

QUALITY ASSURANCE PROGRAM (QAP)

CITY OF CLOVIS
COUNTY OF FRESNO, CALIFORNIA



Adopted June 1998

Updated May 2009

Updated May 2014

Updated September 2017

Approved By:

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Michael J. Harrison, City Engineer

September 20, 2017



OVERVIEW

A Quality Assurance Program (QAP) is a sampling and testing program that provides assurance that the materials and workmanship incorporated in each highway construction project are in conformance with the contract specifications. The main elements of a QAP are acceptance testing and independent assurance sampling and testing. The requirements for the type of QAP depend on whether the project is on or off the NHS. State and Federally funded projects require all local agencies to have a QAP in-place to assure that the materials installed are in compliance with the plans and specifications. This is also sound practice that should be followed regardless of the funding source.

Most specifically, local agencies must have a QAP in conformance with Section 16.14 of the *Local Assistance Procedures Manual (LAPM)* and Caltrans will not process construction Requests for Authorization for projects not covered by a conforming QAP.

PURPOSE

This QAP is official policy of the City of Clovis and will be followed by City of Clovis Engineering Division for construction projects it undertakes off the National Highway System.

POLICY

Both the Caltrans Test Methods and the American Society for Testing and Materials (ASTM) test Methods will be acceptable by this QAP. The method of conversion is shown in Attachment 1 "Caltrans Test Method - ASTM Test Method Conversion Chart," from the Local Assistance Procedures Manual. Any future changes to the LAPM are hereby incorporated by reference. The plans and specifications will determine the method of acceptance for each individual project.

DEFINITIONS

Material Testing Agency – The qualified commercial firm, in the business to do such work, hired by the City of Clovis to take samples in the field, perform the field and laboratory analysis by recognized industry standards, and reports the results directly to the Project Inspector.

Project Inspector – The City of Clovis representative assigned to the project for the purpose of inspection of field work, and coordinating the sampling and testing of materials to verify compliance with the plans and specifications.

Resident Engineer – The City of Clovis representative, licensed as a Civil Engineer in the State of California, which is responsible for the overall administration of the project to assure compliance to the plans and specifications.

QA/QC PROCEDURAL REQUIREMENTS

I. MATERIAL TESTING AGENCY

The City of Clovis will contract out with a commercially licensed firm that regularly performs material testing as a business, to do the field sampling and laboratory testing. All work, performed by the firm, shall be performed under the responsible charge of a qualified licensed Civil Engineer / Geotechnical Engineer in the State of California who is employed by the material-testing agency.

The Material Testing Agency shall maintain laboratory accreditation and have its testing machines calibrated annually by impartial means using devices of accuracy traceable to the National Bureau of Standards. The Laboratory shall participate in the AASHTO Materials Reference Laboratory (AMRL) and Cement and Concrete Reference Laboratory (CCRL) inspection programs as appropriate. The testing agency shall provide evidence, to the City Engineer, of their testing agency laboratory accreditation on an annual basis.

II. ACCEPTANCE TESTING

The Project Inspector shall inspect materials that need to be inspected at the job site, to assure compliance with the plans and specifications. When the Project Inspector determines that field testing and sampling is necessary by the specifications and/or required by recognized industry standards, the project inspector shall coordinate that activity with the Material Testing Agency.

Test results provided by the Material Testing Agency, shall be reported directly to the Project Inspector. On failed test results, it is the Project Inspector's responsibility to

advise the Contractor and direct them to take corrective action in order to obtain corrective work to show compliance with the plans and specifications. Test results and daily activity reports shall be on file and maintained in the project records. Testing reports shall be submitted to the City within five (5) working days of completion of the field work. The City shall also further stipulate the turnaround of testing results in the professional service contract between the City and the Material Testing Agency.

III. TESTING OF MANUFACTURED MATERIALS

In general, the City of Clovis will accept "Certificates of Compliance" from the manufacturer for products in which the industry has demonstrated a high degree of reliability in meeting specifications. The Resident Engineer or the Project Inspector will designate on the approved submittal sheet when sampling, inspection, and/or testing are needed at the source of the material.

When source inspection is necessary, the Project Inspector will arrange to have a qualified individual and/or a qualified Material Testing Agency perform the work. Certificates of Compliance are usually accepted for materials listed in Attachment 2 "Materials Typically Accepted by a Certificate of Compliance," from the LAPM. Any future changes to the LAPM are hereby incorporated by reference.

IV. INDEPENDENT ASSURANCE SAMPLING AND TESTING

The purpose of independent assurance sampling and testing (IAST) is to assure that individuals performing each test are performing it correctly, and that the equipment used has been properly maintained and calibrated. As a result, the City of Clovis will only use the services of a commercially licensed firm that meets the criteria stated above for a Material Testing Agency. The material-testing agency will also have a QAP to verify that acceptance testing is being performed correctly.

V. PROJECT CERTIFICATION

Upon completion of a project the licensed Civil Engineer/ Geotechnical Engineer who is employed by the Material Testing Agency shall complete a "Materials Certificate". Said Civil Engineer/Geotechnical Engineer shall certify that:

- All testing procedures were performed in conformance with the applicable standards and/or methods for that test; and,
- The results of the tests on acceptance samples indicate that the materials incorporated in the construction work were in conformity with the approved plans and specifications.

VI. RECORD OF TEST RESULTS

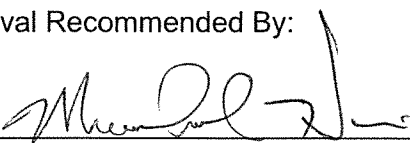
The Project Inspector shall maintain a material and testing "Summary Log" for each material requiring multiple sampling and testing. The summary log shall include appropriate data such as station location, depth of test sample, and approximate quantity of material represented by the test sample, test results, and tester name. Failed initial test results, which require re-testing of the material, will be cross-referenced to the passing test on the summary log.

VII. FREQUENCY OF TESTING

The frequency of sampling and testing shall be conducted in accordance with the plans and specifications, and as required in the LAPM. Attachment 3 "Size, Frequency and Location of Sampling and Testing Tables" is the current LAPM requirement. Any future changes to the LAPM are hereby incorporated by reference.

Whenever a failure occurs, sufficient additional acceptance tests shall be included in the records, including a description of the corrective measures taken.

Approval Recommended By:



Michael J. Harrison, PE

City Engineer

9/20/17

Date

CALTRANS TEST METHOD - ASTM TEST METHOD CONVERSION CHART**Testing Procedures - for local agency use only**

Use this CTM - ASTM conversion chart to assist you in determining acceptance test requirements and frequencies, as detailed in Caltrans *Construction Manual* Chapter 6, "Sampling and Testing." Refer to the Agency, special provisions, contract plans, and applicable standard specifications, for correct sampling and test methods (ASTM-CTM).

