MIXTURE DESIGN PROCEDURE FOR FLEXIBLE BASE

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Mixture Design Procedure for Flexible Base

Product 0-6621-P1

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1.1 Mixture Design

1.1.1 Design Requirements

The Contractor shall use an approved laboratory to perform the base course mixture design. The Construction Division maintains a list of approved laboratories at http://www.dot.state.tx.us/txdot_library/publications/producer_list.htm. When shown on the plans, the Engineer will provide the mixture design.

The Contractor may submit a new mixture design anytime during the project. The Engineer will approve all mixture designs before the Contractor can begin placement of the base course.

Provide the Engineer with a mixture design report using Department-provided software. The mixture design shall meet the requirements of Table 1. Include only those items identified in the specification in the report:
-Aggregate gradation (Tex-110-E, Part II)
-Liquid Limit, Plastic Limit, and Plasticity Index (Tex-104-E, Tex-105-E, Tex-106-E)
-Wet Ball Mill (Tex-116-E)
-Compressive Strength (Tex-117-E)
-Sulfate Content (Tex-145-E)
-Moisture-density relationship (Tex-113-E)
-Percent by total mass of recycled portland cement concrete (RPCC) if utilized
-Properties of RPCC (Table 2) gradation (Tex-110-E), deleterious materials (Tex-413-A), and sulfate content (Tex-145-E)
-Percent by total mass of reclaimed asphalt pavement (RAP) if utilized
-Properties of RAP (Table 3), gradation (Tex-110-E), decantation (Tex-406-A), and deleterious materials (Tex-413-A)
-Signature of the Level SB 202 Certified Technician performing the mixture design
-Date the mixture design was performed
-Unique identification number for the mixture design

1.1.2 Job Mix Formula Approval (JMF)

The job mix formula is the Gradation, Liquid Limit, Plasticity Index, Wet Ball Mill, and Compressive Strength as shown on Table 1 as well as the moisture-density relationship determined by Tex-113-E. Job Mix Formula 1 (JMF 1) is determined from material stockpiled at the plant/production site

or the stockpile located at the project site. The Engineer may accept an existing mixture design previously used on a Department project and may waive the requirement for JMF 1.

Conditional approval for JMF 1 will be granted by the Engineer based on samples obtained from project-dedicated stockpiles provided the test results meet the specification requirements. If JMF 1 submitted by the Contractor does not meet all requirements, a new JMF 1 will be submitted to the Engineer for approval according to the methodology specified herein. It is possible that several JMF 1 mixture designs will be submitted by the Contractor and evaluated by the Engineer prior to conditional approval.

A trial section (Lot 1) will be placed on the project by the Contractor using JMF 1. The Engineer will select the location for the trial section (Lot 1).

Samples of the material will be obtained from the windrow during construction of the trial section (Lot 1). The Contractor's and Engineer's test results will be used to verify JMF 1. Final approval of JMF 1 will be based on acceptable test results from the trial section (Lot 1).

Changes in JMF 1 may be made by the Contractor based on results from this trial section (Lot 1). If changes are made, this mixture design will be identified as JMF 2.

The Contractor will use JMF 2 to place Lot 2. Materials will be sampled and tested during the placement of Lot 2. Based on these results JMF 2 may be changed by the Contractor. This mixture design become JMF 3 and will be used on Lot 3. Additional changes in JMFs may be made during the project as described in this specification.

1.1.3 Contractor's Responsibility

1.1.3.1 Provide Mixture Design Laboratory
Provide a TxDOT approved mixture design laboratory that meets the requirements of Tex-198-E.

1.1.3.2 Provide Certified Technicians
Provide TxDOT approved Technician(s) for conducting the mixture design in accordance with Table 4.

1.1.3.3 Submit JMF 1
Furnish a mix design report (JMF 1) to the Engineer. JMF 1 must be submitted to the Engineer by the Contractor a minimum of 15 working days prior to placement of the trial section (Lot 1).

1.1.3.4 Supply Aggregate and Recycled Materials

Sample base course materials from the project stockpile for testing by the Engineer and Referee. Sampling will be performed according to Tex-400-A. The Engineer will witness the sampling. If blends of natural aggregate and recycled materials are proposed for use, supply sufficient quantities of these materials such that the total amount of materials supplied meets the requirements of Tex-400-A. Supply individual materials (natural, RPCC, and RAP) in their approximate proportions.

