Quality Assurance Program (QAP)
2015

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Quality Assurance Program (QAP)
Agency: County of Tulare

Purpose

This Quality assurance Program (QAP) is a sampling and testing program designed to provide assurance that the materials and workmanship incorporated into Local Agency, Federal-aid projects off the National Highway System (NHS).

The guidelines of the QAP include items addressed as follows:

- □ Definition of Terms
- □ Materials Laboratory
- □ Acceptance Testing (AT)
- □ Independent Assurance Program (IAP)
- □ Reporting Acceptance Testing Results
- □ Testing of Manufactured Materials
- □ Testing by Private Laboratories
- □ Project Certification
- □ Records
- □ Procedure for Dispute Resolution
- □ QAP approval signature
- □ Appendixes
- □ Laboratory Accreditation Manual (LAM)

Definition of Terms

- Acceptance Testing (AT) – Sampling and testing, or inspection, to determine the degree of compliance with contract requirements.

- Independent Assurance Program (IAP) – Verification that AT is being performed correctly by qualified testers and laboratories.

- Quality Assurance Program (QAP) – A sampling and testing program that will provide assurance that the materials and workmanship incorporated into the construction project are in conformance with the contract specifications. The main elements of the QAP are the AT, and the IAP.

- Laboratory Accreditation Manual (LAM) - All or part of the above QAP, including materials laboratory and personnel accreditation.

Materials Laboratory

Tulare County will use their own materials laboratory (See attached "Laboratory Accreditation Manual") or a private consultant materials laboratory to perform AT on Federal-Aid and other designated projects. The materials laboratory shall contain certified test equipment capable of performing the tests conforming to the provisions of this QAP.

The materials laboratory used shall provide documentation that the laboratory complies with the following procedures.

1. **Correlation Testing Program**

   The testing laboratory shall be a participant in one or more of the following testing programs:
   a. ASSHTO Materials Reference Laboratory (AMRL)
   b. Caltrans Reference Sample Program (RSP) and independent correlation.

2. **Certification of Personnel**

   The materials laboratory shall employ personnel who are certified by one or more of the following:
   a. Caltrans District Materials Engineer
   b. Nationally recognized non-Caltrans organizations such as The American Concrete Institute, Asphalt National of Certification of Engineering Technologies, etc.
   c. Other recognized organizations approved by the State of California and/or Recognized by local governments or private associations.

3. **Laboratory Testing Equipment**

   The materials laboratory shall use laboratory and testing equipment that is in good working order. All such equipment shall be calibrated at least once each year. All testing equipment must be calibrated by impartial means using devices traceable to the National Institute of Standards Technology. A decal shall be firmly affixed to each piece of equipment showing the date of last calibration. All testing equipment calibration decals shall be checked as part of the IAP.

Acceptance Testing (AT)

Materials entering a construction project shall be tested to verify, that the materials or products comply with the contract specifications and/or standards. The results from these tests shall be used to determine the quality and acceptability of materials and workmanship incorporated into the project.
Tulare County prescribes to this QAP, Caltrans Testing Procedures, Specifications, Construction Manual, Local Assistance Procedures Manual, ASTM Test Manuals, AASHTO Test Manuals and Tulare County Improvement Standards. Unless specified otherwise in the Special Provisions, these references establish criteria for sampling, frequency and testing of materials.
Included in the Appendixes/Lab Accreditation Manual is a list of Tulare County testing capabilities, Equipment List with related Calibration, also Test Frequencies that may be used for acceptance testing (all tabbed).

Independent Assurance Program (IAP)

IAP shall be provided by Caltrans, the Agency's certified materials laboratory, or consultant's certified materials laboratory. IAP will be used to verify that sampling and testing procedures are being performed properly and that all testing equipment is good condition and properly calibrated.

IAP personnel shall be certified in all required testing procedures, as part of IAP, and shall not be involved in any aspect of AT.

Poor correlation between acceptance tester's results and other test results may indicate probable deficiencies with the acceptance sampling and testing procedures. In cases of unresolved discrepancies, a complete review of AT shall be performed by IAP personnel, or an independent materials laboratory chosen by the Agency. IAP samples and tests are not to be used for determining compliance with contract requirements. Compliance with contract requirements is determined only by AT.

Reporting Acceptance Testing Results

The following are time periods for reporting materials test results to the Resident Engineer.

▪ When the aggregate is sampled at material plants, tests results for Sieve Analysis, Sand Equivalent, and Cleanness Value should be submitted to the Resident Engineer within 24 hours after sampling.

▪ When materials are sampled at the job site, test results for compaction and maximum density should be submitted to the Resident Engineer within 24 hours after sampling.

▪ When soils and aggregates are sampled at the job site:

(1) Test results for Sieve Analysis, Sand Equivalent, and Cleanness Value should be submitted to the Resident Engineer within 72 hours after sampling.