CTM	ASTM	Book of Standards	TEST PROCEDURE	NOTES
105			Calculations Pertaining to Gradings and Specific Gravities	2
125	D75 D979	4.02 4.03	Sampling Highway Materials (when approved) Standard Practice for Sampling Aggregates Practice for Sampling Bituminous Paving Mixtures	3 3
201	C702	4.02	Soil & Aggregate Sample Preparation Reducing Field Samples of Aggregate to Testing Size	13
202	C136 C117	4.02 4.03	Sieve Analysis of Fine and Coarse Aggregate Sieve Analysis of Fine and Coarse Aggregate Material Finer Than 75-um (#200) Sieve in Mineral Aggregates by Washing	
205			Percentage of Crushed Particles	1
206	C127	4.02	Specific Gravity and Absorption of Coarse Aggregate Specific Gravity and Absorption of Coarse Aggregate	
207	C128	4.02	Specific Gravity and Absorption, Fine Aggregate Specific Gravity and Absorption, Fine Aggregate	
208			Apparent Specific Gravity of Fine Aggregate	1
211	C131	4.02	Abrasion of Coarse Aggregate by Use of the Los Angeles Rattler Machine Resistance to Degradation, Small-Size Coarse Agg. by Abrasion & Impact, L.A. Machine	
213	C40	4.02	Organic Impurities in Concrete Sand Organic Impurities in Fine Aggregate for Concrete	
214	C88	4.02	Soundness of Aggregates by Use of Sodium Sulfate Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate	1
216	D1556 D1557	4.08 4.08	Relative Compaction of Untreated and Treated, Soils & Aggregates Density of Soil In-place by the Sand Cone Method Moisture-Density Relations of Soils & Soil-Agg. Mixtures, 10-lb. Rammer, 18-in Drop	11
217			Sand Equivalent (only authorized method per Caltrans 07, District Materials Engineer)	1,9
223			Surface Moisture in Concrete Aggregate	1
226	C566	4.02	Moisture Content in Soils by Oven Drying Total Moisture Content of Aggregate by Drying	
227			Evaluating Cleanness of Coarse Aggregate	1
229	D3744	4.03	Durability Index Aggregate Durability Index	1
231	D2922	4.08	Relative Compaction of Soils by the Area Concept Utilizing Nuclear Gages Density of Soil & Soil-Aggregate In-place by the Nuclear Method	4 4

CTM - ASTM Testing Procedures - for local agency use only

Use this CTM - ASTM conversion chart to assist you in determining acceptance test requirements and frequencies, as detailed in Caltrans *Construction Manual* Chapter 6, "Sampling and Testing." Refer to the Agency, special provisions, contract plans, and applicable standard specifications, for correct sampling and test methods (ASTM-CTM).

CTM	ASTM	Book of Standards	TEST PROCEDURE	NOTES
301	D2844	4.08	R-Value of Treated & Untreated, Bases, Subbases & Basement Soils R-Value and Expansion Pressure of Compacted Soils	1
302	D1664	4.03	Film Stripping Coating and Stripping of Bitumen-Aggregate Mixtures	
303			Centrifuge Kerosene Equivalent	1
304	D1561	4.03	Preparation of Bituminous Mixtures for Testing Prep. of Bituminous Mixture Test Specimens by Means of Calif. Kneading Compactor	1
305			Swell of Bituminous Mixtures	1
307			Moisture Vapor Susceptibility of Bituminous Mixtures	1
308	D1188	4.03	Bulk Specific Gravity and Weight Per Cubic Foot of Bituminous Mixtures Bulk Sp.G. and Density of Compacted Bituminous Mixtures, Paraffin-Coated Specimens	
310	D2172	4.03	Asphalt and Moisture Contents of Bituminous Mixtures by Hot Solvent Extraction Extraction of Bitumen from Bituminous Paving Mixtures (Method A, B, or C)	5 6,10
312			Design and Testing of Class "A" and "B" Cement Treated Base	1
338			Cement or Lime Content in Treated Aggregate by the Titration Method	1
339	D2995	4.03	Determination of Distributor Spread Rate Determining Application Rate of Bituminous Distributors	
362	D2172	4.03	Asphalt Content of Bituminous Mixtures by Vacuum Extraction Quantitative Extraction of Bitumen from Bituminous Paving Mixtures (Method "E")	5 6
366			Stabilometer Value	1
367			Recommending Optimum Bitumen Content (OBC.)	1
370	D4643	4.08	Determining Moisture Content of Asphalt Mixtures or Mineral Agg., Microwave Ovens Determination of Water (Moisture) Content of Soil by the Microwave Oven Method	
375	D2950	4.03	In-place Density & Relative Compaction of AC Pavement (nuclear) Density of Bituminous Concrete In-place by the Nuclear Method	5,7,12 6,7
379	D4125	4.03	Asphalt Content of Bituminous Mixtures by use of the Troxler Nuclear Gage Asphalt Content of Bituminous Mixtures by the Nuclear Method	5,8 6,8
405			Chemical Analysis of Water	1
415			Chloride Content in Organic Additives for Portland Cement Concrete	1

CTM - ASTM Testing Procedures - for local agency use only

Use this CTM - ASTM conversion chart to assist you in determining acceptance test requirements and frequencies, as detailed in Caltrans *Construction Manual* Chapter 6, "Sampling and Testing." Refer to the Agency, special provisions, contract plans, and applicable standard specifications, for correct sampling and test methods (ASTM-CTM).

CT M	ASTM	Book of Standards	TEST PROCEDURE	NOTES
504	C231	4.02	Air Content of Freshly Mixed Concrete by the Pressure Method Air Content of Freshly Mixed Concrete by the Pressure Method	
515			Relative Mortar Strength of Portland Cement Concrete Sand	<i>1</i>
518	C138	4.02	Unit Weight of Fresh Concrete Unit Weight, Yield, and Air Content (Gravimetric) of Concrete	
521	C39	4.02	Compressive Strength of Molded Concrete Cylinders Compressive Strength of Cylindrical Concrete Specimens	
523	C293 C78	4.02 4.02	Flexural Strength of Concrete (using simple beam with center-point loading) Flexural Strength of Concrete (using simple beam with center-point loading) Flexural Strength of Concrete (using simple beam with third-point loading)	<i>1</i>
528			Freeze Thaw Resistance of Aggregates in Air-Entrained Concrete	<i>1</i>
529			Proportions of Coarse Aggregate in Fresh Concrete	<i>1</i>
530			Determining the Effect of H ₂ O-Reducing and Set-Retard. Admix. Drying Shrinkage PCC	<i>1</i>
533	C360 C143	4.03 4.02	Ball Penetration in Fresh Portland Cement Concrete Ball Penetration in Fresh Portland Cement Concrete Slump of Freshly Mixed PCC	
539	C172	4.02	Sampling Fresh Concrete Sampling Freshly Mixed Concrete	
540	C31	4.02	Making, Handling, & Storing Concrete Compressive. Test Specimens in the Field Making & Curing Concrete Test Specimens in the Field	
541			Flow of Grout Mixtures (flow cone method)	<i>1</i>
543	C173	4.02	Air Content of Freshly Mixed Concrete by the Volumetric Method Air Content of Freshly Mixed Concrete by the Volumetric Method	
548			Evaluation of Aggregate for Lean Concrete Base (LCB.)	<i>1</i>

Notes

1. *Use the CALTRANS Method.*
2. *Use the methods of calculation within the applicable test method first. Refer to CTM 105 as necessary.*
3. *Use the Caltrans Construction Manual procedures as necessary when ASTM D75 or D979 do not adequately cover the item to be sampled.*
4. *Use the direct transmission method only, the air gap method shall not be used. All nuclear gages must have local Caltrans District calibration within the last year. The data sheets provided by the local Caltrans District shall be used when determining the in-place density.*
5. *Sample from the job site, across the mat, immediately behind the paving machine (Caltrans Construction Manual).*
6. *Sample per ASTM D 979 paragraph 4.2.3., sample from the job site, across the mat, immediately behind the paving machine.*
7. *All nuclear gages used for this test must be calibrated on the six (6) DNTM&R AC Standard Blocks. The Data sheets provided by the local Caltrans District shall be used when determining the in-place density.*
8. *Recommended Percent (%) AC method for Rubberized Bituminous Paving mixtures.*
9. *The hand method of shaking is not authorized and shall not be used. An electro-mechanical or hand-operated mechanical. Sand Equivalent shaker must be utilized for this test.*
10. *This Method covers hot solvent, centrifuge, and vacuum extraction.*
11. *Compaction Apparatus shall be calibrated in accordance with ASTM D 2168, Method B (ASTM Book 4.08).*
12. *Test Maximum Density (TMD) shall be performed by Caltrans Test Method 375, Section F. Test Max. Density.*
13. *Splitters must be of the fixed riffle type (no adjustable splitters).*

