



**SUPPLEMENTAL SPECIFICATIONS
FOR
FLEXIBLE PAVING MIXTURES**

**Effective Date
November 15, 2011**

THE STANDARD SPECIFICATIONS, SERIES 2009, ARE AMENDED BY THE FOLLOWING MODIFICATIONS AND ADDITIONS. THESE ARE SUPPLEMENTAL SPECIFICATIONS AND THEY SHALL PREVAIL OVER THOSE PUBLISHED IN THE STANDARD SPECIFICATIONS.

2303.01. Description.

Replace Article A:

Design, produce, place, and compact flexible paving (HMA and warm mix asphalt (WMA)) mixtures. Use proper quality control practices for the construction of surface, intermediate, or base course on a prepared subbase, base, or pavement to the dimensions specified in the contract documents.

Add the following Articles:

- C.** WMA refers to asphalt concrete mixtures produced at temperatures approximately 50°F (28 °C) or more below those typically used in production of HMA but no higher than 280°F (135 °C). Temperature reductions may be achieved through additives or water injection systems approved by the Bituminous Engineer. The goal with WMA is to produce mixtures with similar or better strength, durability, and performance characteristics as HMA using substantially reduced production temperatures.
- D.** Unless explicitly stated, produce and place WMA mixtures meeting the same requirements established for HMA mixtures. Equivalent WMA mixtures may be substituted for HMA mixtures unless it is prohibited by the specifications.

2303.02, B, 1, b, 1, Friction Classification L-2.

Replace the Article:

- a)** On Interstates and all mixtures designed for 30,000,000 ESALS and higher (cross-overs and detours with posted speeds below 60 mph excluded), if 40% or more of the total aggregate is a limestone, use a combined aggregate such that:
- (1)** At least 80% of the combined aggregate retained on the No. 4 (4.75 mm) sieve is Type 4 or better friction aggregate,
 - (2)** At least 25% of the combined aggregate retained on the No. 4 (4.75 mm) sieve is Type 2 or better friction aggregate,
 - (3)** At least 30% of the combined aggregate passing the No. 4 (4.75 mm) sieve is Type 2 or better friction aggregate, and
 - (4)** The fineness modulus of the combined Type 2 aggregate is at least 1.0. Calculations for fineness modulus are shown in Materials I.M. 501.

- b) ~~If less than 40% of the total aggregate is a limestone~~ For all other mixtures that do not satisfy Article 2303.02, B, 1, b, 1, a, use a combined aggregate such that:
- (1) At least 80% of the combined aggregate retained on the No. 4 (4.75 mm) sieve is Type 4 or better friction aggregate, and
 - (2) At least 25% of the combined aggregate retained on the No. 4 (4.75 mm) sieve is Type 2 or better friction aggregate, and
 - (3) For Interstates and all mixtures designed for 30,000,000 ESALS and higher, ~~the~~ the fineness modulus of the combined Type 2 aggregate is at least 1.0. Calculations for fineness modulus are shown in Materials I.M. 501.

2303.02, C, Recycled Asphalt Pavement.

Rename the Article:

C. Recycled Asphalt ~~Pavement~~ Materials.

Replace Article 1:

Recycle Asphalt Materials (RAM) includes Recycled Asphalt Pavement (RAP) and Recycled Asphalt Shingles (RAS). RAP is salvaged asphalt pavement. Use RAP from a source designated in the contract documents, or furnish Classified RAP, Certified RAP, or Unclassified RAP from the Contractor's stockpile. The designations Classified, Certified, and Unclassified are exclusively for the use of RAP in HMA.