(2) Test results for "R" Value and Asphalt Concrete extraction should be submitted to the Resident Engineer within 96 hours after sampling.

When sampling products such as Portland Cement Concrete (PCC), cement-treated base (CTB), hot mix asphalt (HMA), and other such materials; the time of such sampling shall be varied with respect to the time of day insofar as possible, in order to avoid a predictable sampling routine. The reporting of AT results, if not reported by the Resident Engineer's staff, shall be done on an expedited basis such as by fax, telephone.

Testing of Manufactured Materials

During the design phase of the project, the Project Engineer may submit a "Source Inspection Request" see appendixes (16-V of the LAPM) to the Agency, consultant, or Caltrans for inspection and testing of manufactured and prefabricated materials by their materials laboratory. A list of materials that can be typically accepted on the basis of certificates of compliance during construction is found in the attached (tabbed) LAM.

All certificates of compliance shall conform to the requirements of the contract specifications, for examples see appendixes (Appendix J of the Caltrans QAPM).

Testing by Private Laboratory

Any test procedures that the County's Materials And Testing Laboratory is not certified to perform shall be contracted out to a private laboratory that is qualified by Caltrans or another professional organization (i.e., AASHTO, Asphalt Institute, American Concrete Institute, National Institute of Certification of Engineering Technologies, etc.) and has written policies and procedures conforming to the County's Quality Assurance Program and are certified to perform the particular test or tests.

Project Certification

Upon completion of a Federal–aid project, a "Materials Certificate" shall be completed by the Resident Engineer. The Agency shall include a "Materials Certificate" in the Report of Expenditures submitted to Caltrans District Director, Attention: District Local Assistance Engineer. A copy of the "Materials Certificate shall also be included in the Agency's Construction records. The Resident Engineer in charge of the construction function for the Agency shall sign the certificate. All materials incorporated into the work which did not conform to specifications must be explained and justified on the "Materials Certificate", including changes by virtue of contract change orders.

Records

All materials records of samples of tests, material releases and certificates of compliance for construction project shall be incorporated into the Resident Engineer's project file.
If a Federal-aid project:

- The files shall be organized in Section 16.8 "Project Files" of the LAPM.

- It is recommended that the complete project file be available at a single location for inspection by Caltrans and the Federal Highway Administration (FHWA) personnel.

- The project files shall be available for at least three years following the date of final project voucher.

- The use of a "Log Summary", as shown in Attachment #7 of the QAPM, facilitates reviews of material sampling and testing by Caltrans and FHWA, and assists the Resident Engineer in tracking the frequency of testing.

When two or more projects are being furnished identical materials simultaneously from the same plant, it is not necessary to take separate samples or perform separate tests for each project; however, copies of the tests reports are to be provided for each of the projects to complete the records.

Procedure for Dispute Resolution

If the contactor or member of a private laboratory has a dispute with the local agency involving a quality assurance item, a manager from the local agency shall be selected to review the dispute. The Resident Engineer and/ or IA person and the party in dispute will submit his/her substantiating paperwork to the management person, within 10 days after requested to do so. In some cases one or more meetings may be needed to resolve disputes. Within a 30 day period, the local agency management person should try to resolve the dispute, based on the evidence presented. Appeals by the contractor, Resident Engineer, the IA person, or acceptance sampler or tester may be made after the final decision by the local agency management person. The person making the appeal should be directed to contact the District Local Assistance Engineer no more than 14 days after receiving written notice of the final decision by the local agency management person.

QAP Approval

The QAP shall be approved by the Public Works Director. A non-registered Public Works Director must delegate the approval to a staff engineer if such individual is appropriately registered. If no registered staff engineer is available, the delegation can be made to a registered consultant engineer retained by the agency. Copies of the QAP shall be kept on file for review; one copy shall be submitted to the Caltrans District Local Assistance Engineer.

Signature of Authority: Johnny Wong

CE# and Expiration Date: C57027 6/30/15

Title: Chief Engineer

Date: 4/29/2015

Quality Assurance Program (QAP)

Testing Frequency Tables

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 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 12 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 Method 231.
PERVIOUS BACKFILL (Section 19-3.02C)					
Sieve Analysis	California Test 202	50 lb	Stockpile	1 every 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	Wet common- composite test maximum value may be used in accordance with California Test Method 231.

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 12 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 Method 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, and 1 every 2000 cu yd, see Remarks	If material is uniform and well within specification limits frequency may be decreased to 1 per day min, 2 per day max
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 2000 cu yd, see Remarks	If material is uniform and well within specification limits frequency may be decreased to 1 per day min, 2 per day max.
Sand Equivalent	California Test 217				

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)					
Durability	California Test 229		Materials site or stockpile	1 per project prior to use	
Sieve Analysis	California Test 202	50 lb	Materials site or stockpile	1 every 2000 cu yd, see Remarks	If material is uniform and well within specification limits frequency may be decreased to 1 per day min, 2 per day max
Sand Equivalent	California Test 217				

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

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

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 12 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 Method 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.