**MATERIALS TYPICALLY ACCEPTED BY CERTIFICATE OF COMPLIANCE
PER CALTRANS STANDARD SPECIFICATIONS - 2006 Edition****Material**

Aluminum Pipe (Entrance Tapers, Arches, Pipe Down drains, Reducers, Coupling Bands and Slip Joints)
Asphaltic Emulsion
Concrete admixtures
Corrugated Steel Pipe and Corrugated Steel Pipe Arches
Culvert and Drainage Pipe Joints
Electrical Conductors/components
Engineering fabric
Fiber
Lime
Liquid Asphalt
Metal Target Plates
Minor Concrete
Mulch
Paint (Traffic Stripe)
Perforated Steel Pipe
Plastic Pipe
Polyvinyl Chloride Pipe and Polyethylene Tubing
Portland Cement
Reinforced Concrete Pipe
Reinforcing Steel
Stabilizing Emulsion
Steel Piles
Structural Timber and Lumber
Temporary Railing (Type K)
Timber and Lumber
Treated Timber and Lumber
Soil Amendment
Structural Metal Plate Pipe Arches and Pipe Arches
Steel Entrance Tapers, Pipe Down Drains, Reducers, Coupling Bands and Slip Joints
Waterstop

* If Caltrans Standard Specifications May 2006 is part of contract specifications.

Note: Usually these items are inspected at the site of manufacture or fabrication and reinspected after delivery to the job site.

Materials Acceptance Sampling and Testing Requirements:
Earthwork (1 of 3)

Test	Test Method	Sample Size & Container Size	Sampling Location (See Note 1)	Acceptance Test Frequency	Remarks
STRUCTURE BACKFILL (Section 19-3.02C)					
Sieve Analysis	California Test 202	50 lb	Materials site or stockpile	1 every 3,000 tons or 2,000 cu yd; see Remarks	If material is uniform and well within specification limits, test 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 2,000 sq yd and test compaction at every 8 in. of thickness, see Remarks	Relative compaction test is required at each location structure backfill is placed
Maximum Wet Density	California Test 216	35 lb	Relative compaction test site locations	1 every relative compaction test, see Remarks	Wet common-composite test maximum value may be used in accordance with California Test 231
PERVIOUS BACKFILL MATERIAL (Section 19-3.02D)					
Sieve Analysis	California Test 202	50 lb	Stockpile	1 every 3,000 tons or 2,000 cu yd; see Remarks	If material is uniform and well within specification limits, test 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; if R-value testing in the materials report is incomplete because of preproject conditions, then additional R-value testing should be done to verify design R-value
Relative Compaction	California Test 231	Sample for California Test 216	California Test 216	1 every 2,000 sq yd	
Maximum Wet Density	California Test 216	35 lb	Relative compaction test site locations	1 every relative compaction test	

Materials Acceptance Sampling and Testing Requirements:
Earthwork (2 of 3)

Test	Test Method	Sample Size & Container Size	Sampling Location (See Note 1)	Acceptance Test Frequency	Remarks
EMBANKMENT CONSTRUCTION (Section 19-6)					
Relative Compaction	California Test 231	Sample for California Test 216	Project site in accordance with California Test 231	1 every 2,000 sq yd and test compaction at every 8 in. of thickness	
Maximum Wet Density	California Test 216	35 lb	Relative compaction test site locations	1 every relative compaction test, see Remarks	Wet common-composite test maximum value may be used in accordance with California Test 231
GEOSYNTHETIC REINFORCED EMBANKMENT (Section 19-6.02B)					
Plasticity Index	California Test 204	50 lb	Materials site or stockpile	1 per source prior to use	
pH	California Test 643		Materials site or stockpile	1 per source prior to use	
Sieve Analysis	California Test 202	50 lb	Stockpile	Prior to use, 1 every 3,000 tons or 2,000 cu yd, see Remarks	If material is uniform and well within specification limits, the test frequency may be decreased to 1 per day
BORROW MATERIAL (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

Materials Acceptance Sampling and Testing Requirements:
Earthwork (3 of 3)

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Test	Test Method	Sample Size & Container Size	Sampling Location (See Note 1)	Acceptance Test Frequency	Remarks
SHOULDER BACKING (Section 19-9)					
Crushed Particles	California Test 205	50 lb	Materials site or stockpile	1 per project prior to use	
Durability	California Test 229		Materials site or stockpile	1 per project prior to use	
Unit Weight	California Test 212 Rodding Method		Materials site or stockpile	1 per project prior to use	
Sieve Analysis	California Test 202	50 lb	Materials site or stockpile	1 every 3,000 tons or 2,000 cu yd, see Remarks	If material is uniform and well within specification limits, test frequency may be decreased to 1 per day
Sand Equivalent	California Test 217				

Note:

1. Refer to California Test 125 for sampling procedures.

Materials Acceptance Sampling and Testing Requirements:
Stabilized Soils (1 of 2)

Test	Test Method	Sample Size & Container Size	Sampling Location (See Note 1)	Acceptance Test Frequency	Remarks
LIME (Section 24-2.02)					
Various properties	See <i>Standard Specifications</i> Section 24-2.02	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 an Authorized Material 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 (Section 24-2.01D)					
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 (Section 24-2.01D)					
Lime Application (Dry Form)	Calibrated tray method or equal	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 4,000 sq yd, 1 per day minimum; see Remarks	Taken prior to compaction

Materials Acceptance Sampling and Testing Requirements:
Stabilized Soils (2 of 2)

Test	Test Method	Sample Size & Container Size	Sampling Location (See Note 1)	Acceptance Test Frequency	Remarks
MIXED STABILIZED SOIL (Sections 24-2.01 and 24-2.03)					
Relative Compaction	California Test 231	Sample for California Test 216	Project site in accordance with California Test 231	1 every 2,000 sq yd and test compaction at every 6 in. of thickness	
Maximum Wet Density	California Test 216	35 lb	Relative compaction test site locations	1 every relative compaction test; see Remarks	Wet common-composite test maximum value may be used in accordance with California Test 231
Dimensions	Measurement	N/A	Random locations in place after compaction	As necessary for verification of stabilized soil thickness and surface grades	
CURING SEAL-ASPHALTIC EMULSION (Section 24-1.02C)					
Various properties based on asphaltic emulsion type used; see <i>Standard Specifications</i> Section 94	Based on asphaltic emulsion type used; see <i>Standard Specifications</i> Section 94	1/2-gal plastic jug with screw-on lid	Sampling line leading to the spray bar	1 each shipment; see Remarks	Each shipment must be accompanied by a certificate of compliance; recommend 1 random test from samples taken

Note:

1. Refer to California Test 125 for sampling procedures.

Materials Acceptance Sampling and Testing Requirements: Aggregate Subbases

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Test	Test Method	Sample Size & Container Size	Sampling Location (See Note 1)	Acceptance Test Frequency	Remarks
AGGREGATE SUBBASE					
Gradation (Sieve Analysis)	California Test 202	50 lb	Windrow or roadway	Every 3,000 tons or 2,000 cu yd; see Remarks and Note 2	If material is uniform and well within specification limits, frequency may be decreased to 1 test per day
Sand Equivalent	California Test 217			Every 3,000 tons or 2,000 cu yd; see Remarks and Note 2	If material is uniform and well within specification limits, frequency may be decreased to 1 test per day
R-Value	California Test 301	50 lb	Windrow or roadway	Every 3,000 tons or 2,000 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
Relative Compaction	California Test 231	Sample for California Test 216	Roadway in accordance with California Test 231	Every 2,000 sq yd	
Maximum Wet Density	California Test 216	35 lb	Relative compaction test site locations	Every 2,000 sq yd; see Remarks	Wet common-composite test maximum value may be used in accordance with California Test 231
Dimensions	N/A	N/A	Random locations	As necessary for acceptance	Verify thickness of aggregate subbase

