GUIDE SCHEDULE OF SAMPLING & TESTING FOR DESIGN-BUILD PROJECTS BY THE INDEPENDENT QUALITY FIRM (IQF)

August 29, 2017

Texas Department of Transportation

Using the Guide Schedule

The Independent Quality Firm (IQF) will perform materials sampling at locations and timing defined in this *Guide Schedule of Sampling and Testing for Design-Build Projects by the IQF* (hereafter referred to as the *DB Guide Schedule*). This minimum testing frequency must be met with random independent samples as defined in the *Quality Assurance Program for CDA / Design-Build Projects with a Capital Maintenance Agreement with Three Optional 5-Year Terms* (*DB QAP*), Section 3.2 – Sampling and Testing. During the start-up of new categories of work and when there are any concerns over the quality of materials, the IQF will conduct testing at a higher frequency.

The IQF will determine random sample locations using ASTM D3665. While the testing of random independent samples is required to meet the requirements of this *DB Guide Schedule*, the IQF will perform additional (fixed) tests when the quality of material is questionable at a location other than the randomly selected location. These fixed tests will constitute an acceptance test, and a failing result must be addressed in a similar manner to a failing random independent test. Fixed tests will not count toward meeting minimum IQF testing frequencies.

Research of sampling and testing rates listed for project tests in this *DB Guide Schedule* show that the risk of either rejecting "good" material or accepting "bad" material ranges from 20% to 40%. To reduce this risk, the sampling rate will be increased during initial production. A four-fold increase in testing frequency will generally reduce risk to approximately 5%. The intent of increasing testing at the start of production is to ensure that the DB Contractor's processes are in control and to establish acceptability requirements early.

The IQF can use results from TxDOT's Material Producer List (MPL). For materials listed on the MPL, the IQF will be required to perform job control tests as defined by the TxDOT *DB Guide Schedule*. Materials that are not monitored or not pre-approved by TxDOT under the MPL are subject to IQF and OV sampling and testing as part of the acceptance program, except as noted in the remarks of this document. The IQF will audit and verify that materials delivered to the project site are in conformance with approved materials submittals. The IQF and TxDOT's designee will use approved laboratories from the MPL when applicable.

When using materials or processes that are listed on the TxDOT MPL, the DB Contractor will furnish samples of materials to be incorporated into the Work at TxDOT's request. Manufacturer's warranties, guarantees, instruction sheets, parts lists, and other materials that are furnished with articles or materials incorporated into the work will be made available to TxDOT upon request.

Other testing required by the specifications but not shown in the *DB Guide Schedule* should be performed at a frequency necessary to provide adequate confidence that materials meet specifications.

This is a guide for minimum sampling and testing.
Testing frequency may need to be increased for high material variability or when test results approach specification limits.

TABLE I – EMBANKMENTS, SUBGRADES, BACKFILL, AND BASE COURSES

			PROJECT TESTS		
MATERIAL OR PRODUCT	TEST FOR	TEST NUMBER	LOCATION OR TIME OF SAMPLING	FREQUENCY OF SAMPLING (D)	REMARKS
EMBANKMENT (CUTS & FILLS)	Liquid Limit **(A)**	Tex-104-E	During stockpiling operations, from completed stockpile, or project site **(B)**	Materials with PI ≤ 15: 10,000 CY	For Type A embankment or when required by the plans. Determine a new liquid limit and plasticity index for each different material or notable change in material. Sample in accordance with Tex-100-E.
	Plasticity Index **(A)**	Tex-106-E		Materials with PI > 15: 5,000 CY	
	Gradation	Tex-110-E		Each 10,000 CY	When shown on plans. Sample in accordance with Tex-100-E.
	Moisture/Density	Tex-114-E		As directed by the IQF	Not required for ordinary compaction. Determine a new optimum moisture and maximum density for each different material or notable change in material. Sample in accordance with Tex-100-E.
	In-Place Density **(A)**	Tex-115-E, Part I	As designated by the IQF	Fill: each 5,000 CY Min 1 per lift	Not required for ordinary compaction. Determine a new optimum moisture and maximum density according to Tex-114-E for each different material or notable change in material. Correct the moisture contents measured by nuclear density gauge in Tex-115-E with the moisture contents determined in accordance with Tex-103-E, as necessary for control, for each different material or notable change in material, and adjust the density accordingly. Materials such as RAP, gypsum, lime, cement, and iron ore tend to bias the counts for nuclear density gauges.
				Cut: each 6,000 LF	
RETAINING WALL (NON-SELECT BACKFILL)	As shown above for Embankment (Cuts and Fills)		As shown above for Embankment (Cuts and Fills)	As shown above for Embankment (Cuts and Fills)	Sample in accordance with Tex-100-E.
RETAINING WALL (SELECT BACKFILL)	Gradation	Tex-110-E	During stockpiling operations, from completed stockpile, or project site **(B)**	Each 5,000 CY	Sample in accordance with Tex-400-A.
	Resistivity **(A)**	Tex-129-E	During stockpiling operations, from completed stockpile, or project site **(B)**	Each 5,000 CY	For material with resistivity between 1,500 and 3,000 ohm-cm, determine chloride and sulfate content, as specified in Item 423. Sample in accordance with Tex-400-A.
	pH **(A)**	Tex-128-E	During stockpiling operations, from completed stockpile, or project site **(B)**	Each 5,000 CY	Sample in accordance with Tex-400-A.

