

SPECIAL PROVISION

341---024

Dense-Graded Hot-Mix Asphalt (QC/QA)

For this project, Item 341, “Dense-Graded Hot-Mix Asphalt (QC/QA),” of the Standard Specifications, is hereby amended with respect to the clauses cited below, and no other clauses or requirements of this Item are waived or changed hereby.

Article 341.2. Materials, Section A. Aggregate is voided and replaced by the following:

A. Aggregate. Furnish aggregates from sources that conform to the requirements shown in Table 1 and as specified in this Section. Aggregate requirements in this Section, including those shown in Table 1, may be modified or eliminated when shown on the plans. Additional aggregate requirements may be specified when shown on the plans. Provide aggregate stockpiles that meet the definition in this Section for either a coarse aggregate or fine aggregate. Aggregate from reclaimed asphalt pavement (RAP) is not required to meet Table 1 requirements unless otherwise shown on the plans. Supply mechanically crushed gravel or stone aggregates that meet the definitions in Tex-100-E. The Engineer will designate the plant or the quarry as the sampling location. Samples must be from materials produced for the project. The Engineer will establish the surface aggregate classification (SAC) and perform Los Angeles abrasion, magnesium sulfate soundness, and Micro-Deval tests. Perform all other aggregate quality tests listed in Table 1. Document all test results on the mixture design report. The Engineer may perform tests on independent or split samples to verify Contractor test results. Stockpile aggregates for each source and type separately. Determine aggregate gradations for mixture design and production testing based on the washed sieve analysis given in Tex-200-F, Part II. Do not add material to an approved stockpile from sources that do not meet the aggregate quality requirements of the Department’s *Bituminous Rated Source Quality Catalog* (BRSQC) unless otherwise approved.

Article 341.2. Materials, Section A. Aggregate, Section 1. Coarse Aggregate. The first and second paragraphs are voided and replaced by the following:

Coarse aggregate stockpiles must have no more than 20% material passing the No. 8 sieve. Provide aggregate from sources listed in the BRSQC. Use only the rated values for hot mix listed in the BRSQC. Rated values for surface treatment (ST) do not apply to coarse aggregate sources used in hot mix. Provide aggregate from non-listed sources only when tested by the Engineer and approved before use. Allow 30 calendar days for the Engineer to sample, test, and report results for non-listed sources.

Provide coarse aggregate with at least the minimum SAC as shown on the plans. SAC requirements apply only to aggregates used on the surface of travel lanes. When shown on the plans, SAC requirements apply to aggregates used on surfaces other than travel lanes. The SAC for sources on the Department's Aggregate Quality Monitoring Program (AQMP) is listed in the BRSQC.

Article 341.2. Materials, Section A. Aggregate, Section 2. RAP is voided and replaced by the following:

2. RAP. RAP is salvaged, milled, pulverized, broken, or crushed asphalt pavement. Crush or break RAP so that 100% of the particles pass the 2-in. sieve.

Use of Contractor-owned RAP including hot-mix asphalt (HMA) plant waste is permitted, unless otherwise shown on the plans. Department-owned RAP stockpiles are available for the Contractor's use when the stockpile locations are shown on the plans. If Department-owned RAP is available for the Contractor's use, the Contractor may use their own fractionated RAP and replace it with an equal quantity of Department-owned RAP. This allowance does not apply to Contractor's using unfractionated RAP. Department-owned RAP generated through required work on the Contract is available for the Contractor's use when shown on the plans. Perform any necessary tests to ensure Contractor or Department-owned RAP is appropriate for use. Unless otherwise shown on the plans, the Department will not perform any tests or assume any liability for the quality of the Department-owned RAP. When shown on the plans, the contractor will retain ownership of RAP generated on the project.

Fractionated RAP is defined as having two or more RAP stockpiles, whereas the RAP is divided into coarse and fine fractions. The coarse RAP stockpile will contain only material retained by processing over a 3/8 in. screen or 1/2 in. screen, unless otherwise approved. The fine RAP stockpile will contain only material passing the 3/8 in. screen or 1/2 in. screen, unless otherwise approved. The Engineer may allow the Contractor to use an alternate to the 3/8 in. screen or 1/2 in. screen to fractionate the RAP. The maximum percentages of fractionated RAP may be comprised of coarse or fine fractionated RAP or the combination of both coarse and fine fractionated RAP. Utilize a separate cold feed bin for each stockpile of fractionated RAP used.