Notes:

1. Refer to 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 Bases

Test	Test Method	Sample Size & Container Size	Sampling Location (See Note 1)	Acceptance Test Frequency	Remarks
AGGREGATE BASES					
Gradation (Sieve Analysis)	California Test 202	50 lb	Windrow or roadway	Every 3,000 tons or 2,000 cu yd; see Remarks and Note 2	If material is uniform and well within specification limits, frequency may be decreased to 1 test per day
Sand Equivalent	California Test 217			Every 3,000 tons or 2,000 cu yd; see Remarks and Note 2	If material is uniform and well within specification limits, frequency may be decreased to 1 test per day
R-Value	California Test 301	50 lb	Windrow or roadway	Every 3,000 tons or 2,000 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 gradation and sand equivalent values, meets minimum R-value requirements
Durability Index	California Test 229	50 lb	Windrow or roadway	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	Roadway in accordance with California Test 231	Every 2,000 sq yd	
Maximum Wet Density	California Test 216	35 lb	Relative compaction test site locations	Every 2,000 sq yd, see Remarks	Wet common-composite test maximum value may be used in accordance with California Test 231
Dimensions	N/A	N/A	Random locations	As necessary for acceptance	Verify thickness of aggregate base

Notes:

1. Refer to 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 Bases (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	Plant, truck, windrow, or roadway	1 every 3,000 tons or 2,000 cu yd, minimum 1 per day of production	
Sand Equivalent	California Test 217				
AGGREGATE Class B					
R-Value (with and without cement)	California Test 301	100 lb for aggregate qualification	Windrow or roadway	Prior to production	
CEMENT Type II Portland Cement					
Various Properties Must comply with <i>Standard Specifications</i> Section 90-1.02B(2)	See <i>Standard Specifications</i> 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	Windrow or roadway 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	Windrow or roadway prior to compaction	1 every 3,000 tons or 2,000 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 Bases (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 Content	California Test 338	See California Test 338, Part I	Windrow or roadway prior to compaction	1 every 1,500 tons or 1,000 cu yd, minimum 1 per day of production	
Optimum Moisture	California Test 312	See California Test 312	Windrow or roadway	Prior to production	
Moisture Content	California Test 226	10 lb in sealed container	Roadway prior to compaction	2 daily	
Relative Compaction	California Test 312 or 231	Sample for California Test 216	Roadway in accordance with California Test 231	1 every 2,000 sq yd	
Maximum Wet Density	California Test 216, California Test 312	35 lb	Relative compaction test site locations	1 every 2,000 sq yd; see Remarks	Wet common-composite test maximum value may be used in accordance with California Test 231
Dimensions	N/A	N/A	Random locations	As necessary for acceptance	Verify thickness of CTB

Note:

1. Refer to California Test 125 for sampling procedures.

Materials Acceptance Sampling and Testing Requirements: Concrete Bases

Lean Concrete Base

Test	Test Method	Sample Size & Container Size	Sampling Location (See Note 1)	Acceptance Test Frequency	Remarks
LEAN CONCRETE BASES					
Compressive strength (7-days)	ASTM C39	2 cylinders - 6x12 inches	Concrete truck discharge chute	1,000 cu yd or 1 day's production if less than 1,000 cu yd	
RAPID STRENGTH CONCRETE BASE					
Modulus of rupture (7-days)	California Test 524	3 beams - 6x6x20 inches	Concrete truck discharge chute	1 per 500 cu yd or 1 day's production if less than 500 cu yd.	
LEAN CONCRETE BASE RAPID SETTING					
Compressive strength (7-days)	California Test 521	2 cylinders - 6x12 inches	Concrete truck discharge chute	1 per 500 cu yd or 1 day's production if less than 500 cu yd.	
CONCRETE BASE					
Modulus of rupture (7-days)	California Test 523	2 beams of 6x6x32 in. for centerpoint loading or 6x6x20 in. for third-point loading	Concrete truck discharge chute	1,000 cu yd or 1 day's production if less than 1,000 cu yd	
Dimensions	N/A	N/A	Random locations	As necessary for acceptance	Verify thickness of base

Note:

1. Refer to California Test 125 for sampling procedures.

Materials Acceptance Sampling and Testing Requirements: Treated Permeable Bases

Asphalt Treated Permeable Base (ATPB) (1 of 2)

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)	Plant	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)	Plant	1 for every 4 hours of production	Recommend 1 acceptance test per day if 3 consecutive results exceed 62
Cleanness Value	California Test 227			1 for every 4 hours of production	
ASPHALT					
Various properties based on asphalt type used; see <i>Standard Specification</i> Section 92	Based on asphalt type used; see <i>Standard Specifications</i> 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 382	40 lb in metal containers	Plant, truck, windrow, or roadbed	1 for every 4 hours of production	
AGGREGATE					
Los Angeles Rattler (loss at 500 revolutions)	California Test 211	50 lb	Plant	Prior to production and minimum 1 random for every 25,000 cu yd	
Soundness	California Test 214	50 lb	Plant		
Sieve Analysis (Gradation)	California Test 202	40 lb	Plant	1 for every 4 hours of production; (see Note 4)	

Materials Acceptance Sampling and Testing Requirements: Treated Permeable Bases

Asphalt Treated Permeable Base (ATPB) (2 of 2)

Test	Test Method	Sample Size & Container Size	Sampling Location (See Note 1)	Acceptance Test Frequency	Remarks
AGGREGATE (Cont.)					
Cleanness Value	California Test 227				
CEMENT					
Cement, various properties; must comply with <i>Standard Specifications</i> Section 90-1.02B(2)	Must comply with <i>Standard Specifications</i> 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
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 <i>Standard Specifications</i> Section 90-1.02D				
Alkalis					
Specific Gravity					

Notes:

1. Refer to 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: Reclaimed Pavement

Test	Test Method	Sample Size & Container Size	Sampling Location (See Note 1)	Acceptance Test Frequency	Remarks
PULVERIZED ROADBED (Section 30-2)					
Thickness	Thickness- Field Measurement	Field Measurement	Random location	3 random locations per lot	
Relative Compaction (% min)	California Test 231	Sample for California Test 216	Project site in accordance with California Test 231	1 every 2,000 sq yd and test compaction at every 6 in. of thickness	
FULL DEPTH RECLAMATION—FOAMED ASPHALT (Section 30-3)					
Relative Compaction (% min)	California Test 231	Sample for California Test 216	Project site in accordance with California Test 231	1 every 2,000 sq yd and test compaction at every 6 in. of thickness	
Thickness	Thickness	California Test 531. 4- or 6-in.-diameter core, full thickness	3 random location per lot	See Section 4-4004 of this manual	
FULL DEPTH RECLAMATION—Cement (Section 30-4)					
Thickness	Thickness- Core thickness measurement	California Test 531, 4- or 6-in.-diameter core, full thickness	3 random locations per lot	See Section 4-4004 of this manual	
Cement application rate	Calibrated tray or equal	Building paper or pan of known area	Surface receiving cement	Each 40,000 sq ft, 2 per day minimum	To determine if application rate is within $\pm 5\%$ of mix design rate
Relative Compaction (% min)	California Test 231	Sample for California Test 216	Project site in accordance with California Test 231	1 every 2,000 sq yd and test compaction at every 6 in. of thickness	

Notes:

1. Refer to California Test 125 for sampling procedures.

Materials Acceptance Sampling and Testing Requirements:
Seal Coats (1 of 4)