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MATERIAL OR PRODUCT	TEST FOR	TEST NUMBER	LOCATION OR TIME OF SAMPLING	FREQUENCY OF SAMPLING (D)	REMARKS
RETAINING WALL (SELECT BACKFILL) (continued)	Soundness	Tex-411-A	During stockpiling operations, or from completed stockpile	1 per source, per project	Micro-Deval test may be used in lieu of the soundness test when the Micro-Deval test results are not greater than 20%. Test when backfill sources appear to contain particles such as shale, caliche, or other soft, poor-durability particles. Sample in accordance with Tex-400-A and submit to CST/M&P for testing prior to use.
	Micro-Deval Abrasion	Tex-461-A	During stockpiling operations, or from completed stockpile	1 per source, per project	Micro-Deval test results may be used in lieu of soundness when test results are not greater than 20%. Test when backfill sources appear to contain particles such as shale, caliche, or other soft, poor-durability particles. Sample in accordance with Tex-400-A.
	In-Place Density **(A)**	Tex-115-E, Part I	As designated by the IQF	1 per backfill lift, per wall	Not required for rock backfill. For walls greater than 500 ft. in length, perform one test per lift for every 500 ft. in length. **(D)** Correct the moisture contents measured by nuclear density gauge in Tex-115-E with the moisture contents determined in accordance with Tex-103-E for each different material or notable change in material, and adjust the density accordingly.
UNTREATED SUBGRADE	Uniformity: Dynamic Cone Penetration (DCP)	ASTM D6951	As designated by the IQF	1 per 250-LF section (when using proof rolling) 1 per 250 Linear Foot or 1000-LF section (when using IC data)	When using proof rolling: perform one test for every 250-LF section. When using proof-mapping IC data: perform one test for every 250-LF section of roadbed for those locations classified as “red-mapped,” or as directed by the IQF. Perform one test for every 1000-LF section of roadbed for non-“red-mapped” locations.
UNTREATED BASE COURSES	Liquid Limit **(A)**	Tex-104-E	During stockpiling operations, from completed stockpile, or windrow **(B)**	Each 5,000 CY	Sample in accordance with Tex-400-A.
	Plasticity Index **(A)**	Tex-106-E	During stockpiling operations, from completed stockpile, or windrow **(B)**	Each 5,000 CY	

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MATERIAL OR PRODUCT		TEST FOR	TEST NUMBER	LOCATION OR TIME OF SAMPLING	FREQUENCY OF SAMPLING (D)	REMARKS
UNTREATED BASE COURSES (continued)		Crushed Face Count (A)	Tex-460-A, Part I	During stockpiling operations, or from completed stockpile	Each 20,000 CY	Required for Type C crushed gravel only.
		Gradation (A)	Tex-110-E	During stockpiling operations, from completed stockpile, or windrow (B)	Each 5,000 CY	Sample in accordance with Tex-400-A.
		Moisture/Density	Tex-113-E	From completed stockpile at the source (C)	Each 20,000 CY	Not required for ordinary compaction. Sample in accordance with Tex-400-A.
		Wet Ball Mill (A)	Tex-116-E	From completed stockpile at the source (C)	Each 20,000 CY	Required for Grades 1–2 and 5, and as shown on the plans for Grade 4. Sample in accordance with Tex-400-A.
		Strength (A)	Tex-117-E	From completed stockpile at the source (C)	Each 20,000 CY	Required for Grades 1–2 and 5, and as shown on the plans for Grade 4. When base material is from a source where the District has a record of satisfactory triaxial results, the frequency of testing may be reduced to one per 30,000 CY. If any one test falls below the minimum value required, the frequency of testing will return to the original frequency of 20,000 CY. Sample in accordance with Tex-400-A.
		In-Place Density (A)	Tex-115-E, Part I	As designated by the IQF	Each 3,000 CY, Min 1 per lift	Correct the moisture contents measured by nuclear density gauge in Tex-115-E with the moisture contents determined in accordance with Tex-103-E, as necessary for control, for each different material or notable change in material, and adjust the density accordingly. Materials such as RAP, gypsum, lime, cement, and iron ore tend to bias the counts for nuclear density gauges.
TREATED SUBGRADE AND BASE COURSES	SUBGRADE BEFORE TREATMENT	Organic Content	Tex-148-E	As designated by the IQF	1 per 500 linear feet or 5,000 CY	Required for existing subgrade material and material imported from a borrow source. Soil survey and geologic maps may be used to determine sampling locations. Sample in accordance with Tex-100-E.
		Sulfate Content	Tex-145-E	As designated by the IQF	1 per 500 linear feet or 5,000 CY	Required for existing subgrade material and material imported from a borrow source. Soil survey and geologic maps may be used to determine sampling locations. Sample in accordance with Tex-100-E.

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				PROJECT TESTS		
MATERIAL OR PRODUCT		TEST FOR	TEST NUMBER	LOCATION OR TIME OF SAMPLING	FREQUENCY OF SAMPLING (D)	REMARKS
TREATED SUBGRADE AND BASE COURSES (continued)	NEW BASE MATERIAL	Liquid Limit (A)	Tex-104-E	During stockpiling operations, from completed stockpile, or windrow (B)	Each 5,000 CY	When central mix site or plant is used, windrow sampling may be waived. Sample in accordance with Tex-400-A.
		Plasticity Index (A)	Tex-106-E	During stockpiling operations, from completed stockpile, or windrow (B)	Each 5,000 CY	
		Gradation (A)	Tex-110-E	During stockpiling operations, from completed stockpile, or windrow (B)	Each 5,000 CY	Sample in accordance with Tex-400-A.
		Wet Ball Mill (A)	Tex-116-E	From completed stockpile at the source (C)	Each 20,000 CY	Required for Grades 1–2 and 5, and as shown on the plans for Grade 4. Sample in accordance with Tex-400-A.
		Strength (A)	Tex-117-E	From completed stockpile at the source (C)	Each 20,000 CY	Required for Grades 1–2 and 5, and as shown on the plans for Grade 4. When base material is from a source where the District has a record of satisfactory triaxial results, the frequency of testing may be reduced to one per 30,000 CY. If any one test falls below the minimum value required, the frequency of testing will return to the original frequency of 20,000 CY.
	RECLAIMED ASPHALT PAVEMENT (RAP), CRUSHED CONCRETE, and RECYCLED MATERIALS	Sulfate Content (A)	Tex-145-E	During stockpiling operations, from completed stockpile, or windrow (B)	Each 5,000 CY	Required only for DB Contractor-furnished recycled material, including crushed concrete. Not required for RAP. Sample in accordance with Tex-400-A.
		Deleterious Material (A)	Tex-413-A		Each 5,000 CY	Required only for DB Contractor-furnished recycled material, including crushed concrete. Sample in accordance with Tex-400-A.
		Decantation (A)	Tex-406-A, Part I		Each 5,000 CY	Required only for DB Contractor-furnished RAP. Sample in accordance with Tex-400-A.