Materials Acceptance Sampling and Testing Requirements:
Aggregate Bases (*2010 Standard Specifications Section 26*) (1 of 1)

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 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 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 2000 cu yd on projects exceeding 5000 cu yd; see Remarks	R-value testing may be 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. Only test when projects exceed 2000 tons.
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 12 in. of thickness	
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 Method 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.

Materials Acceptance Sampling and Testing Requirements:
Aggregate Subbases (*2010 Standard Specifications Section 25*) (1 of 1)

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 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 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 2000 cu yd on projects exceeding 5000 cu yd; see Remarks	R-value testing may be 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. Only test when projects exceed 2000 tons.
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	1 every 2000 sq yd and test compaction at every 12 in. of thickness	
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 Method 231.

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.

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 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

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 Test 312	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.

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

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 engineer for brands which may be used prior to sampling and testing when properly certified; samples must reach a lab 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.

Materials Acceptance Sampling and Testing Requirements:
Treated Permeable Bases (*2010 Standard Specifications Section 29*)
Asphalt Treated Permeable Base (1 of 3)

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	

Materials Acceptance Sampling and Testing Requirements:
Treated Permeable Bases (*2010 Standard Specifications Section 29*)
Cement Treated Permeable Base (2 of 3)

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

Materials Acceptance Sampling and Testing Requirements:
Treated Permeable Bases (*2010 Standard Specifications Section 29*)
Cement Treated Permeable Base (3 of 3)

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.

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	

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.

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
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 sample per day min, 2 samples per day max.	Production start-up Evaluation. Minimum 1 per day of paving.
Sand Equivalent	California Test 217		HMA plant or before lime treatment	1 sample per day min, 2 samples per day max	Production start-up evaluation. 1 random for every 3000 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	Production Start-up evaluation, 1 min. on projects exceeding 3000 tons	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	Production Start-up evaluation, 1 min. on projects exceeding 3000 tons	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	Production Start-up evaluation, 1 min. on projects exceeding 3000 tons	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	Production Start-up evaluation, 1 min. on projects exceeding 3000 tons	Production start-up evaluation, and minimum 1 random for every 50,000 tons or less of paving

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	

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	2, 40 lb, Cardboard boxes (See Notes 5 and 6)	Loose mix behind paver	1 sample per day min, 2 samples per day max	Production start-up evaluation. For standard and method process: minimum 1 per day of paving.	
Stability	California Test 366		Loose mix behind paver	Production start-up evaluation, 1 min. on projects exceeding 3000 tons	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 sample per day min, 2 samples per day max	Production start-up evaluation. 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	Production Start-up evaluation, 1 min. on projects exceeding 3000 tons	Production start-up evaluation, and minimum 1 per projects exceeding 3000 tons	
Voids Filled with Asphalt	California Test 367		Loose mix behind paver	Production Start-up evaluation, 1 min. on projects exceeding 3000 tons	Production start-up evaluation, and minimum 1 per projects exceeding 3000 tons	Report only if the adjustment for asphalt binder content target value is less than ±0.3%

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 continued						
Relative Compaction	California Test 375	N/A	As per California Test 375	As per California Test 375	As per California Test 375	
Total Max Density	California Test 375	2, 40 lb, Cardboard Boxes	From plant prior to first day of paving, or from test strip	Project start up; every 10 paving days, or every 25,000 tons whichever occurs first	As per California Test 375	
Core Density	California Test 375	2 cores equals 1 sample; 4 inch diameter core, full depth	1 sample from under 1 nuclear gauge test location.	Obtain 2 samples for every 500 tons placed; 1 sample per day min.	As per California Test 375	

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.

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; see Remarks	Recommend 1 acceptance test per day if 2 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; see Remarks	Recommend 1 acceptance test per day if 2 consecutive tests are out of 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; see Remarks	Recommend 1 acceptance test per day if 2 consecutive tests over 80; increase sampling to 1 for every 300 cu yd (deductive lot) with engineer's authorization

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; see Remarks	Recommend 1 acceptance test per day if 2 consecutive tests are out of 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; see Remarks	Recommend 1 acceptance test per day if 2 consecutive tests are out of 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 and test if cement quality is questionable; see Remarks	Cement must be on Authorized Material List; cement accepted based on certificate of compliance with each shipment

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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 and test if SCM quality is questionable; see Remarks	SCMs must be on Authorized Material List; SCM accepted based on 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				
Setting Time	ASTM C 191 or ASTM C 266	Contact engineer 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 and test if air entrainment quality is questionable; 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 and test if chemicals quality is questionable; 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.