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 37 of <i>Standard Specifications</i>	See Section 37-2.02A(4)(b)(ii) of <i>Standard Specifications</i>	1/2-gal plastic jug with screw-on lid	Transport tanker	Each shipment	Certificate of compliance required with each shipment
Asphaltic emulsion spread rate	CT 339	Per test method	Full width of boot truck	Once per project	
POLYMER MODIFIED ASPHALTIC EMULSION					
Viscosity	AASHTO T 59	1-qt wide-mouth plastic jar with screw-on lid	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				
Penetration	AASHTO T 49				
Ring and Ball	AASHTO T 53				
ASPHALT MODIFIER FOR ASPHALT RUBBER BINDER					
Viscosity	ASTM D445	1-qt round wide-mouth can with friction top lid or 1-qt rectangular can with screw-on lid	Sample port on tanker truck	1 random per project	
Flash Point	ASTM D92				
Molecular Analysis	ASTM D2007				
CRUMB RUBBER MODIFIER FOR ASPHALT RUBBER BINDER					
Wire in CRM (max %)	CT 385	CRM scrap tire: Two 2.5 lb in gallon zip-lock bags	CRM bulk bag	Minimum 1 random per project	
Fabric in CRM (max %)	CT 385				
CRM particle length	---				

Materials Acceptance Sampling and Testing Requirements:
Seal Coats (2 of 4)

Test	Test Method	Sample Size & Container Size	Sampling Location (See Note 1)	Acceptance Test Frequency	Remarks
CRM specific gravity	CT 208				
Natural rubber content in high nature CRM (%)	ASTM D297				
ASPHALT RUBBER BINDER OR MODIFIED ASPHALT BINDER					
Cone Penetration		1-qt round wide-mouth can with friction top lid	Asphalt feed line connecting to the HMA plant	Production start-up evaluation and 1 random per 5 samples	Certificate of compliance required with each shipment
Resilience					
Softening point					
Asphalt Rubber Binder Viscosity	ASTM D7741	Five 1-qt round wide-mouth cans with friction top lids	Asphalt storage tank	The greater of 1 every 5 lots or once a day, see Remarks	For safety, engineer may witness contractor perform test
Base Asphalt Binder Properties	See <i>Standard Specification</i> Section 92	Five 1-qt round wide-mouth cans with friction top lids	Asphalt storage tank	The greater of 1 every 5 lots or once a day, see Remarks	Certificate of compliance required for each shipment; if asphalt binder source is not on approved list, sample and test asphalt before use
SCREENINGS/AGGREGATE FOR CHIP SEALS					
LA Rattler	California Test 211	50 lb in canvas bags or 5-gal buckets	Stockpile	Once per project	
% Crushed Particles	AASHTO T 335				
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:
Seal Coats (3 of 4)

Test	Test Method	Sample Size & Container Size	Sampling Location (See Note 1)	Acceptance Test Frequency	Remarks
CRACK TREATMENTS					
Crack Treatment Material					
Softening point	ASTM D36	2 each 3-lb minimum samples in silicone release boxes	From crack treatment material dispensing wand	Once per project	Indicate the specified type of crack treatment material on the TL-0101
Cone penetration	ASTM D5329				
Resilience					
Tensile adhesion					
Asphalt compatibility					
Flexibility	ASTM D3111				
Specific gravity	ASTM D70				
Sieve test	See note in Section 37-6.01D(3) "Department Acceptance" of the <i>Standard Specifications</i>				
SAND FOR CRACK TREATMENT					
Sieve Analysis	California Test 202	25 lb	Stockpile	Once per project	
SLURRY SEAL AGGREGATE					
Los Angeles Rattler (loss at 500 revolutions)	California Test 211	50 lb	Stockpile	Once per project	
Percentage of Crushed Particles	California Test 205				
Film Stripping	California Test 302				
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				

Materials Acceptance Sampling and Testing Requirements:
Seal Coats (4 of 4)

Test	Test Method	Sample Size & Container Size	Sampling Location (See Note 1)	Acceptance Test Frequency	Remarks
Sieve Analysis	California Test 202	30 lb	Stockpile	Once daily	
Sand Equivalent	California Test 217				

Note:

1. Refer to California Test 125 for sampling procedures.

Materials Acceptance Sampling and Testing Requirements:
Asphalt Concrete (1 of 6)

Test	Test Method	Sample Size & Container Type	Sampling Location (See Note 1)	Sampling Frequency	Acceptance Test Frequency	Remarks
AGGREGATE: All Types of HMA						
Gradation (Sieve Analysis) (see Note 2)	AASHTO T 27, California Test 105, California Test 384	Combined six 20-lb canvas bags (see Note 3) or Batch 30 lb (proportioned per bin percentages)	HMA plant	1 for each 750 tons, 1 per day minimum	Production start-up evaluation. Minimum 1 per day of paving	
Sand Equivalent	AASHTO T 176		HMA plant or before lime treatment	1 for each 750 tons, 1 per day minimum	Production start-up evaluation. Minimum 1 per day of paving	Not required for OGFC (open graded friction course)
Percent Crushed Particles (Coarse)	AASHTO T 335		HMA plant or before lime treatment	1 for each 750 tons, 1 per day minimum	Production start-up evaluation, and minimum 1 random for every 25,000 tons or less of paving	
Percent Crushed Particles (Fine)	AASHTO T 335		HMA plant or before lime treatment	1 for each 750 tons, 1 per day minimum	Production start-up evaluation, and minimum 1 random for every 25,000 tons or less of paving	
LA Rattler (500 Revolutions)	AASHTO T 96		HMA plant or before lime treatment	1 for each 750 tons, 1 per day minimum	Production start-up evaluation, and minimum 1 random for every 50,000 tons or less of paving	
LA Rattler (100 Revolutions)	AASHTO T 96		HMA plant or before lime treatment	1 for each 750 tons, 1 per day minimum	Production start-up evaluation, and minimum 1 random for every 50,000 tons or less of paving	
Fine Aggregate Angularity	AASHTO T 304, Method A		HMA plant or before lime treatment	1 for each 750 tons, 1 per day minimum	Production start-up evaluation, and minimum 1 random for every 50,000 tons or less of paving	Not required for OGFC or Minor HMA
Flat and Elongated Particles	ASTM D4791		HMA plant or before lime treatment	1 for each 750 tons, 1 per day minimum	Production start-up evaluation, and minimum 1 random for every 50,000 tons or less of paving	Not required for Minor HMA
ASPHALT BINDER						
Various properties based on asphalt type used (see <i>Standard Specifications</i> Section 92)	See <i>Standard Specifications</i> Section 92	1-qt round wide-mouth can with friction top lid	Asphalt feed line connecting the plant storage tanks	1 per day of HMA production	1 random for every 5 samples	Certificate of compliance required for each shipment; if asphalt binder source is not on approved list, sample and test asphalt before use

Materials Acceptance Sampling and Testing Requirements:
Asphalt Concrete (2 of 6)

Test	Test Method	Sample Size & Container Type	Sampling Location (See Note 1)	Sampling Frequency	Acceptance Test Frequency	Remarks
ASPHALT RUBBER BINDER						
Asphalt Rubber Binder Properties	See <i>Standard Specifications</i> Section 39-2.03A(4)(e)(ii)	1-qt round wide-mouth can with friction top lid	Asphalt rubber 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	ASTM D7741	1-qt round wide-mouth can with friction top lid	Asphalt rubber 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 <i>Standard Specifications</i> Section 92	1-qt round wide-mouth can with friction top lid	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 D92 ASTM D2007	1-qt round wide-mouth can with friction top lid. or 1-qt rectangular can with screw-on lid	Sample port on tanker truck	Each shipment	1 random per project	
Crumb Rubber Modifier (CRM) Properties	California Test 208, California Test 385, ASTM D297	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:
Asphalt Concrete (3 of 6)