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				PROJECT TESTS		
MATERIAL OR PRODUCT		TEST FOR	TEST NUMBER	LOCATION OR TIME OF SAMPLING	FREQUENCY OF SAMPLING (D)	REMARKS
TREATED SUBGRADE AND BASE COURSES (continued)	LIME	Compliance with DMS-6350	Tex-600-J	During delivery to project	Commercial Lime Slurry: each 200 tons of lime Carbide Lime Slurry: each 100 tons of lime	Sample in accordance with Tex-600-J.Verify the source is listed on the current MPL for Lime. Only materials appearing on the MPL will be accepted. Sample frequency for Carbide Lime Slurry may be increased as directed by the IQF. For Hydrated Lime and Quick Lime, project testing is not required, but it is encouraged to sample and test the material at a rate of 1 per project as a best practice.
	CEMENT	Compliance with DMS-4600		Railroad car, truck, or cement bins		Verify the source is listed on the current MPL for Cement. If not, sample and test in accordance with DMS-4600.
	FLY ASH MATERIAL	Compliance with DMS-4615		Project samples at location designated by the IQF		Verify the source is listed on the current MPL for Fly Ash. Only materials from CST/M&P-approved sources appearing on the MPL for Fly Ash will be accepted. Project testing is not required, but it is encouraged to sample and test the material at a rate of 1 per project as a best practice.
	UNCOMPACTED MIXTURE	Pulverization Gradation	Tex-101-E, Part III	Roadway, after pulverization and mixing	As necessary for control	At the beginning of the project, one test must be made for each 4,500 CY or 6,000 tons until the IQF is satisfied that acceptable pulverization results are being obtained. Sample in accordance with Tex-100-E.
		Moisture/Density Curve and Strength	Tex-120-E, Part II or Tex-121-E, Part II	From roadway windrow after treatment	Each 20,000 CY	Not required for ordinary compaction. Determine a new moisture/density curve for each different or notable change in material. Perform Tex-120-E, Part II, for Cement-Treated Material, and Tex-121-E, Part II, for Lime, Lime-Fly Ash, or Fly Ash-Treated Material. If Tex-120-E, Part I; Tex-121-E, Part I; or Tex-127-E is performed prior to the project, this test may be waived. Sample in accordance with Tex-100-E.

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MATERIAL OR PRODUCT		TEST FOR	TEST NUMBER	LOCATION OR TIME OF SAMPLING	FREQUENCY OF SAMPLING (D)	REMARKS
TREATED SUBGRADE AND BASE COURSES (continued)	COMPACTED MIXTURE	In-Place Density **(A)**	Tex-115-E, Part I	As designated by the IQF	Each 3,000 CY, Min 1 per lift	Determine the appropriate moisture/density curve for each different material or notable change in material. Correct the moisture contents measured by nuclear density gauge in Tex-115-E with the moisture contents determined in accordance with Tex-103-E, as necessary for control, for each different material or notable change in material, and adjust the density accordingly. Stabilizers and materials such as RAP, gypsum, and iron ore tend to bias the counts for nuclear density gauges.
		Uniformity: Dynamic Cone Penetration (DCP)	ASTM D6951	As designated by the IQF	1 per 250-LF section (when using proof rolling) 1 per 250 Linear foot or 1000-LF section (when using IC equipment)	When using proof rolling: perform one test for every 250-LF section. When using proof-mapping IC data: perform one test for every 250-LF section of roadbed for those locations classified as “red-mapped,” or as directed by the IQF. Red-mapped areas are locations not achieving at least 25% of the Intelligent Compaction Measured Value (ICMV). Perform one test for every 1000-LF section of roadbed for non-“red-mapped” locations. Perform testing on the final treated layer after curing as per specification requirements.
		Ride Quality **(A)**	Tex-1001-S Surface Test Type B	Final riding surface of travel lanes		This section applies to the final travel lanes that receive a 1- or 2-course surface treatment for the final surface, unless otherwise shown on the plans.

TABLE I – FOOTNOTES	
A	When this project acceptance test fails but the product is accepted, document the reasons for acceptance on the Engineering Judgment Log.
B	The IQF will select any of these locations or any combinations thereof with the provision that the initial sample will be obtained from the completed stockpile at the source, and at least one out of ten consecutive samples will be taken at the project site (from the windrow for treated and untreated bases and embankments, when possible).
C	The IQF will sample from the completed stockpile at the source and test prior to placement.
D	Each test performed that is based on a quantity of material is considered “or fraction thereof” for calculating number of tests.

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TABLE IA – ASPHALT TREATED BASE (Plant Mix)					
			PROJECT TESTS		
MATERIAL OR PRODUCT	TEST FOR	TEST NUMBER	LOCATION OR TIME OF SAMPLING	FREQUENCY OF SAMPLING (B)	REMARKS
AGGREGATE	Gradation (A)	Tex-200-F, Part I	During stockpiling operations, from completed stockpile, or prior to mixing	Each 5,000 CY	Sample in accordance with Tex-400-A.
	Liquid Limit (A)	Tex-104-E	During stockpiling operations, from completed stockpile, or prior to mixing	Each 5,000 CY	Sample in accordance with Tex-400-A.
	Plasticity Index (A)	Tex-106-E	During stockpiling operations, from completed stockpile, or prior to mixing	Each 5,000 CY	
	Wet Ball Mill or L.A. Abrasion (A)	Tex-116-E or Tex-410-A	During stockpiling operations, from completed stockpile, or prior to mixing	Each 20,000 CY	When L.A. Abrasion is shown on the plans, tests are not required when the published value of the source, as listed on the current Material Producer List for the BRSQC, meets the project specifications. When the source is not listed on the BRSQC, sample in accordance with Tex-400-A and submit to CST/M&P for testing prior to use.
	Crushed Face Particle Count (A)	Tex-460-A, Part I	During stockpiling operations, from completed stockpile, or prior to mixing	1 per project, per source	Only required for crushed gravel, not for crushed stone sources. Sample in accordance with Tex-400-A.
	Sand Equivalent	Tex-203-F	Hot aggregate bins, feeder belt, or stockpile	1 per project, per source	When designated by the IQF, test may be run on combined aggregates when multiple sources are used. Sample in accordance with Tex-400-A.
RECLAIMED ASPHALT PAVEMENT (RAP) and RECYCLED AGGREGATE	Decantation	Tex-406-A,Part I	During stockpiling operations, from completed stockpile, or prior to mixing	Each 10,000 CY	Sample in accordance with Tex-400-A.
LIME	Compliance with DMS-6350		During delivery to the project	Hydrated Lime: 1 per project Commercial Lime Slurry: each 200 tons of lime (B) Carbide Lime Slurry: each 100 tons of lime (B) Quick Lime: 1 per project	On projects requiring less than 50 tons, material from CST/M&P-approved sources may be accepted on the basis of Producer's Certification without sampling.

