

Table XI, Materials, Sampling & Testing Frequency for Airports in US Customary Units **Page 1 of 7**

Material	Type of Sample	Sample Size	Type of Tests	Frequency	Remarks
Excavation	Acceptance	(5)	Gradation, P.I., Moisture (or visual organic content)	1 per 5,000 yd ³ waste	Number consecutively EX-W-1. No need to test, if waste is designated on the plans.
Embankment	Acceptance	(5)	Standard Density	As required by changes in material	Number consecutively BX-SD-1 or EX-SD-1
			Field Density (1)	1 per 3,000 tons (1,500 yd ³)	Number consecutively BX-D-1 or EX-D-1
			Gradation, P.I., Deleterious (visual)	1 per 10,000 tons (5,000 yd ³)	Number consecutively BX-G-1 or EX-G-1
	Independent Assurance	(5)	Standard Density (2)	1 per source	Numbers correspond to acceptance samples.
			Field Density	1 per 30,000 tons (15,000 yd ³)	
			Gradation, P.I., Deleterious (visual)	1 per 100,000 tons (50,000 yd ³)	
Bedding & Backfill for Structures: Foundation Fill and Filter Material	Acceptance	(5)	Standard Density	As required by changes in material	
			Field Density (1)	See Note (3)	
			Gradation, P.I., (4), Deleterious (visual)	1 per source or 1 per 500 feet of pipe	

General: Independent Assurance Testing may be waived when Acceptance Testing is performed in DOT&PF Regional Laboratories accredited in the acceptance test method. When DOT&PF Regional Laboratories perform Acceptance Testing, they may also perform the Independent Assurance Testing provided different personnel and equipment is used from that used for the Acceptance Testing.

- (1) If material is impractical to test for field density, document quantity and/or area by reporting percent oversize and compactive effort used on a proper density acceptance form.
- (2) Required when Standard Density test is run in the field. Submit copy of the field worksheet with the sample.
- (3) One density per concrete structure (manhole, catch basin, inlet, utility vault, abutments, etc.) or pipe and minimum of one density per 100 lineal feet of pipe (i.e. water, sewer, culvert, conduit, etc.) installed. Pipe densities will be taken within 18 inches of the outside diameter of the pipe.
- (4) Run P.I. tests on the first five samples at the start of production from any source. If these tests indicate the material to be nonplastic, additional tests need only be performed on the assurance samples.
- (5) Size of samples for gradation testing is determined by nominal maximum size. See WAQTC FOP for AASHTO T 27/T 11 for minimum sample size. Size of samples for Standard Densities should be four times the size required for gradation testing.

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Material	Type of Sample	Sample Size	Type of Tests	Frequency	Remarks
Subbase	Quality	150 lbs.	Wear, Degradation	1 per source prior to use	14 days min. for testing and transport
	Acceptance	(5)	Standard Density	1 per source and as required based on changes in material	Number consecutively SB-SD-1
			Field Density (1)	1 per 2,000 tons (1,000 yd ³)	Number consecutively SB-D-1
			Gradation, LL & P.I. (3)	1 per 5,000 tons (2,500 yd ³)	Number consecutively SB-G-1
	Independent Assurance	(5)	Standard Density (2)	1 per source	Numbers correspond to Acceptance samples
			Field Density	1 per 20,000 tons (10,000 yd ³)	
Gradation, LL & P.I.			1 per 50,000 tons (25,000 yd ³)		
Crushed Aggregate Base and Surface Course	Quality	150 lbs.	Wear, degradation, soundness	1 per source prior to use	Allow minimum of 14 days for testing and transport
	Acceptance	(5)	Standard Density	As required by changes in material	Number consecutively BC-SD-1 or SC-SD-1
			Field Density	1 per 1,000 tons (500 yd ³)	Number consecutively BC-D-1 or SC-D-1
			Gradation, Fracture (4), LL & P.I. (3), Sand Equivalent (3)	1 per 2,000 tons (1,000 yd ³)	Number consecutively BC-G-1 or SC-G-1
	Independent Assurance	(5)	Standard Density (2)	1 per source	Numbers correspond to Acceptance samples.
			Field Density	1 per 10,000 tons (5,000 yd ³)	
Gradation, Fracture, LL & P.I., Sand Equivalent			1 per 20,000 tons (10,000 yd ³)		

- (1) If material is impractical to test for field density, document quantity and /or area by reporting percent oversize and compactive effort used on a proper density acceptance form.
- (2) Required when Standard Density is run in the field. Submit copy of the field worksheet with the sample.
- (3) Run tests on the first five samples at the start of production from any source. If these tests indicate the material meets specifications, additional tests need only be performed on the assurance samples. The sand equivalent test is not performed on the aggregate surface course.
- (4) Run fracture tests on the first ten samples at the start of production and after each change in material. If these tests indicate the fracture to be 5% or more above specification, additional tests need only be performed on the assurance samples.
- (5) Size of samples for gradation testing is determined by nominal maximum size. See WAQTC FOP for AASHTO T 27/T 11 for minimum sample size. Size of samples for Standard Densities should be four times the size required for gradation testing.