Test	Test Method	Sample Size & Container Type	Sampling Location (See Note 1)	Sampling Frequency	Acceptance Test Frequency	Remarks
HOT MIX ASPHALT: Type A						
Moisture Content	AASHTO T 329	10 lb, sealed metal container	Loose mix from behind the paver (see Note 4)	Production start-up evaluation, and minimum 1 per project	Production start-up evaluation, and minimum 1 per project during paving	Test within 1 hour of sampling
Asphalt Binder Content	AASHTO T 308, Method A	60 lb (see Note 5) (8x8x3=8 boxes, 8x8x4=6 boxes, 8½x8½x4½=4 boxes) (see Note 5)	Loose mix from behind the paver (see Note 4)	1 for each 750 tons, 1 per day minimum	Production start-up evaluation; minimum 1 per day of paving	
Maximum Theoretical Density	AASHTO T 209		Loose mix from behind the paver (see Note 4)	1 for each 750 tons, 1 per day minimum	Production start-up evaluation. 1 random test per day of paving	
Air Void Content	AASHTO T 269	100 lb (see Note 5) (8x8x3=12 boxes, 8x8x4=10 boxes, 8½x8½x4½=8 boxes)	Loose mix from behind the paver (see Note 4)	Production start-up evaluation, 1 every 25,000 tons of paving	Production start-up evaluation, and minimum 1 random for every 25,000 tons of paving	
Voids in Mineral Aggregate	SP-2 Asphalt Mixture Volumetrics		Loose mix from behind the paver (see Note 4)	Production start-up evaluation, 1 every 25,000 tons of paving	Production start-up evaluation, and minimum 1 random for every 25,000 tons of paving	
Dust Proportion	SP-2 Asphalt Mixture Volumetrics		Loose mix from behind the paver (see Note 4)	Production start-up evaluation, 1 every 25,000 tons of paving	Production start-up evaluation, and minimum 1 random for every 25,000 tons of paving	
Hamburg Wheel Tracker	AASHTO T 324 (Modified)	70 lb (see Note 5) (8x8x3=9 boxes, 8x8x4=7 boxes, 8½x8½x4½=6 boxes)	Loose mix at plant, truck, or windrow	Production start-up evaluation, 1 every 10,000 tons of paving	Production start-up evaluation, and minimum 1 random for every 10,000 tons or less of paving	Not required for Minor HMA
Moisture Susceptibility	AASHTO T 283	140 lb (see Notes 5 & 6) (8x8x3=18 boxes, 8x8x4=15 boxes, 8½x8½x4½=12 boxes)	Loose mix at plant, truck, or windrow	Production start-up evaluation, 1 every 50,000 tons of paving	Production start-up evaluation, and minimum 1 random test for every 50,000 tons of paving	Test for dry strength and wet strength; not required for Minor HMA

Materials Acceptance Sampling and Testing Requirements:
Asphalt Concrete (4 of 6)

Test	Test Method	Sample Size & Container Type	Sampling (See Note 1)	Sampling Frequency	Acceptance Test Frequency	Remarks
HOT MIX ASPHALT: With RAP/RAS						
Binder Recovery	AASHTO T 164 ASTM D1856	10 lb (8x8x3=1 box, 8x8x4=1 box, 8½x8½x4½=1 box)	Loose mix from behind the paver (see Note 4)	Production start-up evaluation, 1 every 25,000 tons of paving	1 random for every 25,000 tons or less of paving	
RUBBERIZED HOT MIX ASPHALT: Gap Graded						
Moisture Content	AASHTO T 329	10 lb, sealed metal container	Loose mix from behind the paver (see Note 4)	Production start-up evaluation, and minimum 1 per project	Production start-up evaluation, and minimum 1 per project during paving	Test within 1 hour of sampling
Asphalt Binder Content	AASHTO T 308, Method A	60 lb (see Note 5) (8x8x3=8 boxes, 8x8x4=6 boxes, 8½x8½x4½=4 boxes)	Loose mix from behind the paver (see Note 4)	1 for each 750 tons, 1 per day minimum	Production start-up evaluation; 1 random test per day of paving	
Maximum Theoretical Density	AASHTO T 209		Loose mix from behind the paver (see Note 4)	1 for each 750 tons, 1 per day minimum	Production start-up evaluation; minimum 1 per day of paving	
Air Void Content	AASHTO T 269		Loose mix from behind the paver (see Note 4)	Production start-up evaluation, 1 every 25,000 tons of paving	Production start-up evaluation, and minimum 1 random test for every 25,000 tons of paving	
Voids in Mineral Aggregate	SP-2 Asphalt Mixture Volumetrics	100 lb (see Note 5) (8x8x3=12 boxes, 8x8x4=10 boxes, 8½x8½x4½=8 boxes)	Loose mix from behind the paver (see Note 4)	Production start-up evaluation, 1 every 25,000 tons of paving	Production start-up evaluation, and minimum 1 random test for every 25,000 tons of paving	
Dust Proportion	SP-2 Asphalt Mixture Volumetrics		Loose mix from behind the paver (see Note 4)	Production start-up evaluation, 1 every 25,000 tons of paving	Production start-up evaluation, and minimum 1 random test for every 25,000 tons of paving	
Hamburg Wheel Track	AASHTO T 324 (Modified)	75 lb (see Note 5) (8x8x3=9 boxes, 8x8x4=7 boxes, 8½x8½x4½=6 boxes)	Loose mix at plant, truck, or windrow	Production start-up evaluation, 1 every 10,000 tons of paving	Production start-up evaluation, and minimum 1 random test for every 10,000 tons or less of paving	

Materials Acceptance Sampling and Testing Requirements:
Asphalt Concrete (5 of 6)

Test	Test Method	Sample Size & Container Type	Sampling (See Note 1)	Sampling Frequency	Acceptance Test Frequency	Remarks
RUBBERIZED HOT MIX ASPHALT: Gap Graded (continued)						
Moisture Susceptibility	AASHTO T 283	75 lb (see Notes 5 & 6) (8x8x3=18 boxes, 8x8x4=15 boxes, 8½x8½x4½=12 boxes)	Loose mix at plant, truck, or windrow	Production start-up evaluation, 1 every 50,000 tons of paving	Production start-up evaluation, and minimum 1 random test for every 50,000 tons of paving	Test for dry strength and wet strength
OPEN GRADED FRICTION COURSE (OGFC)						
Asphalt Binder Content	AASHTO T 308, Method A	20 lb (see Note 5) 4, 1-gal metal containers with friction lids	Loose mix from behind the paver (see Note 4)	1 for each 750 tons, 1 per day minimum	Production start-up evaluation; minimum 1 per day of paving	
Moisture Content	AASHTO T 329	10 lb, sealed metal container	Loose mix from behind the paver (see Note 4)	Production start-up evaluation, and minimum 1 per project	Production start-up evaluation, and minimum 1 per project during paving	Test within 1 hour of sampling
BONDED WEARING COURSE: Gap Graded (BWC-G) (See Note 7)						
Asphalt Binder Content	AASHTO T 308, Method A	20 lb (see Note 5) 4, 1-gal metal containers with friction lids	Loose mix at plant	1 for each 750 tons, 1 per day minimum	Production start-up evaluation. Minimum 1 per day of paving	
Moisture Content	AASHTO T 329	10 lb sealed metal container	Loose mix at plant	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
PAVEMENT DENSITY						
Density of cores (% of maximum theoretical density) (see Note 8)	California Test 375	4- or 6-in cores	Final layer, cored to the specified total paved thickness	1 for each 250 tons	1 for each 250 tons	Density applies to HMA thickness of 0.15 ft or greater

Materials Acceptance Sampling and Testing Requirements:
Asphalt Concrete (6 of 6)

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; see Note 9	Entire final surface; see Remarks	Entire final surface; see Remarks	Areas exempt from Inertial Profiler
Inertial Profiler for Mean Roughness Index and Areas of Localized Roughness	California Test 387 AASHTO R 56 & AASHTO R 57	Each 0.1 mile	Pavement surface	Entire final surface	Entire final surface; see Remarks	Entire final surface excluding areas requiring straightedge; use contractor-furnished profiles for IRI values within 10% of Caltrans' IRI values
TACK COAT						
Asphalt Binder	Based on asphalt type used (see <i>Standard Specifications</i> Section 92)	1-qt round wide-mouth can with friction top lid	Spray bar on asphalt distributor truck	Each truck load	1 random per project	
Asphaltic Emulsion	Based on emulsion type used (see <i>Standard Specifications</i> Section 94)	1/2-gal plastic jug with screw-on lid	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	Verify tack coat spray rate is sufficient to meet the minimum specified residual rate. (see example in Section 4-9403, "During the Course of Work," in this manual)

Notes:

1. Refer to California Test 125 for sampling procedures.
2. When using RAP, RAS or RAP/RAS, adjust gradation by the correction factor determined under California Test 384.
3. Store three 20-lb canvas bags for dispute resolution.
4. Sampling HMA behind the paver is the preferred location. You may also take samples from the windrow, production plant, or truck.
5. Sample sizes are based on split samples—one sample for acceptance testing, and one for dispute resolution. Store one-half of the boxes or cans for dispute resolution.
6. Contractor ships directly to district material laboratory.

