**Table XI, Materials, Sampling & Testing Frequency for Airports in US Customary Units** 

| **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.

**Table XI, Materials, Sampling & Testing Frequency for Airports in US Customary Units** 

| 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.

**Table XI, Materials, Sampling & Testing Frequency for Airports in US Customary Units** 

| 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) | 1 per 5,000 tons | 1st lot uses Mix Design MSG |
| | | | Smoothness | | |
| | 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:<br>a. Prime Coat<br>b. Tack Coat<br>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.

**Table XI, Materials, Sampling & Testing Frequency for Airports in US Customary Units** 

| Material | Type of Sample | Sample Size | Type of Tests | Frequency | Remarks |
|---|---|---|---|---|---|
| Concrete<br>(a) Cement<br>(b) Water<br>(c) Coarse Aggregate<br>(d) Fine Aggregate<br>(e) Air Entraining Agent<br>(f) Joint Sealer<br>(g) Joint Filler<br>(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.

**Table XI, Materials, Sampling & Testing Frequency for Airports in US Customary Units** 

| 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 $yd^3$ 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.

**Table XI, Materials, Sampling & Testing Frequency for Airports in US Customary Units** 

| 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.

**Table XI, Materials, Sampling & Testing Frequency for Airports in US Customary Units** 

**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 $ft^2$.