Lassen County
Public Works Department

Quality Assurance Program Manual

February 2021

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INTRODUCTION PART 1

PURPOSE

1-0 The purpose of this manual is to provide departmental guidelines for quality assurance on construction projects to ensure that materials and workmanship incorporated in each County highway construction project are in conformance with the contract specifications.

The Lassen County Public Works and Road Department (County) is responsible for managing Quality Assurance (QA) on all County construction projects. Quality Assurance includes both acceptance testing and independent assurances sampling and testing. Quality Control (QC) of materials and products is the responsibility of the Contractor. The Engineering Division provides management oversight of independent assurance sampling and testing and of acceptance testing.

REGULATORY REQUIREMENTS

1-1 The Federal Highway Administration (FHWA) requires that each local transportation agency have a Quality Assurance Program for federal aid highway construction projects. Title 23 of the Code of Federal Regulations (637.205), requires that local highway agencies develop sampling and testing programs that will provide assurance that materials and workmanship incorporated in federal aid highway construction projects are in conformance with all requirements of approved plans and specifications.

For NHS Projects it is Caltrans Responsibility to have a Quality Assurance Program. Local agencies (Non-NHS Projects) must follow the QAP procedures described in Chapter 16, Section 14 of the Local Assistance Procedures Manual.

WHAT IS QUALITY CONTROL

1-2 Quality Control (QC) is the plan of action by a Contractor to ensure that materials and products incorporated into the work meet specified standards. QC is always the responsibility of the Contractor. County does not test or inspect materials for Quality Control or assist in controlling the Contractor's production operation. The Contractor provides personnel and specific procedures to perform QC.

Effective Quality Control involves skillful inspection, sampling and testing of materials, data analysis, and specific action to maintain the specified overall quality of a product or service. It requires the expertise to make timely corrective adjustments to achieve and maintain acceptable levels of quality or service. QC means that the Contractor or supplier maintains control of the manufacturing processes. The Process Control is work performed by the manufacturer, or service provider, and encompasses inspection and frequent testing to ensure that manufactured items meet the contract requirements.

QUALITY CONTROL
(PROCESS CONTROL)

Process Control Elements:

- Methods of producing and controlling the materials
- Regularly sampling and testing materials - by certified personnel
- Materials engineering - evaluating test results
  Adjusting the control process, when needed, to produce materials within specifications
  Monitoring trends - making refinements, when needed

Guidelines for performing Quality Control on County construction projects are described in Section 6-3.02 of Caltrans Standard Specifications.

WHAT IS QUALITY ASSURANCE

1-3 Quality Assurance (QA) is a series of planned or systematic actions required by County to provide adequate confidence that a product or service entering the work meets the contract specifications. The main elements of Quality Assurance are acceptance testing and independent assurance sampling and testing. Acceptance tests are frequent tests taken on materials entering the work to verify compliance with specifications. Independent assurance sampling and testing verifies that test equipment is properly calibrated and that Acceptance Testers are correctly performing sampling and testing of materials according to standard test procedures.

The Resident Engineer is responsible for ensuring that materials entering the work on County construction projects have been properly tested and inspected. Guidelines for acceptance testing are provided in Appendix B, Size, Frequency and Location of Sampling and Testing Tables.

QUALITY ASSURANCE

Owner - County
Performs acceptance testing (verifies materials specification compliance) Performs independent assurance sampling and testing (verifies the correctness of sampling, testing and test equipment calibration)

HOW DO QUALITY ASSURANCE AND QUALITY CONTROL INTERRELATE

1-4 Quality Control (QC) is a combination of Contractor sampling and testing of the product to ensure conformance with specifications. Quality Assurance (QA) is composed of the Resident Engineer's assessment of the Contractor's operation and assurance testing results. QC and QA are a joint effort requiring the cooperation of County, the Contractor and the materials supplier.

DEPARTMENT'S ROLES AND RESPONSIBILITIES FOR QUALITY ASSURANCE AND ACCEPTANCE TESTING

1-5 The roles and responsibilities for Quality Assurance are divided among the Director of Transportation and any designated staff member(s).

Lassen County Public Works and Road Department is responsible for the acceptance-testing program on County construction projects. The Director of Transportation will assign the oversight role regarding compliance with acceptance testing requirements on County construction projects. Guidelines for performing tests on County construction projects are presented in Appendix B, Size, Frequency and Location of Sampling and Testing Tables.

ACCEPTANCE SAMPLING AND TESTING PART 2

INTRODUCTION

2-0 Acceptance testing is the regular testing of materials entering a construction project to verify that the materials or products comply with contract specifications. To verify compliance, test data are compared to contract specifications or standards, which include:

1. Acceptable minimum limits
2. Acceptable maximum limits
3. A test range of acceptable limits

Testing frequencies for performing acceptance testing on County Federal/State Aid construction projects are described in Appendix B, Size, Frequency and Location of Sampling and Testing Tables.

Prior to performing acceptance tests, representative materials samples must be taken at specified locations. Guidance documents for sampling of materials may be found in the:

1. Construction Manual (Caltrans)
2. Local Assistance Procedures Manual (Caltrans & County)
3. Materials Testing Manual (Caltrans)
4. Standard Specifications (Caltrans)
5. Special Provisions (Caltrans; & County)
6. Other project documents (Caltrans & County)

The local agency Resident Engineer shall maintain a material and testing "Summary Log" for each material requiring multiple sampling and testing as defined in the "Frequency Tables." The "Summary Log" shall include appropriate data such as station location, depth of test sample, approximate quantity of material represented by the test sample, test result, and tester. Failing tests results require retesting of the material with cross-references of the retest to the initial failing test result previously entered in the "Summary Log."

REPORTING TEST RESULTS

2-1 The following are goals for reporting material tests results to the Resident Engineer:

- When the aggregate is sampled at materials plants, test 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, test results for Sieve Analysis, Sand Equivalent and Cleanness Value should be submitted to the resident Engineer within 24 hours after sampling.
- When soils and aggregates are sampled at the job site, 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), asphalt concrete (AC), 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 test results for tests not performed by the Resident Engineer staff shall be done on an expedited basis such as by fax or telephone.

WHO PERFORMS ACCEPTANCE TESTS?

2-2 On County construction projects, acceptance tests are performed by County personnel and/or consultants representing County.

On federally funded construction projects, personnel who have been properly trained and certified must perform acceptance tests. Each materials sampler and tester must have a valid Certificate of Proficiency for an Acceptance Tester or the designated IAST prior to performing acceptance tests. Except when a state of emergency declared and the repairs have to be done immediately, the personnel may not need to be certified, but they will be properly trained, and there will be a certified Acceptance Tester overseeing the testing.