Determine asphalt content and gradation of RAP stockpiles for mixture design purposes in accordance with Tex-236-F. Perform other tests on RAP when shown on the plans. Do not exceed the maximum allowable percentages of RAP shown in Table 1A. Asphalt binder from RAP and Recycled Asphalt Shingles (RAS) is designated as recycled asphalt binder. When RAP or RAS is used, calculate and ensure that the ratio of the recycled asphalt binder to total binder does not exceed the percentages shown in Table 1A. The allowable percentages shown in Table 1A may be decreased or increased when shown on the plans. Do not use Department or Contractor owned RAP contaminated with dirt or other objectionable materials. Do not use Department or Contractor owned RAP if the decantation value exceeds 5% and the plasticity index is greater than 8. Test the stockpiled RAP for decantation in accordance with Tex-406-A, Part I. Determine the plasticity index in accordance with Tex-106-E if the decantation value exceeds 5%. The decantation and plasticity index requirements do not apply to RAP samples with asphalt removed by extraction.

Do not intermingle Contractor-owned RAP stockpiles with Department-owned RAP stockpiles. Remove unused Contractor-owned RAP material from the project site upon completion of the project. Return unused Department-owned RAP to the designated stockpile location.

**Table 1A
Maximum Allowable Amounts of Recycled Binder, RAP & RAS**

Mixture Description & Location	Maximum Ratio of Recycled Binder ¹ to Total Binder (%)	Maximum Allowable % (Percentage by Weight of Total Mixture)		
		Unfractionated RAP ²	Fractionated RAP ³	RAS ⁴
Surface Mixes ⁵	35	10	20	5
Non-Surface Mixes ⁶ < 8 in. From Final Riding Surface	40	15	30	5
Non-Surface Mixes ⁶ > 8 in. From Final Riding Surface	45	20	40	5

1. Combined recycled binder from RAP and RAS.
2. Do not use in combination with RAS or fractionated RAP.
3. May not be used in addition to unfractionated RAP; however, up to 5% of fractionated RAP may be replaced with RAS.
4. May be used separately or as a replacement for no more than 5% of the allowable fractionated RAP.
5. "Surface" mixes are defined as mixtures that will be the final lift or riding surface of the pavement structure.
6. "Non-Surface" mixes are defined as mixtures that will be an intermediate or base layer in the pavement structure.

Article 341.2. Materials, Section A. Aggregate is supplemented by the following:

4. RAS. Use of post-manufactured RAS or post-consumer RAS is permitted unless otherwise shown on the plans. RAS are defined as processed asphalt shingle material from manufacturing of asphalt roofing shingles or from re-roofing residential structures. "Post-manufactured RAS" are processed manufacturer's shingle scrap by-product. "Post-consumer RAS," or "tear-offs," are processed shingle scrap removed from residential structures. Comply with all regulatory requirements stipulated for RAS by the Texas Commission on Environmental Quality (TCEQ). RAS may be used separately or in conjunction with RAP.

Process the RAS by ambient grinding or granulating such that 100% of the particles pass the 1/2 in. sieve and 90% pass the 3/8 in. sieve when tested in accordance with Tex-200-F, Part I. If needed, sand meeting the requirements of Table 1 and Table 2 or RAP passing the 1/2 in. screen may be added to RAS stockpiles to keep the processed material workable. Perform a sieve analysis on processed RAS material prior to extraction of the asphalt.

Determine asphalt content and gradation of the RAS material for mixture design purposes in accordance with Tex-236-F. Do not exceed the maximum allowable percentages of RAS shown in Table 1A. Asphalt binder from RAS and RAP is designated as recycled asphalt binder. When RAS or RAP is used, calculate and ensure that the ratio of the recycled asphalt binder to total binder does not exceed the percentages shown in Table 1A. The allowable percentages shown in Table 1A may be decreased or increased when shown on the plans.

Certify compliance of the RAS with DMS-11000, “Evaluating and Using Nonhazardous Recyclable Materials (NRM) Guidelines.” If the RAS has not come into contact with any hazardous materials, treat it as an established NRM. Unless otherwise directed, use only RAS from sources on the approved list maintained by the Construction Division. Prior to use, remove all materials that are not part of the shingle, such as wood, paper, metal, and plastics. Do not use RAS if deleterious materials as measured by Tex 217-F, Part I, are more than 1.5% of the stockpiled RAS.

