Section 1 Sample Types and Frequencies

6-101 General

6-101A References

6-102 Types of Sampling and Testing

6-102A Preliminary Samples and Tests

6-102B Initial Samples and Tests

Table 6-1.1 Time Required for Source Testing

6-102B (1) Unprocessed Soils and Aggregates

6-102B (1a) Stone from Ledges and Quarries

6-202C (1b) Material Sites of Sand, Gravel, or Soil

6-102B (2) Processed Aggregates

6-102C Acceptance Samples and Tests

Table 6-1.2 Time Required for Materials Acceptance Tests

Table 6-1.3 Time Required for Products Acceptance Tests

6-102D Dispute Resolution Samples

6-102E Investigation Samples and Tests

6-102F Research Samples and Tests

6-103 Field Sampled Material Identification for Testing

Example 6-1.1 Sample Cylinder Label

Example 6-1.2 Sample Cylinder Label

6-104 Shipping of Field Samples

6-105 Acceptance Records

6-106 Project Materials Certification

6-107 Materials Acceptance Sampling and Testing

Tables—"Materials Acceptance Sampling and Testing Requirements"

Table 6-1.4 Earthwork (2010 *Standard Specifications* Section 19)

Table 6-1.5 Stabilized Soils (2010 *Standard Specifications* Section 24)

Table 6-1.6 Aggregate Subbases (2010 *Standard Specifications* Section 25)

Table 6-1.7 Aggregate Bases (2010 *Standard Specifications* Section 26)

Table 6-1.8 Cement Treated Bases (2010 *Standard Specifications* Section 27)

Table 6-1.9 Concrete Bases (2010 *Standard Specifications* Section 28)

Table 6-1.10 Treated Permeable Bases (2010 *Standard Specifications* Section 29)

Table 6-1.11 Bituminous Seals (2010 *Standard Specifications* Section 37)

Table 6-1.12 Hot Mix Asphalt (2010 *Standard Specifications* Section 39)

Table 6-1.13 Concrete Pavement (2010 *Standard Specifications* Section 40)

Table 6-1.14 Concrete Structures (2010 *Standard Specifications* Section 51)

Table 6-1.15 Concrete (2010 *Standard Specifications* Section 90)

Table 6-1.16 Miscellaneous

This manual is being updated to reflect changes from the 2006 to the 2010 *Standard Specifications*. Bracketed section numbers refer to the 2006 *Standard Specifications*.

Section 1 Sample Types and Frequencies

Section 1 Sample Types and Frequencies

6-101 General

6-101 General

Sampling and testing materials and products must be in accordance with contract specifications. Sampling and testing are of equal importance for assuring materials and products meet acceptance specifications.

Samplers must be familiar with materials handling and processing methods to assure representative samples are obtained. Samplers should be sufficiently knowledgeable about test methods to ensure compatibility between sample and test procedure.

Samples for acceptance must be taken in accordance with California Test 125, "Methods of Test for Sampling Highway Materials and Products Used in the Roadway Structural Sections," or sampling requirements in specifications. For California Tests, samplers must be qualified testers in accordance with the *Independent Assurance Manual*.

It is the resident engineer's responsibility to ensure the safety of the sampler. In accordance with *Material Plant Quality Program* (MPQP) or California Test 109, "Method for Testing of Material Production Plants," the district weights and measures coordinator inspects material plants for safety in areas that the sampler will enter.

In certain situations, to ensure sampler safety, the contractor will take acceptance samples for Caltrans. Where specified, the sampler must witness the contractor taking acceptance samples. The sampler must determine when the sample is taken and then observe that the sample is taken in accordance with California Test 125, or sampling requirements in specifications. The sampler must take possession of the sample from the contractor and transport it to a Caltrans office or the testing laboratory.

The resident engineer is responsible for the "chain of custody" for material acceptance samples. Material acceptance samples and dispute resolution samples must be in Caltrans' possession from the sampling point. Adequate sample storage facilities must be arranged for at construction field offices or other Caltrans facilities. The "chain of custody" for material samples is an important part of Caltrans' quality assurance program.

6-101A References

- *Independent Assurance Manual*, Division of Engineering Services, Materials Engineering and Testing Services, State of California Department of Transportation, available at:

  http://www.dot.ca.gov/hq/esc/Translab

- *California Test (CT-___)*, Division of Engineering Services, Materials Engineering and Testing Services (METS), State of California Department of Transportation, available at:

  http://www.dot.ca.gov/hq/esc/ctms/index.html

- American Association of State Highway and Transportation Officials, American Society for Testing and Materials, and other test methods are available at the IHS Standards Expert intranet website:

  http://onramp.dot.ca.gov/hq/des/spi/

- *Material Plant Quality Program*, Division of Construction, State of California Department of Transportation, available at:

  http://www.dot.ca.gov/hq/construc/hma/MPQP.pdf

6-102 Types of Sampling and Testing

6-102 Types of Sampling and Testing

The following are the types of sampling and testing used by Caltrans.

6-102A Preliminary Samples and Tests

Preliminary samples and tests are made prior to award of a contract. Construction personnel rarely perform preliminary sampling and testing. The district materials engineer is responsible for preliminary sampling and testing. Such tests are used for design purposes, and to provide data for the materials information package for prospective bidders.

6-102B Initial Samples and Tests

Initial samples and tests are performed on materials proposed for use in the project. These initial tests determine whether proposed materials sources, local materials, or products meet the specifications.

Construction personnel may sample potential sources. For soils and aggregate tests, send samples to the district materials lab. Tests may be performed by the district materials laboratory or METS, depending on their respective capabilities.

Sampling and testing potential local materials is not mandatory unless specified. Charge the contractor for the cost of sampling and testing potential local materials sources in accordance with Section 6, "Control of Materials," of the *Standard Specifications*.

The normal time required for testing initial source samples of potential local materials sources is shown in Table 6-1.1.

Table 6-1.1
Time Required for Source Testing

Material	Time
Aggregates for hot mix asphalt	2 weeks
Aggregates for cement treatment	4 weeks
Aggregates for concrete mixture	4 weeks
Aggregates for concrete pavement	60 days
Screenings for seal coats	2 weeks
Soils (R-Value)	3 weeks
Untreated base materials	3 weeks

6-102B (1) Unprocessed Soils and Aggregates

The following discussion is primarily applicable to initial sampling and sampling performed for reasons other than specification compliance, although the same precautions apply when sampling for specification compliance.

6-102B (1a) Stone from Ledges and Quarries

Inspect the ledge or quarry face to determine any variations in strata, or in portions of the ledge. Observe and record differences in color and structure. Obtain separate samples of unweathered stone from all strata that appear to vary in color and structure.

6-102B (1b) Material Sites of Sand, Gravel, or Soil

Select samples representing the different materials available in the deposit. If the deposit is worked as an open face or pit, take the samples by channeling the face so that they will represent material that visual inspection indicates may be used. It is necessary, especially in small deposits, to excavate test holes some distance in back of, and parallel to, the face to determine the extent of the supply. The number and depth of these test holes depend on the quantity of material to be used from the deposit. Obtain samples from open test pits by channeling a face of the test pit in the same manner as sampling a face of a materials site, described above. Do not include material in the sample that will be stripped from the pit as overburden. Obtain separate samples from the face of the bank and from the test holes. If visual inspection indicates that there is considerable variation in the material, obtain separate samples at different depths.

Use test holes to sample deposits that have no open faces. When sampling material sites, select depth and spacing of test holes considering the probable method of operating the pit. In general, dozers will combine the material laterally. A shovel will remove the material vertically. Test results in a "spotty" pit may be misleading to the extent that operations may be too expensive to make the required grading.

If possible, use a dozer or shovel to open up the pit before sampling rather than depending on test holes.

6-102B (2) Processed Aggregates

Sample processed aggregates from locations such as stockpiles, transportation units, conveyors, or windrows in accordance with California Test 125, "Methods of Test for Sampling Highway Materials and Products Used in the Roadway Structural Sections."

6-102C Acceptance Samples and Tests

Acceptance tests are generally performed on materials that will be incorporated into the work. Some acceptance tests are performed on materials already incorporated into the work. Acceptance sampling and testing should begin as soon as the material is delivered or in place.

Sample materials at the locations specified in the *Standard Specifications* or special provisions. If the sampling location is not specified, sample at the location indicated in the materials acceptance sampling and testing requirements tables in Section 6-107 of this manual. Regardless of location, sample randomly and within the frequency specified to obtain representative samples of the material used in the work.

Some acceptance tests may be performed on a priority basis which extends the normal time for performing acceptance tests for other projects.

Use the "priority" designation for the first few acceptance samples of each construction material. Use "priority" for quality control/quality assurance verification tests for acceptance. Use the "priority" designation for all samples if the material being supplied is of questionable quality or if the construction means and methods or source of materials changes. For "priority" tests, indicate if there is a preference for telephone, faxed, or emailed test results on Form TL-0101, "Sample Identification Card," along with the telephone number of the person who is to receive them.

For priority and normal processing times for acceptance tests of materials, refer to Table 6-1.2.

Table 6-1.2
Time Required for Materials Acceptance Tests

Material	Priority Test (Business Days)	Normal Test (Business Days)
Aggregates for hot mixed asphalt	3	7
Aggregates for cement treatment	5	7
Aggregates for concrete	3	7
Screenings	3	7
Soils (R-value)	5	7
Untreated base materials	7	12
Hot mixed asphalt	3	7
Hot mixed asphalt California Test 371	5	30
Asphalt binder	3	15
Asphalt rubber binder	3	15
Asphaltic emulsion	3	15
Asphalt modifier	3	15
Crumb rubber modifier	3	7
Portland cement	3	30

The minimum time required for acceptance tests of products is shown in Table 6-1.3.

Table 6-1.3
Time Required for Products Acceptance Tests

Product	Minimum Time (Business Days)
Coating tests	3
Expansion joint material	3
Fencing, all types	2
Guide posts	3
Geosynthetic fabrics	3
Geosynthetic fabrics (UV testing)	45
Metal guardrail	7
Pavement markers	4
Prestressing steel	10
Reinforcing steel and wire	2
Rubber (accompanied by manufacturers test report)	3
Rubber (without test report)	14
Structural steel	10
Type B joint seal	7

6-102D Dispute Resolution Samples

Code of Federal Regulations Section 637.207, "Quality Assurance Program," paragraph (a)(1)(iii), states, "If the results from the quality control sampling and testing are used in the acceptance program, the STD [state transportation department] shall establish a dispute resolution system. The dispute resolution system shall address the resolution of discrepancies occurring between the verification sampling and testing and the quality control sampling and testing." When specified, the engineer must split acceptance test samples and store the split samples in case of a disputed test result. The Caltrans quality assurance program requires split samples to be stored in a facility under state control in case they are needed for dispute resolution.

6-102E Investigation Samples and Tests

Specific materials or workmanship problems such as pavement failures, difficulty in achieving percent of maximum theoretical density or inconsistent test results, may require special samples and tests. When materials problems are encountered, contact the district materials engineer. The district materials engineer may request help from METS and the Division of Construction. METS will request all acceptance test results and contractor quality control test results along with material-specific additional samples and tests in order to conduct a forensic investigation.

6-102F Research Samples and Tests

Pilot projects usually have special requirements for sampling and testing of materials.

Projects developed around research needs usually require larger samples and more frequent testing than what is required by Caltrans' acceptance testing minimum frequencies. The unit that requested the research project will provide oversight for all of the special sampling and testing requirements.

6-103 Field Sampled Material Identification for Testing

Samples must be properly identified so the testing laboratory can function efficiently and report results to the project in a timely manner. In addition, accuracy in identifying where the material was placed in the project can be very useful if the material must be rejected by the engineer and then removed by the contractor.

For requesting faster processing of samples, use the "priority" designation as discussed in Section 6-102C, "Acceptance Samples and Tests," of this manual.

For field material samples, except for concrete cylinder compressive strength, use Form TL-0101, "Sample Identification Card." For concrete cylinder compressive strength, use Form TL-0502, "Field Sample of Portland Cement Concrete Sample Card."

In general, prepare Form TL-0101 as follows:

- Fill in every blank space with complete information, including the quantity and lot of material sampled.
- The "Location of Source" must clearly indicate the place (that is, behind paver, stockpile, cold feed belt) where the sample was taken.
- Indicate "Normal" for laboratory processing of sample or "Priority" if test result is needed quickly.

