

# QUALITY ASSURANCE PROGRAM (QAP)

[NAME OF LOCAL PUBLIC AGENCY (LPA)]

APPROVED BY:

*[signature by LPA Public Works Director or next highest registered engineer]*

Name: [PE Stamp]

Title:

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*[This document supports the Caltrans Local Assistance Procedures Manual (LAPM) Section 16.11. In case of conflicts, the contract documents and the agency-state agreements prevail.]*

The purpose of the Quality Assurance Program (QAP) is to provide assurance that the materials incorporated into each state and federally funded construction project conform to the contract specifications, as well as to 23 CFR 637.

- The QAP is updated every five years minimum.
- The QAP is updated if changes are made, such as to the test methods or to the testing sampling and frequencies.

## I. Definition of Terms

<b>Acceptance Testing</b>	Testing of project materials to determine compliance with the contract specification criteria.
<b>Certificate of Compliance</b>	A signed document from the material manufacturer committing that the delivered goods meet the contract specifications.
<b>Independent Assurance Program (IAP)</b>	A program that verifies that acceptance testing is being performed correctly by certified testers using accredited laboratories and calibrated equipment.
<b>Materials Acceptance Program</b>	Sampling, testing, inspection, and certification of project materials to determine compliance with the contract specifications.
<b>Quality Assurance Program (QAP)</b>	A program that will ensure materials and workmanship incorporated into the project conform to the contract specifications. The main elements of a QAP are the Material Acceptance Program and the Independent Assurance Sampling and Testing Program.
<b>Source Inspection</b>	Sampling, testing, and/or inspection of manufactured or prefabricated structural materials at a location other than the job site, generally at the manufactured location.

## II. Materials Acceptance Program

Material incorporated into the work is accepted by one or more of the following methods, as specified in the contract specifications:

1. Field Sampling and Acceptance Testing
2. Manufacturer's Certificate of Compliance
3. Source Inspection and Testing
4. Visual Inspection

### Field Sampling and Acceptance Testing

- Acceptance sampling and testing are performed by certified materials personnel.
- Acceptance testing is performed utilizing accredited materials laboratories and properly calibrated equipment.
- Certifications and accreditations are specific to the tests being performed.
- A materials testing results log is maintained for any test method performed more than once on a project.
- Test results for materials incorporated into the work are to be in compliance with the contract specifications.
- Actions taken regarding material with failing test results will be fully documented, including details documenting remove/replace, rework/re-test, and deduction/change order.
- Justification will be provided for any failing material allowed to remain in-place.

### Acceptance Sampling and Testing Locations / Frequencies

- Sample and testing locations and frequencies are to be in accordance with the contract specifications.
- If not specified in the contract documents, sampling and testing locations / frequencies are shown in Attachment 1: Acceptance Sampling and Testing Frequencies.
- When sampling products such as Portland cement concrete, cement-treated base, hot mix asphalt, or similar materials, sampling is varied with respect to the time of the day, in so far as possible, in order to *avoid a predictable sampling routine*.

### Acceptance Test Methods

- The test methods used are as specified in the contract documents. If not specified, testing is done with the California Tests (CT) Method.
- For a material specified to comply with a property shown in the following table, testing is performed utilizing the noted test method(s):

*[If the Caltrans standard specifications are utilized in contracts, use the table below and delete the second table]*

Test Property	Test Method
<b>Relative Compaction</b>	CT 231 & CT 216
<b>Sand Equivalent</b>	CT 217
<b>Resistance (R-value)</b>	CT 301
<b>Grading (sieve analysis)</b>	CT 202
<b>Durability Index</b>	CT 229
<b>Cleanness Value</b>	CT 227

*[If the Greenbook standard specifications are utilized in contracts, use the table below and delete the first table ]*

Test Property	Test Method
<b>Relative Compaction</b>	ASTM D1557 and D2922 or D1556
<b>Sand Equivalent</b>	CT 217 or ASTM D2419
<b>Resistance (R-value)</b>	CT 301
<b>Grading (sieve analysis)</b>	CT 202 or ASTM C136
<b>Durability Index</b>	CT 229
<b>Cleanness Value</b>	CT 227

*[If specifications other than Caltrans or the Greenbook are utilized, or the standard specifications are amended, create a table representative of the specifications, and delete both tables above.]*

Acceptance Materials Testing Laboratory

Acceptance testing will be performed by: *[check all that apply]*

- [Local Public Agency (LPA)]* Materials Laboratory
- Accredited Consultant Materials Laboratory
- Other \_\_\_\_\_ *[explain]*

*[Local Public Agency]* certifies that the following is true:

- The materials laboratory is under the responsible management of a California Registered Engineer with experience in sampling, inspection, and testing of construction materials.
- The Engineer will certify the results of all tests performed by laboratory personnel under the Engineer’s supervision.
- The Materials Laboratory is properly accredited.
- The Materials Laboratory testing personnel are appropriately certified.
- Testing equipment is properly calibrated.
- Materials Laboratories will comply with Section III. Independent Assurance Program (IAP) of this document.