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 or cylinders are molded and when uniformity is questionable	
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	Where air is specified for freeze-thaw resistance, a minimum of 1 every 300 cu yd.	Only test when air entrainment is specified
Temperature	California Test 557	See test method	Concrete truck discharge chute	At beginning of pour, and when compressive test specimens are fabricated; see Remarks	When outside temperatures exceed 90 degrees, test every truck during the duration of the that outside temperatures remain above 90 degrees

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

Materials Acceptance Sampling and Testing Requirements:
Concrete Pavement (*2010 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

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 engineer 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 engineer for sample dimensions	Job site	As necessary for verification if quality is questionable; see Remarks	Each shipment must have certificate of compliance

Materials Acceptance Sampling and Testing Requirements:
Concrete Pavement (*2010 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 lab	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	See Remarks	Must be on Authorized Materials List and certificate of compliance must accompany each shipment

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.
3. 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.

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; 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; 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 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; 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

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; 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; 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 and test if cement quality is questionable; see Remarks	Cement must be on Authorized Material List; cement accepted based on certificate of compliance with each shipment

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 and test if SCM quality is questionable; see Remarks	SCMs must be on Authorized Material List; SCM accepted based on 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				
Setting Time	ASTM C 191 or ASTM C 266	Contact engineer 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 and test if air entrainment quality is questionable; see Remarks	Must be on Authorized Material 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	1-qt can of liquid, 2 lb of powder	Concrete plant	Sample and test if chemicals quality is questionable; see Remarks	Must be on Authorized Material List and certificate of compliance must accompany each shipment.

Materials Acceptance Sampling and Testing Requirements:
Concrete Structures (*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 1 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	
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 4 6x12 in. cylinders (See Note 4)	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	Where air is specified for freeze-thaw resistance, a minimum of 1 every 300 cu yd.	Only test when air entrainment is specified
Temperature	California test 557	See test method	Concrete truck discharge chute	At beginning of pour, and when compressive test specimens are fabricated; see Remarks	When outside temperatures exceed 90 degrees, test every truck during the duration that outside temperatures remain above 90 degrees.

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	N/A	N/A	See Remarks	Must be on Authorized Materials List and certificate of compliance must accompany each shipment

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.
4. More cylinders may be added at Resident Engineers request.

Materials Acceptance Sampling and Testing Requirements:
Concrete (*2010 Standard Specifications Section 90)*
Concrete Except Minor Concrete and Rapid Strength Concrete (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 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; see Remarks.	Recommend 1 acceptance test per day if 2 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; see Remarks.	Recommend 1 acceptance test per day if 2 consecutive tests are out of operating range; increase sampling to 1 for every 300 cu yd (deductive lot) with engineer's authorization

Materials Acceptance Sampling and Testing Requirements:
Concrete (*2010 Standard Specifications Section 90)*
Concrete Except Minor Concrete and Rapid Strength Concrete (2 of 5)

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, see Remarks	Recommend 1 acceptance test per day if 2 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 and test if cement quality is questionable; see Remarks	Cement must be on Authorized Material List; cement accepted based on certificate of compliance with each 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	SCMs must be on Authorized Material List; SCM accepted based on certificate of compliance with each shipment

Materials Acceptance Sampling and Testing Requirements:
Concrete (*2010 Standard Specifications Section 90)*
Concrete Except Minor Concrete and Rapid Strength Concrete (3 of 5)

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 engineer 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 and test if air entrainment quality is questionable; see Remarks	Must be on Authorized Material List and certificate of compliance must accompany each shipment
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 and test if chemicals quality is questionable; see Remarks	Must be on Authorized Material List and certificate of compliance must accompany each shipment

Materials Acceptance Sampling and Testing Requirements:
Concrete (*2010 Standard Specifications Section 90)*
Concrete Except Minor Concrete and Rapid Strength Concrete (4 of 5)

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	
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 4 6x12 in cylinders, or 1 set of 4 4x8 in cylinders; (See note 1)	Concrete truck discharge chute; see Note 3	1 set 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	Where air is specified for freeze-thaw resistance, a minimum of 1 every 300 cu yd.	Only test when air entrainment is specified
Temperature	California Test 557	See test method	Concrete truck discharge chute	At beginning of pour, and when compressive test specimens are fabricated; see Remarks	When outside temperatures exceed 90 degrees, test every truck during the duration that outside temperatures remain above 90 degrees

Materials Acceptance Sampling and Testing Requirements:
Concrete (*2010 Standard Specifications Section 90)*
Concrete Except Minor Concrete and Rapid Strength Concrete (5 of 5)

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 4 6 x 12 in cylinders, or 1 set of 4 4x8 cylinders. (see note 1)	Concrete truck discharge chute; see Note 3	1 set 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	Where air is specified for freeze-thaw resistance, a minimum of 1 every 300 cu yd	Only test when air entrainment is specified
Temperature	California Test 557	See test method	Concrete truck Discharge chute	At beginning of pour, and when compressive test specimens are fabricated; see Remarks	When outside temperatures exceed 90 degrees, test every truck during the duration that outside temperatures remain above 90 degrees
CURING COMPOUND					
Curing Compound; must comply with *Standard Specifications Section 90-1.03B(3)*	ASTM C309	N/A	N/A	See Remarks	Must be on Authorized Materials List and certificate of compliance must accompany each shipment

Notes:
1. More cylinders may be added at Resident Engineers request.