6-103 Field Sampled Material Identification for Testing

- If the sample was taken at the request of the contractor from local deposits as a potential source in accordance with Section 6-2.04 [*6-2*], "Local Materials," of the *Standard Specifications*, note this under "Remarks." Request that the district materials laboratory provides the cost of testing so that Caltrans can be reimbursed by the contractor.
- To protect the sample identification card against moisture or stains, place it in a plastic bag or shipping label protector.
- Distribute copies as shown on the form on the same day the sample is shipped.
- Prepare Form TL-0101 in accordance with the following details based on the type of material:
  - Aggregate sources must comply with the State Mining and Reclamation Act (SMARA) of 1975. Ensure sources of aggregates are indicated and include the SMARA listing number. Mining operations determined to be in compliance are listed on the AB 3098 SMARA Eligible List. The SMARA listing number can be obtained at the Department of Conservation website:

    http://www.consrv.ca.gov/omr/Pages/Index.aspx
  - For hot mixed asphalt (HMA) sample be sure to:
    1. Identify the HMA plant producing the material.
    2. Identify the job mix formula (JMF) producer identification number.
    3. Include the type of mix and aggregate grading specified.
    4. Under "Remarks" include the grade and source of the asphalt binder.
    5. Under "Remarks" include the percentage of asphalt binder designated in the JMF.
  - For asphalt binder sample be sure to:
    1. Identify the HMA plant using the material.
    2. Identify the source of asphalt binder.

    A list of approved asphalt suppliers is available at:

    http://www.dot.ca.gov/hq/esc/Translab/ormt/fpmcoc.htm

    For non-approved suppliers identify the refinery and shipment number for each truckload.
  - For tack coat sample be sure to:
    1. Identify the source of the asphalt binder or asphaltic emulsion.
    2. Under "Remarks" include the dilution rate (50/50 or 60/40) for asphaltic emulsions or enter "Not Diluted."
  - If the specification has requirements based on the use of the material, include the intended use under "Remarks." This is especially important for electrical conductors, as the applicable specifications depend on where and how the conductor is used.

- Prepare Form TL-0502, "Field Sample of Portland Cement Concrete Sample Card," for each pair of cylinders shipped in the same carton as follows:
  - Fill in every blank space with complete information.
  - Indicate sources of aggregates and include the SMARA listing number. Aggregate sources must comply with the SMARA. Mining operations determined to be in compliance are listed on the AB 3098 SMARA Eligible List. The SMARA listing number can be obtained at the Department of Conservation website:

    http://www.consrv.ca.gov/omr/Pages/Index.aspx
  - Indicate in the space for water the total weight of water used per cubic yard of cementitious material in the mix based on actual weight (not design weight).
  - Under "Remarks," indicate the specified concrete strength.
  - Under "Remarks," indicate if the unit weight of the hardened concrete cylinders is required. The testing laboratory will not furnish unit weight data unless it is specifically requested.
  - To protect the sample card against moisture or stains, place it in a plastic bag or shipping label protector.
  - Distribute copies as shown on the form on the same day the sample is shipped.

A uniform system for marking cylinders is used. This system consists of the contract number and the sample number. The sample number consists of a series of digits separated by dashes (-) to indicate: method of storage for curing, age at which cylinders are to be tested; the cylinder number of the pair, or group of five, which is to be tested; and project coding. Use a flow pen to mark the cylinders.

Following are examples of the cylinder marking system.

Example 6-1.1: Sample Cylinder Label

Contract No.	03-100844
Sample No.	1-28-1/5_ _ _ _ _
Date Cast	_____

For Sample No. shown in Example 6-1.1:

- The first digit indicates method 1 storage for curing.
- The second two digits indicate that the cylinder is to be tested at 28 days.
- The 1/5 set indicates that it is the no. 1 cylinder of 5 cylinders. The no. 2 cylinder would be marked 2/5 and so on for the remaining cylinders of the group.
- The last four spaces are reserved for any project coding consisting of numbers, letters, or a combination of both.

Note if only one sample card was made for two cylinders, the third symbol on the card would be 1,2/5.

Example 6-1.2: Sample Cylinder Label

Contract No.	03-100844
Sample No.	2-14-2/2_ _ _ _
Date Cast	_____

For Sample No. shown in Example 6-1.2:

- The first digit indicates method 2 storage for curing.
- The second two digits indicate that the cylinder is to be tested at 14 days.
- The 2/2 set indicates that it is the no. 2 cylinder of a group of 2 cylinders.
- The last four spaces are reserved for any project coding consisting of numbers, letters or a combination of both.

Note if one sample card is made for the two cylinders, the third symbol on the card would be 1,2/2.

6-104 Shipping of Field Samples

6-104 Shipping of Field Samples

Based on turnaround time needed to receive a test result, ship samples from the job site to the laboratory using the most economical mode of transportation available consistent with the time element involved. Do not accumulate samples at the project site to save transportation costs.

Concrete cylinders are shipped to the laboratory in accordance with California Test 540, "Method of Test for Making, Handling, and Storing Concrete Compressive Test Specimens in the Field." Cylinders are shipped without removing the mold and are packed in cardboard containers available at the district warehouse. Each carton holds two cylinders.

If the district laboratory is equipped to test concrete cylinders, they should be shipped there. Otherwise cylinders may be delivered either to the Southern Regional Lab at 13970 Victoria Street, Fontana, CA 92336, or METS at 5900 Folsom Boulevard, Sacramento, CA 95819, whichever is more convenient. Ship concrete cylinders within the time limits specified in California Test 540 or the test result cannot be used as an acceptance test.

Samples are not to be shipped c.o.d. (cash on delivery) to district materials laboratories, the Southern Regional Lab, or METS.

6-105 Acceptance Records

6-105 Acceptance Records

Keep records of all samples and tests in the project files as permanent job records. Monitor acceptance testing by using Form CEM-3701, "Test Result Summary." Corrective action or retesting of failing tests must be noted in the "Remarks" column of the form.

Documentation of the reason materials represented by failing tests were incorporated into the project must be included in the project files. For more information on procedures to follow in the case of failing tests, refer to Section 3-6, "Control of Materials," of this manual.

It is not necessary to secure separate samples for each project when two or more projects receive materials from the same source. File a copy of the test report with each project.

6-106 Project Materials Certification

6-106 Project Materials Certification

When construction work on the project is complete, prepare Form CEM-6302, "Final Materials Certification." Use the form to certify that, other than for the exceptions listed on the form, the results of tests performed on acceptance samples show that the materials used in the work controlled by sampling and testing conform to the approved plans and specifications.

If exceptions exist, check the exceptions box and note all nonconforming materials on the form. The following are examples of nonconforming materials that must be noted as exceptions:

- Materials accepted by applying a specified pay factor or deficiency adjustment, such as for hot mix asphalt, concrete pavement, or rapid-strength concrete.
- Materials out of "operating range" but within "contract compliance" for which a specified payment deduction was made.
- Materials not in compliance with the as-bid contract plans or specifications for which a change order was approved to accept the material.
- Materials that require certificates of compliance but one or more have not been submitted.

Sign the form and put the original in the project files. Send a copy to district construction and, if the project is subject to Federal Highway Administration (FHWA) construction oversight activities, send another copy to the FHWA California division administrator. The name and address of the FHWA California division administrator is available at:

http://www.fhwa.dot.gov/cadiv/

6-107 Materials Acceptance Sampling and Testing

6-107 Materials Acceptance Sampling and Testing

Sampling and testing materials and products must be in accordance with contract specifications. Sampling and testing are of equal importance for assuring materials and products meet acceptance specifications.

The tables on the following pages contain Caltrans' minimum sampling and testing requirements for materials acceptance. The frequency of sampling and testing indicated in the tables is to be used under normal conditions. Materials that are marginal in meeting the specifications should be sampled and tested on a more frequent basis. Request "Priority" testing for samples taken on potentially marginal materials.

When shown in the tables that testing frequencies may be adjusted, document any adjustment through a "Memo to File." Place the "Memo to File" in the appropriate part of Category 37 of the project files.

Close adherence to the sample size requirements shown in the tables will prevent unnecessary delays and expense of obtaining supplementary samples to complete tests.

Refer to Section 6-105 "Acceptance Records," of this manual for documenting acceptance tests results. For more information on procedures to follow in the case of failing tests, refer to Section 3-6, "Control of Materials," of this manual.

Table 6-1.4 Materials Acceptance Sampling and Testing Requirements: Earthwork (2010 *Standard Specifications* Section 19) (1 of 3)

Test	Test Method	Sample Size & Container Size	Sampling Location (See Note 1)	Acceptance Test Frequency	Remarks
STRUCTURE BACKFILL (Section 19-3.02B)					
Sieve Analysis	California Test 202	50 lb	Materials site or stockpile	1 every 3000 tons or 2000 cu yd; see Remarks	If material is uniform and well within specification limits, frequency may be decreased to 1 per day
Sand Equivalent	California Test 217				
Relative Compaction	California Test 231	Sample for California Test 216	Project site in accordance with California Test 231	1 every 2000 sq yd and test compaction at every 8 in. of thickness, see Remarks	Relative compaction test is required at each location structure backfill is placed
Maximum Wet Density	California Test 216	35 lb	Relative compaction test site locations	1 every relative compaction test, see Remarks	Wet common-composite test maximum value may be used in accordance with California Test 231.
PERVIOUS BACKFILL (Section 19-3.02C)					
Sieve Analysis	California Test 202	50 lb	Stockpile	1 every 3000 tons or 2000 cu yd, see Remarks	If material is uniform and well within specification limits, frequency may be decreased to 1 per day
BASEMENT MATERIAL (Section 19-5)					
R-Value	California Test 301	50 lb	Project site	Test to verify R-value if differing site conditions are encountered, see Remarks	R-value used in project designs are usually conservative and do not need to be field verified; when testing done for R-value in the materials report are incomplete because of preproject conditions then additional R-value testing should be requested to verify design R-value
Relative Compaction	California Test 231	Sample for California Test 216	California Test 216	1 every 2000 sq yd	
Maximum Wet Density	California Test 216	35 lb	Relative compaction test site locations	1 every relative compaction test	

Table 6-1.4 Materials Acceptance Sampling and Testing Requirements: Earthwork (2010 *Standard Specifications* Section 19) (2 of 3)

Test	Test Method	Sample Size & Container Size	Sampling Location (See Note 1)	Acceptance Test Frequency	Remarks
EMBANKMENT (Section 19-6)					
Relative Compaction	California Test 231	Sample for California Test 216	Project site in accordance with California Test 231	1 every 2000 sq yd and test compaction at every 8 in. of thickness	
Maximum Wet Density	California Test 216	35 lb	Relative compaction test site locations	1 every relative compaction test, see Remarks	Wet common-composite test maximum value may be used in accordance with California Test 231
GEOSYNTHETIC REINFORCED EMBANKMENT (Section 19-6.02B)					
Plasticity Index	California Test 204	50 lb	Materials site or stockpile	1 per source prior to use	
pH	California Test 643		Materials site or stockpile	1 per source prior to use	
Sieve Analysis	California Test 202	50 lb	Stockpile	Prior to use, 1 every 3000 tons or 2000 cu yd, see Remarks	If material is uniform and well within specification limits, the frequency may be decreased to 1 per day
IMPORTED BORROW (Section 19-7)					
R-Value	California Test 301	50 lb	Import borrow source	1 per source, see Remarks	Test for R-value only when an R-value is specified for import borrow in the special provisions; if material at import borrow source is not uniform, increase testing frequency
SHOULDER BACKING WITH RECLAIMED AGGREGATES (Section 19-9)					
Sieve Analysis	California Test 202	50 lb	Materials site or stockpile	1 every 3000 tons or 2000 cu yd, see Remarks	If material is uniform and well within specification limits, frequency may be decreased to 1 per day
Sand Equivalent	California Test 217				

Table 6-1.4 Materials Acceptance Sampling and Testing Requirements: Earthwork (2010 *Standard Specifications* Section 19) (3 of 3)

Test	Test Method	Sample Size & Container Size	Sampling Location (See Note 1)	Acceptance Test Frequency	Remarks
SHOULDER BACKING (Section 19-9)					
Crushed Particles	California Test 205	50 lb	Materials site or stockpile	1 per project prior to use	
Durability	California Test 229		Materials site or stockpile	1 per project prior to use	
Unit Weight	California Test 212 Rodding Method		Materials site or stockpile	1 per project prior to use	
Sieve Analysis	California Test 202	50 lb	Materials site or stockpile	1 every 3000 tons or 2000 cu yd, see Remarks	If material is uniform and well within specification limits, frequency may be decreased to 1 per day
Sand Equivalent	California Test 217				

Note:
1. See California Test 125 for sampling procedures.