7. For BWC using RHMA-G, RHMA-O, or HMA-O, sampling and testing must comply with requirements for RHMA-G, RHMA-O, or HMA-O.
8. Determine percent of theoretical maximum density under California Test 375, except use AASHTO T 275 to determine in-place density of each core and AASHTO T 209, Method A to determine theoretical maximum density instead of calculating maximum density.
9. May use Inertial Profiler data and ProVAL Smoothness Assurance "Rolling Straightedge Comparison Tool" to assist in determining where to check with 12-foot straightedge.

Materials Acceptance Sampling and Testing Requirements: Concrete Pavement

Test	Test Method	Sample Size & Container Size	Sampling Location (See Note 1)	Acceptance Test Frequency	Remarks
CONCRETE					
Modulus of Rupture (28-days)	California Test 523	2 beams of 6x6x32 in. for centerpoint loading or 6x6x20 in. for third-point loading	Concrete truck discharge chute	1 set per age for each 1,000 cu yd, 1 per day minimum; see Remarks and Note 2	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	Concrete truck discharge chute	1 every day of production; see Remarks	Only test when air entrainment is specified
PAVEMENT					
Thickness	California Test 531	4-in. diameter core, full thickness of pavement	See Section 4-4004, "Level of Inspection," of this manual	1 every 1,200 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 4,000 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 requiring straightedge	
Smoothness - Inertial Profiler for Mean Profile Index and Areas of Localized Roughness	AASHTO R 56, AASHTO R 57, and California Test 387	0.1 mile	Pavement surface	Entire final surface; see Remarks	Entire final surface excluding specified areas

Notes:

1. Refer to California Test 125 for sampling procedures.
2. If concrete modulus of rupture is close to specification limit or outside the specification limits, sample and test concrete every 1,000 cu yd so that deductions may be taken for noncompliant material.

**Materials Acceptance Sampling and Testing Requirements:
Existing Concrete Pavement**

Test	Test Method	Sample Size & Container Size	Sampling Location (See Note 1)	Acceptance Test Frequency	Remarks
INDIVIDUAL SLAB REPLACEMENT WITH RAPID STRENGTH CONCRETE (Section 41-9)					
Coefficient of Friction	California Test 342	N/A	Pavement surface	1 every 1,200 sq yd; 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
Modulus of rupture (3-days)	California Test 524	3 beams of 6x6x20 inches	Concrete truck discharge chute	1 per shift	

Notes:

1. Refer to California Test 125 for sampling procedures.

Materials Acceptance Sampling and Testing Requirements: Concrete Structures

Test	Test Method	Sample Size & Container Size	Sampling Location (See Note 1)	Acceptance Test Frequency	Remarks
JOINT SEALS TYPE B (Section 51-2.02C(2))					
Various properties; must comply with <i>Standard Specifications</i> Section 51-2.02C(2)	See <i>Standard Specifications</i> 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 movement rating, 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 <i>Standard Specifications</i> Section 51-2.02B(2)	See <i>Standard Specifications</i> 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

Notes:

1. Refer to California Test 125 for sampling procedures.

Materials Acceptance Sampling and Testing Requirements:
Concrete (1 of 6)

Concrete, Except Minor Concrete and Rapid Strength Concrete

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

Materials Acceptance Sampling and Testing Requirements:
Concrete (2 of 6)

Concrete, Except Minor Concrete and Rapid Strength Concrete

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

Materials Acceptance Sampling and Testing Requirements:
Concrete (3 of 6)

Concrete, Except Minor Concrete and Rapid Strength Concrete

Test	Test Method	Sample Size & Container Size	Sampling Location (See Note 1)	Acceptance Test Frequency	Remarks
WATER					
Chlorides	California Test 422	Clean 2-qt plastic jug with lined, sealed lid	At point of use	1 per source; see Remarks	Water supplies for domestic use do not need to be tested
Sulfates	California Test 417				
Setting Time	ASTM C 191 or ASTM C 266	Contact METS for required quantity of water sample	At point of use	1 per source; see Remarks	Water supplies for domestic use do not need to be tested
Mortar Compressive Strength	ASTM C109				
Coloring Agents	Must comply with <i>Standard Specifications</i> Section 90-1.02D				
Alkalis					
Specific Gravity					
ADMIXTURES: Air Entraining Agent					
Air entraining properties Must comply with <i>Standard Specifications</i> Section 90-1.02E	See <i>Standard Specifications</i> Section 90-1.02E	1-qt can or plastic bottle of liquid, 2 lb of powder	Concrete plant	Sample each shipment; see Remarks	Must be on Authorized Material List and certificate of compliance must accompany each shipment; recommend 1 verification test per 5 samples
CHEMICAL ADMIXTURE: Water Reducers or Set Retarders					
Claimed properties, chloride identification	ASTM C494 Type A, B, D, F or Type G California Test 415	1-qt can of liquid, 2 lb of powder	Concrete plant	Sample each shipment; see Remarks	Must be on Authorized Material List and certificate of compliance must accompany each shipment; recommend 1 verification test per 5 samples
CONCRETE for Pavement and Structures					
Shrinkage	AASHTO T 160 Modified See <i>Standard Specifications</i> Section 90-1.01D(3)	Set of three: 4x4x11¼ 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

Materials Acceptance Sampling and Testing Requirements:
Concrete (4 of 6)

Concrete, Except Minor Concrete and Rapid Strength Concrete

Test	Test Method	Sample Size & Container Size	Sampling Location	Acceptance Test Frequency	Remarks
CONCRETE Designated Compressive Strength 3600 psi or Greater					
Yield	California Test 518	See test method	Concrete truck discharge chute; see Note 3	As necessary to assure accuracy of mix design; minimum 2 per each mix design	No deductions for cement content will be made based on the results of California Test 518
Concrete Uniformity	ASTM C143, California Test 533	See test method	Concrete truck discharge chute; see Note 3	When compressive test specimen is fabricated and when consistency or uniformity is questionable, minimum 2 per day	
Concrete Uniformity	California Test 529	100 lb	Concrete truck discharge chute; see Note 3	When uniformity is questionable	
Compressive Strength	ASTM C172, California Test 540	1 set of 2 cylinders 6x12 in. for each test	Concrete truck discharge chute; see Note 3	1 set per age for every 300 cu yd concrete or as required for acceptance, minimum 1 set per project; see Remarks	For trial batches, see <i>Standard Specifications</i> or job special provisions and Section 6-3, "Field Tests," of this manual
Air Content	California Test 504	See test method	Concrete truck discharge chute; see Note 3	1 every 4 hours of production and when test specimens are fabricated; see Remarks	Where air is specified for freeze-thaw resistance, a minimum of 1 every 30 cu yd
CONCRETE WITH COMPRESSIVE STRENGTH LESS THAN 3,600 psi					
Concrete Uniformity	ASTM C143, California Test 533	See test method	Concrete truck discharge chute; see Note 3	When compressive test specimen is fabricated and when uniformity is questionable	
Concrete Uniformity	California Test 529	100 lb	Concrete truck discharge chute; see Note 3	When uniformity is questionable	
Compressive Strength	California Test 540, California Test 521	1 set of 2 cylinders, 6x12 in., for each test	Concrete truck discharge chute; see Note 3	1 set per age for every 300 cu yd, minimum 1 set per project	
Air Content	California Test 504	See test method	Concrete truck discharge chute; see Note 3	When compressive test specimens are fabricated; see Remarks	Where air is specified for freeze-thaw resistance, a minimum of 1 every 100 cu yd