Acceptance Testers play a major role in the success of County Quality Assurance Program. They must be properly trained and certified on County Federal/State Aid Construction Projects. Acceptance Testers must also sample and test materials at frequencies noted in the Appendix B. For guidance information on acceptance testing, refer to Local Assistance Procedures Manual (Section 16) on construction projects administered by local agencies.

TESTING OF MANUFACTURED MATERIALS

2-3 Acceptance and testing of manufactured and prefabricated materials will be verified by Certificate of Compliance and inspection by the Resident Engineer.

The following is a list of materials that may be accepted on the basis of a Certificate of Compliance:

1. Asphalt
2. Paving asphalt
3. Liquid asphalt
4. Asphalt emulsion
5. Solid or semi-solid bituminous materials
6. Asphalt rubber latex joint filler
7. Two-component joint sealing compounds
8. Portland cements
9. Mineral admixtures
10. Reinforcement steel bar
11. Other materials as shown on Exhibit 16-T Local Assistance Procedures Manual

INDEPENDENT ASSURANCE SAMPLING AND TESTING PART 3

WHAT IS INDEPENDENT ASSURANCE SAMPLING AND TESTING?

3-0 Independent assurance sampling and testing is periodic testing, by a specially trained tester, to verify that acceptance testing is being performed correctly. The concept of independent assurance sampling and testing is to "Test the Tester" and two main areas are evaluated:

1. Test equipment
2. Test procedure

Prior to construction, a designated Independent Assurance Sampler and Tester must verify that equipment used for acceptance testing is properly calibrated and in good working condition.

During construction, the Independent Assurance Sampler and Tester must verify the reliability of the Acceptance Tester by:

1. Witnessing sampling and testing by the Acceptance Tester
2. Splitting materials samples and comparing the test results between the Acceptance Tester and Independent Assurance Sampler and Tester

For Split-Sample Tests, the Independent Assurance Sampler and Tester may use test equipment not used by the Acceptance Tester.

Independent assurance and testing results are not to be used to verify specification compliance on construction projects. Acceptance test samples cannot be used for independent assurance sampling and testing.

Key elements of independent assurance sampling and testing are summarized below:

1. Performs Split-Sample Tests and evaluate independent results for corroboration.
2. Performs Witness Tests.
3. Trains and issues Certificate of Proficiency Forms to all County Acceptance Testers.
4. Calibrates County-owned materials testing equipment used on County construction projects.
5. Maintains proper independent assurance sampling and testing records and forms.

The Director of Transportation or his designee is responsible for independent assurance sampling and testing on all federally funded construction projects. He or she is also accountable for quickly resolving all unacceptable Split-Sample Tests (i.e., poor corroboration between the certified Independent Assurance Sampler and Tester and the Acceptance Tester.) In addition, the Director or his designee must ensure that all independent assurance sampling and testing records are properly maintained.

When California Test Methods are utilized on construction projects, only a certified Independent Assurance Sampler and Tester is authorized to perform independent assurance functions. The Director will designate one or more Independent Assurance Samplers and Testers to perform the work.

When test procedures other than California Test Methods are specified on construction projects administered by local agencies, the Director or his designee may choose to obtain a qualified Consultant to perform the independent assurance sampling and testing. Consultants that perform independent assurance sampling and testing functions must work under the direct supervision of the Director or his designee. Consultants shall not have a conflict of interest with County and, under no circumstances, shall they be permitted to perform acceptance testing or independent assurance test for County and Quality Control tests for a Contractor on the same construction project.

DUTIES OF INDEPENDENT ASSURANCE SAMPLERS AND TESTERS

3-1 The Director of Transportation or his designee is responsible for administration of the independent assurance sampling and testing program; however the duties are usually delegated to a County staff member who is the designated Independent Assurance Sampler and Tester (IAST).

The Independent Assurance Sampler and Tester duties include the following:

1. Witness and Split-Sample Tests using California Test Methods
2. Caltrans Reference Samples Program
3. Materials forms
4. Equipment calibration/inventory
5. Guidelines for training County Acceptance Testers
6. Issuing Certificate of Proficiency (C of P) Form
7. Decertifying and recertifying Acceptance Testers
8. Performing independent assurance sampling and testing on construction projects.
9. Maintain materials records
10. Certifying County and consultant laboratories
11. Working with consultants to perform "On-Call" materials testing
12. Performing Acceptance Testing when required.

TRAINING OF ACCEPTANCE TESTERS

3-2 County will provide training for County Acceptance Testers. The Director or his designee will arrange for adequate facilities, staff, and training equipment to accomplish this task. The following guidelines have been established to assist Independent Assurance Samplers and Testers to prepare Acceptance Testers for there expected duties.

1. Discuss the responsibilities of an Acceptance Tester and provide an overview of County Quality Assurance Program.
2. Provide the trainee with a current copy of each test procedure that the trainee seeks authorization to perform, Instruct the trainee to study each test procedure thoroughly.
3. Encourage the trainee to observe testing and sampling performed by an Acceptance Tester with a valid Certificate of Proficiency.
4. When the Independent Assurance Sampler and Tester determine that a trainee has a thorough understanding of the test procedure, the trainee will be required to take a written examination. Standard examinations for each test procedure shall be

provided by County. It is the responsibility of the independent Assurance Sampler and Tester to maintain a file for Acceptance Tester certification including original examinations.

5. Candidates without previous field experience must develop proficiency by practicing each test procedure a minimum of three times, Experienced personnel and personnel with a previous Certificate of Proficiency may proceed to Step 7.
6. When a trainee has developed proficiency in each test procedure, he or she may then demonstrate that test to an Independent Assurance Sampler and Tester. If a trainee makes an error during the demonstration, he or she will be asked to repeat the test procedure from the beginning. If a second error occurs, the candidate has failed the test and will be:
    a. Told of the error
    b. Asked to continue practicing and studying the test procedure
    c. Rescheduled for another demonstration no sooner than three days later. Trainees may retest as many times as necessary until they accurately demonstrate each test procedure.
7. Trainees who successfully pass Step 1 through 6 will be given a brief orientation by the Independent Assurance Sampler and Tester concerning:
    a. Proper care of materials test equipment
    b. Proper materials sampling
    c. Proper completion of Split-Sample Test Form

Acceptance Testers who are requesting a Certificate of Proficiency for operating nuclear gages will be trained by a qualified instructor approved by the California Department of Health and the Division of Industrial Safety. This training should be in accordance with California Test 121. Upon completion of this training, a certificate of training will be issued to the trainee. This certification does not qualify the trainee as a nuclear gage operator. It only serves to indicate that the trainee has completed nuclear gage operation training. On an active project where nuclear gage readings are taken for two days or more, the Radiation Administrative Officer shall observe the trainee and ask questions to ensure that the trainee is qualified. The qualified instructor should then issue an operator card or certificate to the trainee.