Table 6-1.5 Materials Acceptance Sampling and Testing Requirements: Stabilized Soils (2010 *Standard Specifications* Section 24) (1 of 2)

Test	Test Method	Sample Size & Container Size	Sampling Location (See Note 1)	Acceptance Test Frequency	Remarks
Lime					
Various properties; must comply with *Standard Specifications Section 24-2.02B.*	See *Standard Specifications* Section 24-2.02B	One 10-lb sample for each type and source of lime; use a 2-qt airtight container	Initial sample provided by contractor; subsequent sampling from mid-point of delivery	Each 100 tons of lime, 2 per day maximum; see Remarks	Must be on Authorized Materials List and certificate of compliance must accompany each shipment; recommend 1 acceptance test per 5 samples of lime
LIME TREATMENT					
DETERMINATION OF LIME APPLICATION RATE					
Unconfined Compressive Strength	California Test 373	100 lb	Native soils; test each type of material to be treated	Prior to soil stabilization work and if source of lime changes; see Remarks	To determine appropriate lime content
Optimum Moisture Content	California Test 373			Prior to soil stabilization work	
VERIFICATION OF LIME APPLICATION RATE AND STABILIZED SOIL MIXTURE					
Lime Application (Dry Form)	Drop pan/ calibration pan method	Building paper or pan of known area	Surface receiving lime	Each 40,000 sq ft, 2 per day minimum; see Remarks.	To determine if application rate is within ± 5% of ordered application rate
Lime Application (Slurry Form)	Volumetric measurement that is then reduced to lime weight	Determined over known area	Slurry holding tank	Each 40,000 sq ft, 2 per day minimum; see Remarks	To determine if application rate is within ± 5% of ordered application rate
Uniformity of Mixed Stabilized Soil	Phenolphthalein alcohol indicator solution spray	N/A	Representative areas	Each day at five separate locations; see Remarks	Taken after completion of initial mixing
Moisture Content of Mixed Stabilized Soil	California Test 226	0.25 lb each sample	Representative areas at mid depth	Each day at five separate locations to verify contractor's quality control tests; see Remarks	Taken during mellowing period
Gradation of Mixed Stabilized Soil	California Test 202	25 lb	Representative areas	1 every 4000 sq yd, 1 per day minimum; see Remarks	Taken prior to compaction

Table 6-1.5 Materials Acceptance Sampling and Testing Requirements: Stabilized Soils (2010 *Standard Specifications* Section 24) (2 of 2)

Test	Test Method	Sample Size & Container Size	Sampling Location (See Note 1)	Acceptance Test Frequency	Remarks
COMPLETED TREATED SOIL					
Relative Compaction	California Test 231	Sample for California Test 216	Project site in accordance with California Test 231	1 every 2000 sq yd and test compaction at every 6 in. of thickness	
Maximum Wet Density	California Test 216	35 lb	Relative compaction test site locations	1 every relative compaction test; see Remarks	Wet common-composite test maximum value may be used in accordance with California Test 231
Dimensions	Measurement	N/A	Random locations in place after compaction	As necessary for verification of stabilized soil thickness and surface grades	
ASPHALTIC EMULSION (Curing Seal Method Only)					
Various properties based on asphaltic emulsion type used; see *Standard Specifications* Section 94	Based on asphaltic emulsion type used; see *Standard Specifications* Section 94	1-gal plastic jug	From spray bar of distributor truck	1 each shipment; see Remarks	Each shipment must be accompanied by a certificate of compliance; recommend 1 random test from samples taken

Note:
1. See California Test 125 for sampling procedures.

Table 6-1.6 Materials Acceptance Sampling and Testing Requirements: Aggregate Subbases (2010 *Standard Specifications* Section 25)

Test	Test Method	Sample Size & Container Size	Sampling Location (See Note 1)	Acceptance Test Frequency	Remarks
AGGREGATE SUBBASE Class 1, Class 2 and Class 3					
Sieve Analysis	California Test 202	50 lb	Materials site or stockpile	Every 3000 tons or 2000 cu yd; see Remarks and Note 2	If material is uniform and well within specification limits, frequency may be decreased to 1 per day
Sand Equivalent	California Test 217			Every 3000 tons or 2000 cu yd; see Remarks and Note 2	If material is uniform and well within specification limits, frequency may be decreased to 1 per day
R-Value	California Test 301	50 lb	Materials site or stockpile	Every 3000 tons or 2000 cu yd; see Remarks	R-value testing may reduced to minimum 1 acceptance test per project when test records demonstrate that material from the same source, and having comparable grading and sand equivalent values, meets minimum R-value requirements
Relative Compaction	California Test 231	Sample for California Test 216	Project site in accordance with California Test 231	Every 2000 sq yd	
Maximum Wet Density	California Test 216	35 lb	Relative compaction test site locations	Every 2000 sq yd; see Remarks	Wet common-composite test maximum value may be used in accordance with California Test 231
Dimensions	N/A	N/A	Random locations	As necessary for acceptance	Verify thickness of aggregate subbase

Notes:
1. See California Test 125 for sampling procedures.
2. If material is outside the specification limits sample and test representative material every 500 cu yd so that deductions may be taken for noncompliant material.

Table 6-1.7 Materials Acceptance Sampling and Testing Requirements: Aggregate Bases (2010 *Standard Specifications* Section 26)

Test	Test Method	Sample Size & Container Size	Sampling Location (See Note 1)	Acceptance Test Frequency	Remarks
AGGREGATE BASES Class 1, Class 2, and Class 3					
Sieve Analysis	California Test 202	50 lb	Materials site or stockpile	Every 3000 tons or 2000 cu yd; see Remarks and Note 2	If material is uniform and well within specification limits, frequency may be decreased to 1 per day
Sand Equivalent	California Test 217			Every 3000 tons or 2000 cu yd; see Remarks and Note 2	If material is uniform and well within specification limits, frequency may be decreased to 1 per day
R-Value	California Test 301	50 lb	Materials site or stockpile	Every 3000 tons or 2000 cu yd; see Remarks	R-value testing may reduced to minimum 1 acceptance test per project when test records demonstrate that material from the same source, and having comparable grading and sand equivalent values, meets minimum R-value requirements
Durability Index	California Test 229	50 lb	Materials site or stockpile	1 per project; see Remarks	Durability test not required for Class 3 aggregate base
Moisture	California Test 226	25 lb	Materials site or stockpile	2 daily when aggregate base is paid for by weight	
Relative Compaction	California Test 231	Sample for California Test 216	Project site in accordance with California Test 231	Every 2000 sq yd	
Maximum Wet Density	California Test 216	35 lb	Relative compaction test site locations	Every 2000 sq yd, see Remarks	Wet common-composite test maximum value may be used in accordance with California Test 231
Dimensions	N/A	N/A	Random locations	As necessary for acceptance	Verify thickness of aggregate base

Notes:
1. See California Test 125 for sampling procedures.
2. If material is outside the specification limits sample and test representative material every 500 cu yd so that deductions may be taken for noncompliant material.

Table 6-1.8 Materials Acceptance Sampling and Testing Requirements: Cement Treated Base (2010 *Standard Specifications* Section 27) (1 of 2)

Test	Test Method	Sample Size & Container Size	Sampling Location (See Note 1)	Acceptance Test Frequency	Remarks
CEMENT TREATED BASE Class A or Class B					
AGGREGATE					
Gradation (Sieve Analysis)	California Test 202, California Test 105	40 lb	Stockpile	1 every 3000 tons or 2000 cu yd, minimum 1 per day of production	
Sand Equivalent	California Test 217				
AGGREGATE Class B					
R-Value (with & without cement)	California Test 301	100 lb for aggregate qualification	Materials site or stockpile	Prior to production	
CEMENT					
Various Properties Must comply with *Standard Specifications Section 90-1.02B(2)*	See *Standard Specifications* Section 90-1.02B(2)	8 lb	CTB plant or cement spreader	1 each 100 tons of cement, 2 per day maximum; see Remarks	Recommend 1 acceptance test per project for cement from approved suppliers and certificate of compliance with each shipment.
WATER					
Chlorides	California Test 422	Clean 2-qt plastic jug with lined, sealed lid	At point of use	1 per source; see Remarks	Water supplies for domestic use do not need to be tested.
Sulfates	California Test 417				
COMPLETED MIX Class A					
Compressive Strength	California Test 312	See California Test 312, Part II	In place prior to compaction	1 per day; see Remarks	If first 3 days of production test records demonstrate materials are in compliance, recommend test every 5 days of production.
COMPLETED MIX Class B					
R-Value	California Test 301	50 lb	In place prior to compaction	1 every 3000 tons or 2000 cu yd; see Remarks	Recommend R-value testing be reduced to 1 every 10,000 cu yd when test records demonstrate that material from the same source, and having comparable grading and sand equivalent values, meets the minimum R-value requirements

Table 6-1.8 Materials Acceptance Sampling and Testing Requirements: Cement Treated Base (2010 *Standard Specifications* Section 27) (2 of 2)

Test	Test Method	Sample Size & Container Size	Sampling Location (See Note 1)	Acceptance Test Frequency	Remarks
COMPLETED MIX Class A and Class B					
Cement Titration	California Test 338	See California Test 338, Part I	In place prior to compaction	1 every 1500 tons or 1000 cu yd, minimum 1 per day of production	
Optimum Moisture	California Test 312	See California Test 312	Materials site or stockpile	Prior to production	
Moisture Content	California Test 226	10 lb in sealed container	In place prior to compaction	2 daily	
Relative Compaction	California Test 231	Sample for California Test 216	Project site in accordance with California Test 231	1 every 2000 sq yd	
Maximum Wet Density	California Test 216, California Test312	35 lb	Relative compaction test site locations	1 every 2000 sq yd; see Remarks	Wet common-composite test maximum value may be used in accordance with California Test 231
Thickness	N/A	N/A	Project site	Random locations as necessary for verification	
CURING SEAL (Asphaltic Emulsion)					
Various Properties in accordance with *Standard Specifications* Section 94	See *Standard Specifications* Section 94	2-qt plastic jug	Spray bar on the distributor truck	Each truckload	Certificate of compliance required with each shipment

Note:

1. See California Test 125 for sampling procedures.

Table 6-1.9 Materials Acceptance Sampling and Testing Requirements:
Concrete Bases (2010 *Standard Specifications* Section 28)
Lean Concrete Base (1 of 2)

Test	Test Method	Sample Size & Container Size	Sampling Location (See Note 1)	Acceptance Test Frequency	Remarks
AGGREGATE					
Sand Equivalent	California Test 217	50 lb	Materials site or stockpile	1 sample for each 3000 tons or 2000 cu yd	
Sieve Analysis	California Test 202, California Test 105				
AGGREGATE Qualification					
Compressive strength of laboratory mixtures (recommended minimum cement content)	California Test 548	200 lb for aggregate qualification	Materials site or stockpile	Prior to production; see Remarks	Aggregate samples must be submitted at least 45 days prior to intended use
CEMENT					
Various properties, must comply with *Standard Specifications* Section 90-1.02B(2)	See *Standard Specifications* Section 90-1.02B(2)	8 lb	Concrete plant	Each 100 tons of cement, 2 per day maximum; see Remarks	Recommend 1 acceptance test per project for cement from approved suppliers and certificate of compliance with each shipment
WATER					
Chlorides	California Test 422	Clean 2-qt plastic jug with lined, sealed lid	At point of use	1 per source; see Remarks	Water supplies for domestic use do not need to be tested
Sulfates	California Test 417				
ADMIXTURES: Air Entraining Agents					
Air entraining properties, must comply with *Standard Specifications* Section 90-1.02E	See *Standard Specifications* Section 90-1.02E	1-qt can or plastic bottle of liquid, 2 lb of powder	Concrete plant	As new supplies arrive on job site or each time brand is changed	Prior to sampling and testing, contact METS for brands which may be used prior to sampling and testing when properly certified; samples must reach METS at least 1 week prior to use; untested brands require 5 weeks prior to use

Table 6-1.9 Materials Acceptance Sampling and Testing Requirements: Concrete Bases (2010 *Standard Specifications* Section 28)
Lean Concrete Base (2 of 2)

Test	Test Method	Sample Size & Container Size	Sampling Location (See Note 1)	Acceptance Test Frequency	Remarks
ADMIXTURES: Water Reducers or Set Retarders					
Claimed properties, chloride identification	ASTM C494 Type A or Type F	1-qt can of liquid, 2 lb of powder	Concrete plant	As new supplies arrive on job site or each time brand is changed; see Remarks	Prior to sampling and testing, contact METS for brands which may be used prior to sampling and testing when properly certified; samples must reach METS at least 1 week prior to use; untested brands require 5 weeks prior to use
COMPLETED MIXTURES					
Ball Penetration	California Test 533	N/A	See ASTM C172	At least once for every 4 hours of production	
Air Content	California Test 504	N/A		At least once for each day's production	
Dimensions	N/A	N/A	Random locations	As required for verification of thickness	
CURING COMPOUND					
Curing Compound Type 3 must comply with *Standard Specifications* Section 90-1.03B(3)	ASTM C309 Pigmented, Type 2, Class A	1-qt can	At time of use	1 every shipment; see Remarks	Each shipment must have certificate of compliance that includes: 1. Test results for tests specified in Section 90-1.01D(6) of *Standard Specifications* 2. Certification that material was tested within 12 months before use

Note:
1. See California Test 125 for sampling procedures.

