401-R-661 QC/QA HOT MIX ASPHALT, HMA, PAVEMENT

(Revised 01-17-19)

The Standard Specifications are revised as follows:

SECTION 401, BEGIN LINE 42, DELETE AND INSERT AS FOLLOWS:

The DMF shall state the calibration factor, test temperature, and absorption factors to be used for the determination of binder content using the ignition oven in accordance with ITM 586, the binder content by extraction in accordance with ITM 571, the Δ Pb determined in accordance with ITM 591 and a Mixture Adjustment Factor, MAF. The DMF shall state the source, type, and dosage rate of any stabilizing additives.

SECTION 401, BEGIN LINE 79, DELETE AND INSERT AS FOLLOWS:

Dust/Calculated Effective Binder Ratio shall be 0.6 to 1.4. The Dust/Calculated Effective Binder Ratio for 4.75 mm mixtures shall be in accordance with AASHTO M 3231.0 to 2.0.

AIR VOIDS AT OPTIMUM BINDER CONTENT								
		Dense Graded Open Graded						
Mixture	25.0	19.0	12.5	9.5	4.75	25.0	19.0	9.5
Designation	mm	mm	mm	mm	mm	mm	mm	mm
Air Voids	4.05.0%	4.05.0%	4.05.0%	4.05.0%	5.0%	0% 15.0% - 20.0% 10.0% - 15.0		

SECTION 401, BEGIN LINE 85, DELETE AND INSERT AS FOLLOWS:

The design for dense graded mixtures shall have at least four points, including a minimum of two points above and one point below the optimum. A one point design may be used for open graded mixtures. The maximum specific gravity shall be mass determined in water in accordance with AASHTO T 209. The bulk specific gravity of the gyratory specimens shall be determined in accordance with AASHTO T 166, Method A or AASHTO T 275331, if required, for dense graded mixtures and AASHTO T 331 for open graded mixtures.

The percent draindown of open graded mixtures shall not exceed 0.30% in accordance with AASHTO T 305. Open graded mixtures may incorporate recycled materials and fibers. The recycled materials shall be in accordance with 401.06, and the fiber type and minimum dosage rate shall be in accordance with AASHTO M 325. The binder for open graded mixtures may have the upper temperature classification reduced by 6°C from the specified binder grade if fibers are incorporated into the mixture or if 3.0% reclaimed asphalt shingles by weight of the total mixture is used.

The percent draindown of dense graded mixtures shall not exceed 0.30% in accordance with AASHTO T 305. Dense graded mixture shall be tested for moisture susceptibility in accordance with AASHTO T 283 except that the loose mixture curing shall be replaced by mixture conditioning for 4 h in accordance with AASHTO R 30. The minimum tensile strength ratio, TSR, shall be 80%. The 6 in. mixture specimens shall be compacted in accordance with AASHTO T 312. If anti-stripping additives are added to the mixture to be in accordance with the minimum TSR requirements, the dosage rate shall be submitted with the DMF.

A PG binder grade or source change will not require a new mix design. If the upper temperature classification of the PG binder is lower than the original PG grade, a new TSR value is required.

The MAF equals the Gmm from the mixture design divided by the following: 2.465 for 9.5 mm mixtures and 2.500 for 12.5 mm, 19.0 mm, and 25.0 mm mixtures. If the MAF calculation results in a value where $0.980 \le MAF \le 1.020$, then the MAF shall be considered to be 1.000. If the MAF is greater than 1.020, the calculated MAF value shall have 0.020 subtracted from the value. If the MAF is less than 0.980, the calculated MAF value shall have 0.020 added to the value. The MAF does not apply to OG mixtures.

Changes in the source or types of aggregates shall require a new DMF.

The mixture design compaction temperature for the specimens shall be $300 \pm 9^{\circ}$ F for dense graded mixtures and 260°F for open graded mixtures.