Replace the first paragraph of Article 6:

For HMA mix design purposes, the Contracting Authority will test samples of the ~~RAP~~ RAM. The aggregate gradation and amount of asphalt binder in the ~~RAP~~ RAM will be based on the Contracting Authority's extraction tests. ~~When the amount of recycled binder exceeds 20% of the total asphalt binder, change the asphalt binder grade as directed in Materials I.M. 510. No adjustments will be made to the contract unit price for required changes to the asphalt binder grade.~~

Add the following Articles:

7. For mixtures not containing RAS, when the amount of recycled binder from RAP exceeds 20.0% of the total asphalt binder, change the asphalt binder grade as directed in Materials I.M. 510. For mixtures containing RAS, adjust the contract binder grade as follows:
 - a. When the amount of recycled binder is inclusively between 15.0% and 25.0%
 - 1) Lower the high temperature grade of the virgin asphalt binder by one grade.
 - 2) Lower the low temperature grade of the virgin asphalt binder by one grade (i.e. PG XX-28 becomes PG XX-34).
 - b. When the amount of recycled binder exceeds 25.0% of the total asphalt binder, the binder grade shall be selected based on testing by the contracting authority at no additional cost to the contracting authority.

The temperature spread of the adjusted PG grade shall be at least that of the contract grade (i.e. for a PG 64-22, maintain a spread of at least $64 - (-22) = 86$). The adjusted grade shall meet the same elastic recovery requirements as the contract binder grade. No adjustments will be made to the contract unit price for required changes to the asphalt binder grade.
8. Pre-consumer or post-consumer shingles that have been processed, sized, and ready for incorporation into an asphalt mixture constitute RAS material.
9. Up to 5% RAS by weight of total aggregate may be used in the design and production of an asphalt mixture. The percentage of RAS used is considered part of the maximum allowable RAP percentage. Unless explicitly stated otherwise in this specification or Materials I.M. 505, use RAS according to the same requirements as prescribed for RAP material.
10. RAS shall be certified from an approved supplier designated in Materials I.M. 506. Material processed prior to DOT source approval will not be certified.

2303.02, D, Hot Mix Asphalt Mixture.**Rename** the Article:**D. Hot Mix Asphalt Flexible Paving Mixture.****Replace** Article 4:

Use ~~an HMA~~ a mixture design meeting gyratory design and mixture criteria corresponding to the design level specified in the contract documents. The Engineer may approve the substitution of any mixture which meets requirements for a higher design level than specified in the contract documents, at no additional cost to the Contracting Authority. When a commercial mix is specified, use a 1/2 inch (12.5 mm) 300K surface mixture or higher for JMF approval.

Replace Article 6:

Prepare gyratory ~~HMA~~ mixture designs for base, intermediate, and surface mixtures. Follow the procedure outlined in Materials I.M. 510. Submit a mixture design complying with Materials I.M. 510. Propose both a production and a compaction temperature between 215°F (102°C) and 280°F (138°C) for WMA mixture designs.

Add the following Article:

8. Unless otherwise indicated in the contract documents, do not use WMA on interstate travel lanes for surface, intermediate, or base courses.

2303.02, E, 2, Anti-strip Agent.**Replace** Article a:

~~On Interstate and Primary highways designed for 30,000,000 ESALS and higher, perform a moisture sensitivity evaluation of the proposed asphalt mixture design in accordance with Materials I.M. 507.~~

Perform a moisture sensitivity evaluation of the proposed asphalt mixture design in accordance with Materials I.M. 507 for the following mixtures when placed in travelled lanes:

- 1) Mixtures for Interstate and Primary highways designed for 30,000,000 ESALS and higher
- 2) Mixtures for Interstate and Primary highways containing quartzite, granite, or other siliceous aggregate (not a limestone or dolomite) in at least 40% of the total aggregate (virgin and recycled) or at least 25% of the plus No. 4 (4.75 mm).
- 3) All WMA mixtures placed in travel lanes designed for 10,000,000 ESALS and higher.

For the purpose of evaluating moisture sensitivity of proposed WMA mix designs which use water injection technologies, in lieu of a lab-scaled foaming device the Contractor may test the proposed JMF from plant produced material placed off-site at no additional cost to the contracting authority.