Table 6-1.10 Materials Acceptance Sampling and Testing Requirements: Treated Permeable Bases (2010 *Standard Specifications* Section 29) (1 of 3)

Asphalt Treated Permeable Base (ATPB)

Test	Test Method	Sample Size & Container Size	Sampling Location (See Note 1)	Acceptance Test Frequency	Remarks
AGGREGATE					
Percentage Crushed Particles	California Test 205	Combined two 40-lb canvas bags (see Note 2) or Batch 160 lb (proportioned per bin percentages)	Stockpile or plant bins	Prior to production and minimum 1 random for every 50,000 tons or less of paving	
Los Angeles Rattler (at 500 revolutions)	California Test 211				
Film Stripping	California Test 302				
Gradation (Sieve Analysis)	California Test 202	Combined two 20-lb canvas bags (see Note 3) or Batch 40 lb (proportioned per bin percentages)	Stockpile or plant bins	1 for every 4 hours of production	
Cleanness Value	California Test 227			1 for every 4 hours of production	Recommend 1 acceptance test per day if 3 consecutive days' tests are over 62
ASPHALT					
Various properties based on asphalt type used; see *Standard Specification* Section 92	Based on asphalt type used; see *Standard Specifications* Section 92	1-qt can	Asphalt feed line connecting plant storage tanks	1 per day	Certificate of compliance required for each shipment; if asphalt binder source is not on approved list, sample and test asphalt before use
COMPLETED MIX					
Asphalt Content	California Test 310 or California Test 362 or California Test 379	40 lb in metal containers	Loose mix behind paver	1 for every 4 hours of production	

Table 6-1.10 Materials Acceptance Sampling and Testing Requirements:
Treated Permeable Bases (2010 *Standard Specifications* Section 29) (2 of 3)

Cement Treated Permeable Base (CTPB)

Test	Test Method	Sample Size & Container Size	Sampling Location (See Note 1)	Acceptance Test Frequency	Remarks
AGGREGATE					
Los Angeles Rattler (loss at 500 revolutions)	California Test 211	50 lb	Stockpile	Prior to production and minimum 1 random for every 25,000 cu yd	
Soundness	California Test 214	50 lb	Stockpile	Prior to production	
Durability	California Test 229		Stockpile	Prior to production	
Gradation (Sieve Analysis)	California Test 202	40 lb	Stockpile	1 for every 4 hours of production; see Note 4	
Cleanness Value	California Test 227			1 for every 4 hours of production; see Remarks and Note 4	Recommend 1 acceptance test per day if 3 consecutive test over 80
CEMENT					
Cement, various properties; must comply with *Standard Specifications* Section 90-1.02B(2)	Must comply with *Standard Specifications* Section 90-1.02B(2)	8 lb	Concrete plant	1 for each 100 tons, 2 per day max; see Remarks	Recommend 1 acceptance test per project for cement from approved suppliers with certificate of compliance

Table 6-1.10 Materials Acceptance Sampling and Testing Requirements: Treated Permeable Bases (2010 *Standard Specifications* Section 29) (3 of 3)

Cement Treated Permeable Base (CTPB)

Test	Test Method	Sample Size & Container Size	Sampling Location (See Note 1)	Acceptance Test Frequency	Remarks
WATER					
Chlorides	California Test 422	Clean 2-qt plastic jug with lined, sealed lid	At point of use; see Remarks	1 per source; see Remarks	Water supplies for domestic use do not need to be tested
Sulfates	California Test 417				
Setting Time	ASTM C 191 or ASTM C 266	Contact METS for required quantity of water sample	At point of use; see Remarks	1 per source; see Remarks	Water supplies for domestic use do not need to be tested
Mortar Compressive Strength	ASTM C109				
Coloring Agents	Must comply with *Standard Specifications* Section 90-1.02D				
Alkalis					
Specific Gravity					

Notes:
1. See California Test 125 for sampling procedures.
2. Store one 40-lb canvas bag for dispute resolution.
3. Store one 20-lb. canvas bag for dispute resolution.
4. If test records determine that aggregate gradation or cleanness value is close to specification limit or outside the specification limits, sample and test concrete every 300 cu yd so that deductions may be taken for noncompliant material.

Table 6-1.11 Materials Acceptance Sampling and Testing Requirements: Bituminous Seals (2010 *Standard Specifications* Section 37) (1 of 2)

Test	Test Method	Sample Size & Container Size	Sampling Location (See Note 1)	Acceptance Test Frequency	Remarks
Asphaltic Emulsion and Asphaltic Emulsion for Flush Coat					
Various properties in accordance with Section 94 of *Standard Specifications* or special provisions	See Section 94 of *Standard Specifications* or special provisions	2-qt plastic jug	Transport tanker	Each shipment	Certificate of compliance required with each shipment
Polymer Modified Asphaltic Emulsion					
Viscosity	AASHTO T 59	1-qt can	Transport tanker	Each shipment	Certificate of compliance required with each shipment
Sieve Test	AASHTO T 59				
Demulsibility	AASHTO T 59				
Torsional Recovery	California Test 332				
Asphalt Rubber Binder or Modified Asphalt Binder					
Various properties in accordance with special provisions	See special provisions	1-qt can	Transport tanker	Each shipment	Certificate of compliance required with each shipment
Screenings					
LA Rattler	California Test 211	50 lb	Stockpile	Once per project	
% Crushed Particles	California Test 205				
Film Stripping	California Test 302				
Sieve Analysis	California Test 202	30 lb	Stockpile	Twice daily	
Cleanness Value	California Test 227			Once daily	
Sand for Flush Coat					
Sieve Analysis	California Test 202	25 lb	Stockpile	Once per project	

Table 6-1.11 Materials Acceptance Sampling and Testing Requirements: Bituminous Seals (2010 *Standard Specifications* Section 37) (2 of 2)

Test	Test Method	Sample Size & Container Size	Sampling Location (See Note 1)	Acceptance Test Frequency	Remarks
Slurry Seal Aggregate					
Film Stripping	California Test 302	30 lb	Stockpile	Once per project	
Durability Index	California Test 229				
Sieve Analysis	California Test 202, California Test 105	30 lb	Stockpile	Once daily	
Sand Equivalent	California Test 217				
Micro-Surfacing Aggregates					
Los Angeles Rattler (Loss at 500 revolutions)	California Test 211	50 lb	Stockpile	Once per project	
Percentage of Crushed Particles	California Test 205				
Durability Index	California Test 302				
Sieve Analysis	California Test 202	30 lb	Stockpile	Once daily	
Sand Equivalent	California Test 227				

Note:
1. See California Test 125 for sampling procedures.

Table 6-1.12 Materials Acceptance Sampling and Testing Requirements: Hot Mix Asphalt (2010 *Standard Specifications* Section 39) (1 of 5)

Test	Test Method	Sample Size & Container Type	Sampling Location (See Note 1)	Sampling Frequency	Acceptance Test Frequency	Remarks
AGGREGATE						
Gradation (Sieve Analysis) (see Note 2)	California Test 202, California Test 105, Laboratory Procedure 9	Combined two 20-lb canvas bags (see Note 3) or Batch 40 lb (proportioned per bin percentages)	HMA plant	1 for each 750 tons, 1 per day minimum	Production start-up evaluation. For standard and method process: minimum 2 per day of paving For QCQA process: 1 random for every 3750 tons of paving	
Sand Equivalent	California Test 217		HMA plant or before lime treatment	1 for each 750 tons, 1 per day minimum	Production start-up evaluation. For standard and method process: minimum 2 per day of paving For QCQA process: 1 random for every 3750 tons of paving	
LA Rattler (100 Revolutions)	California Test 211	Combined two 40-lb canvas bags (see Note 4) or Batch 160 lb (proportioned per bin percentages)	HMA plant or before lime treatment	1 for each 750 tons, 1 per day minimum	Production start-up evaluation, and minimum 1 random for every 50,000 tons or less of paving	
LA Rattler (500 Revolutions)	California Test 211		HMA plant or before lime treatment	1 for each 750 tons, 1 per day minimum	Production start-up evaluation, and minimum 1 random for every 50,000 tons or less of paving	
Percent Crushed Particles (Course)	California Test 205		HMA plant or before lime treatment	1 for each 750 tons, 1 per day minimum	Production start-up evaluation, and minimum 1 random for every 50,000 tons or less of paving	
Percent Crushed Particles (Fine)	California Test 205		HMA plant or before lime treatment	1 for each 750 tons, 1 per day minimum	Production start-up evaluation, and minimum 1 random for every 50,000 tons or less of paving	
Fine Aggregate Angularity	AASHTO T304, Method A		HMA plant or before lime treatment	1 for each 750 tons, 1 per day minimum	Production start-up evaluation, and minimum 1 random for every 50,000 tons or less of paving	
Flat and Elongated Particles	ASTM D 4791		HMA plant or before lime treatment	1 for each 750 tons, 1 per day minimum	Production start-up evaluation, and minimum 1 random for every 50,000 tons or less of paving	

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Table 6-1.12 Materials Acceptance Sampling and Testing Requirements: Hot Mix Asphalt (2010 *Standard Specifications* Section 39) (2 of 5)

Test	Test Method	Sample Size & Container Type	Sampling Location (See Note 1)	Sampling Frequency	Acceptance Test Frequency	Remarks
ASPHALT BINDER						
Various properties based on asphalt type used (see *Standard Specification* Section 92)	See *Standard Specification* Section 92	1-qt wide-mouth can	Asphalt feed line connecting the plant storage tanks	1 per day of HMA production	1 per day of HMA production; see Remarks	Certificate of compliance required for each shipment; if asphalt binder source is not on approved list, sample and test asphalt before use
ASPHALT RUBBER BINDER						
Asphalt Rubber Binder Properties	See *Standard Specification* Section 39-1.02D	1-qt wide-mouth can	Asphalt feed line connecting to the HMA plant	1 every lot	Production start-up evaluation and 1 random per 5 samples	Certificate of compliance required for each lot
Asphalt Rubber Binder Viscosity	Laboratory Procedure LP-11	1-gal wide-mouth can	Asphalt feed line connecting to the HMA plant	1 every lot	1 every lot; see Remarks	For safety, engineer may witness contractor perform test
Base Asphalt Binder Properties	See *Standard Specification* Section 92	1-qt wide-mouth can	Asphalt storage tank	Each shipment	Production start-up evaluation and 1 random per 5 samples	Certificate of compliance required for each shipment; if asphalt binder source is not on approved list, sample and test asphalt before use
Asphalt Modifier Properties	ASTM D445 ASTM D 92 ASTM D 2007	1-qt wide-mouth can	Sample port on tanker truck	Each shipment	1 random per project	
Crumb Rubber Modifier (CRM) Properties	Laboratory Procedure LP-10 California Test 208 ASTM D 297	CRM scrap tire: Two 2.5-lb in gallon zip-lock bags CRM high natural: Two 2.5-lb in gallon zip-lock bags	CRM bulk bag	Each shipment	1 random per project	