Design criteria for each mixture shall be based on the ESAL shown in the contract documents and shall be as follows:

GYRATORY COMPACTION EFFORT					
ESAL	N _{ini} *	N _{des} *	N _{max} *	Max. % Gmm @ N _{ini}	Max. % Gmm @ N _{max}
	Den	ise Graded 4	4.75 mm		
< 3,000,000	7	75	115	90.5	98.0
3,000,000 to < 10,000,000	8	100	160	89.0	98.0
<u>≥</u> 10,000,000	8	100	160	89.0	98.0
Dense Graded 9.5 mm, 12.5 mm, 19.0 mm and 25.0 mm					
< 3,000,000	5	30	40	91.5	97.0
3,000,000 to $< 10,000,000$	6	50	75	91.5	97.0
<u>></u> 10,000,000	6	50	75	91.5	97.0
Open Graded					
All ESAL	n/a	20	n/a	n/a	n/a
* Nini, Ndes, Nmax - definitions are included in AASHTO R 35					

VOIDS IN MINERAL AGGREGATE, VMA, CRITERIA @ Ndes			
Mixture Designation	Minimum VMA, %		
4.75 mm	17.0		
9.5 mm	15.0 16.0		
12.5 mm	14.0 15.0		
19.0 mm	13.0 14.0		
25.0 mm	12.0 13.0		
OG 19.0 mm	n/a		
OG25.0 mm	n/a		

VOLUME OF EFFECTIVE BINDER, Vbe, CRITERIA @ N_{des}

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Mixture Designation	Minimum Vbe, %
4.75 mm	12.0
9.5 mm	11.0
12.5 mm	10.0
19.0 mm	9.0
25.0 mm	8.0
OG	n/a

VOIDS FILLED WITH ASPHA			ALT, VFA, CRITERIA @ Ndes		
		ESAL	VFA, %		
		< 3,000,000	65-78 60-73		
3,	000),000 to < 10,000,000	65-75 60-70		
		≥ 10,000,000	65-75 60-70		
Notes:	1.	For 9.5 mm mixtures, the	specified VFA range shall be 73% to		
		76%68% to 71% for design tra	affic levels \geq 3 million ESALs.		
	2.	For 25.0 mm mixtures, the sp	becified lower limit of the VFA shall be		
		6762% for design traffic levels	s < 0.3 million ESALs.		
	3. For 4.75 mm mixtures, the specified VFA range shall be 67% to 79%.				
	4.	For OG9.5 mm, OG19.0 mm	m, OG25.0 mm mixtures, VFA is not		
		applicable.			

401.06 Recycled Materials

Recycled materials may consist of reclaimed asphalt pavement, RAP, or reclaimed asphalt shingles, RAS, or a blend of both. RAP shall be the product resulting from the cold milling or crushing of an existing HMA pavement. Before entering the plant, RAP shall be processed so that 100% will pass the 2 in. (50 mm) sieve and RAS shall be processed so that 100% will pass the 3/8 in. (9.5 mm) sieve. The RAP coarse aggregate shall pass the maximum size sieve for the mixture being produced.

RAP for the ESAL category 3 and 4 surface mixtures shall be *a fine RAP with* 100% passing the 3/8 in. (9.5 mm) sieve and 95 to 100% passing the No. 4 (4.75 mm) sieve. *The Contractor may request the use of coarse RAP in a category 4 surface mixture up to a maximum 20.0% by volume of material retained on the No. 4 (4.75 mm) sieve. The election to use coarse RAP in a category 4 surface mixture will void the allowed use of crushed stone and gravel coarse aggregate materials in accordance with 904.03(d). SMA RAP as defined in 410.06 shall not be used in any HMA mixture.*

	INVIA IIIIXUUES UUIIZIIIG KAF OI KAS OI a DIEIU OI KAF aliu KAS									
	MAXIMUM BINDER REPLACEMENT, %									
		Base and Intermediate Surface								
Mixture		Dense Graded Open Graded Dense Graded				ded				
Category	25.0	19.0	12.5	9.5	25.0	19.0	9.5	12.5	9.5	4.75
	mm	mm	mm	mm	mm	mm	тт	mm	mm	mm
2		25.0* 25.0* 25.0*								
3		25.0* 25.0* 25.0*								
4	25.0* 25.0* 25.0*									
* The contribution of RAS to any HMA mixture shall be $\leq 3.0\%$ by total mass of mixture and $\leq 15.0\%$ binder replacement.										

SECTION 401, BEGIN LINE 197, DELETE AND INSERT AS FOLLOWS:

401.09 Acceptance of Mixtures

Acceptance of mixtures for VMAVbe at N_{des} , and air voids at N_{des} for each lot will be based on tests performed by the Engineer for dense graded 9.5 mm, 12.5 mm, 19.0 mm and 25.0 mm mixtures with original contract pay item quantities greater than or equal to 300 t.