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			PROJECT TESTS		
MATERIAL OR PRODUCT	TEST FOR	TEST NUMBER	LOCATION OR TIME OF SAMPLING	FREQUENCY OF SAMPLING (B)	REMARKS
ASPHALT BINDER	Compliance with Item 300 – Binder and Tack Coat		Sampled, tested, and preapproved by CST/M&P. Take project samples when designated by the IQF.	1 each for binder and tack coat per project, per grade, per source	Test at least one sample taken from the project. Sample tack coat at the distributor on the roadway in accordance with Tex-500-C, Part III. Sample binder at the hot mix plant in accordance with Tex-500-C, Part II. Binder should arrive on the project pre-approved. If not pre-approved, sample binder before use.
MIX DESIGN VERIFICATION	Compliance with applicable specification	Tex-204-F	At source (if not approved)	Min 1 design per Mix Type and Asphalt Grade	Verify that aggregates, recycled asphalt pavement, recycled asphalt shingles, mineral filler, asphalt binder, anti-stripping additives, and warm mix systems are on the MPL, where applicable, and that they meet project specification requirements. Project sampling and testing may be conducted on individual materials as necessary for control.
COMPLETE MIXTURE	Laboratory Density (A)	Tex-126-E	Plant Mix	20,000 CY (25,000 tons)	Sample in accordance with Tex-222-F.
	Percent Asphalt (A)	Tex-236-F	Plant Mix	Each 1,500 CY (2,000 tons) or days production	Determine asphalt content correlation factors for ignition oven at a minimum of one per project. Sample in accordance with Tex-222-F.
	Indirect Tensile Strength – Dry (A)	Tex-226-F	Plant Mix	1 per project	Sample in accordance with Tex-222-F.
	Moisture Content (A)	Tex-212-F, Part II	Plant Mix	1 per project	Sample in accordance with Tex-222-F.
	Moisture Susceptibility	Tex-530-C	As designated by the IQF	1 per project, per design	Sample in accordance with Tex-222-F.
ROADWAY	In-Place Air Voids (A)	Tex-207-F	Roadway cores, as designated by the IQF (B)	Each 2,500 CY (3,000 tons) or days production	Not required for ordinary compaction. Sample in accordance with Tex-222-F.
	Ride Quality (A)	Surface Test Type A	On finished Surface	As directed by IQF	Unless otherwise shown on the plans.

TABLE IA – FOOTNOTES	
A	When this project acceptance test fails but the product is accepted, document the reasons for acceptance on the Engineering Judgment Log.
B	Each test performed that is based on a quantity of material is considered “or fraction thereof” for calculating number of tests.

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TABLE II – SEAL COAT					
			PROJECT TESTS		
MATERIAL OR PRODUCT	TEST FOR	TEST NUMBER	LOCATION OR TIME OF SAMPLING	FREQUENCY OF SAMPLING (B)	REMARKS
AGGREGATE	Gradation (A)	Tex-200-F, Part I	Stockpile (At source or at point of delivery)	One each 1,000 CY	Rate may be reduced to one each 2,000 CY if the IQF approves a DB Contractor quality control plan. Sample in accordance with Tex-221-F.
	L. A. Abrasion (A)	Tex-410-A	Stockpile	1 per 20,000 CY	Verify the published value of the source, as listed on the current BRSQC, meets the project specifications. If not, sample in accordance with Tex-221-F and submit to CST/M&P for testing prior to use.
	Magnesium Soundness (A)	Tex-411-A	Stockpile	1 per 20,000 CY	Verify the published value of the source, as listed on the current BRSQC, meets the project specifications. If not, sample in accordance with Tex-221-F and submit to CST/M&P for testing prior to use.
	Surface Aggregate Classification (A)	Tex-612-J, Tex-411-A	Stockpile	1 per 20,000 CY	Verify the published value of the source, as listed on the current BRSQC, meets the project specifications. If not, sample in accordance with Tex-221-F and submit to CST/M&P for testing prior to use.
	Pressure Slake (A)	Tex-431-A	Stockpile	1 per 20,000 CY	Verify the published value of the source, as listed on the current BRSQC, meets the project specifications. If not, sample in accordance with Tex-221-F and submit to CST/M&P for testing prior to use. Required only for lightweight aggregate.
	Freeze Thaw (A)	Tex-432-A	Stockpile	1 per 20,000 CY	Verify the published value of the source, as listed on the current BRSQC, meets the project specifications. If not, sample in accordance with Tex-221-F and submit to CST/M&P for testing prior to use. Required only for lightweight aggregate.
	Unit Weight	Tex-404-A	Stockpile	1 per 20,000 CY	Verify the published value of the source, as listed on the current BRSQC, meets the project specifications. If not, sample in accordance with Tex-221-F and submit to CST/M&P for testing prior to use. Required only for lightweight aggregate.
	24-hr. Water Absorption (A)	Tex-433-A	Stockpile	1 per 20,000 CY	Verify the published value of the source, as listed on the current BRSQC, meets the project specifications. If not, sample in accordance with Tex-221-F and submit to CST/M&P for testing prior to use. Required only for lightweight aggregate.
	Crushed Face Count	Tex-460-A, Part I	Stockpile	1 per 20,000 CY	Only required for crushed gravel. Sample in accordance with Tex-221-F.
	Deleterious Material (A)	Tex-217-F, Part I	Stockpile	1 per 10,000 CY	Not required for lightweight aggregate. Sample in accordance with Tex-221-F.

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TABLE II – SEAL COAT					
			PROJECT TESTS		
MATERIAL OR PRODUCT	TEST FOR	TEST NUMBER	LOCATION OR TIME OF SAMPLING	FREQUENCY OF SAMPLING (B)	REMARKS
AGGREGATE (continued)	Decantation (A)	Tex-406-A	Stockpile	1 per 10,000 CY	Sample in accordance with Tex-221-F.
	Flakiness Index	Tex-224-F	Stockpile	Frequency as directed by the IQF	Sample in accordance with Tex-221-F.
	Micro-Deval Abrasion	Tex-461-A	Stockpile	1 per project or as necessary for control	Compare result to published value listed on the current BRSQC. Submit sample to CST/M&P for Soundness and L.A. Abrasion testing when results differ by more than 3% points, unless otherwise directed by the IQF. Sample in accordance with Tex-221-F.
PRECOATED AGGREGATE	Asphalt Content	Tex-236-F	Stockpile	Frequency as directed by the IQF when a target value is specified	Sample in accordance with Tex-221-F.
ASPHALT	Compliance with Item 300		Sampled, tested, and preapproved by CST/M&P. Take project samples when designated by the IQF from the distributor or transport.	1 per project, per grade, per source	Sample in accordance with Tex-500-C. Binder should arrive on the project pre-approved. If not pre-approved, sample binder before use.