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Table 6-1.12 Materials Acceptance Sampling and Testing Requirements: Hot Mix Asphalt (2010 *Standard Specifications* Section 39) (3 of 5)

Test	Test Method	Sample Size & Container Type	Sampling Location (See Note 1)	Sampling Frequency	Acceptance Test Frequency	Remarks
HOT MIX ASPHALT MIX						
Moisture Content	AASHTO T304, Method A	10 lb, sealed metal container	Loose mix behind paver	Production start-up evaluation, and minimum 1 per project	Production start-up evaluation, and minimum 1 per project during paving	Samples should be tested within 1 hour of sampling
Asphalt Binder Content	California Test 397 or California Test 382	140 lb, cardboard boxes (see Notes 5 and 6)	Loose mix behind paver	1 for each 750 tons, 1 per day minimum	Production start-up evaluation. For standard and method process: minimum 1 per day of paving For QCQA process: 1 random for every 3,750 tons of paving	
Stability	California Test 366		Loose mix behind paver	1 for each 750 tons, 1 per day minimum	Production start-up evaluation, and minimum 1 random for every 10,000 tons or less of paving	
Maximum Theoretical Density	California Test 309		Loose mix behind paver	1 for each 750 tons, 1 per day minimum	Production start-up evaluation. For standard and QCQA, minimum 1 random test per day of paving	Testing frequency can be modified per California Test 375, Part 5D-5
Air Void Content	California Test 367		Loose mix behind paver	1 for each 750 tons, 1 per day minimum	Production start-up evaluation, and minimum 1 random for every 25,000 tons of paving	
Voids Filled with Asphalt	California Test 367		Loose mix behind paver	Production start-up evaluation, 1 every 25,000 tons of paving	Production start-up evaluation, and minimum 1 random for every 25,000 tons of paving	Report only if the adjustment for asphalt binder content target value is less than ±0.3%
Voids in Mineral Aggregate	California Test 367		Loose mix behind paver	Production start-up evaluation, 1 every 25,000 tons of paving	Production start-up evaluation, and minimum 1 random for every 25,000 tons of paving	Report only if the adjustment for asphalt binder content target value is less than ±0.3%

Table 6-1.12 Materials Acceptance Sampling and Testing Requirements: Hot Mix Asphalt (2010 *Standard Specifications* Section 39) (4 of 5)

Test	Test Method	Sample Size & Container Type	Sampling Location (See Note 1)	Sampling Frequency	Acceptance Test Frequency	Remarks
HOT MIX ASPHALT MIX Continued						
Dust Proportion	California Test 367	See Hot Mix Asphalt, page 3 of 5	Loose mix behind paver	Production start-up evaluation, 1 every 25,000 tons of paving	Production start-up evaluation, and minimum 1 random for every 25,000 tons of paving	Report only if the adjustment for asphalt binder content target value is less than ±0.3%
HOT MIX ASPHALT MIX Construction Process QC/QA						
Moisture Susceptibility	California Test 371	150 lb (see Note 7), sealed metal containers	Loose mix behind paver	Production start-up evaluation, 1 per project	Only for QC/QA: production start-up evaluation, and minimum 1 per project during paving; see Remarks	Report only; do not use test result for acceptance
HOT MIX ASPHALT MIX Type A and RHMA-G using Warm Mix Asphalt or Type A HMA with Greater Than 15 Percent Reclaimed Asphalt Pavement						
Moisture Susceptibility	California Test 371	75 lb, sealed metal containers	Loose mix behind paver	Production start-up evaluation, and minimum 1 random for every 50,000 tons of paving	Production start-up evaluation, and minimum 1 random for every 50,000 tons of paving	
Hamburg Wheel Track	AASHTO T 324 (Modified)	75 lb, sealed metal containers	Loose mix behind paver	Production start-up evaluation, and minimum 1 random for every 50,000 tons of paving	Production start-up evaluation, and minimum 1 random for every 50,000 tons of paving	

Table 6-1.12 Materials Acceptance Sampling and Testing Requirements: Hot Mix Asphalt (2010 *Standard Specifications* Section 39) (5 of 5)

Test	Test Method	Sample Size & Container Type	Sampling Location (See Note 1)	Sampling Frequency	Acceptance Test Frequency	Remarks
PAVEMENT SMOOTHNESS						
Straightedge	N/A	N/A	Pavement surface	Entire final surface	Entire final surface; see Remarks	Areas exempt from Inertial Profiler
Inertial Profiler for Mean Profile Index and Areas of Localized Roughness	AASHTO R 56 & AASHTO R 57	Each 0.1 mile	Pavement surface	Entire final surface	Entire final surface; see Remarks	Entire final surface excluding specified areas requiring straightedge. May use contractor-furnished profiles provided that engineer witnessed profile testing
TACK COAT						
Asphalt Binder	Based on asphalt type used (see *Standard Specifications* Section 92)	1-qt wide-mouth can	Spray bar on asphalt distributor truck	Each truck load	1 random per project	
Asphaltic Emulsion	Based on emulsion type used (see *Standard Specifications* Section 94)	1-gal plastic jug	Spray bar on emulsion distributor truck	Each truck load	1 random per project	
Spread Rate	California Test 339	N/A	Pavement	N/A	As necessary for verification of tack coat spread rate	

Notes:
1. See California Test 125 for sampling procedures.
2. When using RAP, adjust gradation by the correction factor determined under Laboratory Procedure 9.
3. Store one 20-lb canvas bag for dispute resolution.
4. Store one 40-lb canvas bag for dispute resolution
5. Need twelve 8X8X3 boxes or eight 8½X8½X4½ boxes. Store six 8X8X3 or four 8½X8½X4½ for dispute resolution.
6. For Open Graded Friction Course, 40-lb sample size and use metal containers in place of cardboard boxes.
7. Contractor ships 75 lb to district material laboratory for testing and 75 lb to METS for testing.

Table 6-1.13 Materials Acceptance Sampling and Testing Requirements: Concrete Pavement (2010 *Standard Specifications* Section 40) (1 of 8)

Test	Test Method	Sample Size & Container Size	Sampling Location (See Note 1)	Acceptance Test Frequency	Remarks
AGGREGATE: Coarse Aggregate					
Los Angeles Rattler (loss at 500 revolutions)	California Test 211	See Note 2	Stockpile	Prior to production and minimum 1 random for every 25,000 cu yd or less of paving; see Remarks	1 for every 4,000 cu yd if initial test shows abrasion loss greater than 40%
Cleanness Value	California Test 227	25 lb	Stockpile	Prior to production and minimum 1 for every 600 cu yd, 1 per day minimum; see Remarks	Recommend 1 acceptance test per day if 3 consecutive tests over 80; increase sampling to 1 for every 300 cu yd (deductive lot) with engineer's authorization
Sieve Analysis	California Test 202	50 lb	Belt feed	Prior to production and minimum 1 for every 600 cu yd, 1 per day minimum; see Remarks	Recommend 1 acceptance test per day if 3 consecutive tests are within operating range; increase sampling to 1 for every 300 cu yd (deductive lot) with engineer's authorization
AGGREGATE: Fine Aggregate					
Organic Impurities	California Test 213	See Note 2	Stockpile	Prior to production or when contamination is suspected	
Durability	California Test 229	See Note 2	Stockpile	Prior to production	
Sand Equivalent	California Test 217	25 lb	Stockpile	Prior to production and minimum 1 for every 600 cu yd, 1 per day minimum; see Remarks	Recommend 1 acceptance test per day if 3 consecutive tests over 80; increase sampling to 1 for every 300 cu yd (deductive lot) with engineer's authorization

Table 6-1.13 Materials Acceptance Sampling and Testing Requirements: Concrete Pavement (2010 *Standard Specifications* Section 40) (2 of 8)

Test	Test Method	Sample Size & Container Size	Sampling Location (See Note 1)	Acceptance Test Frequency	Remarks
AGGREGATE: Fine Aggregate Continued					
Sieve Analysis	California Test 202	50 lb	Belt feed	Prior to production and minimum 1 for every 600 cu yd, 1 per day minimum; see Remarks	Recommend 1 acceptance test per day if 3 consecutive tests are within operating range; increase sampling to 1 for every 300 cu yd (deductive lot) with engineer's authorization
AGGREGATE: Coarse & Fine Aggregate					
Specific Gravity & Absorption	California Test 206, California Test 207	See Note 2	Stockpile	Prior to production and when aggregate source changes	
Soundness	California Test 214	See Note 2	Stockpile	Prior to production	Soundness for fine aggregate waived if durability is ≥ 60
Sieve Analysis (combined gradation determined with fine and coarse aggregate sieve analyses)	California Test 202		N/A	Prior to production and minimum 1 for every 600 cu yd, 1 per day minimum; see Remarks	Recommend 1 acceptance test per day if 3 consecutive tests are within operating range; increase sampling to 1 for every 300 cu yd (deductive lot) with engineer's authorization
CEMENTITIOUS MATERIALS					
Cement, Various Properties; must comply with *Standard Specifications* Section 90-1.02B(2)	See *Standard Specifications* Section 90-1.02B(2)	8 lb	Concrete plant	Sample each 100 tons of cement, 2 per day maximum; see Remarks	Cement must be on Authorized Material List; cement accepted based on certificate of compliance with each shipment; recommend 1 verification test per 5 samples

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Table 6-1.13 Materials Acceptance Sampling and Testing Requirements: Concrete Pavement (2010 *Standard Specifications* Section 40) (3 of 8)

Test	Test Method	Sample Size & Container Size	Sampling Location (See Note 1)	Acceptance Test Frequency	Remarks
CEMENTITIOUS MATERIALS Continued					
Supplementary Cementitious Materials (SCM), various properties; must comply with *Standard Specifications* Section 90-1.02B(3)	See *Standard Specifications* Section 90-1.02B(3)	8 lb	Concrete plant	Sample each 100 tons of SCM, 2 per day maximum; see Remarks	SCMs must be on Authorized Material List; SCM accepted based on certificate of compliance with each shipment; recommend 1 verification test per 5 samples
WATER					
Chlorides	California Test 422	Clean 2-qt plastic jug with lined, sealed lid	At point of use	1 per source; see Remarks	Water supplies for domestic use do not need to be tested
Sulfates	California Test 417				
Setting Time	ASTM C 191 or ASTM C 266	Contact METS for required quantity of water sample	At point of use	1 per source; see Remarks	Water supplies for domestic use do not need to be tested
Mortar Compressive Strength	ASTM C109				
Coloring Agents	Must comply with *Standard Specifications* Section 90-1.02D				
Alkalis					
Specific Gravity					
ADMIXTURE: Air Entraining Agent					
Air Entraining Properties; must comply with *Standard Specifications* Section 90-1.02E)	See *Standard Specifications* Section 90-1.02E	1-qt can or plastic bottle of liquid, 2 lb of powder	Concrete plant	Sample each shipment ; see Remarks	Must be on Authorized Material List and certificate of compliance must accompany each shipment; recommend 1 verification test per 5 samples
CHEMICAL ADMIXTURE: Water Reducers or Set Retarders					
Claimed properties, chloride identification	ASTM C494 Type A, B, D, F or Type G California Test 415	1-qt can of liquid, 2 lb of powder	Concrete plant	Sample each shipment; see Remarks	Must be on Authorized Material List and certificate of compliance must accompany each shipment; recommend 1 verification test per 5 samples

Note:
1. See California Test 125 for sampling procedures.