SECTION 401, BEGIN LINE 222, DELETE AND INSERT AS FOLLOWS:

Acceptance samples will be reduced to the appropriate size for testing in accordance with ITM 587. The binder content and gradation will be determined in accordance with ITM 586 or ITM 571 as directed by the Engineer. The maximum specific gravity will be mass determined in water in accordance with AASHTO T 209.

The effective specific gravity, Gse, of the mixture will be determined in each sublot and reported from the acceptance sample testing.

The total aggregate bulk specific gravity, Gsb, value will be determined in accordance with ITM 597.

The air voids will be determined in accordance with AASHTO R 35 based on the average bulk specific gravity from two gyratory specimens and the MSG for the sublot. The VMA will be determined in accordance with AASHTO R 35 based on the average bulk specific gravity from two gyratory specimens, the percent aggregate in the mixture from the sublot and the BSG of the aggregate blend from the DMF as applicable. The gyratory pills will be prepared in accordance with AASHTO T 312.

The dust/calculated effective binder ratio and the volume of effective binder in the mixture will be determined and reported from the acceptance sample testing conducted in each sublot. The volume of effective binder will be the difference between VMA and air voids. The Contractor shall take action in accordance with ITM 583 to address a dust/calculated effective binder ratio greater than 1.4not in accordance with 401.05, or a volume of effective binder in the mixture below design minimums, or a volume of effective binder in the mixture greater than 2.0% above design minimums.

The bulk specific gravity of gyratory specimens for dense graded mixtures will be determined in accordance with AASHTO T 166, Method A or AASHTO T 275331, if required, except samples are not required to be dried overnight. The bulk specific gravity of gyratory specimens for open graded mixtures, OG19.0 mm, OG25.0 mm will be determined in accordance with AASHTO T 331.

SECTION 401, BEGIN LINE 261, DELETE AND INSERT AS FOLLOWS:

Air voids, binder content and VMAVbe values will be reported to the nearest 0.01%. Draindown test results will be rounded to the nearest 0.01%. Rounding will be in accordance with 109.01(a).

SECTION 401, BEGIN LINE 285, INSERT AS FOLLOWS:

Samples shall not be obtained from areas placed with paving equipment in accordance with 409.03(c)2 or 409.03(c)3. If a random location falls within this area, the Engineer will randomly select another location within the sublot for sampling. If an entire sublot falls within this area, test results from the previous sublot will be used for acceptance. If the previous sublot is not available, the subsequent sublot will be used for acceptance. If previous or subsequent sublot results for a mixture accepted by 401.19(a) will be replicated for an entire lot, each sublot in that lot will be accepted by 401.19(b).

SECTION 401, BEGIN LINE 370, DELETE AND INSERT AS FOLLOWS:

401.14 Spreading and Finishing

The mixture shall be placed upon an approved surface by means of laydown equipment in accordance with 409.03(c). Prior to paving, both the planned quantity and lay rate shall be adjusted by multiplying by the MAF. When mixture is produced from more than one DMF for a given pay item, the MAF will be applied to the applicable portion of the mixture for each. The temperature of each mixture at the time of spreading shall not be moreless than 315°F whenever PG 64-22 or PG 70-22 binders are used or not more than 325°F whenever PG 76-22 binder is used.

SECTION 401, BEGIN LINE 482, DELETE AND INSERT AS FOLLOWS:

Density of any random core location in these areas will be assigned a value of 92.094.0% MSG and compaction shall be in accordance with 402.15.

SECTION 401, BEGIN LINE 504, DELETE AND INSERT AS FOLLOWS:

The Contractor shall obtain cores in the presence of the Engineer with a device that shall produce a uniform 6.00 ± 0.25 in. diameter pavement sample. Coring shall be completed prior to the random location being covered by the next course.

Surface courses All core locations will be marked and shall be cored within two work days of placement. A dDamaged core shall be discarded and replaced with a core from a location selected by adding 1 ft to the longitudinal location of the damaged core using the same transverse offset.

The Contractor and the Engineer shall mark the core to define the course to be tested. If the core indicates a course thickness of less than two times the maximum particle size, the core will be discarded and a core from a new random location will be selected for testing.