Replace Article b:

~~On all other Interstate and Primary highways, perform a moisture sensitivity evaluation in accordance with Materials I.M. 507 of the proposed asphalt mixture design if 25% or more of the plus No. 4 (4.75 mm) (virgin and RAP) aggregates or more than 40% of the total (virgin and RAP) aggregates is:~~

- ~~• Quartzite.~~
- ~~• Granite.~~
- ~~• Other siliceous aggregate (not a limestone or dolomite) which is obtained by crushing from ledge rock.~~

Sample and test plant produced mixture for moisture susceptibility in accordance with Materials I.M. 204 and Materials I.M. 507 for bid item plan quantities of more than 1000 tons (1000 Mg) as follows:

- 1) For mixtures satisfying Article 2303.02, E, 2, a
- 2) For conditions satisfied in Article 2303.02, E, 2, g

Replace Article g:

When there is a "significant mix change", the Engineer may require a re-evaluation and an evaluation of the test method in Materials I.M. 507, for plant produced mixture as follows:

- 1) When there is a "significant mix change" to a mix satisfying Article 2303.02, E, 2, a
- 2) When there is contamination and/or coating of the aggregate for any mixture placed in a travel lane.
- 3) When aggregates are inadequately dried during production of any mixtures placed in a travel lane.

2303.02, E, 2, h, 2 Liquid Anti-strip Additives.

Add the following Article:

- c) A dosage rate can be selected such that the conditioned indirect tensile strength can be improved by at least 10% while meeting all other requirements.

2303.02, E, Other Materials.

Add the following Article:

5. WMA Technologies.

Chemical additives, organic additives, or water injection systems approved by the Bituminous Engineer may be used at the rate established by the mixture design in the production of WMA. Once production of a bid item has begun with a WMA technology, continue its use throughout the remainder of the bid item's production unless otherwise approved by the District Materials Engineer.

2303.03, A, General.

Replace Articles 3 and 4:

3. Apply Quality Management - Asphalt (QM-A) to asphalt mixture bid items when the plan quantity is greater than 1000 tons (1000 Mg) and all Interstate contracts. Follow the procedures and meet the criteria established in Articles 2303.02 and 2303.03, B; Section 2521; and Materials I.M. 510 and 511.
4. Apply Article 2303.03, E for asphalt mixture bid items that have a plan quantity of 1000 tons (1000 Mg) or less as well as any patching bid items. For items bid in square yards (m^2), apply Article 2303.03, E when the plan quantity by weight (estimated with a unit weight of 145 pounds per cubic foot ($2323 \text{ kg}/m^3$)) unless otherwise stated on the plans) does not exceed 1000 tons (1000 Mg). Article 2303.03, E applies to Interstate patching as well as Interstate bid items of less than 1000 tons (1000 Mg), all of which are placed in a non-travel lane.

2303.03, B, Equipment.

Replace the first paragraph with the following:

Provide sufficient equipment of the various types required to produce, place, and compact each layer of HMA mixture as specified, such that the mixture is workable at the minimum placement and compaction temperature desired, regardless of storage or haul distance considerations.

Modify the asphalt mixing plant as required by the manufacturer when introducing a WMA technology. Plant modifications may include additional plant instrumentation, the installation of water injection systems and/or WMA additive delivery systems, tuning the plant burner and adjusting the flights in order to operate at lower production temperatures and/or reduced tonnage.

2303.03, C, 2, c, 5.

Replace the Article:

Place other fabrics with a heavy coat of ~~the same~~ asphalt binder ~~grade used in the HMA and applied~~ at a rate of 0.20 to 0.25 gallons per square yard (0.9 to 1.1 L/m²). Use the same binder grade used in the asphalt concrete mixture. For binders containing a WMA technology, ~~Place~~ at a temperature between 260°F and 315°F (127°C and 160°C), otherwise place at a temperature between 295°F and 315°F (145°C and 160°C).

2303.03, C, 3, d, 2.

Delete the Article:

~~2) Coating aids may be added with the Engineer's approval.~~

2303.03, C, 3, d, 4.