Table 6-1.13 Materials Acceptance Sampling and Testing Requirements: Concrete Pavement (2010 *Standard Specifications* Section 40) (4 of 8)

Test	Test Method	Sample Size & Container Size	Sampling Location	Acceptance Test Frequency	Remarks
CONCRETE					
Shrinkage	AASHTO T 160 Modified See *Standard Specifications* Section 90-1.01D(3)	Set of three 4 x 4 x 11¼ in.	During mix design process	Prior to production; see Remarks	Engineer may use contractor-provided test result for acceptance; test result must be within 3 years of contract authorization date
Coefficient of Thermal Expansion	AASHTO T 336	4 specimens from single concrete sample	Field qualification	Prior to production and 1 random per project; see Remarks	JPCP – report only CRCP – test result for acceptance
Concrete Uniformity	California Test 533 ASTM C 143	See test method	Point of concrete delivery into the work	When beams are molded and when uniformity is questionable, minimum 2 per day	
Concrete Uniformity	California Test 529	100 lb	Point of concrete delivery into the work	When uniformity is questionable	
Modulus of Rupture	California Test 523	1 set of 2 beams 6 x 6 x 32 in. (min.) for centerpoint loading or 6 x 6 x 20 in. (min.) for third-point loading	Point of concrete delivery into the work	1 set per age for each 1,000 cu yd, 1 per day minimum; see Remarks and Note 3	Recommend frequency of every 2,000 cu yd if after 10 sets all tests are in compliance
Air Content	California Test 504	See test method	Point of concrete delivery into the work	1 every day of production; see Remarks	Only test when air entrainment is specified

Table 6-1.13 Materials Acceptance Sampling and Testing Requirements: Concrete Pavement (2010 *Standard Specifications* Section 40) (5 of 8)

Test	Test Method	Sample Size & Container Size	Sampling Location	Acceptance Test Frequency	Remarks
PAVEMENT					
Thickness	California Test 531	4-in.-diameter core, full thickness of pavement	See Section 4-4004 of this manual	1 every 1200 sq yd	
Dowel Bar Alignment and Concrete Consolidation	Measurement and Inspection	4-in.-diameter core size	Transverse pavement joints	1 test every 700 sq yd; see Remarks	Each test consists of 2 cores, one on each end of dowel bar
Tie Bar Alignment and Concrete Consolidation	Measurement and Inspection	4-in.-diameter core size	Longitudinal pavement joints	1 test every 4000 sq yd; see Remarks	Each test consists of 2 cores, one on each end of tie bar
Coefficient of Friction	California Test 342	N/A	Pavement surface	1 test for each day of paving; see Remarks	Each test consists of 5 measurements
Smoothness - Straightedge	Measurement with 12-ft straightedge	N/A	Pavement surface	Entire final surface; see Remarks	Areas exempt from Inertial Profiler
Smoothness - Inertial Profiler for Mean Profile Index and Areas of Localized Roughness	AASHTO R 56 and AASHTO R 57	Each 0.1 mile	Pavement surface	Entire final surface; see Remarks	Entire final surface excluding specified areas requiring straightedge

Table 6-1.13 Materials Acceptance Sampling and Testing Requirements: Concrete Pavement (*Standard Specifications* Section 40) (6 of 8)

Test	Test Method	Sample Size & Container Size	Sampling Location	Acceptance Test Frequency	Remarks
MISCELLANEOUS CONCRETE PAVEMENT MATERIALS					
BAR REINFORCING					
Bar Reinforcing; must comply with *Standard Specifications* Section 40-1.02 and Section 52	See *Standard Specifications* Section 40-1.02 and Section 52	Two 30-in.-long samples of each size for each shipment (epoxy-coated prefabricated bar reinforcement)	Job site	See *Standard Specifications* Section 52 and as necessary for verification if quality is questionable; see Remarks	Each shipment must have certificate of compliance
TIE BARS					
Tie Bars; must comply with *Standard Specifications* Section 40-1.02 and Section 52	*See Standard Specifications* Section 40-1.02 and Section 52	Two 30-in.-long samples of each size for each shipment (epoxy-coated or epoxy-coated prefabricated reinforcement)	Job site	See *Standard Specifications* Section 52 and as necessary for verification if quality is questionable; see Remarks	Each shipment must have certificate of compliance
TIE BAR COUPLERS					
			Job site	As necessary for verification if quality is questionable; see Remarks	Each shipment must have certificate of compliance
TIE BAR BASKETS					
Tie Bar Baskets; must comply with *Standard Specifications* Section 40-1.02 and Section 52	See *Standard Specifications* Section 40-1.02 and Section 52	1 tie bar basket	Job site	1 per project and as necessary for verification if quality is questionable; see Remarks	Each shipment must have certificate of compliance
DOWEL BARS					
Dowel Bars; must comply with *Standard Specifications* Section 40-1.02 and Section 52	See *Standard Specifications* Section 40-1.02 and Section 52	Two 30-in.-long samples of each size for each shipment (epoxy-coated or epoxy-coated prefabricated reinforcement)	Job site	See *Standard Specifications* Section 52 and as necessary for verification if quality is questionable; see Remarks	Each shipment must have certificate of compliance

Table 6-1.13 Materials Acceptance Sampling and Testing Requirements: Concrete Pavement (*Standard Specifications* Section 40) (7 of 8)

Test	Test Method	Sample Size & Container Size	Sampling Location	Acceptance Test Frequency	Remarks
MISCELLANEOUS CONCRETE PAVEMENT MATERIALS					
DOWEL BAR BASKETS					
Dowel Bar Baskets; must comply with *Standard Specifications* Section 40-1.02 and Section 52	See *Standard Specifications* Section 40-1.02 and Section 52	1 dowel bar basket	Job site	1 per project and as necessary for verification if quality is questionable; see Remarks	Each shipment must have certificate of compliance
CHEMICAL ADHESIVE FOR DRILLING AND BONDING TIE BARS AND DOWEL BARS					
Chemical Adhesive Properties		1 prepackaged cartridge per shipment	Job site	As necessary for verification if quality is questionable; see Remarks	Chemical adhesive must be on Authorized Material List; each shipment must have certificate of compliance
SILICONE JOINT SEALANT					
Silicone Joint Sealant; must comply with *Standard Specifications* Section 40-1.02	See *Standard Specifications* Section *40-1.02*	1 prepackaged cartridge per shipment	Job site	As necessary for verification if quality is questionable; see Remarks	Each shipment must have certificate of compliance
ASPHALT RUBBER JOINT SEALANT					
Asphalt Rubber Joint Sealant; must comply with *Standard Specifications* Section 40-1.02)	See *Standard Specifications* Section 40-1.02	1-qt wide-mouth can	Job site	As necessary for verification if quality is questionable; see Remarks	Each shipment must have certificate of compliance
PREFORMED COMPRESSION SEAL					
Preformed Compression Joint Seals Properties	ASTM D 2628	1 sample per size of seal for each shipment. Contact METS for sample dimensions	Job site	As necessary for verification if quality is questionable; see Remarks	Each shipment must have certificate of compliance
BACKER RODS					
Backer Rod Properties	ASTM D 5249, Type 1	1 sample per size of backer rod for each shipment. Contact METS for sample dimensions	Job site	As necessary for verification if quality is questionable; see Remarks	Each shipment must have certificate of compliance

Table 6-1.13 Materials Acceptance Sampling and Testing Requirements: Concrete Pavement (*Standard Specifications* Section 40) (8 of 8)

Test	Test Method	Sample Size & Container Size	Sampling Location	Acceptance Test Frequency	Remarks
MISCELLANEOUS CONCRETE PAVEMENT MATERIALS					
JOINT FILLER MATERIAL					
Joint Filler Properties	ASTM D 994	1 sample per thickness for each shipment, 6 in. by full width of material	Job site	As necessary for verification if quality is questionable; see Remarks	Each shipment must have certificate of compliance
EPOXY POWDER COATING					
Epoxy Powder Coating Properties		4 oz, within airtight container for each batch	Contractor supplier sample to ship to METS	1 per batch and as necessary for verification if quality is questionable; see Remarks	Must be on the Authorized Material List; each shipment must have certificate of compliance
CURING COMPOUND					
Curing Compound no. 1 or no. 2; must comply with *Standard Specifications* Section 90-1.03B(3)	ASTM C309 Pigmented, Type 2, Class B	1-qt can	At time of use	1 every shipment; see Remarks	Each shipment must have certificate of compliance that includes: 1. Test results for the tests specified in Section 90-1.01D(6) of *Standard Specifications* 2. Certification that the material was tested within 12 months before use

Notes:
1. See California Test 125 for sampling procedures.
2. For initial testing, provide 100 lb of 1-1/2 in. x 3/4 in., 75 lb of 3/4 in. x No. 4, 75 lb of pea gravel, and 50 lb of sand. Use this material for California Test 202, 206, 207, 211, 213, 214, 217, 227, and 229.
4. If concrete modulus of rupture is close to specification limit or outside the specification limits, sample and test concrete every 1000 cu yd so that deductions may be taken for noncompliant material.

Table 6-1.14 Materials Acceptance Sampling and Testing Requirements: Concrete Structures (2010 *Standard Specifications* Section 51) (1 of 5)

Test	Test Method	Sample Size & Container Size	Sampling Location (See Note 1)	Acceptance Test Frequency	Remarks
AGGREGATE: Coarse Aggregate					
Los Angeles Rattler (loss at 500 revolutions)	California Test 211	See Note 2	Stockpile	Prior to production and minimum 1 random for every 25,000 cu yd or less of concrete; see Remarks	1 for every 4,000 cu yd, if initial test shows abrasion loss greater than 40%
Cleanness Value	California Test 227	25 lb	Stockpile	Prior to production and minimum 1 for every 600 cu yd, 1 per day minimum; see Remarks	Recommend 1 acceptance test per day if 3 consecutive tests over 80. Increase sampling to 1 for every 300 cu yd (deductive lot) with engineer's authorization
Sieve Analysis	California Test 202	50 lb	Belt feed	Prior to production and minimum 1 for every 600 cu yd, 1 per day minimum; see Remarks	Recommend 1 acceptance test per day if 3 consecutive tests are within operating range; increase sampling to 1 for every 300 cu yd (deductive lot) with engineer's authorization
AGGREGATE: Fine Aggregate					
Organic Impurities	California Test 213	See Note 2	Stockpile	Prior to production or when contamination is suspected	
Durability	California Test 229	See Note 2	Stockpile	Prior to production	
Sand Equivalent	California Test 217	25 lb	Stockpile	1 every 600 cu yd, 1 per day minimum; see Remarks	Recommend 1 acceptance test per day if 3 consecutive tests over 80. Increase sampling to 1 for every 300 cu yd (deductive lot) with engineer's authorization

Table 6-1.14 Materials Acceptance Sampling and Testing Requirements: Concrete Structures (2010 *Standard Specifications* Section 51) (2 of 5)

Test	Test Method	Sample Size & Container Size	Sampling Location (See Note 1)	Acceptance Test Frequency	Remarks
AGGREGATE: Fine Aggregate Continued					
Sieve Analysis	California Test 202	50 lb	Belt feed	Prior to production and minimum 1 for every 600 cu yd, 1 per day minimum; see Remarks	Recommend 1 acceptance test per day if 3 consecutive tests are within operating range; increase sampling to 1 for every 300 cu yd (deductive lot) with engineer's authorization
AGGREGATE: Coarse & Fine Aggregate					
Specific Gravity & Absorption	California Test 206, California Test 207	See Note 2	Stockpile	Prior to production and when aggregate source changes	
Soundness	California Test 214	See Note 2	Stockpile	Prior to production	Soundness for fine aggregate waived if durability is ≥ 60
Sieve Analysis (combined gradation determined with fine and coarse sieve analyses)	California Test 202		N/A	Prior to production and minimum 1 for every 600 cu yd, 1 per day minimum; see Remarks	Recommend 1 acceptance test per day if 3 consecutive tests are within operating range; increase sampling to 1 for every 300 cu yd (deductive lot) with engineer's authorization
CEMENTITIOUS MATERIALS					
Cement, various properties; must comply with *Standard Specifications* Section 90-1.02B(2)	See *Standard Specifications* Section 90-1.02B(2)	8 lb	Concrete plant	Sample each 100 tons of cement, 2 per day maximum; see Remarks	Cement must be on Authorized Material List; cement accepted based on certificate of compliance with each shipment; recommend 1 verification test per 5 samples

Table 6-1.14 Materials Acceptance Sampling and Testing Requirements: Concrete Structures (2010 *Standard Specifications* Section 51) (3 of 5)