Article 341.2. Materials, Section B. Mineral Filler. The first paragraph is voided and replaced by the following:

B. Mineral Filler. Mineral filler consists of finely divided mineral matter, such as agricultural lime, crusher fines, hydrated lime, cement, or fly ash. Mineral filler is allowed unless otherwise shown on the plans. Do not use more than 2% mineral hydrated lime or cement unless otherwise shown on the plans. If a substitute binder is used, do not use more than 1% hydrated lime or cement unless otherwise shown on the plans or allowed by the Engineer. The plans may require or disallow specific mineral fillers. When used, provide mineral filler that:

- is sufficiently dry, free-flowing, and free from clump and foreign matter;
- does not exceed 3% linear shrinkage when tested in accordance with Tex-107-E; and
- meets the gradation requirements in Table 3.

Article 341.2. Materials, Section D. Asphalt Binder is voided and replaced by the following:

D. Asphalt Binder. Furnish the type and grade of performance-graded (PG) asphalt specified on the plans. Unless otherwise shown on the plans, the contractor may use a substitute PG binder listed in Table 3A in lieu of the PG binder originally specified, if the substitute PG binder and mixture made with the substitute PG binder meet the following:

- the substitute binder meets the specification requirements for the substitute binder grade in accordance with Section 300.2.J, “Performance-Graded Binders;”
- the substitute binder has an un-aged dynamic shear value less than or equal to 2.00 kPa and an RTFO aged dynamic shear value less than or equal to 5.00 kPa at the PG test temperature; and
- the mixture has less than 10.0 mm of rutting on the Hamburg Wheel test (Tex-242-F) after the number of passes required for the originally specified binder. Use of substitute PG binders may only be allowed at the discretion of the Engineer if the Hamburg Wheel test results are between 10.0 mm and 12.5 mm.

**Table 3A
Allowable Substitute PG Binders**

PG Binder Originally Specified	Allowable Substitute PG Binders
PG 76-22	PG 70-22 or PG 64-22
PG 70-22	PG 64-22 or PG 58-22
PG 64-22	PG 58-22
PG 76-28	PG 70-28 or PG 64-28
PG 70-28	PG 64-28 or PG 58-28
PG 64-28	PG 58-28

Article 341.2. Materials, Section F. Additives is supplemented by the following:

Warm Mix Asphalt (WMA) is defined as additives or processes that allow a reduction in the temperature at which asphalt mixtures are produced and placed. WMA is allowed for use at the Contractor's option unless otherwise shown on the plans. The use of WMA is required when shown on plans. When WMA is required by the plans, produce an asphalt mixture within the temperature range of 215°F and 275°F. When WMA is not required as shown on plans, produce an asphalt mixture within the temperature range of 215°F and 350°F. Unless otherwise directed, use only WMA additives or processes on the approved list maintained by the Construction Division.

Article 341.4. Construction. The first paragraph is voided and replaced by the following:

Produce, haul, place, and compact the specified paving mixture. On or before the first day of paving, it is mandatory to schedule and participate in a pre-paving meeting with the Engineer unless otherwise shown on the plans.

Article 341.4. Construction, Section D. Mixture Design. The first paragraph, Table 6, and Table 7 are voided and replaced by the following:

The Contractor may elect to design the mixture using a Texas Gyratory Compactor (TGC) or a Superpave Gyratory Compactor (SGC), unless otherwise shown on the plans. Use the typical weight design example given in Tex-204-F, Part I, when using a TGC. Use the Superpave mixture design procedure given in Tex-204-F, Part IV, when using a SGC. Design the mixture to meet the requirements listed in Tables 1, 2, 3, 6, 7, and 8. When using the TGC, design the mixture at a 96.5% target laboratory-molded density or as noted in Table 7. When using the SGC, design the mixture at 50 gyrations (Ndesign). Use only a target laboratory-molded density of 96.0% when using the SGC to design the mixture; however, adjustments can be made to the Ndes value as noted in Table 7.

Use an approved laboratory to perform the Hamburg Wheel test and provide results with the mixture design, or provide the laboratory mixture and request that the Department perform the Hamburg Wheel test. The Construction Division maintains a list of approved laboratories. The Engineer will be allowed 10 working days to provide the Contractor with Hamburg Wheel test results on the laboratory mixture design.