Materials Acceptance Sampling and Testing Requirements:
Concrete (*2010 Standard Specifications Section 90)*
Minor Concrete (1 of 2)

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	Sample and test if air entrainment quality is questionable; 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	Sample and test if chemicals quality is questionable; see Remarks	Must be on Authorized Materials List and certificate of compliance must accompany each shipment

Materials Acceptance Sampling and Testing Requirements:
Concrete (*2010 Standard Specifications Section 90)*
Minor Concrete (2 of 2)

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 4 6x12" cylinders, or 1 set of 4 4x8" cylinders (see note 4)	Concrete truck discharge chute; see Note 3	1 set for every 300 cu yd, minimum 1 set per project 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 300 cu yd.	Only test when air entrainment is specified
Temperature	California Test 557	See test method	Concrete truck Discharge chute	At beginning of pour, and when compressive test specimens are fabricated; see Remarks	When outside temperatures exceed 90 degrees, test every truck during the duration that outside temperatures remain above 90 degrees
CURING COMPOUND					
Curing Compound; must comply with *Standard Specifications Section 90-1.03B(3)*	ASTM C309	N/A	N/A	See remarks	Must be on Authorized Materials List and certificate of compliance must accompany each shipment

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.
4. More cylinders may be added at Resident Engineers request.

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 engineer for instructions		Contact engineer 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

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.

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

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 engineer for instructions		Contact engineer 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	

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

Acceptance Sampling and Testing Frequencies

Note: It may be desirable to sample and store some materials. If warranted, testing can be performed at a later date.

("Acceptance Sampling and Testing Frequencies" of the QAP Manual) is out of date for the current Hot Mix Asphalt (HMA) Specification. For HMA the samples shall be taken at the locations and frequencies as shown in Table above. Cores will not generally be taken for Acceptance Testing. In place density tests per CT 375 Nuclear Gage field test shall be performed during HMA operations to meet compaction requirements per Standard Specifications. The frequency of testing shall be in accordance with CT 375 except when densities are taken on dig out areas, one test shall be taken per dig out.

Attachment #1

COVER MEMOSOURCE INSPECTION REQUEST
FROM LOCAL AGENCY TO CALTRANS' DISTRICT LOCAL ASSISTANCE ENGINEER

SAMPLE COVER MEMO
SOURCE INSPECTION REQUEST
FROM LOCAL AGENCY TO
CALTRANS' DISTRICT LOCAL ASSISTANCE ENGINEER
(Prepared By Applicant On Applicant Letterhead)

To: (name) **Date:_____**
Caltrans' District Local Assistance Engineer
Caltrans' Local Assistance Office
(district office address)

Federal-aid Project Number:_____
Project Description: _____
Project Location: _____
_____

Subject: ***(Source Inspection for Project Name, County)***

We are requesting that Caltrans provide Source Inspection (reimbursed) services for the above mentioned project. We understand we are responsible for paying for this service provided for by the State. Listed below are the materials for which we are requesting Caltrans' Source Inspection (reimbursed) services. Materials that will require source inspection:

_____
_____
_____
_____
_____

Justification for request:_____
_____

Any question you might have about the above materials should be directed to:_____ , at _____

Approved:

_____ _____
(***Applicant Representative Name***) District Local Assistance Engineer

_____ _____
(***Title***) (Date)

_____
(Local agency, name & address)

Attachment #2

Construction Materials Accepted by a Certificate of Compliance

Construction Materials Accepted by a Certificate of Compliance

Soil Amendment
Fiber
Mulch
Stabilizing Emulsion
Plastic Pipe
Lime
Reinforcing Steel
Structural Timber and Lumber
Treated Timber and Lumber
Timber and Lumber
Culvert and Drainage Pipe Joints
Reinforced Concrete Pipe
Corrugated Steel Pipe and Corrugated Steel Pipe Arches
Structural Metal Plate Pipe Arches and Pipe Arches
Perforated Steel Pipe
Polyvinyl Chloride Pipe and Polyethylene Tubing
Steel Entrance Tapers, Pipe Down drains, Reducers, Coupling Bands and Slip Joints
Aluminum Pipe (Entrance Tapers, Arches, Pipe Down drains, Reducers, Coupling Bands and Slip Joints)
Plastic Pipe
Performed Elastomeric Joint Seal
Plain and Fabric Reinforced
Elastomeric Bearing Pads
Steel Reinforced Elastomeric Bearing Pads
Structural Steel
Paint (Traffic Stripe)
Painting and Electrical equipment
Engineering Fabric
Liquid Asphalt
Asphaltic Emulsion
Metal Target Plates
Electrical Conductors
Portland Cement
Minor Concrete
Waterstop