Replace the Article:

~~Unless the Engineer approves, do not allow the temperature of the mixtures to exceed 330°F (165°C).~~ Do not allow the temperature of the mixtures to ~~exceed 330°F (165°C).~~ fall outside the following parameters:

- a) Keep the production temperature of WMA mixtures between 215°F (102°C) and 280°F (138°C) until placed on the grade.
- b) Do not produce WMA mixtures more than 10°F (6°C) below the target temperature designated in the JMF without the approval of the Engineer.
- c) Keep the production temperature of HMA mixtures between 225°F (102°C) and 330°F (165°C) until placed on the grade. Do not discharge HMA into the hopper when its temperature is less than:
 - (1) 245 °F (118°C) for a nominal layer thickness of 1 1/2 inches (40 mm) or less, or
 - (2) 225 °F (102°C) for a nominal layer thickness of more than 1 1/2 inches (40 mm).
- d) Flexible paving mixtures not meeting these requirements will be rejected.

2303.03, C, 3, d, 7.

Delete the Article:

- ~~7) Ensure mixture temperature allows for the specified compaction and density to be attained. Do not discharge HMA into the paver hopper when its temperature is less than:

 - 245°F (120°C) for a nominal layer thickness of 1 1/2 inches (40 mm) or less, or
 - 225°F (110°C) for a nominal layer thickness of more than 1 1/2 inches (40 mm).~~

2303.03, C, 4, c, 2.

Replace Tables 2303.03-1 and 2303.03-2:

Table 2303.03-1: Base and Intermediate Course Lifts of HMA Asphalt Mixtures

Nominal Thickness - inches (mm)	Road Surface Temperature, °F (°C)
1 1/2 (40)	40 (4)
2 - 3 (50 - 80)	35 (2)
Over 3 (Over 80)	25 (4) 35 (2)

Table 2303.03-2: Surface Course Lifts of HMA Asphalt Mixtures

Nominal Thickness - inches (mm)	Road Surface Temperature, °F (°C)
1 (30)	HMA: 50 (10) / WMA: 40 (4)
1 1/2 (40)	HMA: 45 (7) / WMA: 40 (4)
2 and greater (50 and greater)	40 (4)

2303.03, C, 5, b, 1, a.

Replace the Article:

Use Class I compaction for base, intermediate, and surface courses for the traffic lanes, ramps, and loops on ~~Interstate, Primary, and Secondary highways~~ all roadways.

2303.03, C, 7, a, 3.

Replace the Article:

Compact leveling courses and intermediate mixtures placed as leveling/scratch courses (less than or equal to 1 inch (25mm) plan thickness) using Class II compaction, except make all passes with a pneumatic roller.

2303.03, C, 7, b, Wedge Courses.

Add the following Article:

4) The Engineer may waive field void sampling for wedge courses provided compaction has been thorough and effective.

2303.03, D Quality Assurance Program

Replace the first two paragraphs:

For interstate mixtures placed in a travel lane and each HMA mixture bid item that has a plan quantity of more than 1000 tons (1000 Mg) (patching excluded) apply requirements of this article. For items bid in square yards (m^2), apply the requirements of this article when the plan quantity by weight (estimated with a unit weight of 145 pounds per cubic foot ($2323 \text{ kg}/m^3$) unless otherwise specified in the plans) exceeds 1000 tons (1000 Mg).

HMA Mixture bid items with plan quantities of 1000 tons (1000 Mg) or less and patching bid items are both defined as small quantities. For those bid items, meet the requirements of Article 2303.03, E. For items bid in square yards (m^2), when the plan quantity by weight (estimated with a unit weight of 145 pounds per cubic foot ($2323 \text{ kg}/m^3$) unless otherwise specified in the plans) does not exceed 1000 tons (1000 Mg), meet the requirements of Article 2303.03, E.

2303.03, D, 3, b, 3, vi.

Add the following Article:

h) When the same mix type is produced for multiple bid items in one day, assign all box samples to each bid item's existing PWL lot for lab voids. Assign the quantity of each bid item produced to its respective lot.

2303.03, D, 3, b, 3, vii, a.

Replace the Article:

Prepare and compact two gyratory specimens according to Materials I.M. 325G. Compact loose WMA field samples, transported to the laboratory, at 240°F (115°C).