**Table 6
Master Gradation Bands (% Passing by Weight or Volume)
and Volumetric Properties**

Sieve Size	A Coarse Base	B Fine Base	C Coarse Surface	D Fine Surface	F Fine Mixture
2"	100.0	–	–	–	–
1-1/2"	98.0–100.0	100.0	–	–	–
1"	78.0–94.0	98.0–100.0	100.0	–	–
3/4"	64.0–85.0	84.0–98.0	95.0–100.0	100.0	–
1/2"	50.0–70.0	–	–	98.0–100.0	100.0
3/8"	–	60.0–80.0	70.0–85.0	85.0–100.0	98.0–100.0
#4	30.0–50.0	40.0–60.0	43.0–63.0	50.0–70.0	70.0–90.0
#8	22.0–36.0	29.0–43.0	32.0–44.0	35.0–46.0	38.0–48.0

#30	8.0–23.0	13.0–28.0	14.0–28.0	15.0–29.0	12.0–27.0
#50	3.0–19.0	6.0–20.0	7.0–21.0	7.0–20.0	6.0–19.0
#200	2.0–7.0	2.0–7.0	2.0–7.0	2.0–7.0	2.0–7.0
Design VMA¹, % Minimum					
–	12.0	13.0	14.0	15.0	16.0
Plant-Produced VMA, % Minimum					
–	11.0	12.0	13.0	14.0	15.0

1. Voids in mineral aggregates.

**Table 7
Laboratory Mixture Design Properties**

Mixture Property	Test Method	Requirement
Target laboratory-molded density, %	Tex-207-F	96.5 ¹
Design gyrations (N _{design})	Tex-241-F	50 gyrations ²
Tensile strength (dry), psi	Tex-226-F	85-200 ³
Boil test ⁴	Tex-530-C	-

1. May be adjusted within a range of 96.0–97.0% when shown on the plans or allowed by the Engineer when using the TGC (Tex-204-F, Part I).
2. May be adjusted within a range of 35–100 gyrations when shown on the plans or allowed by the Engineer when using the SGC (Tex-204-F, Part IV).
3. May exceed 200 psi when approved and may be waived when approved.
4. Used to establish baseline for comparison to production results. May be waived when approved.

Article 341.4. Construction, Section D. Mixture Design, Section 2. Job-Mix Formula Approval. The first paragraph is voided and replaced by the following:

2. Job-Mix Formula Approval. The job-mix formula (JMF) is the combined aggregate gradation and target asphalt percentage used to establish target values for hot mix production. JMF1 is the original laboratory mixture design used to produce the trial batch. When WMA is used, JMF1 may be designed and submitted to the Engineer without including the WMA additive. When WMA is used, document the additive or process used and recommend rate on the JMF1 submittal. The Engineer and the Contractor will verify JMF1 based on plant-produced mixture from the trial batch, unless otherwise approved. The Engineer may accept an existing mixture design previously used on a Department project and may waive the trial batch to verify JMF1.

Article 341.4. Construction, Section D. Mixture Design, Section 2. Job-Mix Formula Approval, Section a. Contractor’s Responsibilities, Section (1) Providing Texas Gyratory Compactor is voided and replaced by the following:

(1) Providing Gyratory Compactor. Use a Texas Gyratory Compactor (TGC) calibrated in accordance with Tex-914-K when electing or required to design the mixture in accordance with Tex-204-F, Part I, for molding production samples. Furnish a Superpave Gyratory Compactor (SGC) calibrated in accordance with Tex-241-F when electing or required to design the mixture in accordance with Tex-204-F, Part IV, for molding production samples. If the SGC is used, locate the SGC at the Engineer’s field laboratory and make the SGC available to the Engineer for use in molding production samples.

Article 341.4. Construction, Section D. Mixture Design, Section 2. Job-Mix Formula Approval, Section a. Contractor's Responsibilities, Section (2) Gyratory Compactor Correlation Factors is voided and replaced by the following:

(2) Gyratory Compactor Correlation Factors. Use Tex-206-F, Part II, to perform a gyratory compactor correlation when the Engineer uses a different gyratory compactor. Apply the correlation factor to all subsequent production test results.

Article 341.4. Construction, Section D. Mixture Design, Section 2. Job-Mix Formula Approval, Section a. Contractor's Responsibilities, Section (6) Ignition Oven Correction Factors is voided and replaced by the following:

(6) Ignition Oven Correction Factors. Determine the aggregate and asphalt correction factors from the ignition oven in accordance with Tex-236-F. Provide the Engineer with split samples of the mixtures, including all additives (except water) and blank samples used to determine the correction factors. Correction factors established from a previously approved mixture design may be used for the current mixture design, provided that the mixture design and ignition oven are the same as previously used, unless otherwise directed.