Attachment #3

Example of a Vendor's Certificate of Compliance

Example of a Vendor's Certificate of Compliance

No. 583408

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
VENDOR'S CERTIFICATE OF COMPLIANCE
MR-0543 (REV. 5/93) #CT-7541-6020-2

☐ PRECAST CONCRETE PRODUCTS OR ☒ SOUNDWALL

TO: BILL SYNDER

~~STATE HIGHWAY ENGINEER~~
RESIDENT ENGINEER – CITY OF FLATLAND

We certify that the portland cement, chemical and mineral admixtures contained in the material described below are brands stated and comply with specifications for:

CONTRACT NUMBER:	
CEMENT BRAND: XYZ CEMENT CO.	MILL LOCATION: MIDLAND, CALIFORNIA
TYPE: II MODIFIED	

CHEMICAL ADMIXTURE

1. BRAND: ABC ADMIXTURE	MANUFACTURER: XYZ SUPPLIER
TYPE: WATER REDUCER	
2. BRAND	MANUFACTURER
TYPE	

☐ *CHECK BOX IF A CHEMICAL ADMIXTURE WAS NOT USED*

MINERAL ADMIXTURE

MANUFACTURER: POZZ. INC.	CLASS: F

☐ *CHECK BOX IF A MINERAL ADMIXTURE WAS NOT USED*

DELIVERY DATE *(Ready-Mix)*: 7/7/01	DATES OF FABRICATION *(Precast)*

LIST PRODUCTS TO WHICH CERTIFICATE APPLIES. *(Show size and lin. ft. of pipe, etc., delivery slip numbers for ready-mix.)*

Portland Cement
Flyash
Water Reducer

MANUFACTURER OF CONCRETE PRODUCTS: A.&B. READY MIX

By: AUTHORIZED REPRESENTATIVE SIGNATURE: Joe Anderson

FM 93 1839 — Original to Res. Engr. Retain Duplicate. — OSP 01 55624

Example of a Certificate of Compliance for Portland Cement (continued)

This is to certify that the

Portland Cement

Supplied by ABC Cement Company complies with all Requirements for the Type II Portland Cement when tested in Accordance with ASTM C – 494.

Local Agency Project No
HP21L – 5055- 111

Albert Howakowa
Quality Assurance Engineer
ABC Cement Company

Date: 07/07/07

Attachment #4

Examples of Materials Certificates/Exceptions

Examples of Materials Certificates/Exceptions
(Signed by the Resident Engineer at the Completion of the Project)

Federal-aid Project No.: Project HP21L – 5055 – 111

Subject: Materials Certification

This is to certify that the results of the tests on acceptance samples indicate that the materials incorporated in the construction work and the construction operations controlled by sampling:

[X] and testing were in conformity with the approved plans and specifications.

[ ] All materials exceptions to the plans and specifications on this project are noted below.

No exceptions were found to the plans and specifications on this project.

Bill Sanders	*Bill Sanders*	*7/7/07*
Resident Engineer (Print Name)	**Resident Engineer (Signature)**	**(Date)**

Note: The signed original of this certificate is placed in the Resident Engineer's project files ad copy is mailed to the DLAE and filed under "Report of Expenditures."

See the attachment (next page)

Attachment #4 (continued)

Attachments: Materials Exceptions (Acceptance Testing)

Type of Test	Description of Work	Total Test Performed On the Project	Number of Failed Tests	Action Taken
Slump Test	Concrete Sidewalk	8	1	When the measured slump exceeded the maximum limit, the entire concrete load was rejected.
Sand Equivalent	Aggregate for Structural Concrete	10	1	The tested S.E. was 70 and the contract compliance specification was 71 minimum. However, the concrete 28-day compressive strength was 4800 psi. The concrete was Considered adequate and no materials Deductions were taken.
Compaction	Sub Grade Material	12	1	One failed test was noted. The failed area was watered and reworked. When this was completed, a retest was performed. The retest was acceptable.
Compaction	Hot Mix As-phalt	12	1	One failed area was noted. It was reworked and retested. The second test met specifications.

Bill Sanders — *Bill Sanders* — July 4, 2007

Resident Engineer (Print Name) Resident Engineer (Signature) Date

Attachment #5

Checklists for use by the County of Tulare to guide the County through the QAP process.