The above training guidelines assume that an employee has little or no materials testing experience. At the discretion of the Independent Assurance Sampler and Tester, certification efforts may be greatly reduced for employees with extensive knowledge and materials testing work experience.

ISSUING CERTIFICATES OF PROFICIENCY (C OF P) TO ACCEPTANCE TESTERS ON COUNTY ADMINISTERED CONSTRUCTION PROJECTS

3-3 Acceptance Testers (County Employees)

Prior to performing acceptance tests on County construction projects, County employees must be issued a Certificate of Proficiency for an Acceptance Tester. A County Independent Assurance Sampler and Tester may only issue certificate of Proficiency (C of P). With supervisory approval, any County employee who successfully completes Steps 1 through 7 of Part 3-2, above, is eligible to receive a C of P.

Each C of P is prepared on standard size paper. (See Appendix A) It indicates the name of the Acceptance Tester, the agency, the California Test Methods that the Acceptance Tester is authorized to

perform (by test number), the date issued, and the signature of the Independent Assurance Sampler and Tester. Personnel with a valid C of P are authorized to perform acceptance tests on any County project.

An Independent Assurance Sampler and Tester may also issue a C of P to a candidate with a valid certificate for nuclear gage testing, as outlined in Part 3-2, and who has successfully completed a written examination as outlined in Step 4 in Part 3-2.

Each County employee with a valid C of P is authorized to continually perform acceptance tests as long as he or she conforms to specified County requirements. Acceptance Testers (both field and laboratory personnel) are always subject to decertification (See Part 3-4 for decertification guidelines)

Acceptance Testers (Consultants Contracted by County)

Consultants are sometimes hired by County to perform acceptance tests on County construction projects. Prior to performing acceptance tests, they must be issued a C of P by an Independent Assurance Sampler and Tester. The criteria used for issuing consultants a Certificate of Proficiency for an Acceptance Tester on County construction projects are based on the following:

1. Private Lab must have a QAP approved by the Lassen County Director of Transportation.
2. Employees training: The employer will submit written evidence of materials testing training to the Director or his designee. Each type of training provided by the agency or firm must be summarized to include: a comprehensive description of the training, total hours of
training, training dates, and verification that the candidate completed the training.
3. Employee work experience: The employer will submit written evidence to the Director or his designee, describing the type of materials work experience as well as the number of years of experience.
4. Employee certification: If applicable, the employer shall submit written evidence of a candidate's materials certification to the Director or his designee. Examples of recognized
organizations that certify personnel include: The National Institute for Certification in Engineering Technologies (NICET), the American Concrete Institute (ACI) and the National Ready-Mixed Concrete Association (NRMCA).

When a consultant submits written documentation to request a C of P, the Director and/or the Independent Assurance Sampler and Tester must review the written evidence and decide whether or not to issue a C of P. If the written evidence appears insufficient or incomplete, the Independent Assurance Sampler and Tester will not issue a C of P. If the written evidence indicates adequate qualifications, the Independent Assurance Sampler and Tester may immediately issue a C of P, based on the submitted written evidence. If the written evidence appears marginal, the Independent Assurance Sampler and Tester will request that the individual do one or more of the following:

I. Take a written examination, prepared by the Independent Assurance Sampler and Tester.
2. Perform the test procedure(s) in the presence of the Independent Assurance Sampler and Tester.
3. Present his or her testing equipment for inspection.

When a C of P is denied, the Independent Assurance Sampler must immediately notify the candidate and Tester and a Certification Denial letter sent to the consultant firm. Specific reasons why the candidate did not meet minimum qualifications and suggested corrective action must be stated in the letter.

It is the responsibility of the Director or his designee to keep current records of all Acceptance Testers and related materials work.

DECERTIFICATION AND RECERTIFICATION OF ACCEPTANCE TESTERS ON COUNTY ADMINISTERED CONSTRUCTION PROJECTS

3-4 Decertification (County Employee and Consultants Contracted by County)

Independent Assurance Samplers and Testers always have the authority to decertify Acceptance Testers who deviate from accepted sampling and testing procedures. Any of the following actions by an Acceptance Tester is justification for immediate decertification for a test:

1. Using incorrect testing equipment
2. Using equipment with an expired calibration sticker or no calibration sticker
3. Sampling materials incorrectly
4. Testing materials incorrectly

Expired "Certificate of Proficiency for an Acceptance Tester" (County Employees and Consultants Contracted by County)

It is the responsibility of each Acceptance Tester working on a County construction project to contact an Independent Assurance Sampler and Tester to arrange for Witness and Split-Sample Tests. A description of these tests, and required frequencies, are outlined in Table 1, Frequencies of Split-Sample and Witness Testing. Acceptance Testers that do not perform Witness and Split-Sample Tests at minimum frequencies (per Table 1) are subject to expiration of their Certificate of Proficiency for Acceptance Testers.

Once an employee's C of P has expired or the individual has been decertified for a specific test, the Acceptance Tester may not perform the test(s) until he or she has been recertified for the test(s), However, the Acceptance Tester may perform other acceptance tests if certified to do so.

Recertification of an Acceptance Tester
(DOT Employees and Consultants Contracted by County)

When an Acceptance Tester is decertified or simply has allowed his or her C of P to expire, the Acceptance Tester must contact an Independent Assurance Sampler and Tester and make an appointment to demonstrate one or more of the following:

1. Proper test equipment
2. Proper calibration sticker
3. Proper sampling and testing procedure

When recertification occurs, the C of P will clearly show the test method(s) involved, the date of the recertification, and the signature of the Independent Assurance Sampler and Tester. Individual Quality Assurance records for all Acceptance Testers must be maintained by the Director or his designee. These records shall be reviewed regularly by personnel, associated with the County Quality Assurance Program.

The Independent Assurance Sampler and Tester shall immediately notify the Director or his designee when an Acceptance Tester has:

1. Allowed his or her C of P to expire
2. Been decertified
3. Been recertified

After making initial contact by telephone or in person, the Independent Assurance Sampler and Tester must always send a letter to the Director or his designee, summarizing the action taken.