Article 341.4. Construction, Section D. Mixture Design, Section 2. Job-Mix Formula Approval, Section a. Contractor's Responsibilities, Section (8) Trial Batch Approval is voided and replaced by the following:

(8) Trial Batch Approval. Upon receiving conditional approval of JMF1 from the Engineer, provide a plant-produced trial batch including the WMA additive or process, if applicable for verification testing of JMF1 and development of JMF2.

Article 341.4. Construction, Section D. Mixture Design, Section 2. Job-Mix Formula Approval, Section a. Contractor's Responsibilities, Table 9 is voided and replaced by the following:

**Table 9
Operational Tolerances**

Description	Test Method	Allowable Difference from Current JMF Target	Allowable Difference between Contractor and Engineer ¹
Individual % retained for #8 sieve and larger	Tex-200-F or Tex-236-F	±5.0 ²	±5.0
Individual % retained for sieves smaller than #8 and larger than #200		±3.0 ²	±3.0
% passing the #200 sieve		±2.0 ²	±1.6
Asphalt content, %	Tex-236-F	±0.3 ³	±0.3
Laboratory-molded density, %	Tex-207-F	±1.0	±1.0
In-place air voids, %		N/A	±1.0
Laboratory-molded bulk specific gravity		N/A	±0.020
VMA, %, min		Note 4	N/A
Theoretical maximum specific (Rice) gravity	Tex-227-F	N/A	±0.020

1. Contractor may request referee testing only when values exceed these tolerances.
2. When within these tolerances, mixture production gradations may fall outside the master grading limits; however, the % passing the #200 will be considered out of tolerance when outside the master grading limits.
3. Tolerance between trial batch test results and JMF1 is not allowed to exceed 0.5%, unless otherwise directed. Tolerance between JMF1 and JMF2 is allowed to exceed ± 0.3%.
4. Test and verify that Table 6 requirements are met.

Article 341.4. Construction, Section D. Mixture Design, Section 2, Job-Mix Formula Approval, Section b. Engineer’s Responsibilities, Section (1) Gyratory Compactor is voided and replaced by the following:

(1) Gyratory Compactor. For mixtures designed in accordance with Tex-204-F, Part I, the Engineer will use a Department TGC, calibrated in accordance with Tex-914-K, to mold samples for trial batch and production testing. The Engineer will make the Department TGC and the Department field laboratory available to the Contractor for molding verification samples, if requested by the Contractor.

For mixtures designed in accordance with Tex-204-F, Part IV, the Engineer will use a Department SGC, calibrated in accordance with Tex-241-F, to mold samples for laboratory mixture design verification. For molding trial batch and production specimens, the Engineer will use the Contractor-provided SGC at the field laboratory or provide and use a Department SGC at an alternate location. The Engineer will make the Contractor-provided SGC in the Department field laboratory available to the Contractor for molding verification samples.

Article 341.4. Construction, Section E. Production Operations, Section 2. Mixing and Discharge of Materials is supplemented by the following:

When WMA is specified on the plans, produce the mixture and monitor the temperature of the material in the truck before shipping to ensure that it does not exceed 275°F or is less than 215°F. When WMA is specified, the Department will not pay for or allow placement of any WMA produced at more than 275°F or less than 215°F, unless otherwise directed.

Article 341.4. Construction, Section G. Placement Operations is voided and replaced by the following:

G. Placement Operations. Collect haul tickets from each load of mixture delivered to the project and provide the Department's copy to the Engineer approximately every hour, or as directed by the Engineer. Measure and record the temperature of the mixture as discharged from the truck or material transfer device prior to entering the paver and an approximate station number on each ticket. Unless otherwise directed, calculate the daily and cumulative yield for the specified lift and provide to the Engineer at the end of paving operations for each day. The Engineer may suspend production if the Contractor fails to produce haul tickets and yield calculations by the end of paving operations for each day.

Prepare the surface by removing raised pavement markers and objectionable material such as moisture, dirt, sand, leaves, and other loose impediments from the surface before placing mixture. Remove vegetation from pavement edges. Place the mixture to meet the typical section requirements and produce a smooth, finished surface with a uniform appearance and texture. Offset longitudinal joints of successive courses of hot mix by at least 6 in. Place mixture so longitudinal joints on the surface course coincide with lane lines, or as directed. Ensure that all finished surfaces will drain properly. Place mixture within the compacted lift thickness shown in Table 10, unless otherwise shown on the plans or allowed.