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Material	Type of Sample	Sample Size	Type of Tests	Frequency	Remarks	
Bituminous Pavement	Quality	150 lbs. Aggregate	Wear, degradation, soundness	1 per source prior to use	Allow 25 days for testing and transport.	
	Mix Design	500 lbs. Aggregate (5)	Mix Design (1), Sand equivalent, Flat & Elongated, Fracture	As required by changes in material	Allow 15 days for design and testing after receipt of material.	
		5 gal. of AC (6)	0.25 L of Anti Strip (6)			
	Acceptance	(4)		Mat Density, Joint Density, Gradation, Oil Content, P.I. (2), Fracture (3), Flat & Elongated (2), Sand Equivalent (2), Thickness	1 per 500 tons	Coating test (AASHTO T 195)
				MSG (Maximum Specific Gravity) Smoothness	1 per 5,000 tons	1 st lot uses Mix Design MSG
	Independent Assurance	(4)		Mat Density, Gradation, Oil Content, P.I., Fracture, Flat & Elongated, Sand Equivalent	1 per 5,000 tons	
MSG				1 per 50,000 tons	See Note (8)	
Asphalt Cement	Quality				Supplier certification required	
	Acceptance	3-1 quart cans	(7)	1 per 50,000 gallons or 1 per 200 tons	Sampled on project. Test for anti-strip if required by QAE/ME	
Liquid Asphalt for: a. Prime Coat b. Tack Coat c. Seal Coats and Surface Treatment	Quality				Supplier certification required	
	Acceptance	1 gallon in plastic or glass jug	(7)	1 per 50,000 gallons or 1 per 200 tons	Sample must be tested by Lab, which did not test material for Quality. Material sampled prior to dilution.	
Cover coat Material for Surface Treatment	Quality	75 lbs. Aggregate	Wear, soundness, degradation, (1)	1 per source prior to use	Allow 25 days for testing and transport.	
	Acceptance	(4)	Gradation, Fracture (3)	1 per 500 tons	May be taken from stockpile or production.	
	Independent Assurance	(4)	Gradation, Fracture	1 per 5,000 tons		

(1) Recommendations regarding stripping must be determined for each project.

(2) Run tests on the first five samples at the start of production from any source. If these tests indicate the material meets specifications, additional tests need only be performed on the assurance samples.

(3) Run tests on the first ten samples at the start of production and after each change in material. If these tests indicate the material to be 5% or more above specification, additional tests need only be performed on the assurance samples.

(4) Size of sample for gradation is determined by nominal maximum size. See the specified test method for minimum sample size.

(5) Proportion coarse and fine aggregate to the proposed Job Mix Design blend ratio.

(6) Contact the Regional Materials Laboratory for instructions on submitting the Asphalt Cement and Anti-strip if necessary.

(7) Refer to project specifications.

(8) Required when MSG is run in the field. Submit copy of the field worksheet with the sample.

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Material	Type of Sample	Sample Size	Type of Tests	Frequency	Remarks
Concrete (a) Cement (b) Water (c) Coarse Aggregate (d) Fine Aggregate (e) Air Entraining Agent (f) Joint Sealer (g) Joint Filler (h) Curing Materials	Quality	(a) 10 lbs. in can	Physical properties	1 per shipment or Manufacturer Cert.	Allow 40 days for testing and transport. Manufacturer's certification required. (1)
		(b)			Potable water accepted by the Project Engineer
		(c) 100 lbs.	Wear, Soundness	1 per source	Allow 25 days for testing and transport.
		(d) 25 lbs.	Soundness	1 per source	Allow 25 days for testing and transport.
		(e)			Supplier certification required
		(f)			Supplier certification required
		(g)			Supplier certification required
		(h)			Supplier certification required
	Mix Design (2)	Aggregate: Coarse: 300 lbs Fine: 100 lbs Cement: 1 sack Additives: 1 qt.	Mix design	1 per source prior to use	Contractor furnished material. Allow 45 days for testing and transport

- (1) Re-test any cement stored in silos or bins over six months, or in bags over two months.
- (2) Complete the Concrete Plant Inspection prior to production.