MATERIALS TESTING EQUIPMENT

3-5 All materials testing equipment purchased for field and laboratory usage is to be calibrated prior to use. The Director or his designee will coordinate all equipment calibration efforts. Guidance for equipment calibration is available from the following:

1. The manufacturer
2. The Quality Assurance Program Manual
3. The District Weights and Measures Coordinator
4. The accepted standards of recognized organizations
5. The Materials Testing Manual

It is the responsibility of the IAST to perform the following:

1. Calibrate test equipment at least annually
2. Issue equipment to field and laboratory personnel when needed.
3. Repair and maintain test equipment

EQUIPMENT CALIBRATION (COUNTY ADMINISTERED CONSTRUCTION PROJECTS)

3-5.1 When new field or laboratory equipment is purchased by the County, it will not be used to perform acceptance tests or independence assurance tests until it is properly calibrated. The materials testing equipment listed below will be calibrated prior to use on a County construction project:

1. Unit weight kits
2. Air meters
3. Ball penetrometers
4. Compression testing machine
5. Sieves
6. Thermometers
7. Compaction tubes
8. Timers
9. Nuclear gage
10. Scales and balances
11. Oven
12. Graduated Cylinders

Items 1 through 12, noted above, must be calibrated by an Independent Assurance Sampler and Tester or a County delegated authority. All new balances and scales shall be calibrated prior to first use. This equipment must be recalibrated when there is reason to believe it has lost calibration through damage or wear. County delegated authority or competent service technician must perform calibration of scales and balances. Calibration of scales and balances will be traceable to the National Institute of Standards and Technology in Washington, D.C.

CALIBRATION DECALS (COUNTY CONSTRUCTION PROJECTS)

3-5.2 When a piece of equipment is properly calibrated, a calibration sticker will be firmly affixed to the equipment, indicating the calibration date, name of the calibrator, and the next calibration date. Calibration decals may be from a manufacturer or consultant, provided they are durable, able to be firmly affixed to equipment and contain the above information. If calibration stickers become unreadable or lost, testers should:

1. Remove the equipment from service
2. Have the equipment recalibrated as soon as possible.

MAINTAINING CALIBRATION (COUNTY CONSTRUCTION PROJECTS)

3-5.3 After initial calibration, County-owned field and laboratory testing equipment shall be recalibrated annually by trained laboratory personnel. If a piece of equipment is broken or appears to be out of calibration, the equipment will not be used until it has been repaired and recalibrated. Equipment repairs may involve:

I. Installing new parts
2. Repairing existing parts
3. Making mechanical adjustments
4. Making electrical adjustments
5. Any combination of the above items

Whenever a permanently installed piece of test equipment is relocated or major repairs are performed, verification of calibration is required. The tester must disregard the time interval when the equipment was last calibrated. If a piece of equipment cannot be properly calibrated after severe wear or repairs, then it must be replaced.

The Independent Assurance Sampler and Tester shall assist the Resident Engineer in quickly obtaining acceptable replacement equipment. If the equipment appears repairable but cannot be repaired locally, it should then be shipped to a service consultant or the manufacturer for repair.

CONSULTANT-OWNED TESTING EQUIPMENT (COUNTY CONSTRUCTION PROJECTS)

3-6 Prior to materials testing on a County construction project, consultants must provide written evidence to the Resident Engineer that each piece of supplied equipment is properly calibrated. Once calibrated, each piece of the consultant's field and laboratory equipment must be calibrated on an annual basis. Each piece of the consultant's equipment shall also contain a calibration sticker firmly affixed to the item indicating the calibration date, the name of the calibrator and the next calibration date. The Resident Engineer shall submit copies of all calibration records to the Director or his designee for verification. Equipment without proper calibration stickers shall not be used.

CALIBRATION OF NUCLEAR GAGES

3-7 Nuclear gages owned by the County and consultants shall be calibrated prior to use on construction projects, using State-supplied test blocks or other certified test blocks. A minimum of 40-hours notice is required for nuclear gage calibration. Calibration of nuclear gage test equipment shall be in accordance with California Test 111.

Nuclear gage calibrations are valid for up to one year. Calibration records must be current throughout the term of the contract. Private laboratories must conform to all State and Federal safety requirements for testing and storage of nuclear gages.

ACCURACY AND SUITABILITY OF SCALES AND METERS (MATERIALS-PRODUCING PLANTS)

3-8 California Test 109 sets forth the procedures involved in determining the accuracy and suitability of weighing and measuring devices used to proportion materials in materials-processing plants. The Contractor is responsible for having plant scales and meters calibrated by a quality service company. The District Weights and Measures Coordinator is responsible for witnessing the test and verifying the suitability of weighing devices. County Form is used to document this test, and a sticker applied to the test device that identifies 'the last date tested (refer to Construction Manual). The Contractor must give a minimum of 24-hour notice before performing this test, furnishing all equipment, and provide plant access as needed, to accomplish the test(s). This service is performed by Caltrans. For more information, contact the Office of Construction Engineering and Management (Caltrans).

PERFORMING INDEPENDENT ASSURANCE SAMPLING AND TESTING FUNCTIONS

3-9 Independent assurance samples and tests are categorized into two groups:

1. Split-Sample Tests
2. Witness Tests

Split-Sample and Witness Tests are major elements of the Counties independent assurance sampling and testing program. The Independent Assurance Sampler and Tester to verify test methods and equipment used by the Acceptance Tester perform them. A list of the required Split-Sample and Witness Test is presented in Table 1, Frequencies of Split Sample and Witness Testing. Table 1 also describes minimum frequencies of tests that an Acceptance Tester must perform to maintain a valid Certificate Of Proficiency for an Acceptance Tester. (See Part 3-3)

TABLE 1 - Frequencies of Split-Sample and Witness Tests

SPLIT-SAMPLE TESTS

CALIFORNIA TEST	DESCRIPTION OF TEST PROCEDURE	FREQUENCY OF SPLIT-SAMPLE TESTS
202*	Sieve Analysis	Once Every Twelve Months
217*	Sand Equivalent	Once Every Twelve Months
227	Cleanness Value	Once Every Twelve Months

WITNESS TESTS

CALIFORNIA TEST	DESCRIPTION OF TEST PROCEDURE	FREQUENCY OF WITNESS TESTS
216',231	Relative Compaction (Soils)	Once Every Twelve Months
375	Relative Compaction (Asphalt Concrete)	Once Every Twelve Months
504	Air Content (PCC)	Once Every Twelve Months
518	Unit Weight (PCC)	Once Every Twelve Months
533	Ball Penetration (PCC)	Once Every Twelve Months
539	Sampling Fresh Concrete	Once Every Twelve Months
540	Making, Handling and Storing Concrete Compressive Strength Test Specimens	Once Every Twelve Months
205	Percent Crushed Particles	Once Every Twelve Months
206', 207', 208-	Specific Gravity and Absorption	Once Every Twelve Months
223,226	Moisture	Once Every Twelve Months
229*	Durability Index	Once Every Twelve Months

*These California tests are also incorporated as part of Caltrans Reference Samples Program

SPLIT-SAMPLE TESTS

3-10.1 Split-Sample Tests require an Independent Assurance Sampler and Tester and Acceptance Testers to perform separate tests of the same materials using California Tests 202, 217 and 227 at least once every year. The purpose of Split-Sample Tests is to verify test methods and calibration of equipment. During Split-Sample Testing, the Acceptance Tester is required to use his or her testing equipment assigned to a construction project. The Independent Assurance Sampler and Tester may use different testing equipment.