Article 341.4. Construction, Section G. Placement Operations, Section 1. Weather Conditions is voided and replaced by the following:

1. Weather Conditions. Place mixture when the roadway surface temperature is equal to or higher than the temperatures listed in Table 10A, unless otherwise approved or as shown on the plans. Measure the roadway surface temperature with a handheld infrared thermometer. The Engineer may allow mixture placement to begin prior to the roadway surface reaching the required temperature requirements, if conditions are such that the roadway surface will reach the required temperature within 2 hrs. of beginning placement operations. Unless otherwise shown on the plans, place mixtures only when weather conditions and moisture conditions of the roadway surface are suitable in the opinion of the Engineer.

In lieu of complying with the requirements in Table 10A, the Contractor may pave any time the roadway is dry and the roadway surface temperature is at least 32°F by using a Pave-IR system (paver mounted infrared bar) and demonstrating to the Engineer that no more than 25°F of thermal segregation exists. When used, operate the Pave-IR system in accordance with Tex-244-F and provide the Engineer with the output results on a daily basis unless otherwise directed.

Article 341.4. Construction, Section G. Placement Operations, Section 1. Weather Conditions is supplemented by the following:

**Table 10A
Minimum Pavement Surface Temperatures**

Originally Specified High Temperature Binder Grade	Minimum Pavement Surface Temperatures in Degrees Fahrenheit	
	Subsurface Layers or Night Paving Operations	Surface Layers Placed in Daylight Operations
PG 64 or lower	45	50
PG 70	55 ¹	60 ¹
PG 76 or higher	60 ¹	60 ¹

1. Contractors may pave at temperatures 10°F lower than the values shown in Table 10A when utilizing a paving process including WMA or equipment that eliminates thermal segregation. In such cases, the contractor must use either a hand held thermal camera or a hand held infrared thermometer operated in accordance with Tex-244-F to demonstrate to the satisfaction of the Engineer that the uncompacted mat has no more than 10°F of thermal segregation.

Article 341.4. Construction, Section G. Placement Operations, Section 3. Lay-Down Operations. The first paragraph is voided and not replaced.

Article 341.4. Construction, Section G. Placement Operations, Section 3. Lay-Down Operations, Section a. Thermal Profile is voided and replaced by the following:

a. Thermal Profile. Use an infrared thermometer or thermal camera to obtain a thermal profile on each subplot in accordance with Tex-244-F. The Engineer may allow the Contractor to reduce the testing frequency based on a satisfactory test history. The Engineer may also obtain as many thermal profiles as deemed necessary. Thermal profiles are not applicable in miscellaneous paving areas subject to hand work such as driveways, crossovers, turnouts, gores, tapers, and other similar areas.

(1) Moderate Thermal Segregation. Any areas that have a maximum temperature differential greater than 25°F but not exceeding 50°F are deemed as having moderate thermal segregation. Take immediate corrective action to eliminate the moderate thermal segregation. Evaluate areas with moderate thermal segregation by performing a density profile in accordance with Section 341.4.I.3.c(2), “Segregation (Density Profile).”

(2) Severe Thermal Segregation. Any areas that have a maximum temperature differential greater than 50°F are deemed as having severe thermal segregation. When the Pave-IR system is not used, no production or placement bonus will be paid for any subplot that contains severe thermal segregation. Unless otherwise directed, suspend operations and take immediate corrective action to eliminate severe thermal segregation. Resume operations when the Engineer determines that subsequent production will meet the requirements of this Item. Evaluate areas with severe thermal segregation by performing a density profile in accordance with Section 341.4.I.3.c(2), “Segregation (Density Profile).” Unless otherwise directed, remove and replace the material in any areas that have both severe thermal segregation and a failing result for Segregation (Density Profile). The subplot in question may receive a production and placement bonus if applicable when the defective material is successfully removed and replaced.

(3) Use of the Pave-IR System. In lieu of obtaining thermal profiles on each subplot using an infrared thermometer or thermal camera, the Contractor may use the Pave IR system (paver mounted infrared bar) to obtain a continuous thermal profile in accordance with Tex-244-F. When using the Pave-IR system, review the output results on a daily basis and, unless otherwise directed, provide the output results to the Engineer for review. Modify the paving process as necessary to eliminate any (moderate or severe) thermal segregation identified by the Pave-IR system. The Engineer may suspend paving operations if the Contractor cannot successfully modify the paving process to eliminate thermal segregation. Density profiles in accordance with Section 341.4.I.3.c(2), “Segregation (Density Profile),” are not required and are not applicable when using the Pave-IR system.