1.1.3.5 Request Conditional Approval of JMF 1

Request conditional approval of JMF 1 from the Engineer. Conditional approval by the Engineer will be based on testing for requirements in Table 1 (Gradation, Liquid Limit, Plasticity Index, Wet Ball Mill, and Compressive Strength) and a moisture-density relationship. Testing will be performed on the materials supplied in Section 1.1.3.4.

1.1.3.6 Request Approval for Placement of Trial Section (Lot 1)

Request approval for placement of trial section (Lot 1) from the Engineer.

1.1.3.7 Place Trial Section (Lot 1)

The purpose of the trial section (Lot 1) is to verify that both the material and mixture properties meet the requirements in JMF 1 and the materials can be placed at the specified in-place moisture content and in-place dry density. In addition, information is provided to ensure that the difference in measured parameters by both the Contractor and Engineer are within certain limits.

Upon receiving conditional approval of JMF 1 and authorization from the Engineer to place a trial section (Lot 1), place materials from the project stockpile in the trial section (Lot 1).

For placement of the trial section (Lot 1), use only equipment and materials proposed for use on the project. Use a sufficient quantity of materials during the placement of the trial section (Lot 1) to ensure that the mixture meets the specification requirements. Typically the trial section will represent one lot of material.

Provide a trial section that meets the requirements of Table 1 and Table 7, and with an in-place density and in-place moisture content that meets the specification as shown on Table 9.

Note the Engineer may require that the entire Lot be removed and replaced or reworked at the Contractor's expense for failing test results.

1.1.3.8 Number of Trial Sections

Place trial sections as necessary to obtain a mixture that meets the specification requirements.

1.1.3.9 Trial Section Sampling

Obtain representative samples of the materials placed on the trial section (Lot 1) from a windrow according to Tex-400-A. Split the sample into three equal portions. Label these portions as Contractor, Engineer, and Referee. Deliver samples to an appropriate laboratory as directed by the Engineer.

1.1.3.10 Trial Section (Lot 1) Testing

1.1.3.10.1 Material (Production) Properties

Test materials from the trial section to ensure that the materials produced using the proposed JMF 1 meet the requirements shown on Table 1 for the following material parameters for the Grade identified on the Plans:
-Master Gradation
-Liquid Limit
-Plasticity Index
-Wet Ball Mill
-Compressive Strength

A laboratory compacted moisture-density relationship is also determined from samples obtained from the windrow.

For the Contractor, sampling and testing frequency requirements assume that the trial section (Lot 1) is a lot. The minimum sampling and testing for the Contractor are shown on Table 8 and Table 9.

The test results must be within the "Allowable Difference from Current JMF Target" as shown in Table 7. This difference is relative to JMF 1 results obtained by the Contractor's JMF submittal information. Provide a copy of the trial section test results to the Engineer.

Both the Contractor and Engineer are required to sample and test material properties. The allowable difference between Contractor and Engineer test results are shown on Table 7 (Allowable Difference between Contractor and Engineer Test Results).

If the material properties do not meet the requirements of Table 1 and Table 7, additional sampling and testing will be performed and/or a new trial section will be placed and evaluated as directed by the Engineer.

1.1.3.10.2 In-Place (Placement) Properties

Determine in-place density and in-place moisture content of the base course in the trial section according to Tex-115-E. Use the sampling and testing frequency shown for a Lot on Table 9. The test results from the Contractor and Engineer must meet the specification requirements shown on Table 9 as well as the "Allowable Difference between Contractor and Engineer Test Results" shown on Table 9.

1.1.3.11 Request Final Approval of JMF 1

The Engineer will grant final approval of JMF 1 only after all of the Engineer's and Contractor's test results from the Trial Section (Lot 1) are available and all meet the requirements of Table 1, Table 7, and Table 9 as specified above.

1.1.3.12 Development of JMF 2

Based on the results from the trial section (Lot 1), the Contractor may develop a new JMF. This new JMF becomes JMF 2 and will be used to place Lot 2. JMF 2 must meet all the requirements of Table 1.

1.1.3.13 Production

After receiving approval for JMF 2, proceed to Lot 2 placement. Note the Engineer may require that the entire Lot be removed and replaced or reworked at the Contractor's expense for failing test results.

1.1.3.14 Development of JMF 3

Based on the results from the Lot 2, the Contractor may develop a new JMF. This new JMF becomes JMF 3 and will be used to place Lot 3. JMF 3 must meet all the requirements of Table 1.