Test	Test Method	Sample Size & Container Size	Sampling Location (See Note 1)	Acceptance Test Frequency	Remarks
CEMENTITIOUS MATERIALS Continued					
Supplementary Cementitious Materials (SCM), various properties; must comply with *Standard Specifications* Section 90-1.02B(3)	See *Standard Specifications* Section 90-1.02B(3)	8 lb	Concrete plant	Sample each 100 tons of SCM, 2 per day maximum; see Remarks	SCMs must be on Authorized Material List; SCM accepted based on certificate of compliance with each shipment; recommend 1 verification test per 5 samples
WATER					
Chlorides	California Test 422	Clean 2-qt plastic jug with lined, sealed lid	At point of use	1 per source; see Remarks	Water supplies for domestic use do not need to be tested
Sulfates	California Test 417				
Setting Time	ASTM C 191 or ASTM C 266	Contact METS for required quantity of water sample	At point of use	1 per source; see Remarks	Water supplies for domestic use do not need to be tested
Mortar Compressive Strength	ASTM C109				
Coloring Agents	Must comply with *Standard Specifications* Section 90-1.02D				
Alkalis					
Specific Gravity					
ADMIXTURES: Air Entraining Agent					
Air Entraining Properties; must comply with *Standard Specifications* Section 90-1.02E	See *Standard Specifications* Section 90-1.02E	1-qt can or plastic bottle of liquid, 2 lb of powder	Concrete plant	Sample each shipment; see Remarks	Must be on Authorized Material List and certificate of compliance must accompany each shipment; recommend 1 verification test per 5 samples
CHEMICAL ADMIXTURES: Water Reducers or Set Retarders					
Claimed properties, chloride identification	ASTM C494 Type A, B, D, F or Type G California Test 415	1-qt can of liquid, 2 lb of powder	Concrete plant	Sample each shipment; see Remarks	Must be on Authorized Material List and certificate of compliance must accompany each shipment; recommend 1 verification test per 5 samples

Table 6-1.14 Materials Acceptance Sampling and Testing Requirements: Structures Concrete (2010 *Standard Specifications* Section 51) (4 of 5)

Test	Test Method	Sample Size & Container Size	Sampling Location (See Note 3)	Acceptance Test Frequency	Remarks
CONCRETE					
Shrinkage	AASHTO T 160 Modified See *Standard Specifications* Section 90-1.01D(3)	Set of three 4 x 4 x 11¼ in.	During mix design process	Prior to production; see Remarks	Engineer may use contractor provided test result for acceptance; test result must be within 3 years of contract authorization date
Yield	California Test 518	See test method	Concrete truck discharge chute	As necessary to assure accuracy of mix design; minimum 2 per each mix design	No deductions for cement content will be made based on results of California Test 518
Concrete Uniformity	California Test 533 ASTM C143	See test method	Concrete truck discharge chute	When compressive test specimen is fabricated & when uniformity is questionable, minimum 2 per day	
Concrete Uniformity	California Test 529	100 lb	Concrete truck discharge chute	When uniformity is questionable.	
Compressive Strength	California Test 540, California Test 521	1 set of 2 cylinders, 6 x 12 in., for each test	Concrete truck discharge chute	1 set per age for every 300 cu yd concrete or as required for acceptance; minimum 1 set per project and mix of concrete for each day's production of critical structural elements; see Remarks	For trial batches, see *Standard Specifications* or job special provisions and Section 6-3 of this manual
Air Content	California Test 504	See test method	Concrete truck discharge chute	1 every 4 hours of production and when test specimens are fabricated; see remarks.	Where air is specified for freeze-thaw resistance, a minimum of 1 every 30 cu yd

Table 6-1.14 Materials Acceptance Sampling and Testing Requirements: Concrete Structures (2010 *Standard Specifications* Section 51*)* (5 of 5)

Test	Test Method	Sample Size & Container Size	Sampling Location (See Note 1)	Acceptance Test Frequency	Remarks
CURING COMPOUND					
Curing Compound, must comply with *Standard Specifications* Section 90-1.03B(3)	ASTM C309	1-qt can	At time of use	1 every shipment; see Remarks	Each shipment must have certificate of compliance that includes: 1. Test results for tests specified in Section 90-1.01D(6) of *Standard Specifications* 2. Certification that material was tested within 12 months before use

Notes:
1. See California Test No. 125 for sampling procedures.
2. For initial testing, provide 100 lb of 1-1/2 in. x 3/4 in., 75 lb of 3/4 in. x No. 4, 75 lb of pea gravel, and 50 lb of sand. Use this material for California Test 202, 206, 207, 211, 213, 214, 217, 227, and 229.
3. See California Test 539 for sampling concrete procedures.

Table 6-1.15 Materials Acceptance Sampling and Testing Requirements: Concrete (2010 *Standard Specifications* Section 90) (1 of 7)

Concrete Except Minor Concrete and Rapid Strength Concrete

Test	Test Method	Sample Size & Container Size	Sampling Location (See Note 1)	Acceptance Test Frequency	Remarks
AGGREGATE: Coarse Aggregate					
Los Angeles Rattler (loss 500 revolutions)	California Test 211	See Note 2	Stockpile	Prior to production and minimum 1 random for every 25,000 cu yd; see Remarks	1 for every 4,000 cu yd, if initial test shows abrasion loss greater than 40%.
Cleanness Value	California Test 227	25 lb	Stockpile	Prior to production and minimum 1 for every 600 cu yd, 1 per day minimum; see Remarks	Recommend 1 acceptance test per day if 3 consecutive tests over 80; increase sampling to 1 for every 300 cu yd (deductive lot) with engineer's authorization
Sieve Analysis	California Test 202	50 lb	Belt Feed	Prior to production and minimum 1 for every 600 cu yd, 1 per day minimum; see remarks	Recommend 1 acceptance test per day if 3 consecutive tests are within operating range. Increase sampling to 1 for every 300 cu yd (deductive lot) with engineer's authorization
AGGREGATE: Fine Aggregate					
Organic Impurities	California Test 213	See Note 2	Stockpile	Prior to production or when contamination is suspected	
Durability	California Test 229	See Note 2	Stockpile	Prior to production	
Sand Equivalent	California Test 217	25 lb	Stockpile	Prior to production and minimum 1 for every 600 cu yd, 1 per day minimum; see Remarks.	Recommend 1 acceptance test per day if 3 consecutive tests over 80; increase sampling to 1 for every 300 cu yd (deductive lot) with engineer's authorization
Sieve Analysis	California Test 202	50 lb	Belt feed	Prior to production and minimum 1 for every 600 cu yd, 1 per day minimum; see Remarks.	Recommend 1 acceptance test per day if 3 consecutive tests are within operating range; increase sampling to 1 for every 300 cu yd (deductive lot) with engineer's authorization

Table 6-1.15 Materials Acceptance Sampling and Testing Requirements: Concrete (2010 *Standard Specifications* Section 90) (2 of 7)

Concrete Except Minor Concrete and Rapid Strength Concrete

Test	Test Method	Sample Size & Container Size	Sampling Location (See Note 1)	Acceptance Test Frequency	Remarks
AGGREGATE: Coarse & Fine Aggregate					
Specific Gravity & Absorption	California Test 206, California Test 207	See Note 2	Stockpile	Prior to production and when aggregate source changes	
Soundness	California Test 214	See Note 2	Stockpile	Prior to production	Soundness for fine aggregate waived if durability is ≥ 60
Sieve Analysis (combined gradation determined with fine and coarse aggregate sieve analyses)	California Test 202		N/A	Prior to production and minimum 1 for every 600 cu yd, 1 per day minimum; see Remarks	Recommend 1 acceptance test per day if 3 consecutive tests are within operating range. Increase sampling to 1 for every 300 cu yd (deductive lot) with engineer's authorization
CEMENTITIOUS MATERIALS					
Cement, various properties; must comply with *Standard Specifications Section 90-1.02B(2)*	See *Standard Specifications* Section 90-1.02B(2)	8 lb	Concrete plant	Sample each 100 tons of cement, 2 per day maximum; see Remarks	Cement must be on Authorized Material List; cement accepted based on certificate of compliance with each shipment; recommend 1 verification test per 5 samples
Supplementary Cementitious Materials (SCM), various properties; must comply with *Standard Specifications* Section 90-1.02B(3)	See *Standard Specifications* Section 90-1.02B(3)	8 lb	Concrete plant	Sample each 100 tons of SCM, 2 per day maximum; see Remarks	SCMs must be on Authorized Material List; SCM accepted based on certificate of compliance with each shipment; recommend 1 verification test per 5 samples

Table 6-1.15 Materials Acceptance Sampling and Testing Requirements: Concrete (2010 *Standard Specifications* Section 90) (3 of 7)

Concrete Except Minor Concrete and Rapid Strength Concrete

Test	Test Method	Sample Size & Container Size	Sampling Location (See Note 1)	Acceptance Test Frequency	Remarks
WATER					
Chlorides	California Test 422	Clean 2-qt plastic jug with lined, sealed lid	At point of use	1 per source; see Remarks	Water supplies for domestic use do not need to be tested
Sulfates	California Test 417				
Setting Time	ASTM C 191 or ASTM C 266	Contact METS for required quantity of water sample	At point of use	1 per source; see Remarks	Water supplies for domestic use do not need to be tested
Mortar Compressive Strength	ASTM C109				
Coloring Agents	Must comply with *Standard Specifications* Section 90-1.02D				
Alkalis					
Specific Gravity					
ADMIXTURES: Air Entraining Agent					
Air entraining properties Must comply with *Standard Specifications* Section 90-1.02E	See *Standard Specifications* Section 90-1.02E	1-qt can or plastic bottle of liquid, 2 lb of powder	Concrete plant	Sample each shipment; see Remarks	Must be on Authorized Material List and certificate of compliance must accompany each shipment; recommend 1 verification test per 5 samples
CHEMICAL ADMIXTURE: Water Reducers or Set Retarders					
Claimed properties, chloride identification	ASTM C494 Type A, B, D, F or Type G California Test 415	1-qt can of liquid, 2 lb of powder	Concrete plant	Sample each shipment; see Remarks.	Must be on Authorized Material List and certificate of compliance must accompany each shipment; recommend 1 verification test per 5 samples

Table 6-1.15 Materials Acceptance Sampling and Testing Requirements: Concrete (2010 *Standard Specifications* Section 90) (4 of 7)

Concrete Except Minor Concrete and Rapid Strength Concrete

Test	Test Method	Sample Size & Container Size	Sampling Location	Acceptance Test Frequency	Remarks
CONCRETE for Pavement and Structures					
Shrinkage	AASHTO T 160 Modified See *Standard Specifications* Section 90-1.01D(3)	Set of three: 4 x 4 x 11¼ in.	During mix design process	Prior to production; see Remarks	Engineer may use contractor provided test result for acceptance; test results must be within 3 years of contract authorization date
CONCRETE Designated Compressive Strength 3600 psi or Greater					
Yield	California Test 518	See test method	Concrete truck discharge chute; see Note 3	As necessary to assure accuracy of mix design; minimum 2 per each mix design	No deductions for cement content will be made based on the results of California Test 518
Concrete Uniformity	ASTM C143, California Test 533	See test method	Concrete truck discharge chute; see Note 3	When compressive test specimen is fabricated and when consistency or uniformity is questionable, minimum 2 per day	
Concrete Uniformity	California Test 529	100 lb	Concrete truck discharge chute; see Note 3	When uniformity is questionable	
Compressive Strength	ASTM C172, California Test 540	1 set of 2 cylinders 6 x 12 in. for each test	Concrete truck discharge chute; see Note 3	1 set per age for every 300 cu yd concrete or as required for acceptance, minimum 1 set per project; see Remarks	For trial batches, see *Standard Specifications* or job special provisions and Section 6-3 of this manual
Air Content	California Test 504	See test method	Concrete truck discharge chute; see Note 3	1 every 4 hours of production and when test specimens are fabricated; see remarks	Where air is specified for freeze-thaw resistance, a minimum of 1 every 30 cu yd

Table 6-1.15 Materials Acceptance Sampling and Testing Requirements: Concrete (2010 *Standard Specifications* Section 90) (5 of 7)