Check List to Assist Local Agencies Monitor Acceptance Testing Requirements

No.	Item	Yes, No Or N/A
1	Was the Resident Engineer able to present an approved QAP, when requested?	
2	Were the Certificates of Compliance in the project files for materials that were accepted (without testing) on the project?	
3	Did the type and number of acceptance tests on the project match (or exceed) the minimum type and number required in the frequency tables approved by the QAP?	
4	Did all acceptance samplers and testers (local agency employees and/or consultants) have valid Certificates of Proficiency for the duration of the project?	
5	Were the calibration stickers firmly affixed to all the test equipment used by the acceptance samplers and testers on the project?	
6	Were the calibration dates on the stickers (affixed to the test equipment) within 12 months of the current date?	
7	Did the Resident Engineer have a log summary sheet of all acceptance tests performed on the project?	
8	If plant inspection and/or source inspection were performed on this project, were there test records to show that testing was performed for the items used?	
9	Did any acceptance samplers and testers get decertified for any test during the construction of the project?	
10	Did the Resident Engineer provide written approval of the PCC mix designs used on the project?	
11	Did the Resident Engineer provide written approval of the hot mix asphalt designs used on the project?	
12	If the materials did not meet minimum specifications but were still used on the project, did the Resident Engineer fully document all testing and attach justifications for use and cost of reduction information to the Materials Certificate?	
13	Did the Resident Engineer sign and date the Materials Certificate after the project was completed?	

Note (for No. 3 above):
Assume that a concrete structure was 50% complete and approximately 1000 cubic yards of PCC will be used on the project. If the testing frequency in the local agency's QAP states that two concrete cylinders will be tested for compressive strength every 500 cubic yards, did the Resident Engineer have at least two compressive strength tests in the project file? Likewise if the structure was 100% complete, were there four compressive-strength tests in the project file?

Print Name of the Local Agency: _____

Print Name of the Resident Engineer: _____

Print Name of the Reviewer: _____

Date of Review: _____

Check List for Local Agencies to Help Monitor Independent Assurance Requirements

No.	Items	Yes, No Or N/A
1	Did the IA person have a letter (or contract) stating he (or she) was authorized to perform IA services for the city or the county?	
2	Did the IA person have a recent Qualification Certificate from a qualified tester from a qualified laboratory that regularly participates in Reference Samples of Programs with AMRL and CCRL?	
3	Did the IA person maintain separate files for ach acceptance sampler and tester for all local agency projects?	
4	Did the IA person have annual Witness Test records for each acceptance tester for all local agency projects?	
5	Did the Split-Sample Testing include the following tests: sieve analysis, sand equivalent, cleanness, slump (or penetration) of fresh concrete air content of fresh concrete, unit weight of fresh concrete, compaction of hardened hot mix asphalt?	
6	Did the IA person have annual Witness Test Records for each acceptance sampler and tester for all local agency projects?	
7	On each project, did the IA records include: certification, decertification, and recertification for each acceptance sampler tester?	
8	Did the IA person have annual Certificates of Proficiency for each acceptance sampler and tester for all local agency projects?	
9	Did the IA person issue annual Laboratory Certificates for each laboratory that performed tests for all local agency projects?	
10	Did the IA person verify that all test equipment for each acceptance tester conformed to current test standards and the equipment had firmly affixed calibration stickers (dated within the last 12 months)?	
11	Did the IA person train acceptance samplers and testers and also perform IA services involving these people?	
12	Did the IA person use separate materials testing equipment than used by the acceptance testers?	

Printed Name of the City or County: _____
Printed Name of the IA Person: _____

Printed Name of the Reviewer: _____
Date of Review: _____

***Answer is "no", others should be "yes" or "not applicable"**

Attachment #6

Project File Organization

Project Record Filing System – Locally Administered Federal-aid Projects

1. Project Personnel
2. Correspondence
    a. Contractor
    b. General
3. Weekly record of working days (if contract time is specified. See Sections 12.9 and 16.5 of this manual)
4. Materials Data
    a. Certificate of Proficiency –Form 03-HC-1 (Exhibit 16-D)
    b. Independent Assurance Sampling and Testing –Form MR-0102 (Exhibit 16-E)
    c. Report of Witness Tests –Form MR-0103 (Exhibit 16-F)
    d. Project Acceptance Test Results and Initial tests (no form available)
    e. Project Independent Assurance Tests (no form available)
    f. Report of Comparison Between Independent Assurance Tests (IAT) and Acceptance Tests –Form MR-0104 (Exhibit 16-G)
    g. Summary of Independent Assurance Testing –Form MR-0105 (Exhibit 16-H)
    h. Notice of Materials to be Used –Form HC-30 (3/81) (Exhibit 16-1)
    i. Notice of Materials to be Furnished –Form MR-0608 (Old: TL-608) (Exhibit 16-J)
    j. Notice of Materials to be Inspected –Form Mr-0028 (Old: TL-28) (Exhibit 16-M)
    k. Report of Inspection of Material –Form Tl-29 (REV. 2-80) (Exhibit 16-K)
    l. Field Laboratory Assistant Reports
    m. Certificates of Compliance
    n. Material Test Summary Log (as specified in Section 16.14, “Quality Assurance Program”)
5. Engineer’s Daily Reports
    a. Resident Engineer
    b. Structure Engineer
6. Contract Item Pay Quantity Documents
7. Contract Change Orders
8. Extra Work Reports
9. Progress Pay Estimates and Status of Funds
10. Labor Compliance and EEO records
11. Contractor’s Payrolls
12. Final Report
13. Materials Certificate
14. DBE Records