1.1.3.15 JMF Adjustments

If necessary, adjust the JMF before beginning a new lot.
-The adjusted JMF must be provided to the Engineer in writing before the start of a new lot
-The JMF must be numbered in sequence to the previous JMF
-The JMF must meet all other requirements shown in Table 1
-The JMF must be verified according to the procedures shown in Section 1.1.3.10 for the next Lot placed

1.1.3.16 Requesting Referee Testing

If needed, use referee testing to resolve testing differences with the Engineer. The Construction Division is the referee laboratory. The Contractor may request referee testing if a "rework," "stop production," or a "remove and replace" condition is determined based on the Engineer's test results, or if the differences between Contractor and Engineer test results exceed the maximum allowable difference shown on Table 7 and the difference cannot be resolved. Make the request within two (2) working days after receiving test results and samples from the Engineer. Referee tests will be performed only on the sublot or lot in question and only for the particular test in question. Allow 15 working days from the time the samples are received at the referee laboratory for test results to be reported. The Department may require the Contractor to reimburse the Department for referee tests if more than 3 Referee tests per project are required and the Engineer's test results are closer than the Contractor's test results to the Referee test results.

Referee test results are final and will establish pay adjustment factors for the sublot or lot in question. The Contractor may decline referee testing and accept the Engineer's test results.

1.1.4 Engineer's Responsibility

1.1.4.1 Provide Mixture Design Laboratory

Provide a TxDOT-approved mixture design laboratory that meets the requirements of Tex-198-E.

1.1.4.2 Provide Certified Technicians

Provide TxDOT approved Technician(s) for conducting the mixture design in accordance with Table 4.

1.1.4.3 Conditional Approval of JMF 1

The Engineer will evaluate JMF 1 with samples obtained from Section 1.1.3.4. Materials produced by the Contractor must meet the requirements of Table 1.

The following tests will be conducted:
-Gradation
-Liquid Limit
-Plasticity Index
-Wet Ball Mill
-Compressive Strength
-Optimum Moisture Content
-Maximum Dry Density

The Engineer will consider approval of JMF 1 within 15 working days after receiving samples submitted as described in Section 1.1.3.4.

If JMF 1 submitted by the Contractor does not meet all requirements, a new JMF 1 will be submitted by the Contractor for approval according to the methodology specified herein. It is possible that several JMF 1 mixture designs will be submitted by the Contractor and evaluated by the Engineer prior to conditional approval.

The Engineer may sample and test project materials at any time during the project to verify specification compliance.

1.1.4.4 Approval for Placement of Trial Section (Lot 1)
The Engineer will consider approving the placement of the trial section within one working day of receipt of request for approval from the Contractor in accordance with Section 1.1.3.6. JMF 1 will be used to place the Trial Section (Lot 1).

1.1.4.5 Testing of Trial Section (Lot 1)
Within five working days, the Engineer will sample and test materials from the trial section (Lot 1) to ensure that the material meets the requirements of Table 1, Table 7, and Table 9.

The Engineer is required to perform a minimum of one test for Gradation, Liquid Limit, Plastic Limit, Wet Ball Mill, and Compressive Strength. These test results must meet the requirements of Table 1, the "Allowable Difference from Current JMF Target" shown on Table 7 and "Allowable Difference between Contractor and Engineer Test Results" shown on Table 7. When comparing the "Allowable Difference from Current JMF Target" utilize test results from JMF 1 testing in Section 1.1.4.3 of this specification. When comparing the "Allowable Difference between Contractor and Engineer Test Results" utilize test results from the Trial Section (Lot 1).

A single point on the moisture-density laboratory compaction curve will be determined according to Tex-113-F.

The single point determination for the moisture content and dry density relationship obtained by the Engineer on materials sampled from the Trial Section (Lot 1) must be within the "Allowable Difference from Current JMF Target" shown on Table 7 and the "Allowable Difference between Contractor and Engineer Test

Results" shown on Table 7. When comparing the "Allowable Difference from Current JMF Target" utilize the test result from JMF 1 testing in Section 1.1.4.3 of this specification. When comparing the "Allowable Difference between Contractor and Engineer Test Results" utilize test results from the Trial Section (Lot 1).

The in-place moisture content and dry density for the Trial Section (Lot 1) will be determined at four (4) locations and must meet the specification requirements shown on Table 9 and the "Allowable Difference between Contractor and Engineer Test Results" shown on Table 9.