For a Split-Sample Test, the Independent Assurance Sampler and Tester carefully split a representative materials sample and present one portion of the sample to the Acceptance Tester. The portion retained by the Independent Assurance Sampler and Tester must be kept under the direct control of the Independent Assurance Sampler and Tester.

Materials for Split Sample Testing may either be job-related or non-job-related materials, at the discretion of the Independent Assurance Sampler and Tester. Upon receiving the Split Sample, the Acceptance Tester must perform the requested test and submit the test results to the Independent Assurance Sampler and Tester within 48 hours. In some cases, test results may have to be faxed to the certified Independent Assurance Sampler and Tester.

Likewise, the Independent Assurance Sampler and Tester are required to test, or oversee the testing, for his or her Split Sample. When the Independent Assurance Sampler and Tester complete testing, test results of the Acceptance Tester are compared with test results of the Independent Assurance Sampler and Tester.

When test results of the Acceptance Testers are received, it is the responsibility of the Independent Assurance Sampler and Tester to complete a Corroboration Report Form. The corroboration of test results between the Independent Assurance Sampler and Tester and Acceptance Tester shall be determined based on the values presented in Table 2, Corroboration of Test Results between Acceptance Testers and Independent Assurance Testers (Split Sample Tests). In the case of poor corroboration, it is the responsibility of the Independent Assurance Sampler and Tester, or delegated authority, to immediately provide follow-up action to resolve the difference. There are many possible explanations for poor corroboration (i.e., an uneven or segregated materials split, defective or improper test equipment, improper test procedure, and a calculation error). In most cases, coordination efforts are made using the telephone. Both testers will be required to immediately check their calculations, their individual equipment and their test procedures. One of the most common reasons for poor corroboration is a calculation error. This type of error is easily detected and quickly corrected.

If an equipment deficiency is discovered, the defective equipment must be repaired or replaced immediately. If the equipment cannot be repaired within 24 hours, another piece of calibrated equipment must be obtained quickly to resolve the poor corroboration. The defective equipment must immediately be tagged defective and taken out of service. Within 24 hours after the poor corroboration is detected and corrective action taken, a second split sample is presented to the Acceptance Tester by the Independent Assurance Sampler and Tester. The Acceptance Tester shall test the split sample and forward the results to the Independent Assurance Sampler and Tester within 48 hours. Likewise, the Independent Assurance Sampler and Tester will obtain test results of the split sample. If a good or fair corroboration is achieved, the poor corroboration is resolved.

If a good or fair corroboration is not achieved after two splits samples the Independent Assurance Sampler and Tester is required to go to the location of the Acceptance Testers. The Independent Assurance Sampler and Tester would then present the Acceptance Tester with a third split sample and observe the person performing the test procedure. Hopefully, a reason for lack of satisfactory corroboration will be determined and documented at this point.

Acceptance Testers with three consecutive poor corroboration's for a specific test will be decertified for that test. This information will be reported to the Director or his designee.

If an Acceptance Tester does not forward split sample test results to the Independent Assurance Sample and Tester in a timely manner he or she is also subject to decertification.

TABLE 2 - Corroboration of Test Results Between Acceptance Testers and Independent Assurance Samplers and Testers (Split Sample Tests)

CALIFORNIA TEST NUMBER	DESCRIPTION OF TEST PROCEDURE	DEGREE OF CORROBORATION* GOOD FAIR POOR
202*	Sieve Analysis	
	No. 4 Sieve and Larger	2 or Less 3 or 4 5 or More
	No. 8 - No. 30	2 or Less 3 4 or More
	No. 50 - No. 100	2 or Less 3 4 or More
	No. 200	1 or Less 2 3 or More
217	Sand Equivalent	4 or Less 5 to 11 12 or More
227	Cleanness Value	3 or Less 4 to 7 8 or More

*EXAMPLE: After Split-Sample Testing, assume the AT gets a S.E. value of 82 and the IAST gets a S.E. value of 77. The S.E. difference is 5. Per Table 2. This is a "fair" corroboration. If the AT got a S.E.. value of 82 and the IAST got a S.E. value of 70, the difference is 12, thus a "poor" corroboration.

WITNESS TESTS

3-10.2 A witness test occurs whenever an Independent Assurance Sampler and Tester:

1. Observes an Acceptance Tester sample materials and/or conduct a test procedure.
2. Documents the event by completing an appropriate form.

Witness tests shall be performed at the project site (preferred), or another site as mutually agreed by the Independence Assurance Sampler and Tester and the Acceptance Tester (acceptable), considering the availability of materials, location of testers, and impact on the construction testing. Another important component of a Witness Test is equipment verification by the Independent Assurance Sampler and Tester. The Independent Assurance Sampler and Tester will determine if the equipment is properly calibrated and in good working condition. Table 1 describes various California Test Methods and minimum frequencies for Witness Tests.

Following a Witness Test, it is the responsibility of the Independent Assurance Sampler and Tester to properly complete the appropriate form. The required information to document a Witness Test consists of the following:

1. Name of Acceptance Tester
2. Date of the Witness Test
3. The test procedure witnessed
4. The location of the test
5. Test results
6. Type of material sampled or tested
7. The signature of the Independent Assurance Sampler and Tester

Each completed form will be kept in a materials file (Independent Assurance Sampling and Testing Records) in the Lassen County Public Works and Road Department Office.

PROCESS REVIEW OF INDEPENDENT ASSURANCE SAMPLING AND TESTING RECORDS

3-10.3 When Federal funds are used on construction projects, the Federal Highway Administration (FHWA) requires that each Local Transportation Agency have a sampling and testing program to verify that materials incorporated into a project comply with approved plans and specifications. The County has developed a Quality Assurance Program to ensure that materials and construction workmanship are in close conformity with state and federal requirements. An important part of the Counties Quality Assurance Program includes independent assurance sampling and testing to verify the reliability of Acceptance Testers and equipment. Employee training, certification of personnel, calibration of testing equipment, periodic materials testing correlation and maintaining accurate independent assurance sampling and testing records are key elements of this program.