TABLE II – FOOTNOTES	
A	When this project acceptance test fails but the product is accepted, document the reasons for acceptance on the Engineering Judgment Log.
B	Each test performed that is based on a quantity of material is considered “or fraction thereof” for calculating number of tests.

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TABLE III – HYDRAULIC CEMENT CONCRETE – STRUCTURAL (Classes: C, F, H, S, CO, K, LMC, or SS)						
				PROJECT TESTS		
MATERIAL OR PRODUCT		TEST FOR	TEST NUMBER	LOCATION OR TIME OF SAMPLING	FREQUENCY OF SAMPLING	REMARKS
MINERAL AGGREGATE	COARSE AGGREGATE	Decantation	Tex-406-A	From stockpile at concrete plant	Each 20,000 CY of concrete (each source)	Sample in accordance with Tex-400-A.
		Sieve Analysis (A)	Tex-401-A		Each 1,000 CY of concrete (each source)	Sample in accordance with Tex-400-A. Test combined aggregate when used.
		Deleterious Materials	Tex-413-A		1 per project or as necessary for control	Sample in accordance with Tex-400-A.
		Los Angeles Abrasion (A)	Tex-410-A		Two, each source	Verify the value of the source, as listed on the current CRSQC, meets the project specifications. If not, sample and submit to CST/M&P for testing prior to use in accordance with Tex-499-A. Sample in accordance with Tex-400-A.
		5-Cycle Magnesium Sulfate Soundness (A)	Tex-411-A		Two, each source	Verify the value of the source, as listed on the current CRSQC, meets the project specifications. If not, sample and submit to CST/M&P for testing prior to use in accordance with Tex-499-A. Sample in accordance with Tex-400-A.
	FINE AGGREGATE	Sand Equivalent	Tex-203-F	From stockpile at concrete plant	1 per project or as necessary for control	Sample in accordance with Tex-400-A. Test combined aggregate when used.
		Organic Impurities	Tex-408-A		1 per project, per source	Sample in accordance with Tex-400-A.
		Sieve Analysis (A)	Tex-401-A		Each 1,000 CY of concrete (each source)	Sample in accordance with Tex-400-A.
		Fineness Modulus	Tex-402-A		1 per project or as necessary for control	Sample in accordance with Tex-400-A. Test combined aggregate when used. Test to confirm material variability when strength values are in question.
		Deleterious Material	Tex-413-A		1 per project or as necessary for control	Sample in accordance with Tex-400-A. Test to confirm material variability when strength values are in question.

This is a guide for minimum sampling and testing.
Testing frequency may need to be increased for high material variability or when test results approach specification limits.

TABLE III – HYDRAULIC CEMENT CONCRETE – STRUCTURAL (Classes: C, F, H, S, CO, K, LMC, or SS)						
				PROJECT TESTS		
MATERIAL OR PRODUCT		TEST FOR	TEST NUMBER	LOCATION OR TIME OF SAMPLING	FREQUENCY OF SAMPLING	REMARKS
MINERAL AGGREGATE (continued)	FINE AGGREGATE (continued)	Acid Insoluble Residue **(A)**	Tex-612-J		Two, each source	Only for concrete subject to direct traffic. Verify the value of the source, as listed on the current CRSQC, meets the project specifications. If not, sample and submit to CST/M&P for testing prior to use in accordance with Tex-499-A. If the DB Contractor decides to use Micro-Deval as described in Item 421.4.2.2 in lieu of acid insoluble, test in accordance with Tex-461-A. Sample in accordance with Tex-400-A.
SILICA FUME		Compliance with DMS-4630 **(A)**		Railroad car, truck, bags or silos	1 per project, per class of concrete (for each type and brand)	Sample in accordance with DMS-4630.
METAKAOLIN		Compliance with DMS-4635 **(A)**		Railroad car, truck or silos	1 per project, per class of concrete (for each type and brand)	Sample in accordance with Tex-733-I.
MIX DESIGN		Compliance with Standard Specification Item 421.4		At source (if not approved)	Min 1 design per class, per source	Verify if cement, fly ash, slag cement, and chemical admixture sources are listed on the MPLs. If not, sample and submit to CST/M&P for testing. Water testing is contracted by the concrete supplier (commercial lab report to be reviewed by TxDOT). Sample in accordance with Tex-300-D for cement and in accordance with Tex-733-I for fly ash.
JOINT MATERIAL		Compliance with DMS-6300				Sample in accordance with Tex-500-C. Verify the source is listed on the MPL for Joint Sealers. If not, sample and test prior to use in accordance with DMS-6310.
CURING COMPOUND		Compliance with DMS-4650		Sampled at jobsite; tested by CST/M&P. See remarks.	When requested by CST	Only products listed on the MPL for Concrete Curing Compounds will be allowed. When sample is requested by CST, sample in accordance with Tex-718-I. Ensure container has been agitated and mixed prior to sampling.
EVAPORATION RETARDANTS		Compliance with DMS-4650				Only products listed on the MPL for Evaporation Retardants will be allowed.
REINFORCING STEEL		Compliance with the Standard Specifications and Special Provisions	As Specified			Only materials from CST/M&P-approved sources listed on the MPLs for Reinforcing Steel Mills and Seven Wire Steel Strand will be allowed.
MECHANICAL COUPLERS		Compliance with DMS-4510	Tex-744-I	Sampled at jobsite; tested by CST/M&P	Tex-743-I	Only materials from CST/M&P-approved sources listed on the MPL for Mechanical Couplers will be allowed.

This is a guide for minimum sampling and testing.
Testing frequency may need to be increased for high material variability or when test results approach specification limits.