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Material	Type of Sample	Sample Size	Type of Tests	Frequency	Remarks
Concrete continued					
Coarse Aggregate	Acceptance (5)	(4)	Flat & Elongated (6), Gradation	1 per 200 yd ³	Number consecutively CA-G-1
Fine Aggregate		(4)	Gradation, Fineness Modulus	1 per 200 yd ³	Number consecutively FA-G-1
Mix		As required	Yield, Cement Factor, Slump, Water Cement Ratio, % Air, Smoothness, Grade	1 per ½ days pour (1) or 1 per 200 yd ³	(2)
		2 cylinders or beams	Compressive strength or Flexural Strength (3)	1 per ½ days pour (1) or 1 per 200 yd ³	Test at 28 days. (2) (7)
	Information	Cylinders or beams	Compressive strength or Flexural Strength (3)	As required (e.g. for 7 day break)	
Coarse Aggregate	Independent Assurance	(4)	Gradation, All Deleterious, Flat & Elongated	1 per 2,000 yd ³ (with minimum of 1 per project) if over 100 yd ³ is placed	Numbers correspond to acceptance samples.
Fine Aggregate		(4)	Gradation, All Deleterious, Fineness Modulus		
Mix		As required	Yield, Cement Factor, Slump, Water Cement Ratio, % Air	1 per project	
		2 cylinders or beams	Compressive strength or Flexural Strength (3)	1 per 2,000 yd ³	

(1) Half day's pour considered to be six hours or less.
 (2) Commercial sources, which are periodically inspected, do not have to be tested if *total quantity* of concrete placement is less than 5 yd³ as determined by the Project Engineer. Placement reports summarizing all minor pours will be completed.
 (3) Only required when strength criteria is included for the item.
 (4) Size of sample for gradation is determined by nominal maximum size. See WAQTC FOP for AASHTO T 27/T 11 for minimum sample size.
 (5) Truck inspections are required for each pour.
 (6) Run tests on the first five samples at the start of production from any source. If these tests indicate the material meets specifications, additional tests need only be performed on the assurance samples.
 (7) Non-structural or minor concrete construction, 1 set minimum per project is recommended.

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Material	Type of Sample	Sample Size	Type of Tests	Frequency	Remarks
Misc. Hardware	Quality	See contract special provisions, Project Engineer's inspection and acceptance.			Certs/Mill reports approved by QA/ME or SME
Reinforcing Steel	Quality	2 pieces 36 inches long per size and grade		1 per 20 tons minimum or 1 per project when a pay item	Mill reports approved by QA/ME or SME in lieu of testing, or QPL.
Porous Backfill	Quality	(1)	Standard Density	As required by changes in material	Number consecutively PB-SD-1
	Acceptance	(1)	Density	1 per installation	Number consecutively PB-D-1
			Gradation	1 per source	Number consecutively PB-G-1
Topsoil	Quality	15 lbs.	Organic content, pH, Gradation	1 per source prior to use	Allow 15 days for testing and transport.
	Acceptance	(1)	Organic content, Gradation	1 per 2,500 yd ³	Number consecutively TS-G-1
Lighting Equipment	Within 30 days following contract award, the contractor must submit to the Project Engineer for approval a complete list of material and equipment that is proposed to be used for this item. The data must include catalogue cuts, diagrams, test reports, manufacturers' certifications, etc. The above data must be submitted in eight sets. Any proposed deviation from the Plans must also be submitted.				
(1) Size of samples for gradation testing is determined by nominal maximum size. See WAQTC FOP for AASHTO T 27/T 11 for minimum sample size. Size of samples for Standard Densities should be four times the size required for gradation testing.					

Minor Quantities

A. **Portland Cement Concrete.** Concrete for the following items may be accepted on the basis of an approved mix design and placement reports documenting batch information and pour location, time, and quantity. Under this system, the producer must state on the delivery ticket accompanying each load of concrete, the class of concrete being furnished, the weights of cement, aggregates and water used in the batch, and the time of batching. Only State-tested aggregates and cement, or supplier certified cement, approved by the State Materials Engineer, may be used. Document each pour on a Concrete Placement Report.

1. Slope paving and headers
2. Paved ditch
3. Small culvert headwalls
4. Fence post footings
5. Catch basins, manhole bases, and inlets
6. Electrical vault, light or signal boxes

B. **Small Quantities of Miscellaneous Materials.** The primary documentation of delivery and placement may be the Project Materials Report.

1. Aggregates:--Not to exceed 500 tons per item per project.
2. Asphalt/Aggregate Mixtures:--Not to exceed 1,500 tons per approved mix design.
3. Bituminous Material:--Not to exceed 85 tons per project.
4. Paint:--Not to exceed 20 gallons per project. Acceptance to be based on weights and analysis on the container label.
5. Lumber:--Not to exceed 5,000 Board Feet per project. Recognized commercial grades only may be used.
6. Masonry Items:--Not to exceed 100 pieces. Subject to checking of nominal size and visual inspection.
7. Plain concrete or clay pipe:--Not to exceed 100 lineal feet.
8. Hardware:-- When a minor component to other small quantities of work.
9. Topsoil:--Not to exceed 6,000 ft².