2303.03, D, 3, b, 3.

Replace Articles ix and x:

ix) Use the following methods of acceptance for laboratory voids:

a) For base widening, non-high speed ramps, non-interstate shoulders, recreational trails, and other mixture bid items not placed in travel lanes of a permanent pavement, acceptance for laboratory voids will be based on a moving absolute average deviation (AAD) from target as defined in Appendix A of this specification. Use the production tolerance in Table 2303.03-5.

- b) For all other mixture bid items, Determine PWL for each lot as defined in Materials I.M. 501. Use 1.0% below the target air voids as the lower specification limit and 1.0% above the target air voids as the upper specification limit. Lot size is defined in Article 2303.03, D, 3, b, 3, vi. When the same mix type is placed in both PWL and AAD areas in a single day, include all samples for that day in the PWL lot as well as the quantity of the mixture bid item produced and placed in the PWL area.
- x) For mixture bid items in a PWL lot, Determine the pay factor using the absolute average deviation (AAD) procedure described in Materials I.M. 501 for proportions of a mixture bid item which are produced in irregular intervals and placed in irregular areas. The following items qualify as such and shall be combined into weekly lots:
 - Asphalt mixture produced and placed on gores, detours, cross-overs, temporary pavements, turning lanes, and fillets,
 - Asphalt mixture produced and placed on ramps that are not high-speed ramps,
 - Asphalt mixture produced and placed on non-interstate shoulders.

To be considered irregular, the production rate for mixture bid items described above is not to exceed 1000 tons (1000 mg) or 10,000 square yards (8400 m²) for items bid in square yards in a single day.

2303.03, D, 3, b, 4, i.

Replace the Article:

The Engineer may obtain plant produced samples for moisture susceptibility testing in accordance with Materials I.M. 507 at any time for mixtures requiring moisture sensitivity testing identified in Article 2303.02, E, 2, A or Article 2303.02, E, 2, G to verify the minimum TSR has been achieved.

2303.03, D, 3, c.

Replace Table 2303.03-5:

Table 2303.03-5: Production Tolerances

Measured Characteristic	Target Value (%)	Specification Tolerance (%) ^(a)
Cold feed gradation No. 4 (4.75 mm) and larger sieves	by JMF	± 7.0
Cold feed gradation No. 8 (2.36 mm)	by JMF	± 5.0
Cold feed gradation No. 30 (600 µm)	by JMF	± 4.0
Cold feed gradation No. 200 (75 µm)	by JMF	± 2.0 ^(b)
Daily asphalt binder content	by JMF	± 0.3
Field laboratory air voids absolute deviation from target ^(c)	0.0	≤ 1.0
VMA ^(e)	by JMF	± 1.0 ^(f)

(a) Based on single test unless noted otherwise.
 (b) Maintain the filler/bitumen ratio of the plant produced mixture between 0.6 and 1.4.
 (c) When lab voids acceptance is not based on PWL.
 (e) Restricted to an asphalt film thickness as specified for the level of HMA mixture. May be waived per Materials I.M. 510 Appendix A.
 (f) Based on the daily lot average.

Replace Articles 8, 9, and 10:

- 8) Prepare quality control charts according to Materials I.M. 511. Keep the charts current and available showing both individual sample results and moving average values for both lab voids and absolute deviation from target. Base moving average values on four consecutive sample results. The moving average absolute deviation from target may restart only in the

- event of a mandatory plant shutdown for failure to maintain the average within the production tolerance. Include the target value and specification tolerances on control charts.
- 9) Calculate laboratory voids for individual samples according to Materials I.M. 501. Use the individual density and individual maximum specific gravity determined for each sample. To determine the moving average of laboratory voids, use the average of the last four individual sample laboratory voids. Calculate absolute deviation from target lab voids according to Appendix A of this specification. To determine the moving average absolute deviation from target laboratory voids, use the average of the last four individual sample absolute deviations from target laboratory voids.
 - 10) Monitor the test results and make mix adjustments, when appropriate, to keep the mixture near the target values. Notify the Engineer whenever the process approaches a specification tolerance limit. When acceptance for lab voids is not based on PWL, cease operations when the moving average point for absolute deviation from target lab voids is outside the specification tolerance limit. Assume responsibility to cease operations, including not incorporating material which has not been placed. Do not start the production process again until notifying the Engineer of the corrective action proposed.