TABLE III – HYDRAULIC CEMENT CONCRETE – STRUCTURAL (Classes: C, F, H, S, CO, K, LMC, or SS)					
			PROJECT TESTS		
MATERIAL OR PRODUCT	TEST FOR	TEST NUMBER	LOCATION OR TIME OF SAMPLING	FREQUENCY OF SAMPLING	REMARKS
LATEX	Compliance with DMS-4640 for concrete chemical admixtures		Sampled at jobsite	Min of 1 test per project	Sample in accordance with ASTM C494
EPOXY	Compliance with DMS-6100, unless otherwise specified		Sampled at jobsite if not pre-approved by CST/M&P	1 per batch or shipment	Verify the source is listed on the MPL for Epoxies and Adhesives. If not, sample and test prior to use in accordance with DMS-6100. Sample in accordance with Tex-734-I.
CONCRETE	Compressive Strength (A)	Tex-418-A	At point of concrete placement	4 cylinders for each 60 CY per class, per day. (For bridge railing and traffic railing, testing may be reduced to 4 cylinders per 180 CY per class regardless of days)	Sampling must be in accordance with Tex-407-A. Test 2 cylinders at 7 days, and if the average value is below the design strength as defined in Item 421, Table 8, test the remaining 2 cylinders at 28 days. If the average value of the 2 cylinders tested at 7 days meets the minimum design strength listed in Item 421, Table 8, the 2 remaining cylinders need not be tested.
	Slump	Tex-415-A		1 test for each 60 CY per class, per day. (For bridge railing and traffic railing, testing may be reduced to 1 test per 180 CY per class regardless of days)	Sample in accordance with Tex-407-A. Perform slump and temperature tests on the same load from which strength test specimens are made. Perform entrained air test only when entrained air concrete is specified in the plans. Check temperature of every load for bridge slabs and mass concrete placements. DB Contractor's required testing will be in accordance with specification requirements for the appropriate specification Item.
	Entrained Air (A)	Tex-416-A or Tex-414-A			
	Temperature of Concrete (A)	Tex-422-A			
	Bridge Deck or Culvert Top Slab Thickness and Depth of Reinforcement	Tex-423-A, Part II	During dry run and during concrete placement (Bridge decks and direct traffic culverts)	1 per span	Min 6–Max 18 locations per span

TABLE III – FOOTNOTES	
A	When this project acceptance test fails but the product is accepted, document the reasons for acceptance on the Engineering Judgment Log.
B	Each test performed that is based on a quantity of material is considered "or fraction thereof" for calculating number of tests.

This is a guide for minimum sampling and testing.
Testing frequency may need to be increased for high material variability or when test results approach specification limits.

TABLE IV – HYDRAULIC CEMENT CONCRETE – NON-STRUCTURAL CONCRETE (Classes: A, B, or E)					
			PROJECT TESTS		
MATERIAL OR PRODUCT	TEST FOR	TEST NUMBER	LOCATION OR TIME OF SAMPLING	FREQUENCY OF SAMPLING	REMARKS
CONCRETE	Compressive Strength (A)	Tex-418-A	At point of concrete placement	2 cylinders per 180 CY, per class	Sampling must be in accordance with Tex-407-A. Strength will be determined by 7-day specimens.
MIX DESIGN	Compliance with the Standard Specification		At source if not approved.	Min 1 design per class, per source	Verify if cement, fly ash, slag cement, and chemical admixture sources are listed on the MPLs. If not, sample and submit to CST/M&P for testing. Sample in accordance with Tex-300-D for cement and in accordance with Tex-733-I for fly ash. Water testing is contracted by the concrete supplier (commercial lab report to be reviewed by TxDOT).
SILICA FUME	Compliance with DMS-4630		Railroad car, truck, bags or silos	1 test per project, per class (for each type and brand)	Sample in accordance with DMS-4630.
METAKAOLIN	Compliance with DMS-4635		Railroad car, truck or silos	1 test per project, per class (for each type and brand)	Sample in accordance with Tex-733-I.

TABLE IV – FOOTNOTES	
A	When this project acceptance test fails but the product is accepted, document the reasons for acceptance on the Engineering Judgment Log.

This is a guide for minimum sampling and testing.
Testing frequency may need to be increased for high material variability or when test results approach specification limits.

TABLE V – HYDRAULIC CEMENT CONCRETE PAVEMENT (Classes: P or HES)						
				PROJECT TESTS		
MATERIAL OR PRODUCT		TEST FOR	TEST NUMBER	LOCATION OR TIME OF SAMPLING	FREQUENCY OF SAMPLING (B)	REMARKS
MINERAL AGGREGATE	COARSE AGGREGATE	Decantation	Tex-406-A	From stockpile at concrete plant	Each 20,000 CY of concrete (each source)	Sample in accordance with Tex-400-A.
		Sieve Analysis (A)	Tex-401-A		As necessary for control	Sample in accordance with Tex-400-A. Test combined aggregate when used.
		Deleterious Materials	Tex-413-A		Each 20,000 CY of concrete (each source)	Sample in accordance with Tex-400-A.
		L.A. Abrasion (A)	Tex-410-A		Two, each source	Verify the value of the source, as listed on the current CRSQC, meets the project specifications. If not, sample and submit to CST/M&P for testing prior to use in accordance with Tex-499-A. Sample in accordance with Tex-400-A.
		5-Cycle Magnesium Sulfate Soundness (A)	Tex-411-A			
	FINE AGGREGATE	Sand Equivalent	Tex-203-F	From stockpile at concrete plant	Each 3,000 CY of concrete (each source or combination of sources)	Sample in accordance with Tex-400-A. Test combined aggregate when used. No less than one per week's production.
		Organic Impurities	Tex-408-A		1 per project, per source	Sample in accordance with Tex-400-A.
		Sieve Analysis (A)	Tex-401-A		As necessary for control	Sample in accordance with Tex-400-A. Test combined aggregate when used.
		Fineness Modulus	Tex-402-A			
		Deleterious Material	Tex-413-A		Each 20,000 CY of concrete (each source)	Sample in accordance with Tex-400-A.
		Acid Insoluble (A)	Tex-612-J		1 per project, per source	Verify the value of the source, as listed on the current CRSQC, meets the project specifications. If not, sample and submit to CST/M&P for testing prior to use in accordance with Tex-499-A. If the DB Contractor decides to use Micro-Deval as described in Item 421.4.2.2 in lieu of acid insoluble, test in accordance with Tex-461-A. Sample in accordance with Tex-400-A.
MIX DESIGN		Compliance with Standard Specification Item 421.4		At source, if not approved	Min 1 design, per class, per source	Verify if cement, fly ash, ground granulated blast furnace slag, and admixture sources are listed on the MPLs. If not, sample and submit to CST/M&P for testing. Sample in accordance with Tex-300-D for cement and in accordance with Tex-733-I for fly ash. Water testing is contracted by the concrete supplier (commercial lab report to be reviewed by TxDOT).