Periodically, FHWA conducts materials process reviews to check conformance with the County Quality Assurance Program.

RECORDS

3-11 All material records of samples and tests, material releases and certificates of compliance for a given project shall be incorporated into the Resident Engineer's project file. This file shall be organized as described in Section 16.8, "Project Files," of the Local Assistance Procedures Manual. The complete project file shall be available at a single location for inspection by Caltrans and FHWA personnel at any time during the construction project. The file shall be available at the local agency administrative office for at least three years following the date of final payment. The use of a "Summary Log," facilitates reviews of material sampling and testing by Caltrans and FHWA reviewing personnel, and assist the Resident Engineer in tracking the frequency of testing.

When two or more projects are being furnished materials simultaneously from a single plant, it is not necessary to secure samples for each project; however, individual test reports are to be supplied to complete the records for each project.

TEST METHODS PART 4

CALIFORNIA TEST METHODS

4-0 Caltrans Division Materials Engineering and Test Services (METS) has developed California Test Methods. The primary purpose of the California Test Methods is to establish standards in sampling and testing. These standards ensure that materials and workmanship in California Transportation System facilities are uniformly tested.
The County uses the Caltrans standard specifications and California Test Method for the material specifications and testing and only use ASTM or AASTHTO standards when they are approved in chapter 6, "Sampling and Testing" of the Caltrans Construction Manual or in approved Caltrans procedures.

Through the years, a California Test Method (CTM) has usually been generated by two sources:

1.Test methods, which follow a national standard, but are modified to some degree to meet Caltrans needs.

2. Test methods, which have been developed by Caltrans.

The California Test Methods are categorized as follows:

100 to 199 Calibration, Nuclear Gauges, Sampling, Materials Reports
200 to 299 Soils, Aggregates, Compressive Strength, Moisture
300 to 399 R-Values, Bituminous Mixtures, Asphalt Content
400 to 499 Cement Treated Bases, Lime, Chloride Content
500 to 599 Concrete, Freeze-Thaw, Admixtures
600 to 699 Reflectors, Wire, Traffic Signals, Steel, Tensile Strength

OTHER TEST PROCEDURES

4-1 When local agencies specify ASTM, AASHTO or other test methods on their construction projects, the Independent Assurance Sampler and Tester must ensure that witness tests and split sample tests are performed. To accomplish this task, the County may use their trained staff or arrange for an "On-Call" materials tester to perform the independent assurance sampling and testing. In the County Quality Assurance Program, the Director or his designee is responsible for performing independent assurance sampling and testing on County construction projects. Consultants used to perform independent assurance sampling and testing shall not have a "conflict of interest" concerning the project or perform acceptance tests for that project.

Acceptance testers from consultant laboratories that use non-California Test Methods must also receive a Certificate of Proficiency for an Acceptance Tester from an Independent Assurance Sampler and Tester prior to performing acceptance tests.

For additional information on acceptance testing on local agency projects involving non-Caltrans test procedures, refer to Appendix A and B of this Plan.

Dave Ernaga, Associate Engineer RCE 53213

2/18/2021 *
Approval Date

* The original QAP was approved on July 18, 2014 and at the request of the Caltrans, METS, Local Assistance IA staff, we are adding clarification to Section 2-2 and Section 4-0 and that is the reason for the new approval date.

APPENDIX A

SAMPLES OF LASSEN COUNTY SAMPLING AND TESTING FORMS

Exhibit A-1

Lassen County Public Works and Road Department

CERTIFICATE OF PROFICIENCY

In the Sampling and Testing of Construction Materials

This certifies that

_____

is qualified to perform the following tests:

CALIFORNIA TEST	DATE CERTIFIED BY	DATE RENEWED BY
202 Sieve Analysis		
217 Sand Equivalent		
226 Moisture Content		
227 Cleanness Value		
229 Durability Index		
231 Relative Compaction-Nuclear		
375 Relative Compaction of AC		
379 Asphalt Content-Nuclear		
504 Air entertainment in PCC		
518 Unit Weight-PCC		
523 Flexural Strength of PCC-Beams		
533 Kelly Ball penetration-PCC		
539 Sampling Fresh Concrete		
540 Fabricating PCC Cylinders		
___ _____		
___ _____		
___ _____		
___ _____		

_____ _____

County Materials Engineer **Acceptance Tester Certificate Issued Date**

Certification expires three years from above dates.

Note: This certificate is valid as long as the Acceptance Tester complies with the applicable requirements of the Lassen County *Quality Assurance Program Manual.*

THIS FORM IS TO BE ON FILE AT THE COUNTY MATERIALS LAB AND CONSTRUCTION OFFICES. A COPY OF THE MASTER LIST SHALL BE KEPT IN THE RESIDENT ENGINEERS PROJECT FILE.

Exhibit A-2

Lassen County Public Works and Road Department
Report of Witness Test

Date _____ File: Category 39, Independent Assurance Tests

District _____ County _____ Route _____ P.M. _____

Contract No. _____ Federal No. _____

Resident Engineer: _____ Contractor: _____

Test No. _____

Material Being Tested: _____

Test Procedure (No. and Title):

_____

_____

_____

Samples
from: _____

Location of Source:

_____

Certificate of Proficiency
(Yes/No/Not Applicable)

Sampler/Tester: _____

RESULTS:

Were the sampling and testing procedures satisfactory?
Remarks: _____

_____

_____

_____

_____

Signed by
Witness: _____
Independent Assurance Sampler and Tester

Exhibit A-3

Lassen County Public Works and Road Department
CORROBORATION REPORT

File: Materials Category 100

Instructions:	Use this form to compare Split-Sample Test results (Acceptance Tester's test results of the Independent Assurance Sample and Tester)

NAME (Acceptance Tester)		Valid MR-0111 [ ] YES [ ] NO
DATE (When the split sample was presented to the Acceptance Tester)	DATE(when the Acceptance Tester's results were received by the IAST)	DATE (When the Independent Assurance Sampler's & Tester's results were completed.

CORROBORATION OF TEST RESULTS

	ACCEPTANCE TESTER (AT)		INDEPENDENT ASSURANCE SAMPLER & TESTER (AST)		CORROBORATION BETWEEN THE AT AND THE AST		
TEST PROCEDURE OR CALIFORNIA TEST NUMBER	TEST RESULTS	SAMPLE ID NUMBER	TEST RESULTS	SAMPLE ID NUMBER	GOOD	FAIR	POOR

(1) SUBSEQUENT ACTION TAKEN FOR POOR CORROBORATION (List all actions taken and follow-up tests performed. Attach copy of each test report. If no action was taken, document reason(s) for no action taken).