2303.03, D, 4, a.

Replace Articles 2, 3, and 4:

- 2) A lot is considered to be one layer of one mixture bid item placed during a day's production. The Engineer may approve classifying multiple layers of construction placed during a single day as a lot provided only one mixture was used.
- 3) ~~The Engineer may waive sampling for field voids in the following situations, provided compaction has been thorough and effective:~~ For the following situations sampling for field voids may be waived by the Engineer provided compaction has been thorough and effective, or sampling may be modified by mutual agreement to include more than one day's production provided samples are taken prior to trafficking:
 - When the day's operation is not more than 2500 square yards (2500 m²) excluding areas deducted from the field voids lot,
 - When the day's operation is not more than 500 tons (500 Mg) excluding quantities deducted from the field voids lot,
 - When the mixture is being placed in irregular areas, or
 - When placing wedge or strengthening courses.
- 4) Engineer will obtain and test samples for each lot according to Materials I.M. 204 Appendix F. The Contractor may request to have a quality control plan that indicates a higher testing frequency at no additional cost to the Contracting Authority if pre-approved by the Engineer at the preconstruction meeting. The Engineer will determine the core locations. The length laid in each lot will be divided into approximately equal sublots. Obtain one sample at a random location, as directed and witnessed by the Engineer, in each subplot. Determine a new random location for the subplot when the designated core location falls on a runout taper at an existing pavement, bridge, or bridge approach section where the thickness is less than the design thickness.

Replace Article 6:

Use the following methods of acceptance for field voids:

- a) For mixture bid items placed in the following areas:
 - Base widening placed in a travel lane,
 - Non high-speed ramps,
 - Bridge approaches placed as a separate operation,
 - Non-interstate travel lanes intended to be in service for fewer than 12 months,
 - State Park and Institutional roadways,
 - Recreational trails,
 - Irregular areas identified by the Engineer that may include areas not suitable for continuous paving, and

- Wedges,
the Engineer will accept the field voids lot based on the average test results or an established effective rolling pattern when approved by the Engineer. Do not exceed 8% average field voids. The Engineer may modify the sample size and frequency provided compaction is thorough and effective. The Engineer may apply the pay schedule in 2303.05, A, 3, b, 3 to areas where thorough and effective compaction is not achieved.

- b) For all other areas of Class I compaction, determine PWL, as defined in Materials I.M. 501, for each lot using a lower specification limit (LSL) of 3.5% voids (96.5% of G_{mm}) and an upper specification limit (USL) of 8.5% voids (91.5% G_{mm}).

Add the following Article:

- 9) Use maximum specific gravity (G_{mm}) results in field voids calculations as follows:
- a) When cores represent one day's production and more than one G_{mm} test result is available, use the average G_{mm} in the field voids calculation for all cores.
 - b) When cores represent one day's production and only one G_{mm} test result is available, use the single G_{mm} test result in the field voids calculation for all cores.
 - c) When the cores represent more than one day's production, use the average of all G_{mm} test results from all days corresponding with the cores.

2303.03, D, 5, b, 7.

Replace the Article:

Facsimile, or deliver by other methods the Engineer approves, the Daily Plant Report to the Engineer and the designated laboratory daily. At project completion, provide the Engineer a copy of the electronic file(s) containing project information generated during the progress of the work.

2303.03, D, 5, d, 2.

Replace the Article:

If the Engineer's verification test results validate the Contractor's test results, the Contractor's results will be used for material acceptance. Disputes between the Contractor's and Engineer's test results will be resolved according to Materials I.M. 511. The DME may consider results from the IAP in the dispute resolution process. Do not apply Materials I.M. 511, 5, C, 1, c as a non-validation criterion.