This is a guide for minimum sampling and testing.
Testing frequency may need to be increased for high material variability or when test results approach specification limits.

TABLE V – HYDRAULIC CEMENT CONCRETE PAVEMENT (Classes: P or HES)					
			PROJECT TESTS		
MATERIAL OR PRODUCT	TEST FOR	TEST NUMBER	LOCATION OR TIME OF SAMPLING	FREQUENCY OF SAMPLING (B)	REMARKS
SILICA FUME	Compliance with DMS-4630		Railroad car, truck, bags or silos	1 per project per class of concrete (for each type and brand)	Sample in accordance with DMS-4630.
METAKAOLIN	Compliance with DMS-4635		Railroad car, truck or silos	1 per project per class of concrete (for each type and brand)	Sample in accordance with Tex-733-I.
JOINT MATERIAL	Compliance with DMS-6310		Sampled at jobsite if not sampled at source by CST/M&P; tested by CST/M&P. See remarks.	1 per batch or shipment	Sample in accordance with Tex-500-C. Sampling may be waived when the source is listed on the MPL for Joint Sealers.
CURING COMPOUND	Compliance with DMS-4650		Sampled at jobsite; tested by CST/M&P. See remarks.	When requested by CST	Only products listed on the MPL for Concrete Curing Compounds will be allowed. Sample in accordance with Tex-718-I, when requested. Ensure container has been agitated and mixed prior to sampling.
EVAPORATION RETARDANTS	Compliance with DMS-4650				Only products listed on the MPL for Evaporation Retardants will be allowed.
REINFORCING STEEL	Compliance with the Standard Specifications and Special Provisions	As Specified			Only materials from CST/M&P-approved sources listed on the MPL for Reinforcing Steel Mills and Seven Wire Steel Strand will be accepted.
MULTIPLE PIECE TIE BARS	Compliance with DMS-4515	Tex-712-I	Sampled at jobsite if not sampled at source by CST/M&P; tested by CST/M&P. See remarks.	Refer to Tex-711-I for sampling rates	Only materials from CST/M&P-approved sources listed on the MPL for Multiple Piece Tie-bars for Concrete Pavements will be allowed. Sample in accordance with Tex-711-I.
EPOXY	Compliance with DMS-6100		Sampled at jobsite if not pre-approved by CST/M&P. See remarks.	1 batch per shipment	Verify the source is listed on the MPL for Epoxies and Adhesives. If not, sample and test prior to use in accordance with DMS-6100. Sample in accordance with Tex-734-I.
CONCRETE	Strength **(A) (B)**	Tex-448-A or Tex-418-A	At point of concrete placement	1 test (2 specimens) for each 3,000 SY of concrete or fraction thereof or per day	Sample in accordance with Tex-407-A. A 7-day target compressive strength or 7-day target flexural strength as correlated in accordance with Tex-427-A may be used.

This is a guide for minimum sampling and testing.
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TABLE V – HYDRAULIC CEMENT CONCRETE PAVEMENT (Classes: P or HES)					
			PROJECT TESTS		
MATERIAL OR PRODUCT	TEST FOR	TEST NUMBER	LOCATION OR TIME OF SAMPLING	FREQUENCY OF SAMPLING (B)	REMARKS
CONCRETE (continued)	Slump	Tex-415-A	At time and location strength specimens are made	1 test for each 3,000 SY of concrete or fraction thereof or per day	Sample in accordance with Tex-407-A. Slump is not required for slip-formed pavement. Perform slump and temperature tests on the same load from which the strength specimens are made. Perform entrained air test only when entrained air concrete is specified in the plans.
	Entrained Air **(A)**	Tex-416-A or Tex-414-A			
	Temperature	Tex-422-A			
	Thickness	Tex-423-A, Part I	Center of paving machine	Every 500 ft.	Methods other than Tex-423-A may be shown on the plans.
	Pavement Texture	Tex-436-A	Final riding surface of travel lanes	1 per day, per driving lane	A carpet drag texture and a metal-tine texture finish are required for all areas with a posted speed limit in excess of 45 mph. When shown on the plans, a carpet drag texture can be the only surface texture required for areas with a posted speed limit less than 45 mph.
	Ride Quality **(A)**	Tex-1001-S Surface Test Type B	Final riding surface of travel lanes		OV may verify IQF's results for surface test Type B. Results from surface test Type A are not required to be reported.

TABLE V – FOOTNOTES	
A	When this project acceptance test fails but the product is accepted, document the reasons for acceptance on the Engineering Judgment Log.
B	Each test performed that is based on a quantity of material is considered "or fraction thereof" for calculating number of tests.

This is a guide for minimum sampling and testing.
Testing frequency may need to be increased for high material variability or when test results approach specification limits.