Cores shall not be obtained from areas placed with paving equipment in accordance with 409.03(c)2 or 409.03(c)3. If a random location falls within this area, the Engineer will randomly select another location within the sublot for coring. If an entire sublot falls within this area, test results from the previous sublot will be used for acceptance. If the previous sublot is not available, the subsequent sublot will be used for acceptance.

The Engineer will take immediate possession of the cores. If the Engineer's cores are subsequently damaged, additional coring will be the responsibility of the Department. Subsequent core locations will be determined by subtracting 1 ft from the random location using the same transverse offset.

The density for the mixture will be expressed as the percentage of maximum specific gravity, % MSG, obtained by dividing the average bulk specific gravity by the maximum specific gravity for the sublot, times 100. Samples for the bulk specific gravity and maximum specific gravity will be dried in accordance with ITM 572. The Engineer will determine the bulk specific gravity of the cores in accordance with AASHTO T 166, Method A or AASHTO T 275331, if required. The maximum specific gravity will be mass determined in water in accordance with AASHTO T 209.

Within one work day of coring operations the Contractor shall clean, dry, and refill the core holes with HMA of similar or smaller size particles.

The Engineer's acceptance test results for each sublot will be available when the sublot testing is complete. Acceptance of the pavement for density (% MSG) will be reported to the nearest 0.01%. Rounding will be in accordance with 109.01(a).

section 401, begin line 660, delete and insert as follows: ${\rm 401.19~Pay~Factors}$

(a) Dense Graded Mixture \geq One Lot

Pay factors, PF, are calculated for the air voids at N_{des} , VMAVbe at N_{des} and inplace density, % Gmm. The Percent Within Limits, PWL, for each lot will be determined in accordance with ITM 588. The appropriate pay factor for each property is calculated as follows:

Estimated PWL greater than 90:

PF = ((0.50 x PWL) + 55.00)/100

Estimated PWL greater than or equal to 5070 and equal to or less than 90:

$$PF = ((0.40 \text{ x PWL}) + 64.00)/100$$

Estimated PWL greater than or equal to 50 and equal to or less than 70:

$$PF = ((0.62585 \text{ x PWL}) + 43.7532.5)/100$$

If the Lot PWL for any one of the properties is less than 50 or, a sublot has an air void content less than 1.0% or greater than 7.0%, or a sublot has a volume of effective binder greater than 3.0% above design minimums, the lot will be referred to the Office of Materials Management for adjudication as a failed material in accordance with normal Department practice as listed in 105.03.

Air voids, VMAVbe, and in-place density, % Gmm, PF values will be reported to the nearest 0.01. Rounding will be in accordance with 109.01(a).

A composite pay factor for each lot based on test results for mixture properties and density is determined by a weighted formula as follows:

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Lot
$$PF = 0.30(PF_{VOIDS}) + 0.35(PF_{VMAVBE}) + 0.35(PF_{DENSITY})$$

where:

Lot PF = Lot Composite Pay Factor for Mixture and Density PF_{VOIDS} = Lot Pay Factor for Air Voids at N_{des} PF_{VMAVBE} = Lot Pay Factor for VMAVbe at N_{des} $PF_{DENSITY}$ = Lot Pay Factor for In-Place Density, %Gmm

The lot quality assurance adjustment for mixture properties and density is calculated as follows:

$$q = L x U x (Lot PF - 1.00)/MAF$$

where:

q = quality assurance adjustment for mixture properties and density of the
 lot
 L = Lot quantity
 U= Unit price for the material, \$/ton

Lot PF = Lot Pay Factor

Lot test results for the air voids at Ndes, VMAVbe at Ndes, and density will be used to determine the Lot Pay Factors.

The specification limits for the air voids at N_{des} , VMAVbe at N_{des} , and density will be as follows:

SPECIFICATION LIMITS				
MIXTURE				
	LSL*	USL**		
Air Voids at N _{des} , %	2.60 3.60	5.40 6.40		
Voids In Mineral Aggregate Volume of Effective Binder at Ndes, %	Spec	Spec + 2. 00 50		
DENSITY				
	LSL*	USL**		
Roadway Core Density (% Gmm), %	91.00 93.00	n/a		
 * LSL, Lower Specification Limit ** USL, Upper Specification Limit 				