1.1.4.6 Final Approval of JMF 1

The Engineer will grant final approval of JMF 1 only after all of the Engineer's and Contractor's test results from the Trial Section (Lot 1) are available and all meet the requirements of Table 1, Table 7, and Table 9 as specified above. The Engineer will notify the Contractor that an additional trial section is required if the trial section does not meet these requirements.

The Contractor may develop JMF 2 based on results from the Trial Section (Lot 1).

1.1.4.7 Conditional Approval of JMF 2 and Placement of Lot 2

The Engineer will provide conditional approval of JMF 2 within 1 working day if the submitted JMF meets the requirements shown on Table 1. JMF 2 will be used to place Lot 2 at the Contractor's risk.

1.1.4.8 Final Approval of JMF 2

The Engineer will grant final approval of JMF 2 only after all of the Engineer's and Contractor's test results from Lot 2 are available and all meet the requirements of Table 1, Table 7, and Table 9. Sections 1.1.3.10 and 1.1.4.5 of this specification will be used to determine the acceptance of JMF 2.

The Contractor is allowed to submit a JMF 3 based on results from Lot 2. JMF 3 will be evaluated using the same process as described for JMF 2 in Section 1.1.4.8 of this specification.

The Contractor may submit a new mixture design anytime during the project. The new mixture design will be approved on the next Lot produced according to Sections 1.1.3.10 and 1.1.4.5 of this specification.

Table 1. Material Requirements.

Property	Test Method	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5
Master gradation sieve size (cumulative % passing)						
2 ½ in	Tex-110-E	-	0	0	As shown on the plans	100
1 ¾ in		100	90–100	90–100		95–100
7/8 in		65–90	-	-		65–90
3/8 in		50–70	-	-		35–65
No. 4		35–55	25–55	25–55		25–50
No. 40		15–30	15–40	15–50		10–30
No. Y						
Liquid limit, % max[1]	Tex-104-E	35	40	40	As shown on the plans	35
Plasticity Index, max[1]	Tex-106-E	10	12	12	As shown on the plans	10
Plasticity Index, min[1]		As Shown on Plans				
Wet ball mill, max[2]	TEX-116-E	40	45	-	As shown on the plans	40
Wet ball mill, % max Increase passing the No. 40 sieve		20	20	-	As shown on the plans	20
Sulfate content, max ppm	Tex-145-E					
Min. compression strength, psi	Tex-117-E				As shown on the plans	
Lateral pressure, 0 psi		45	35	-		-
Lateral pressure, 3 psi		-	-	-		90
Lateral pressure, 15 psi		175	175	-		175

[1] Determine plasticity index in accordance with Tex-107-E (linear shrinkage) when liquid limit is unattainable as defined in Tex-104-E.

[2] When a soundness value is required by the plans, test material in accordance with Tex-411-A.

[3] When Classification is required by other plans, a triaxial Classification of 1.0 or less for Grades 1 and 2.3 or less for Grade 2 is required. The Classification requirement for Grade 4 will be as shown on the plans.

Table 2. Requirements for Recycled Portland Cement Concrete (RPCC).

Property	Test Method	Requirement
Gradation Cumulative % Passing, Maximum 2 inches	Tex-110-E	100
Deleterious Materials, % Maximum	Tex 413-A	1.5
Sulfate, ppm Maximum	Tex-145-E	3000

Table 3. Requirements for Reclaimed Asphalt Pavement.

Property	Test Method	Requirement
Gradation Cumulative % Passing, Maximum 2 inches	Tex-110-E	100
Decantation, % Maximum	Tex-406-A	5.0
Deleterious Materials, % Maximum	Tex-413-A	1.5

Table 4. Test Methods, Test Responsibility, and Minimum Certification Levels.