TABLE VI – HOT-MIX ASPHALT PAVEMENT (Items 341, 342, 344, 346, 347 and 348) (All testing as noted in Table VI may be waived for exempt production as defined by specification.)					
			PROJECT TESTS		
MATERIAL OR PRODUCT	**TEST FOR**	**TEST NUMBER**	**LOCATION**	**FREQUENCY OF SAMPLING**	**REMARKS**
COARSE AGGREGATE	L.A. Abrasion **(A)**	Tex-410-A	Stockpile **(B)**	1 per project, per source	Verify the published value of the source, as listed on the current BRSQC, meets the project specifications. If not, sample in accordance with Tex-221-F and submit to CST/M&P for testing prior to use in accordance with Tex-499-A.
	Magnesium Sulfate Soundness **(A)**	Tex-411-A			
	Surface Aggregate Classification **(A)**	Tex-499-A		1 per project, per source	
	Micro-Deval Abrasion	Tex-461-A		1 per project, per aggregate source	Not required when the Rated Source Soundness Magnesium loss is 15 or less as listed on the current published BRSQC. If testing is required, sample in accordance with Tex-221-F.
COMBINED AGGREGATE	Sand Equivalent	Tex-203-F	Stockpiles, hot bins or feeder belts	1 per project, per source, per design	Does not apply to Item 342. Sample in accordance with Tex-221-F. The timing of when the test is performed is at the discretion of the IQF.
ASPHALT BINDER	Compliance with Item 300 – Binder & Tack Coat **(A)**		Sampled, tested, and pre-approved by CST/M&P. Project test sampled at the plant for Binder & road for Tack Coat	1 each for binder and tack coat per project, per grade, per source	Test a minimum of one sample taken from the project. Sample tack coat at the distributor on the roadway in accordance with Tex-500-C, Part III. Sample binder at hot mix plant in accordance with Tex-500-C, Part II. Binder should arrive on the project pre-approved. If not pre-approved, sample binder before use.
MIX DESIGN VERIFICATION	Compliance with applicable specification	Tex-204-F	At source (if not approved)	Min 1 design per Mix Type and Asphalt Grade	Verify that aggregates, recycled asphalt pavement, mineral filler, asphalt binder, anti-stripping additives, and warm mix systems are on the MPL where applicable and that they meet project specification requirements. Project sampling and testing may be conducted on individual materials as necessary for control.

This is a guide for minimum sampling and testing.
Testing frequency may need to be increased for high material variability or when test results approach specification limits.

TABLE VI – HOT-MIX ASPHALT PAVEMENT (Items 341, 342, 344, 346, 347 and 348) (All testing as noted in Table VI may be waived for exempt production as defined by specification.)					
			PROJECT TESTS		
MATERIAL OR PRODUCT	TEST FOR	TEST NUMBER	LOCATION	FREQUENCY	REMARKS
COMPLETE MIXTURE	Asphalt Content (%) **(A)**	Tex-236-F	Truck Sample **(C)**	1 per Sublot	Sample in accordance with Tex-222-F. Determine correlation factors for ignition oven using Tex-236-F at a minimum of one per project. When Tex-236-F does not yield reliable results, the IQF may use alternative methods for determining asphalt content, such as Tex-210-F (ASTM D2172/AASHTO T 164) and Tex-228-F (ASTM D4125/AASHTO T 287).
	Voids in Mineral Aggregates (VMA)	Tex-204-F	Truck Sample **(C)**	1 per Sublot	Sample in accordance with Tex-222-F. Does not apply to Items 342 and 348.
	Gradation **(A)**	Tex-200-F	Truck Sample **(C)**	1 per Sublot	Sample in accordance with Tex-222-F. Determine correlation factors for ignition oven using Tex-236-F at a minimum of 1 per project.
	Moisture Susceptibility	Tex-530-C	Truck Sample	1 per lot	Sample in accordance with Tex-222-F.
	Indirect Tensile Strength – Dry	Tex-226-F		1 per project (Lot 1)	Sample in accordance with Tex-222-F. Does not apply to Items 342, 346, 347, and 348.
	Moisture Content	Tex-212-F, Part II	Truck Sample	1 per project	Sample in accordance with Tex-222-F.
	Lab-Molded Density **(A)**	Tex-207-F, Parts I and IV; Tex-227-F	Truck Sample **(C)**	1 per Sublot	Sample in accordance with Tex-222-F. DB Contractor's required testing will be in accordance with specification requirements for the appropriate specification Item.
	Drain Down Test **(A)**	Tex-235-F	Truck Sample (C)	1 per sublot	Sample in accordance with Tex-222-F. Not required for Items 341 and 344.
	Hamburg Wheel Test **(A)**	Tex-242-F	Truck Sample	1 per project	Sample in accordance with Tex-222-F. Sample during production.
	Cantabro Loss **(A)**	Tex-245-F	Truck Sample	1 per project	Sample in accordance with Tex-222-F. Does not apply to Items 341 and 344.
	Overlay Test **(A)**	Tex-248-F	Truck Sample	1 per project	Sample in accordance with Tex-222-F. TxDOT will perform Tex-248-F.

This is a guide for minimum sampling and testing.
Testing frequency may need to be increased for high material variability or when test results approach specification limits.

TABLE VI – HOT-MIX ASPHALT PAVEMENT (Items 341, 342, 344, 346, 347, and 348) (All testing as noted in Table VI may be waived for exempt production as defined by specification.)					
			PROJECT TESTS		
MATERIAL OR PRODUCT	**TEST FOR**	**TEST NUMBER**	**LOCATION**	**FREQUENCY**	**REMARKS**
ROADWAY	In-Place Air Voids **(A)**	Tex-207-F, Parts I and IV; Tex-227-F	Roadway **(C)**	2 cores per Sublot	Two cores taken per Sublot and averaged. Sample in accordance with Tex-222-F. Does not apply to Items 342, 347, and 348.
ROADWAY	Segregation Profile **(A)**	Tex-207-F, Part V	Roadway	1 per Sublot	Not required when DB Contractor uses thermal imaging system. Does not apply to Items 342, 347, and 348.
	Joint Density **(A)**	Tex-207-F, Part VII	Roadway	1 per Sublot	
	Thermal Profile **(A)**	Tex-244-F	Immediately behind paver	1 per Sublot	Not required when DB Contractor uses thermal imaging system.
	Ride Quality Test Type B **(A)**	Tex-1001-S	Final riding surface of travel lanes	1 per project	OV may verify IQF's results for surface test Type B. Reporting results for surface test Type A is not required.
	Permeability **(A)**	Tex-246-F	Roadway	1 per Lot (Items 342 348) 1 per Sublot (Item 347)	Only applies to Items 342, 347, and 348.
FABRIC UNDERSEAL	Compliance with DMS-6220		Sampled, tested, and approved by CST/M&P		Sampling must be in accordance with Tex-735-I. Verify the source is listed on the current MPL for Silt Fence, Filter Fabric, and Fabric Underseals. If not, sample and test prior to use in accordance with DMS-6220.

TABLE VI – FOOTNOTES	
A	When this project acceptance test fails but the product is accepted, document the reasons for acceptance on the Engineering Judgment Log.
B	Sampling may be performed at the plant, quarry, or both. Aggregate properties may be re-tested at any time during the project. These project tests may be used for one or more projects furnishing hot mix with the same aggregate source.
C	Perform random sampling as specified in Tex-225-F, "Random Selection of Bituminous Mixture Samples."