(b) Dense Graded Mixture < One Lot and Open Graded Mixture

A composite pay factor for each sublot based on test results for mixture properties and density is determined in a weighted formula as follows:

Dense Graded Mixture:

 $SCPF = 0.30(PF_{VOIDS}) + 0.35(PF_{VMAVBE}) + 0.35(PF_{DENSITY})$

Open Graded Mixture:

$$SCPF = 0.20(PF_{BINDER}) + 0.35(PF_{VOIDS}) + 0.45$$

where:

 $\begin{array}{ll} \mathrm{SCPF} &= \mathrm{Sublot} \ \mathrm{Composite} \ \mathrm{Pay} \ \mathrm{Factor} \ \mathrm{for} \ \mathrm{Mixture} \ \mathrm{and} \ \mathrm{Density} \\ \mathrm{PF}_{\mathrm{BINDER}} &= \mathrm{Sublot} \ \mathrm{Pay} \ \mathrm{Factor} \ \mathrm{for} \ \mathrm{Binder} \ \mathrm{Content} \\ \mathrm{PF}_{\mathrm{VOIDS}} &= \mathrm{Sublot} \ \mathrm{Pay} \ \mathrm{Factor} \ \mathrm{for} \ \mathrm{Air} \ \mathrm{Voids} \ \mathrm{at} \ \mathrm{N}_{\mathrm{des}} \\ \mathrm{PF}_{\mathrm{VMA}VBE} &= \mathrm{Sublot} \ \mathrm{Pay} \ \mathrm{Factor} \ \mathrm{for} \ \mathrm{VMA}Vbe \ \mathrm{at} \ \mathrm{N}_{\mathrm{des}} \\ \mathrm{PF}_{\mathrm{DENSITY}} &= \mathrm{Sublot} \ \mathrm{Pay} \ \mathrm{Factor} \ \mathrm{for} \ \mathrm{Density} \end{array}$

If the SCPF for a sublot is less than 0.85 or the volume of effective binder is greater than 3.0% above design minimums, the Office of Materials Management will evaluate the pavement. If the Contractor is not required to remove the mixture, quality assurance adjustments of the lot will be assessed or other corrective actions taken as determined by the Office of Materials Managementsublot will be referred to the Office of Materials Management for adjudication as a failed material in accordance with normal Department practice as listed in 105.03.

	VMA Vbe		
Dense Graded	Open Graded		
Deviation from	Deviation from	Pay Factors	
Spec Minimum	Spec Minimum		
>+ <u>2.5</u> 3.0		Submitted to the Office of Materials Management*	
$\Rightarrow \ge +2.02.5 \text{ and } \le +2.53.0$		0.251.00 minus 0.05 for each 0.1% over +2.5%	
$\Rightarrow \ge + \frac{1.52.0}{1.52.0}$ and $\le < + \frac{2.02.5}{2.0}$		0.651.05 minus 0.01 for each 0.1% over +2.0%	
> + 0.5 and \leq < + $1.52.0$		1.05	
\geq 0.0 and \leq + 0.5	All	1.001.05 minus 0.01 for each 0.1% under +0.5%	
\geq - 0.5 and < 0.0		0.851.00 minus 0.02 for each 0.1% under 0.0%	
\geq -2.0 and < -0.5		0.90 minus 0.06 for each 0.1% under - 0.5%	
\geq - 1.0 and < - 0.5		0.65	
\geq - 1.5 and < - 1.0		0.45	
\geq - 2.0 and < - 1.5		0.25	
\geq - 2.5 and < - 2.0		0.00	
< - 2.5 - 2.0		Submitted to the Office of Materials Management*	
* Test results will be considered and adjudicated as a failed material in accordance with normal			
Department practice as listed in 105.03.			

SECTION 401, BEGIN LINE 756, DELETE AND INSERT AS FOLLOWS:

AIR VOIDS			
Dense Graded	Open Graded		
Deviation from	Deviation** from	Pay Factor	
$\overline{\text{DMFSpec}} (\pm \%)$	DMF (± %)		
≤ 0.5	\leq 13.0	1.05	
> 0.5 and ≤ 1.07	$>$ 1 <i>3</i> .0 and \leq 3 <i>4</i> .0	1.00	
1.1	3 4.1	0.98	
1. 2 8	3 4.2	0.96	
1.3	3 4.3	0.94	
1.4	3 4.4	0.92	
1. 5 9	3 4.5	0.90	
1.6 2.0	3 4.6	0.84	
1.7	3 4.7	0.78	
1.8	3 4.8	0.72	
<u>1.9</u>	3 4.9	0.66	
2.0	45.0	0.60	
		Submitted to the	
> 2.0	> 45.0	Office of Materials	
		Management*	
* Test results will be considered and adjudicated as a failed material in			
accordance with normal Department practice as listed in 105.03.			
** Deviation shall be from 17.5% for OG25.0 mm and OG19.0 mm			
mixtures and shall be	mixtures and shall be from 12.5% for OG9.5 mm mixtures.		