Attachment #7

Log Summary

Example of a Log Summary Sheet

Subgrade Materials

Date	CT	Station	Elevation	Test Results	Minimum Spe.	Passed Or Failed	Action Taken
5/15/07	231	1+ 00(30'L)	99.00	93	90 or greater	Passed	N/A
5/16/07	231	1+ 50 (20'R)	100.50	94	90 or greater	Passed	N/A
5/17/07	231	2+ 25 (25'R)	101.00	96	90 or greater	Passed	N/A
5/18/07	231	1+ 50 (30'L)	101.50	95	95 or greater	Passed	N/A
5/19/07	231	2+ 50 (20'L)	102.00	92*	95 or greater	Failed	See note 1
5/19/07	231	2+ 50 (20'L)	102.00	95	95 or greater	Passed	N/A

CT 231= Compaction (Nuclear Gage)

*Note 1: The Contractor used a water tank to dampen the soil surface at the failed subgrade location. Using a sheep's foot compactor, he reworked the subgrade (making at least 10 passes) from Station 2+ 00 to Station 3+ 00. After approximately 30 minutes, another compaction test was taken. This time the relative compaction was 95.

Aggregates and Bases Materials

Date	CT	Station	Elevation	Test Results	Minimum Spec.	Passed or Failed	Action Taken
6/20/07	202	1+ 00 (10'R)	102.50	See Data sheet	See data sheet	Passed	N/A
6/20/07	202	2+ 00 (20'L)	102.50	See Data Sheet	See data sheet	Passed	N/A
6/22/07	217	1+ 00 (10'R)	102.50	75	25 or greater	Passed	N/A
6/22/07	217	2+ 00 (20'L)	102.50	83	25 or greater	Passed	N/A
6/20/07	227	1+ 00 (20'R)	102.50	86	71 or greater	Passed	N/A
6/20/07	227	1+ 50 (20'L)	102.50	85	71 or greater	Passed	N/A
6/24/07	231	2+ 00 (20'R)	102.50	98	95 or greater	Passed	N/A
6/24/07	231	2+ 50 (20'L)	102.50	97	95 or greater	Passed	N/A

CT 202 = Sieve Analysis, CT217 = Sand Equivalent, CT227 = Cleanness Value,
CT 231 = Compaction (Nuclear Gage)

Hot Mix Asphalt

Date	CT	Station	Elevation	Test Results	Minimum Spec.	Passed or Failed	Action Taken
7/10/07	339	1+ 00 (10'R)	103.00	0.08 gal/sq yd	0.05 -0.10 gal/sq/ yd	Passed	N/A
7/10/07	366	2+ 00 (20'L)	103.00	32	>23	Passed	N/A
7/10/07	366	1+ 00 (10'R)	103.00	41	>23	Passed	N/A
7/10/07	375	2+ 00 (20'L)	103.00	94	RC = 93 to 97	Passed	N/A
7/15/07	375	1+ 00 (20'R)	103.00	96	RC = 93 to 97	Passed	N/A
7/15/07	375	1+ 50 (20'L)	103.00	95	RC = 93 to 97	Passed	N/A

CT 339 = Distributor Spread Rate, CT 366 = Stabilometer Value
CT 375 = In-Place Density & Relative Compaction

Portland Cement Concrete

Date	Ct	Station	Elevation	Test Results	Minimum Spec.	Passed or Failed	Action Taken
9/25/07	504	10+ 50 (50'R)	102.50	6.5%	>6.0%	Passed	N/A
9/25/07	533	12+ 50 (50'R)	102.50	1.5"	<2"	Passed	N/A
9/25/07	518	11+ 50 (50'R)	102.50	151 lb/cu ft	>145 lb/cu ft	Passed	N/A
9/25/07	521	10+ 50 (50'R)	102.50	28 day = 4200 psi	>3800 psi	Passed	N/A
9/28/07	521	11+ 50 (50'R)	102.50	28 day = 4290 psi	>3800 psi	Passed	N/A
9/30/07	521	12+ 50 (50'R)	102.50	28 day = 4160 psi	>3800 psi	Passed	N/A

CT 504 = Air Content, CT 518 = Unit Weight, CT 521 = Compressive Strength,
CT 533 = Ball Penetration