Test Description	Test Method	Contractor	Engineer	Level
1. Aggregate and Recycle Material Testing				
Sampling	Tex-400-A	x	x	SB 101
Sample Preparation	Tex-101-E	x	x	SB 101
Liquid Limit	Tex-104-E	x	x	SB 101
Plastic Limit	Tex-105-E	x	x	SB 101
Calculate Plasticity Index	Tex-106-E	x	x	SB 101
Linear Shrinkage	Tex-107-E	x	x	SB 101, 2
Sieve Analysis of Soils	Tex-110-E	x	x	SB 101
Wet Ball Mill	Tex-116-E	x	x	SB 101
Sulfate Content	Tex-145-E	x	x	SB 103
Dry Sieve	Tex-200-F, Part I	x	x	IA
Wet Sieve	Tex-200-F, Part II	x	x	IA
Decantation	Tex-406-A Tex-217-F, Part II	x	x	Not available 2
Sulfate Soundness	Tex-411-A	x	x	Not available
Deleterious Material	Tex-413-A Tex-217-F, Part I	x	x	Not available 2
Crushed Faces	Tex-460-A	x	x	2
2. Mix Design and Verification				
Moisture Content	Tex-103-E	x	x	SB 102
Moisture Content	Tex-115-E	x	x	SB 102

Test Description	Test Method	Contractor	Engineer	Level
Moisture Density Relationships	Tex-113-E	x	x	SB 201
Triaxial Compression	Tex-117-E	x	x	SB 202
3. Production Testing				
Sampling	Tex-100-E	x	x	SB 101
Sampling	Tex-400-A	x	x	SB 101
Sample Preparation	Tex-101-E	x	x	SB 101
Liquid Limit	Tex-104-E	x	x	SB 101
Plastic Limit	Tex-105-E	x	x	SB 101
Calculate Plasticity Index	Tex-106-E	x	x	SB 101
Linear Shrinkage	Tex-107-E	x	x	SB 101
Sieve Analysis of Soils	Tex-110-E	x	x	SB 101
Wet Ball Mill	Tex-116-E	x	x	SB 101
Sulfate Content	Tex-145-E	x	x	SB 103
Dry Sieve	Tex-200-F, Part I	x	x	IA
Wet Sieve	Tex-200-F, Part II	x	x	IA
Decantation	Tex-406-A Tex-217-F, Part II	x	x	Not available 2
Sulfate Soundness	Tex-411-A	x	x	Not available
Deleterious Material	Tex-413-A Tex-217-F, Part I	x	x	Not available 2
Crushed Faces	Tex-460-A	x	x	2
Moisture Content	Tex-103-E	x	x	SB 102

Test Description	Test Method	Contractor	Engineer	Level
Moisture Content	Tex-115-E	x	x	SB 102
Moisture Density Relationship	Tex-113-E	x	x	SB 201
Selecting Random Numbers	Tex-225-F, Part I	x	x	IA
Control Charts	Tex-233-F	x	x	IA
4. Placement Testing				
Moisture Content	Tex-103-E	x	x	SB 102
Moisture Density Relationship	Tex-113-E	x	x	
Field In-Place Density	Tex-115-E	x	x	SB 102
Triaxial Compression	Tex-117-E	x	x	SB 202
Depth	Tex-140-E	x	x	SB 102
Selecting Random Numbers	Tex-225-F, Part II	x	x	IA
Control Charts	Tex-233-F	x	x	IA
5. Prime Coat				
Prime Coat Sampling	Tex-500-C, Part III	x	x	IA

Table 5. Reporting Schedule.

Description	Reported by	Reported to	To Be Reported Within
Production Quality Control	Contractor	Engineer	1 working day of completion of the sublot or lot
Gradation, liquid limit, plasticity index, wet ball mill, sulfate content, optimum moisture content, maximum dry density			
Production Quality Assurance	Engineer	Contractor	1 working day of completion of the sublot or lot
Gradation, liquid limit, plasticity index, wet ball mill, sulfate content, optimum moisture content, maximum dry density			
Placement Quality Control	Contractor	Engineer	1 working day of completion of the sublot or lot
Optimum moisture content, maximum dry density, in-place density, in-place moisture content, thickness			
Placement Quality Assurance	Engineer	Contractor	1 working day of completion of the sublot or lot
Optimum moisture content, maximum dry density, in-place density, in-place moisture content, thickness			
Pay Adjustment Minus No. 4, Minus No. 200, in-place moisture content, in-place density	Engineer	Contractor	2 working days of performing all required tests and receiving contractors' test data

Table 6. Minimum Production and Placement Sampling and Testing Requirements.