For mixtures produced during a plant's adjustment period, pay factors based on the DMF with the above tolerances will be used to compute quality assurance adjustments.

Sublot test results for density will be assigned pay factors in accordance with the following:

DENSITY			
Percentages are based on %MSG	Pay Factors , %		
Dense Graded			
≥ 97.0 98.0	Submitted to the Office of Materials Management*		
97.0-97.9	1.00		
95.6 - 96.9 96.6 - 96.9	1.05 - 0.01 for each 0.1% above 95.596.5		
94.0 - 95.5 95.0 - 96.5	1.05		
93.1 - 93.9 94.1 - 94.9	1.00 + 0.005 for each 0.1% above 93.0 94.0		
92.0 - 93.0 93.0 - 94.0	1.00		
91.0 - 91.9 92.0 - 92.9	1.00 - 0.005 for each 0.1% below 92.093.0		
90.0 - 90.9 91.0 - 91.9	0.95 - 0.010 for each 0.1% below 91.0 92.0		
89.0 - 89.9 90.0 - 90.9	0.85 - 0.030 for each 0.1% below 90.0 91.0		
≤ 88.9 89.9	Submitted to the Office of Materials Management*		
* Test results will be considered and adjudicated as a failed material in accordance with normal Department practice as listed in 105.03.			

SECTION 401, BEGIN LINE 826, DELETE AND INSERT AS FOLLOWS:

The Contractor may appeal an individual sublot for the binder content, the MSG, the BSG of the gyratory specimens or the BSG of the density cores when the QC results are greater than one standard deviation from the acceptance test results as follows: 0.25 for binder content, 0.010 for the MSG and 0.010 for both the BSG of the gyratory specimens and 0.020 for the BSG of the density cores. Upon request from the Contractor, the BSG of the density core will be exempted from the individual sublot appeal if both the QC and QA results show a %MSG for the density greater than or equal to 93.0%.

SECTION 401, BEGIN LINE 862, DELETE AND INSERT AS FOLLOWS:

(c) Binder Content

The backup binder content sample will be prepared and tested in accordance with the test method that was used for acceptance or as directed by the Engineer*ITM* 571.

(d) BSG of the Density Core

Additional cores shall be taken within seven calendar days unless otherwise directed. Additional core locations will be determined by adding 1 ft longitudinally of the cores tested using the same transverse offset. The appeal density cores will be dried in accordance with ITM 572 and tested in accordance with AASHTO T 166, Method A or AASHTO T 275331, if required.

SECTION 401, BEGIN LINE 940, DELETE AND INSERT AS FOLLOWS:

If QC/QA-HMA intermediate19.0 mm over QC/QA-HMA base25.0 mm mixtures are specified, QC/QA-HMA intermediate19.0 mm mixture may be considered as a substitute for the QC/QA-HMA intermediate19.0 mm and QC/QA-HMA base25.0 mm mixtures upon a written request by the Contractor. The request for the substitution shall be prepared in advance of the work. A computation will be made in order to obtain a unit price for the QC/QA-HMA intermediate19.0 mm mixture. The quantity and amount for QC/QA-HMA intermediate19.0 mm mixture shall equal the sum of the contract quantities and amounts shown for QC/QA-HMA intermediate19.0 mm and QC/QA-HMA base25.0 mm mixtures. The unit price for QC/QA-HMA intermediate19.0 mm mixture shall equal the sum of the contract quantities equal to the sum of contract amounts divided by the sum of contract quantities. Payment for the QC/QA-HMA intermediate19.0 mm mixture will be made at the unit price per ton for QC/QA-HMA intermediate19.0 mm mixture. No payment will be made for additional work or costs which may result due to this change.