LAST NAME (Please print)	DISTRICT
SIGNATURE (Last)	AST CERTIFIED? [ ]YES [ ] NO
IF YES, AST CERTIFICATE NUMBER	REPORT DATE

FM93 1901 M

NOTE: ATTACH ALL TEST DATA

Exhibit A-4

Lassen County Public Works and Road Department

SPLIT-SAMPLE TEST (1-99)

FILE MATERIALS CATEGORY
100

INSTRUCTIONS: This form is used by the AT and 1AST for split-sample. After testing, the AT must submit this form to the /AST

(A) CALIFORNIA TEST 202 - SIEVE ANALYSIS OF COARSE AND FINE AGGREGATE

TOTAL SAMPLE WEIGHT *nearest gram)*	DRY WEIGHT BEFORE *(nearest gram)*
TYPE OF SHAKER	DRY WEIGHT AFTER WASHING *(nearest gram)*
	SHAKING TIME *(minutes)*
SHAKING TIME *(minutes)*	TYPE OF SHAKER

SIEVE SIZE	***Weight*** Retained *(nearest gram)*	***Percent*** Retained *(nearest whole number)*	***Percent Passing*** (nearest *whole* no.)	SIEVE SIZE	***Weight*** Gained *(nearest gram)*	*Percent Retained (nearest whole*	*Percent* ***Passing*** *(nearest whole no.)*	*Combined* ***Passing*** *(nearest whole no.)*
37.5 mm				No. 8				
25.0 mm				No. 16				
19.0 mm				No. 30				
12.5 rnm				No. *50*				
9.5 mm				No. 100				
No. 4				No. *200*				

(13) CALIFORNIA TEST 217 - SAND EQUIVALENT

HEIGHT OF CLAY READING *(highest 0. I of a unit)**

SEDIMENT HEIGHT *(nearest 0. I of a unit)*

SAND EQUIVALENT *(highest whole number)*

(C) CALIFORNIA TEST 227 - CLEANLINESS VALUE

SEDIMENT HEIGHT *(nearest 0. 1 of a unit)*	CLEANLINESS VALUE *(whole numbers)*
CHECK APPROPRIATE BOX: ☐ ACCEPTANCE TESTER VALID C of P ☐ YES ☐ NO	☐ INDEPENDENT ASSURANCE SAMPLER AND TESTER (IAST) IAST _____
TESTER'NAME (please print)	
SIGNATURE TESTER (Tester)	REPORT DATE

Exhibit A-5

STATE OF CALIFORNIA • DEPARTMENT OF TRANSPORTATION

INDEPENDENT ASSURANCE SAMPLING AND TESTING LOG SUMMARY

TL-0110 (REV. 9/95)

FILE : MATERIALS CATEGORY 100

IAST LOG SUMMARY SHEET: *(Print Full Name of Acceptance Tester)* | DISTRICT

DATE	WITNESS OF TEST PROCEDURE *(Indicate Test Number)*	WITNESS OF MATERIALS SAMPLING *(Indicate Test Number)*	Did the Acceptance Tester successfully pass the Witness Test?	Was equipment in good working condition?	Did equipment have a current calibration sticker?	SPLIT-SAMPLE COMPARISON *(Check one)*	COMMENTS OR FOLLOW-UP ACTION
			☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Good ☐ Fair ☐ Poor	
			☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Good ☐ Fair ☐ Poor	
			☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Good ☐ Fair ☐ Poor	
			☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Good ☐ Fair ☐ Poor	
			☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Good ☐ Fair ☐ Poor	
			☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Good ☐ Fair ☐ Poor	
			☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Good ☐ Fair ☐ Poor	
			☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Good ☐ Fair ☐ Poor	
			☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Good ☐ Fair ☐ Poor	
			☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Good ☐ Fair ☐ Poor	
			☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Good ☐ Fair ☐ Poor	
			☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Good ☐ Fair ☐ Poor	
			☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Good ☐ Fair ☐ Poor	
			☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Good ☐ Fair ☐ Poor	
			☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Good ☐ Fair ☐ Poor	
			☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Good ☐ Fair ☐ Poor	
			☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Good ☐ Fair ☐ Poor	
			☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Good ☐ Fair ☐ Poor	

FM 93 1900 M

Exhibit A-6

Lassen County Public Works and Road Department

SUMMARYLOG

INDEX_____ MATERIAL_____

TEST NO	DATE	STA	Location	Quantity Represented	Elev Below F.G.	Moisture Opt.	Moisture Field	Test Result	Tester	Remarks

APPENDIX B

SIZE, FREQUENCY AND LOCATION OF SAMPLING AND TESTING FORMS

Exhibit B-1 - Acceptance Sampling and Testing Frequencies

Table 6-1.4 Materials Acceptance Sampling and Testing Requirements: Earthwork (2018 *Standard Specifications* Section 19) (1 of 3)

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

Table 6-1.4 Materials Acceptance Sampling and Testing Requirements: Earthwork (2018 *Standard Specifications* Section 19) (2 of 3)

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

Table 6-1.4 Materials Acceptance Sampling and Testing Requirements: Earthwork (2018 *Standard Specifications* Section 19) (3 of 3)

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

Note:

1. See California Test 125 for sampling procedures.

Table 6-1.5 Materials Acceptance Sampling and Testing Requirements: Stabilized Soils (2018 *Standard Specifications* Section 24) (1 of 2)

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

Table 6-1.5 Materials Acceptance Sampling and Testing Requirements: Stabilized Soils (2018 *Standard Specifications* Section 24) (2 of 2)

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

Note:

1. See California Test 125 for sampling procedures.

Table 6-1.6 Materials Acceptance Sampling and Testing Requirements: Aggregate Subbases (2018 *Standard Specifications* Section 25)

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

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

Table 6-1.7 Materials Acceptance Sampling and Testing Requirements: Aggregate Bases (2018 *Standard Specifications* Section 26)

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

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

Table 6-1.8 Materials Acceptance Sampling and Testing Requirements: Cement Treated Base (2018 *Standard Specifications* Section 27) (1 of 2)

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

Table 6-1.8 Materials Acceptance Sampling and Testing Requirements: Cement Treated Base (2018 *Standard Specifications* Section 27) (2 of 2)

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

Note:

1. See California Test 125 for sampling procedures.

Table 6-1.9 Materials Acceptance Sampling and Testing Requirements:
Concrete Bases (2018 *Standard Specifications* Section 28)
Lean Concrete Base (1 of 2)

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

Table 6-1.9 Materials Acceptance Sampling and Testing Requirements: Concrete Bases (2018 *Standard Specifications* Section 28)
Lean Concrete Base (2 of 2)

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

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

Table 6-1.10 Materials Acceptance Sampling and Testing Requirements: Treated Permeable Bases (2018 *Standard Specifications* Section 29) (1 of 3)
Asphalt Treated Permeable Base (ATPB)

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

Table 6-1.10 Materials Acceptance Sampling and Testing Requirements:
Treated Permeable Bases (2018 *Standard Specifications* Section 29) (2 of 3)
Cement Treated Permeable Base (CTPB)

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

Table 6-1.10 Materials Acceptance Sampling and Testing Requirements:
Treated Permeable Bases (2018 *Standard Specifications* Section 29) (3 of 3)
Cement Treated Permeable Base (CTPB)

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

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

Table 6-1.11 Materials Acceptance Sampling and Testing Requirements: Bituminous Seals (2018 *Standard Specifications* Section 37) (1 of 2)

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

Table 6-1.11 Materials Acceptance Sampling and Testing Requirements: Bituminous Seals (2018 *Standard Specifications* Section 37) (2 of 2)

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

Note:

1. See California Test 125 for sampling procedures.

Table 6-1.12 Materials Acceptance Sampling and Testing Requirements: Hot Mix Asphalt (2018 *Standard Specifications* Section 39) (1 of 5)

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

Table 6-1.12 Materials Acceptance Sampling and Testing Requirements: Hot Mix Asphalt (2018 *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	

Table 6-1.12 Materials Acceptance Sampling and Testing Requirements: Hot Mix Asphalt (2018 *Standard Specifications* Section 39) (3 of 5)

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

Table 6-1.12 Materials Acceptance Sampling and Testing Requirements:
Hot Mix Asphalt (2018 *Standard Specifications* Section 39) (4 of 5)

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

Table 6-1.12 Materials Acceptance Sampling and Testing Requirements: Hot Mix Asphalt (2018 *Standard Specifications* Section 39) (5 of 5)

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

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

Table 6-1.13 Materials Acceptance Sampling and Testing Requirements: Concrete Pavement (2018 *Standard Specifications* Section 40) (1 of 8)

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

Table 6-1.13 Materials Acceptance Sampling and Testing Requirements: Concrete Pavement (2018 *Standard Specifications* Section 40) (2 of 8)

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

Table 6-1.13 Materials Acceptance Sampling and Testing Requirements: Concrete Pavement (2018 *Standard Specifications* Section 40) (3 of 8)

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

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

Table 6-1.13 Materials Acceptance Sampling and Testing Requirements: Concrete Pavement (2018 *Standard Specifications* Section 40) (4 of 8)

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

Table 6-1.13 Materials Acceptance Sampling and Testing Requirements: Concrete Pavement (2018 *Standard Specifications* Section 40) (5 of 8)

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

Table 6-1.13 Materials Acceptance Sampling and Testing Requirements: Concrete Pavement (2018 *Standard Specifications* Section 40) (6 of 8)

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

Table 6-1.13 Materials Acceptance Sampling and Testing Requirements: Concrete Pavement (2018 *Standard Specifications* Section 40) (7 of 8)

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

Table 6-1.13 Materials Acceptance Sampling and Testing Requirements: Concrete Pavement (2018 *Standard Specifications* Section 40) (8 of 8)

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

Notes:

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

Table 6-1.14 Materials Acceptance Sampling and Testing Requirements: Concrete Structures (2018 *Standard Specifications* Section 51) (1 of 5)

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

Table 6-1.14 Materials Acceptance Sampling and Testing Requirements: Concrete Structures (2018 *Standard Specifications* Section 51) (2 of 5)

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

Table 6-1.14 Materials Acceptance Sampling and Testing Requirements: Concrete Structures (2018 *Standard Specifications* Section 51) (3 of 5)

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

Table 6-1.14 Materials Acceptance Sampling and Testing Requirements: Structures Concrete (2018 *Standard Specifications* Section 51) (4 of 5)

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

Table 6-1.14 Materials Acceptance Sampling and Testing Requirements: Concrete Structures (2018 *Standard Specifications* Section 51) (5 of 5)

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

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

Table 6-1.15 Materials Acceptance Sampling and Testing Requirements:
Concrete (2018 *Standard Specifications* Section 90) (1 of 7)
Concrete Except Minor Concrete and Rapid Strength Concrete

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

Table 6-1.15 Materials Acceptance Sampling and Testing Requirements: Concrete (2018 *Standard Specifications* Section 90) (2 of 7)
Concrete Except Minor Concrete and Rapid Strength Concrete

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

Table 6-1.15 Materials Acceptance Sampling and Testing Requirements:
Concrete (2018 *Standard Specifications* Section 90) (3 of 7)
Concrete Except Minor Concrete and Rapid Strength Concrete

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

Table 6-1.15 Materials Acceptance Sampling and Testing Requirements: Concrete (2018 *Standard Specifications* Section 90) (4 of 7)
Concrete Except Minor Concrete and Rapid Strength Concrete

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

Table 6-1.15 Materials Acceptance Sampling and Testing Requirements:
Concrete (2018 *Standard Specifications* Section 90) (5 of 7)
Concrete Except Minor Concrete and Rapid Strength Concrete

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

Table 6-1.15 Materials Acceptance Sampling and Testing Requirements: Concrete (2018 *Standard Specifications* Section 90) (6 of 7) Minor Concrete

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

Table 6-1.15 Materials Acceptance Sampling and Testing Requirements: Concrete (2018 *Standard Specifications* Section 90) (7 of 7)
Minor Concrete

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

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

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

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

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

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

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

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

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

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

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

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

Chapter 6 Sampling and Testing

Exhibit B-2 - 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 to do so?	
2	Were there 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 taken on the project match (or exceed) the minimum type and number required in the frequency tables of the approved 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 there 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 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 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?

Printed Name of the Local Agency: _____

Printed Name of the Resident Engineer: _____

Printed Name of the Reviewer: _____

Date of Review: _____

Exhibit B-3 - 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)
Metal Target Plates
Electrical Conductors
Portland Cement
Minor Concrete
Waterstop

And any other materials that are on the current Caltrans list of Constrcution Materials Accepted by a Certificate of Compliance

If Caltrans Standard Specifications 2018 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.