Materials Acceptance Sampling and Testing Requirements:
Concrete (5 of 6)

Concrete, Except Minor Concrete and Rapid Strength Concrete

Test	Test Method	Sample Size & Container Size	Sampling Location	Acceptance Test Frequency	Remarks
CURING COMPOUND					
Curing Compound; must comply with <i>Standard Specifications</i> Section 90-1.03B(3)	ASTM C309	1-qt can	At time of use; see Note 1	1 every shipment; see Remarks	Each shipment must have certificate of compliance that includes: 1. Test results for tests specified in Section 90-1.01D(6) of <i>Standard Specifications</i> 2. Certification that material was tested within 12 months before use
CEMENTITIOUS MATERIALS					
Cement, various properties; must comply with <i>Standard Specifications</i> Section 90-1.02B(2)	See <i>Standard Specifications</i> 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 Material List; certificate of compliance must accompany each cement shipment
Supplementary Cementitious Materials (SCM), various properties; must comply with <i>Standard Specifications</i> Section 90-1.02B(3)	See <i>Standard Specifications</i> 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 Material List; certificate of compliance must accompany each SCM shipment
ADMIXTURES: Air Entraining Agent					
Air entraining properties; must comply with <i>Standard Specifications</i> Section 90-1.02E	See <i>Standard Specifications</i> Section 90-1.02E	N/A	N/A	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	N/A	N/A	See Remarks	Must be on Authorized Material List and certificate of compliance must accompany each shipment

Materials Acceptance Sampling and Testing Requirements:
Concrete (6 of 6)

Minor Concrete

Test	Test Method	Sample Size & Container Size	Sampling Location	Acceptance Test Frequency	Remarks
CONCRETE					
Yield	California Test 518	See test method	Concrete truck discharge chute; see Note 3	As necessary to assure accuracy of mix design; minimum 1 per each mix design; see Remarks	No deductions for cement content will be made based on the results of California Test 518
Compressive Strength	California Test 540, California Test 521	1 set of 2 cylinders, 6x12 in., for each test	Concrete truck discharge chute; see Note 3	Sample and test if concrete quality is questionable; minimum 1 per mix design; see Remarks	Minor concrete must have the strength described or 2,500 psi, whichever is greater; see <i>Standard Specifications</i> Section 90-1.02A
Air Content	California Test 504	See test method	Concrete truck discharge chute; see Note 3	Where air is specified for freeze-thaw resistance, a minimum of 1 every 100 cu yd	Where air is specified for freeze-thaw resistance, a minimum of 1 every 100 cu yd
CURING COMPOUND					
Curing Compound; must comply with <i>Standard Specifications</i> Section 90-1.03B(3)	ASTM C309	1-qt can	At time of use; see Note 1	1 every shipment; see Remarks	Each shipment must have certificate of compliance that includes: 1. Results for tests specified in Section 90-1.01D(6) of <i>Standard Specifications</i> 2. Certification that material was tested within 12 months before use

Notes:

1. Refer to 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. Refer to California Test 539 for method of sampling fresh concrete.

Materials Acceptance Sampling and Testing Requirements:
Miscellaneous Materials (1 of 4)

Test	Test Method	Sample Size & Container Size	Sampling Location	Acceptance Test Frequency	Remarks
BARBED WIRE AND WIRE MESH FENCES (Section 80-2)					
Barbed Wire, various properties; must comply with <i>Standard Specifications</i> Section 80-2.02D	ASTM A121	1 yd length	Job site	As necessary for verification if quality is questionable	
BOLTS AND HARDWARE (Section 75)					
		2 samples each diameter		Each lot	Sample and test if not previously inspected at the source
CHAIN LINK FENCES (Section 80-3)					
Wire Mesh, various properties; must comply with <i>Standard Specifications</i> 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 PIPE (Section 65)					
Compliance with specifications		Contact METS for instructions		Contact METS for instructions	Sample and test if not previously inspected at source
CONDUIT (Section 86-1.02B)					
Conduit, various properties; must comply with <i>Standard Specifications</i> Section 86-1.02B	See <i>Standard Specifications</i> Section 86-1.02B	2 ft. long from center of length, 2 samples each size	Job site	As necessary for verification if quality is questionable	
ELECTRICAL CONDUCTORS AND CABLES (Section 86-1.02F)					
Electrical Conductors and Cables, various properties; must comply with <i>Standard Specifications</i> Section 86-1.02F	See <i>Standard Specifications</i> Section 86	2 ft. long, include markings, 2 samples per gauge	Job site	Each lot for verification if quality is questionable	

Materials Acceptance Sampling and Testing Requirements:
Miscellaneous Materials (2 of 4)

Test	Test Method	Sample Size & Container Size	Sampling Location	Acceptance Test Frequency	Remarks
EXPANSION JOINT FILLER					
Compliance with specifications		6 in. long, full width of sheet		Each 1,000 sq ft not less than 2 per shipment	
GEOSYNTHETICS (Section 96)					
Various properties; must comply with <i>Standard Specifications</i> Section 96	See <i>Standard Specifications</i> Section 96	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
PAINT (Section 91)					
Paint, various properties; must comply with <i>Standard Specifications</i> Section 91	See <i>Standard Specifications</i> 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
PAVEMENT MARKERS (Section 81-3)					
Pavement Markers, various properties; must comply with <i>Standard Specifications</i> Section 81-3	See <i>Standard Specifications</i> Section 81-3	20 markers	Job site	As necessary for verification if quality is questionable; see Remarks	Each shipment must have certificate of compliance
PERMEABLE MATERIALS: (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	
PRESTRESSED TENDON GROUT (Section 50)					
Efflux time	California Test 541	One 6x12 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 (3 of 4)

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	See <i>Standard Specifications</i> Section 52	2 samples, 30 in., except 40 in. for No. 14 and No. 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)					
Size	N/A		Quarry or stockpile	As required for acceptance; see Remarks	Adequate size of slope protection documented by measuring or weighing the material
Apparent Specific Gravity	California Test 206	75 lb	Quarry or stockpile	Prior to use	
Absorption	California Test 206				
Durability Index	California Test 229				
STEEL PRODUCTS					
		Contact METS for instructions		Contact METS for instructions	
STRUCTURAL STEEL AND MISCELLANEOUS METAL (Sections 55 & 75)					
		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
STRUCTURAL STEEL COATINGS (Section 59)					
Paint, various properties; must comply with <i>Standard Specifications</i> Section 59	See <i>Standard Specifications</i> 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, "Acceptance of Manufactured or Fabricated Materials and Products," of this manual

Materials Acceptance Sampling and Testing Requirements:
Miscellaneous Materials (4 of 4)

Test	Test Method	Sample Size & Container Size	Sampling Location	Acceptance Test Frequency	Remarks
WATER-PROOFING MATERIALS (Section 54)					
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	
WELDED WIRE REINFORCEMENT (Section 52-1.02C)					
Welded Wire Reinforcing Steel, must comply with <i>Standard Specifications</i> Section 52-1.02C	ASTM A 1064/A 1064M	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