Article 341.4. Construction, Section G. Placement Operations, Section 3. Lay-Down Operations. Table 11 is voided and not replaced.

Article 341.4. Construction, Section I. Acceptance Plan, Section 1. Referee Testing. The second paragraph is voided and replaced by the following:

The Construction Division will determine the laboratory-molded density based on the molded specific gravity and the maximum theoretical specific gravity of the referee sample. The in-place air voids will be determined based on the bulk specific gravity of the cores, as determined by the referee laboratory and the Engineer’s average maximum theoretical specific gravity for the lot. With the exception of “remove and replace” conditions, referee test results are final and will establish pay adjustment factors for the subplot in question. The Contractor may decline referee testing and accept the Engineer’s test results when the placement pay adjustment factor for any subplot results in a “remove and replace” condition. Sublots subject to be removed and replaced will be further evaluated in accordance with Article 341.6, “Payment.”

Article 341.4. Construction, Section I. Acceptance Plan, Section 2. Production Acceptance, Section c. Production Testing. The first paragraph is voided and replaced by the following:

The Contractor and Engineer must perform production tests in accordance with Table 12. The Contractor has the option to verify the Engineer’s test results on split samples provided by the Engineer. The Engineer may use asphalt content results from quality control testing performed by the Contractor to determine VMA. Determine compliance with operational tolerances listed in Table 9 for all sublots.

Article 341.4. Construction, Section I. Acceptance Plan, Section 3. Placement Acceptance, Section a. Placement Lot, Section (2) Incomplete Placement Lots is voided and replaced by the following:

(2) Incomplete Placement Lots. An incomplete placement lot consists of the area placed as described in Section 341.4.I.2.a(2), “Incomplete Production Lot,” excluding miscellaneous areas as defined in Section 341.4.I.3.a(4), “Miscellaneous Areas.” Placement sampling is required if the random sample plan for production resulted in a sample being obtained from an incomplete production subplot.

Article 341.4. Construction, Section I. Acceptance Plan, Section 3. Placement Acceptance, Section b. Placement Sampling. The third and fifth paragraphs are voided and replaced by the following:

Unless otherwise determined, the Engineer will witness the coring operation and measurement of the core thickness. Unless otherwise approved, obtain the cores within 1 working day of the time the placement subplot is completed. Obtain two 6-in. diameter cores side by side from within 1 ft. of the random location provided for the placement subplot. Mark the cores for identification, measure and record the untrimmed core height, and provide the information to the Engineer. Visually inspect each core and verify that the current paving layer is bonded to the underlying layer. If an adequate bond does not exist between the current and underlying layer, take corrective action to ensure that an adequate bond will be achieved during subsequent placement operations. For Type D and Type F mixtures, 4-in. diameter cores are allowed.

If the core heights exceed the minimum untrimmed values listed in Table 10, trim and deliver the cores to the Engineer within 1 working day following placement operations, unless otherwise approved. Trim the bottom or top of the core only when necessary to remove any foreign matter and to provide a level and smooth surface for testing. Foreign matter is another paving layer, such as hot mix, surface treatment, subgrade, or base material. Trim no more than 1/2 in. of material. Do not trim the core if the surface is level and there is not foreign matter bonded to the surface of the core.

In lieu of having the Contractor trim the cores, the Engineer may elect to take possession of the cores immediately after they are obtained from the roadway by the Contractor. In such cases, the Engineer will be responsible for trimming the cores if necessary. If the core height is less than the minimum untrimmed value shown in Table 10, notify the Engineer if electing to not have the cores included in air void determination. After testing, the Engineer will return the cores to the Contractor.

Article 341.4. Construction, Section I. Acceptance Plan, Section 3. Placement Acceptance, Section c. Placement Testing is voided and replaced by the following:

c. Placement Testing. Perform placement tests in accordance with Table 12. After the Engineer returns the cores, the Contractor has the option to test the cores to verify the Engineer's test results for in-place air voids. The allowable differences between the Contractor's and Engineer's test results are listed in Table 9.

