butadiene (SB) elastomeric polymer modifier and the resultant binder shall meet all requirements of this Section.

5. Polyphosphoric acid may be used as a modifier not exceeding 0.75% by weight of asphalt binder for PG 76-22 (PMA)~~,~~ and PG 76-22 (ARB)~~, and PG 82-22 (PMA)~~ binders. Polyphosphoric acid may not be used in High Polymer binder.

6. PG 76-22 (ARB) shall meet the additional requirements of 916-2.1.1.

7. All PG asphalt binders having a high temperature designation of PG 67 or lower shall not have a high temperature true grade more than 5.9°C higher than the specified PG grade, (for example, if a PG 58-22 is specified, do not supply a PG 64-22 or higher).

8. The use of waste oil is prohibited in the modification of any PG binder grade. Waste oil shall be defined as recycled oil products that have not been processed through a vacuum tower and have an initial boiling point of 385°C (725°F) or lower when tested in accordance with ASTM D6352.

For all PG binder used in all hot mix asphalt, silicone may be added to the PG binder at the rate of 25 cubic centimeters of silicone mixed to each 5,000 gallons of PG binder. If a disbursing fluid is used in conjunction with the silicone, the resultant mixture containing the full 25 cubic centimeters of silicone shall be added in accordance with the manufacturer's recommendation. The blending of the silicone with the PG binder shall be done by the supplier prior to the shipment. When the asphalt binder will be used with a foaming warm mix technology, refer to the technology supplier's guidance on the addition of silicone.

Where an anti-strip additive is required, the anti-strip additive shall meet the requirements of 916-4. The anti-strip additive shall be introduced into the PG binder by the supplier during loading.

916-2.1.1 Additional Requirements for PG 76-22 (ARB): The following additional requirements apply only to PG 76-22 (ARB):

1. The asphalt binder shall contain a minimum of 7.0% ground tire rubber (GTR) by weight of asphalt binder.

2. The GTR shall meet the requirements of Section 919.
3. Polymer modification is optional for PG 76-22 (ARB).
~~4. Use of excess PG 76-22 (ARB): The Contractor may use excess PG 76-22 (ARB) in other asphalt concrete mixes requiring the use of a PG 67-22 binder by blending with straight PG 67-22 binder so that the total amount of ground tire rubber in the binder is less than 2.0%. The Contractor may use excess PG 76-22 (ARB) in asphalt concrete mixtures requiring the use of a PG 52-28 or PG 58-22 by blending with the designated binder in such proportions that the total amount of ground tire rubber in the binder is less than 1.0%.~~

SUBARTICLE 916-2.3 is deleted and the following substituted:

916-2.3 Reporting: Specification compliance testing results shall be reported for the tests in the table below, unless noted otherwise. Quality control (QC) testing results shall be reported for original binder DSR (G/sin δ and phase angle, as applicable).

SUPERPAVE PG ASPHALT BINDER		
Test and Method	Conditions	Specification Minimum/Maximum Value
Superpave PG Asphalt Binder Grade		Report
APL Number		Report
Modifier (name and type)	Polymer, Ground Tire Rubber with Approved Product List (APL) number, Sulfur, PPA, REOB, and any Rejuvenating Agents	Report
Original Binder		
Solubility, AASHTO T 44-14	in Trichloroethylene	Minimum 99.0% (Not applicable for PG 76-22 (ARB))
Flash Point, AASHTO T 48-06 (2015)	Cleveland Open Cup	Minimum 450ºF
Rotational Viscosity, AASHTO T 316-13	275ºF	Maximum 3 Pa·s[a]
Dynamic Shear Rheometer [b], AASHTO T 315-12	$G^*/\sin\delta$	Minimum 1.00 kPa
	Phase Angle, δ[c] PG 76-22 (PMA) and PG 76-22 (ARB)[d] ~~PG 82-22 (PMA)~~	Maximum 75 degrees ~~Maximum 65 degrees~~
Separation Test, ASTM D 7173-14 and Softening Point, AASHTO T 53-09 (2013)	163±5°C 48 hours	Maximum 15°F (PG 76-22 (ARB) only)

Rolling Thin Film Oven Test Residue (AASHTO T 240-09)		
Rolling Thin Film Oven, AASHTO T 240-13	Mass Change %	Maximum 1.00
Multiple Stress Creep Recovery, $J_{nr, 3.2}$ AASHTO M 332-14	Grade Temperature (Unmodified binders only)	"S" = 4.50kPa^{-1} max
Multiple Stress Creep Recovery, $J_{nr, 3.2}$[d, e, f] AASHTO M 332-14	67°C (Modified binders only) 76°C (High Polymer binder only) ~~67°C~~ ~~(Modified binders only)~~	"V" = 1.0 kPa^{-1} max Maximum $J_{nr,diff}$ = 75% 0.1 kPa^{-1} max ~~"E" = 0.5 kPa^{-1} max~~ ~~Maximum $J_{nr,diff}$ = 75%~~
Multiple Stress Creep Recovery, %Recovery[d, e] AASHTO M 332-14	67°C (Modified binders only) 76°C (High Polymer binder only)	$\%R_{3.2} \geq 29.37\ (J_{nr, 3.2})^{-0.2633}$ $\%R_{3.2} \geq 90.0$
Pressure Aging Vessel Residue (AASHTO R 28-12)		
Dynamic Shear Rheometer, AASHTO T 315-12	$G^{*}\sin\delta$, 10 rad/sec.	Maximum 5000 kPa[f, g]
Creep Stiffness, AASHTO T 313-12	S (Stiffness), @ 60 sec. m-value, @ 60 sec.	Maximum 300 MPa Minimum 0.300

(a) Binders with values higher than 3 Pa·s should be used with caution and only after consulting with the supplier as to any special handling procedures, including pumping capabilities.
(b) Dynamic Shear Rheometer (AASHTO T 315) shall be performed on original binders for the purposes of QC testing only.
(c) The original binder phase angle (AASHTO T 315-12) shall be performed at grade temperature.
(d) AASHTO T 315-12 and AASHTO T 350-14 will be performed at a 2 mm gap for PG 76-22 (ARB)
(e) All binders with a high temperature designation >67 will be tested at 67°C. PG 76-22 (PMA) and PG 76-22 (ARB) shall pass a "V" grade~~d and PG 82-22 (PMA) shall pass an "E" grade~~ per AASHTO M 332-14.
(f) A maximum Jnr diff = 75% does not apply for any Jnr value ≤ 0.5 kPa-1.
(g) For all PG grades of a PG 67 or higher, perform the PAV residue testing at 26.5°C with a maximum of 5000 kPa.