Property	Test Method	Process Control [1]	Quality Control [2]	Quality Assurance [3]	Pay Adjustment [4]
Gradation Accumulative % Passing					
2 ½ in	Tex-110-E, Part II	Determined by Contractor	1 per sublot	1 per 12 sublots	
1 ¾ in					
7/8 in					
3/8 in					
No. X					4 per lot
No. 40					
No. Y					4 per lot
Liquid Limit, % Max[1]	Tex-104-E		1 per lot	1 per 3 lots	
Plasticity Index, Max[1]	Tex-105-E Tex-106-E		1 per lot	1 per 3 lots	
Plasticity Index, Min[1]					
Wet Ball Mill, Max[2]	Tex-116-E		1 per lot	1 per 3 lots	
Wet Ball Mill, % Max Increase Passing the No. 40 Sieve					
Sulfate Content, ppm[3]	Tex-145-E		1 per lot	1 per 3 lots	
Min. Compression Strength[3], psi Lateral Pressure, 0 psi Lateral Pressure, 3 psi Lateral Pressure, 15 psi	Tex-117-E		1 per lot	1 per 3 lots	
Optimum Moisture Content, %	Tex-113-E		1 per lot	1 per 3 lots	
Max Dry Density, lb per cu. ft.					
In-place Density, %	Tex-115-E		4 per sublot	1 per sublot	16 per lot
In-place Moisture Content, %					16 per lot
Thickness	Tex-140-E		1 per sublot	1 per lot	

[1] Determined by Contractor
[2] Performed by Contractor
[3] Performed by Engineer
[4] Performed by Engineer

Table 7. Allowable Material Property (Production) Differences and Specification Limits.

Property	Test Method		Allowable Difference from Current JMR Target	Allowable Difference between Contractor and Engineer Test Results	Specification Limits for Pay Factor Determination
Gradation Accumulative Percent Passing					
2 ½ in	Tex-110-E				
1 ¾ in			5	5	
7/8 in			5	5	
3/8 in			5	5	
No. 4			5	5	± 5
No. 40			3	3	
No. Y					Plus or minus
Liquid Limit	Tex-104-E		5	5	
Plasticity Index	Tex-105-E Tex-106-E		4	4	
Wet Ball Mill, Max	Tex-116-E		5	5	
Wet Ball Mill, % Increase Passing the No. 40 Sieve Percentage Points			4	4	
Sulfate Content, ppm	Tex-145-E				
Min. Compression Strength, psi	Tex-117-E				
Lateral Pressure, 0 psi			10	8	
Lateral Pressure, 3 psi			15	12	
Lateral Pressure, 15 psi			20	15	
Optimum Moisture Content, %	Tex-113-E		0.3	0.3	
Max Dry Density, lb per cu. ft.			1.0	1.0	

Table 8. Production Testing Frequency.

Property	Test Method	Minimum Contractor Testing Frequency (Quality Control)	Minimum Engineer Testing Frequency (Quality Assurance)
Gradation			
2 ½ in	Tex-110-E	1 per sublot	1 per 12 sublots
1 ¾ in			
7/8 in			
3/8 in			
No. 4			
No. 40			
No. 200			
Liquid Limit	Tex-104-E	1 per lot	1 per 3 lots
Plasticity Index	Tex-105-E Tex-106-E	1 per lot	1 per 3 lots
Wet Ball Mill	Tex116-E	1 per lot	1 per 3 lots
Sulfate Content, ppm	Tex-145-E	1 per lot	1 per 3 lots
Min. Compression Strength[3], psi Lateral Pressure, 0 psi Lateral Pressure, 3 psi Lateral Pressure, 15 psi	Tex-117-E	1 per lot	1 per 3 lots
Optimum Moisture Contend Maximum Dry Density	Tex-113-E	1 per lot	1 per lot

Table 9. Placement Testing Frequency, Allowable Differences, and Specification Limits.

Property	Test Method	Minimal Contractor Testing Frequency	Minimal Engineer Testing Frequency	Allowable Difference from Current JMF Target	Allowable Difference between Contractor and Engineer	Specification Limits
Optimum Moisture Content, %	Tex-113-E	1 per lot	1 per 3 lots	0.3 (percentage points)	0.3 (percentage points)	
Maximum Dry Density, lb per cu. ft				1.0	1.0	
In-place Density, % [1]	Tex-115-E	4 per sublot	1 per sublot		2.0 (percentage points)	100
In-place Moisture Content, % [1]					0.5 (percentage points)	± 1.5
Thickness, in.	Tex-140-E	1 per sublot	1 per sublot		0.5	– 0.5 + 0.5

[1] Relative to max dry density and optimum moisture content as determined according to Tex-113-E