Concrete Except Minor Concrete and Rapid Strength Concrete

Test	Test Method	Sample Size & Container Size	Sampling Location	Acceptance Test Frequency	Remarks
CONCRETE With Compressive Strength Less Than 3600 psi					
Concrete Uniformity	ASTM C143, California Test 533	See test method	Concrete truck discharge chute; see Note 3	When compressive test specimen is fabricated and when uniformity is questionable	
Concrete Uniformity	California Test 529	100 lb	Concrete truck discharge chute; see Note 3	When uniformity is questionable	
Compressive Strength	California Test 540, California Test 521	1 set of 2 cylinders, 6 x 12 in., for each test	Concrete truck discharge chute; see Note 3	1 set per age for every 300 cu yd, minimum 1 set per project	
Air Content	California Test 504	See test method	Concrete truck discharge chute; see Note 3	When compressive test specimens are fabricated; see Remarks	Where air is specified for freeze-thaw resistance, a minimum of 1 every 100 cu yd
CURING COMPOUND					
Curing Compound; must comply with *Standard Specifications Section 90-1.03B(3)*	ASTM C309	1-qt can	At time of use; see Note 1	1 every shipment; see Remarks	Each shipment must have certificate of compliance that includes: 1. Test results for tests specified in Section 90-1.01D(6) of *Standard Specifications* 2. Certification that material was tested within 12 months before use

Table 6-1.15 Materials Acceptance Sampling and Testing Requirements: Concrete (2010 *Standard Specifications* Section 90) (6 of 7)

Minor Concrete

Test	Test Method	Sample Size & Container Size	Sampling Location (See Note 1)	Acceptance Test Frequency	Remarks
CEMENTITIOUS MATERIALS					
Cement, various properties; must comply with *Standard Specifications* Section 90-1.02B(2)	See *Standard Specifications* Section *90-1.02B(2)*	8 lb	Concrete plant	Sample and test if cement quality is questionable; see Remarks	Cement source must be shown on Authorized Materials List; certificate of compliance must accompany each cement shipment
Supplementary Cementitious Materials (SCM), various properties; must comply with *Standard Specifications* Section 90-1.02B(3)	See *Standard Specifications* Section 90-1.02B(3)	8 lb	Concrete plant	Sample and test if SCM quality is questionable; see Remarks	SCM source must be shown on Authorized Materials List; certificate of compliance must accompany each SCM shipment
ADMIXTURES: Air Entraining Agent					
Air entraining properties; must comply with *Standard Specifications* Section 90-1.02E	See *Standard Specifications* Section 90-1.02E	N/A	N/A	See Remarks	Must be on Authorized Materials List and certificate of compliance must accompany each shipment
CHEMICAL ADMIXTURES: Water Reducers or Set Retarders					
Claimed properties, chloride identification	ASTM C494 Type A, B, D, F or Type G California Test 415	N/A	N/A	See Remarks	Must be on Authorized Materials List and certificate of compliance must accompany each shipment

Table 6-1.15 Materials Acceptance Sampling and Testing Requirements: Concrete (2010 *Standard Specifications* Section 90) (7 of 7)

Minor Concrete

Test	Test Method	Sample Size & Container Size	Sampling Location	Acceptance Test Frequency	Remarks
CONCRETE					
Yield	California Test 518	See test method	Concrete truck discharge chute; see Note 3	As necessary to assure accuracy of mix design; minimum 1 per each mix design; see Remarks	No deductions for cement content will be made based on the results of California Test 518.
Compressive Strength	California Test 540, California Test 521	1 set of 2 cylinders, 6 x 12 in., for each test	Concrete truck discharge chute; see Note 3	Sample and test if concrete quality is questionable; minimum 1 per mix design; see Remarks	Minor concrete must have the strength described or 2,500 psi, whichever is greater; see *Standard Specifications* Section 90-1.02A
Air Content	California Test 504	See test method	Concrete truck discharge chute; see Note 3	Where air is specified for freeze-thaw resistance, a minimum of 1 every 100 cu yd.	Where air is specified for freeze-thaw resistance, a minimum of 1 every 100 cu yd
CURING COMPOUND					
Curing Compound; must comply with *Standard Specifications Section 90-1.03B(3)*	ASTM C309	1-qt can	At time of use; see Note 1	1 every shipment; see Remarks	Each shipment must have certificate of compliance that includes: 1. Test results for tests specified in Section 90-1.01D(6) of *Standard Specifications*. 2. Certification that material was tested within 12 months before use

Notes:
1. See California Test No. 125 for sampling procedures.
2. For initial testing, provide 100 lb of 1-1/2 in. x 3/4 in., 75 lb of 3/4 in. x No. 4, 75 lb of pea gravel, and 50 lb of sand. Use this material for California Test 202, 206, 207, 211, 213, 214, 217, 227 and 229.
3 See California Test 539 for sampling procedures.

Table 6-1.16 Materials Acceptance Sampling and Testing Requirements: Miscellaneous Materials (1 of 5)

Test	Test Method	Sample Size & Container Size	Sampling Location	Acceptance Test Frequency	Remarks
BARBED WIRE (Section 80-2.02D)					
Barbed Wire, various properties; must comply with *Standard Specifications* Section 80-2.02D	ASTM A 121	1 yd length	Job site	As necessary for verification if quality is questionable	
BOLTS AND HARDWARE					
		2 samples each diameter		Each lot	Sample and test if not previously inspected at the source
CHAIN LINK FENCING (Section 80-2.02E)					
Wire Mesh, various properties; must comply with *Standard Specifications* Section 80	ASTM A116, Class 1	2 ft width	Job site	Each lot for verification if quality is questionable; see Remarks	Certificate of Compliance required for vinyl clad fencing
CONCRETE AND CLAY PIPE					
Compliance with specifications		Contact METS for instructions		Contact METS for instructions	Sample and test if not previously inspected a source
JOINT FILLER EXPANSION					
Compliance with specifications		6 in. long, full width of sheet		Each 1000 sq ft not less than 2 per shipment	
ELECTRICAL CONDUCTORS (Section 86-2.08)					
Plastic Conduit, various properties; must comply with *Standard Specifications* Section 86-2.08	See *Standard Specifications* Section 86-2.08	2 each, 3 in. long, include markings	Job site	Each lot for verification if quality is questionable; see Remarks.	Certificate of compliance required

Table 6-1.16 Materials Acceptance Sampling and Testing Requirements: Miscellaneous Materials (2 of 5)

Test	Test Method	Sample Size & Container Size	Sampling Location	Acceptance Test Frequency	Remarks
GALVANIZED PIPE					
Compliance with specifications		1-ft length from each end of length tested of each size		Each 500 lengths or fraction	Sample and test if not previously inspected at the source
GEOSYNTHETICS (Section 88)					
Various properties; must comply with *Standard Specifications* Section 88	See *Standard Specifications* Section 88	1 piece, 3 ft x full width of roll	Job site	Each lot for verification if quality is questionable. See Remarks.	Certificate of compliance required for each lot; unroll at least 1 circumference before sampling.
JOINT SEALS TYPE B (Section 51-2.02C(2))					
Various properties; must comply with *Standard Specifications* Section 51-2.02C(2)	See *Standard Specifications* Section 51-2.02(C)	1 piece, 3 ft	Job site	Each lot; see Remarks	Certificate of compliance and certified test report required for each lot; test report must include the seal MR, manufacturer minimum uncompressed width and test results; submit samples at least 30 days before use
JOINT SEALS Type A and Type AL (Section 51-2.02B)					
Various properties; must comply with *Standard Specifications* Section 51-2.02B(2)	See *Standard Specifications* Section 51-2.02B(2)	1 qt of each component and primer	Job site	1 sample from each component of each batch	Certificate of compliance required for each batch of sealant; submit samples at least 30 days prior to use
PAINT (Section 91)					
Paint, various properties; must comply with *Standard Specifications* Section 91	See *Standard Specifications* Section 91	For miscellaneous painting, 1 qt (see Section 6-2 of this manual)	Job site	Each batch; see Remarks	If less than 20 gallons, testing not required and resident engineer must field release. Zinc-rich primer must be on the Authorized Material List.

Table 6-1.16 Materials Acceptance Sampling and Testing Requirements: Miscellaneous Materials (3 of 5)

Test	Test Method	Sample Size & Container Size	Sampling Location	Acceptance Test Frequency	Remarks
PAINT Structural Steel (Section 59)					
Paint, various properties; must comply with *Standard Specifications* Section 59	See *Standard Specifications* Section 59	For bridge or major structure, send an unopened 5-gal can	Job site	Each batch; see Remarks	Unused portion of 5-gal sample will be returned to job; see Section 6-2 of this manual
PAVEMENT MARKERS (Section 85)					
Pavement Markers, various properties; must comply with *Standard Specifications* Section 85	See *Standard Specifications* Section 85	20 markers	Job site	As necessary for verification if quality is questionable; see Remarks	Each shipment must have certificate of compliance
PERMEABLE MATERIALS: Class 1, Class 2 & Class 3 (Section 68-2.02F)					
Durability Index	California Test 229	50 lb	Stockpile	Prior to use	
Sieve Analysis	California Test 202	50 lb	Stockpile	Prior to use,1 every day	
PERMEABLE MATERIALS: Class 3 (Section 68-2.02F)					
Crushed Faces	California Test 205	50 lb	Stockpile	Prior to use	
PLASTIC CONDUIT (Section 86-2.05)					
Plastic Conduit, various properties; must comply with *Standard Specifications* Section 86-2.05	See *Standard Specifications* Section 86-2.05	2 in. long from center of length, 2 samples each size	Job site	As necessary for verification if quality is questionable	
PRESTRESSED TENDON GROUT (Section 50-1.02C)					
Efflux time	California Test 541	One 6 x 12 in. cylinder mold can	From batch immediately after mixing for prequalification, thereafter from outlet end of tendon and/or storage tank	At the start of each day's work and thereafter 1 test per each 5% of ducts; see Remarks	Repeat acceptance tests whenever source of material is changed

Table 6-1.16 Materials Acceptance Sampling and Testing Requirements: Miscellaneous Materials (4 of 5)

Test	Test Method	Sample Size & Container Size	Sampling Location	Acceptance Test Frequency	Remarks
RAISED BARS (PRECAST)					
Compliance with specifications		1 unit or full size bar		Each lot	Sample and test if not previously inspected at the source
REINFORCING STEEL (Section 52)					
Reinforcing Steel, various properties; must comply with *Standard Specifications* Section 52	See *Standard Specifications* Section 52	2 samples, 30 in., except 40 in. for #14 & #18	Job site	As necessary for verification if quality is questionable; see Remarks.	Each shipment must be accompanied by a certificate of compliance
SLOPE PROTECTION (Section 72-2.02A)					
Size	N/A		Quarry or stockpile	As required for acceptance; see Remarks	Adequate size of slope protection documented by measuring or weighing the material
Apparent Specific Gravity	California Test 206	75 lb	Quarry or stockpile	Prior to use	
Absorption	California Test 206				
Durability Index	California Test 229				
STEEL PRODUCTS					
		Contact METS for instructions		Contact METS for instructions	
STRUCTURAL STEEL AND MISCELLANEOUS IRON AND STEEL					
		2 samples, 30-in., cut parallel to direction of rolling		Each heat or melt or 10 tons or fraction	Sample and test if not previously inspected at the source
WATER-PROOFING MATERIALS (Section 54-2)					
Glass Fiber	ASTM D1668, Type 1	9 sq ft of asphalt saturated cotton fabric	Job site	1 sample from each lot	
Asphalt	ASTM D449	5 lb of asphalt	Job site	1 sample from each lot	
Primer	ASTM D41	1 qt of asphalt primer	Job site	1 sample from each lot	

Table 6-1.16 Materials Acceptance Sampling and Testing Requirements: Miscellaneous Materials (5 of 5)

Test	Test Method	Sample Size & Container Size	Sampling Location	Acceptance Test Frequency	Remarks
WIRE MESH REINFORCING (Section 52-1.02C)					
Wire Mesh Reinforcing Steel, various properties; must comply with *Standard Specifications* Section 52-1.02C	ASTM A 185/A 185M or ASTM A 497/A 497M	9 sq ft	Job site	As necessary for verification if quality is questionable; see Remarks	Each shipment must be accompanied by a certificate of compliance