Use a maximum lot pay factor of 1.000 when the Engineer's results are used for any portion of a lot. When using "Procedure B" in Materials I.M. 511 Appendix C to establish a correction factor, choose three consecutive split test results such that the differences between the splits each has the same sign (+ or -) and at least two of the selected three are outside the Materials I.M. 216 tolerance. When non-validation of test results cannot be explained by an assignable cause as determined by the DME, the Engineer's results will be used for acceptance.

2303.03, E, 1.

Replace the first sentence of the second paragraph:

For mixtures meeting the criteria in Articles 2303.02, E, 2, a ~~or b~~:

2303.04, A, 1, General.

Add the following Article:

- d. Unless stated otherwise, equivalent WMA mixtures may be substituted for specified HMA mixtures.

2303.04, Method Measurement.

Add the following Article

I. Recycled Asphalt Shingles (RAS)

67% of the asphalt binder from RAS which is incorporated into the mixture will be included in the quantity of asphalt binder used.

2303.05, A, 1.

Add to the end of the Article:

Unless stated otherwise, equivalent WMA mixtures may be substituted for specified HMA mixtures with no change in the contract unit price.

2303.05, A, 2.

Replace the Article:

Payment for ~~surface course test strip placement in an intermediate lift test strips~~ will be the contract unit price for ~~Hot Mix Asphalt Mixture, Surface Course~~, the test strip mixture bid item per ton (megagram) ~~regardless of lift placement~~.

2303.05, A, 3, b.

Add the following Article:

3) Payment when PWL is not used for acceptance:

Average Field Voids (Pa), %	Pay Factor
0.0 to 8.0	1.000
8.1 to 9.5	$PF = \frac{11 - Pa}{3}$
Over 9.5	0.500 maximum

When the average air void content exceeds 8.0%, the Engineer may declare the lot or parts of the lot deficient or unacceptable.

2303.05, B, 2.

Replace the Article:

Payment for asphalt binder will be for new asphalt binder ~~and~~, the asphalt binder in the RAP which is incorporated in the mixture, and 67% of the asphalt binder from RAS which is incorporated into the mixture. The quantity of asphalt binder in ~~RAP RAM~~, which is incorporated into the mix, will be calculated in tons (megagrams) of asphalt binder in the ~~RAP RAM~~. This will be based on the actual asphalt binder content determined for the mix design from the results of the Engineer's extraction test.

2303.05, D, 1.

Replace the Article:

When anti-strip agent is required, the incorporation of the anti-strip agent into the asphalt mixture will be considered as extra work ordered by the Engineer if the Contracting Authority's TSR results from the field produced mixture meet or exceed the minimum requirement and the conditioned indirect tensile strength is improved by at least 10% over that from the plant mixture without anti-strip (or original JMF conditioned strength when plant mix without anti-strip is not available). Payment will be made at the rate of \$2.00 per ton (megagram) of asphalt mixture in which the anti-strip agent is incorporated. WMA mixtures designed for 10,000,000 ESALS and higher must satisfy Articles 2303.02, E, 2, a, 1 or 2 to be eligible for anti-strip payment. For HMA mix designs (small quantities excluded) with a TSR greater than or equal to 80%, payment will stop when the Contracting Authority's TSR results of the field produced mixture without the agent are greater than or equal to 80%.

Appendix A – Calculations for Absolute Deviation from Target Lab Voids

Calculate the absolute deviation from target (ADT_i) for sample, i , using the following equation:

$$ADT_i = |Pa_i - Target Pa|$$

Where,

i = Sequential sample, i

ADT_i = Absolute deviation from target for sample, i

Pa_i = Laboratory air voids test result for sample, i

Target Pa = Target laboratory air voids for mixture

$| |$ = Absolute value

Calculate the moving average ADT for $i \geq 4$ using the following equation:

$$\frac{ADT_i + ADT_{i-1} + ADT_{i-2} + ADT_{i-3}}{4}$$

Where,

i = Sequential sample, i

ADT_i = Absolute deviation from target for sample i

$| |$ = Absolute value