Article 341.4. Construction, Section I. Acceptance Plan, Section 3. Placement Acceptance, Section c. Placement Testing, Section (2) Segregation (Density Profile). The first and third paragraphs are voided and replaced by the following:

Test for segregation using density profiles in accordance with Tex-207-F, Part V. Provide the Engineer with the results of the density profiles as they are completed. Density profiles are not required and are not applicable when using the Pave-IR system. Areas defined in Section 341.4.I.3.a(4), "Miscellaneous Areas," are not subject to density profile testing. Density profiles are not applicable in miscellaneous paving areas subject to hand work such as driveways, crossovers, turnouts, gores, tapers, and other similar areas.

The density profile is considered failing if it exceeds the tolerances in Table 13. No production or placement bonus will be paid for any subplot that contains a failing density profile. When the Pave-IR system is not used, the Engineer may measure the density profile at any time, at any location, and as often as deemed necessary to verify conformance. The Engineer's density profile results will be used when available. The Engineer may require the Contractor to remove and replace the area in question if the area fails the density profile and has surface irregularities as defined in Section 341.4.I.3.c(5), "Irregularities." The subplot in question may receive a production and placement bonus if applicable when the defective material is successfully removed and replaced.

Article 341.4. Construction, Section I. Acceptance Plan, Section 3. Placement Acceptance, Section c. Placement Testing, Section (5) Irregularities is voided and replaced by the following:

(5) Irregularities. Identify and correct irregularities including but not limited to segregation, rutting, raveling, flushing, fat spots, mat slippage, irregular color, irregular texture, roller marks, tears, gouges, streaks, uncoated aggregate particles, or broken aggregate particles. The Engineer may also identify irregularities, and in such cases, the Engineer will promptly notify the Contractor. If the Engineer determines that the irregularity will adversely affect pavement performance, the Engineer may require the Contractor to remove and replace (at the Contractor's expense) areas of the pavement that contain irregularities and areas where the mixture does not bond to the existing pavement. If irregularities are detected, the Engineer may require the Contractor to immediately suspend operations or may allow the Contractor to continue operations for no more than 1 day while the Contractor is taking appropriate corrective action.

Article 341.6. Payment. The first paragraph is voided and replaced by the following:

The work performed and materials furnished in accordance with this Item and measured as provided under Article 341.5, "Measurement," will be paid for at the unit price bid for "Dense Graded Hot-Mix Asphalt (QC/QA)" of the type, surface aggregate classification, and binder specified. When shown on the plans, "level up" may be specified. Pay adjustments for bonuses and penalties will be applied as determined in this Item except for level ups, where a pay adjustment factor of 1.000 will be assigned for all production and placement sublots. These prices are full compensation for surface preparation, materials including tack coat, placement, equipment, labor, tools, and incidentals.

Article 341.6. Payment, Section A. Production Pay Adjustment Factors is supplemented by the following:

When WMA is specified on the plans, at the Contractor's request, the Engineer has the option to assign all sublots a production pay adjustment factor of 1.000. When the Engineer elects to assign all sublots a production pay adjustment factor of 1.000, control mixture production to yield a laboratory-molded density with an absolute deviation no greater than 1.0 percent from the target laboratory-molded density as defined in Table 7 or as shown on plans, as tested by the Engineer. The Engineer may suspend production and shipment of mixture if the laboratory-molded density deviates more than 1.0 percent from the target laboratory-molded density for two consecutive sublots.

Article 341.6. Payment, Section B. Placement Pay Adjustment Factors, Section 2. Placement Sublots Subject to Removal and Replacement is voided and replaced by the following:

2. Placement Sublots Subject to Removal and Replacement. If after referee testing, the placement pay adjustment factor for any subplot results in a “remove and replace” condition as listed in Table 15, the Engineer will choose the location of two cores to be taken within 3 ft. of the original failing core location. The Contractor will obtain the cores in the presence of the Engineer. The Engineer will take immediate possession of the untrimmed cores and submit the untrimmed cores to the Materials and Pavements Section of the Construction Division, where they will be trimmed if necessary and tested for bulk specific gravity within 10 working days of receipt. The average bulk specific gravity of the cores will be divided by the Engineer’s average maximum theoretical specific gravity for that lot to determine the new pay adjustment factor of the subplot in question. If the new pay adjustment factor is 0.700 or greater, the new pay adjustment factor will apply to that subplot. If the new pay adjustment factor is less than 0.700, no payment will be made for the subplot. Remove and replace the failing subplot. Replacement material meeting the requirements of this Item will be paid for in accordance with this Article.