Reporting Acceptance Test Results

- The laboratory reports test results to the Resident Engineer (RE) as soon as possible by email or telephone.
- Copies of the complete material test result reports, including data and calculation sheets, are provided to the RE in accordance with the following timetable:  
*[hours shown may be reduced to meet agency requirements]*

If the material is sampled ...	and the test performed is ...	submit results to the RE within ...
at the material plant	Sieve Analysis or Sand Equivalent (SE) or Cleanness Value (CV)	24 hours
at the jobsite	Compaction and/or maximum density	24 hours
	Sieve Analysis or Sand Equivalent (SE) or Cleanness Value (CV)	72 hours
	R value or Asphalt extraction	96 hours

### Acceptance Testing Summary Logs

The RE maintains a testing summary log for each test method performed on the project utilizing Attachment 2: Test Result Summary Log.

*[The LPA may choose to use a different form for Attachment 2; however, the log must include the following information: Name and ID Number of the Test Method Performed; Date Tested; Name of Tester; Location; Approximate Quantity of Material Represented by the Test; Required Passing Result; Actual Test Result; Resolution of any Failing Results]*

The logs are used by the RE to track that:

- Sampling is performed at the required frequencies.
- Acceptance tests are performed at the required frequencies.
- Tester certifications are current and on file.
- All failing tests have been mitigated and documented.

### Manufacturer's Certificate of Compliance

- Various manufactured materials may be accepted for incorporation into the work without sampling or testing, based on the following:
  - Visual examination of material is performed
  - Supplier has furnished similar material with a history of having met specifications
  - Manufacturer certification that materials comply with contract specifications
  - The products, materials, or assemblies do not involve structural integrity or safety to the public
- Where required by the contract specifications, the contractor must submit a certificate of compliance and comply with Buy America certification requirements as applicable.
- Where required by the contract, the contractor must attach test data or other documents to the certificate of compliance.
- The RE may perform sampling and testing on such materials at any time.
- Certificates of compliance must:
  - Be submitted by the Contractor before the material is incorporated into the work;
  - Accompany the material to the job site.
  - Identify the lot (or heat) number for each lot delivered;
  - Include the contract number;
  - Include test data and other documents when required.
  - State that the material complies with the contract specifications; and
  - Be signed by the producer of the material.

List of Materials Accepted by Certificate of Compliance

- [LPA] uses the [Caltrans 2023, Caltrans 2024, Greenbook, Other by Name] Standard Specifications
- In accordance with [Standard Specifications named above] the materials listed in Attachment 3 may be accepted by Certificate of Compliance [choose an appropriate Attachment 3; either the 2024 CTSS or the 2024 Greenbook, or create an appendix table appropriate for the standard specifications utilized]
- This list may be amended by the contract Special Provisions or Technical Provisions

Source Inspection and Testing

- Some manufactured or pre-fabricated structural materials will be inspected or tested prior to arrival at the jobsite, generally at the manufacturer’s location (a.k.a. source inspected).
- Structural items categorized as “catastrophic consequences of failure” or “significant safety concern” may be source inspected. Materials that might be source inspected include: structural steel, precast pre-stressed concrete girders and pilings; RCP greater than 60”, joint seals, bearing pads, lighting and signal poles, sign structures, electrical items.
- The RE may reject source inspected material at the job site if deemed not acceptable, including:
  - Material damage in shipment or installation;
  - Defective material (source inspection is usually a random sampling and may not have checked 100% of the material.)
- The following materials laboratories will be used to perform source inspection and testing. [check all that apply]
  - [Local Public Agency] Laboratory
  - Accredited Consultant Materials Laboratory
  - Other \_\_\_\_\_ [explain]

Visual Inspection

- Relatively minor quantities of construction materials may be accepted without testing.
- The following 3 conditions must be met:
  1. Visual examination of the material is performed.
  2. The manufacturer or supplier has recently furnished similar materials found to be satisfactory using normal sampling and testing requirements.
  3. The manufacturer (or supplier in the case of HMA or concrete) provides certification that the material furnished complies with the contract specifications.

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Approximate Quantities that May be Accepted by Visual Inspection

- Aggregates other than for use in Portland Cement Concrete, not to exceed:
  - 100 tons per day, nor
  - 500 tons per project
- Bituminous mixtures (example: HMA), not to exceed
  - 50 tons per day
  - If project total is less than 500 tons., sample at engineer's discretion
- Bituminous material (example: Liquid Asphalt), not to exceed:
  - 100 gallons per project

### III. Independent Assurance Program (IAP)

- The IAP verifies that:
  - Sampling and testing procedures are being performed correctly
  - All acceptance testing performed on the project uses an accredited laboratory and certified testing personnel.
  - All testing equipment is in good condition and properly calibrated
- The IAP duties, including certification of testers and laboratory accreditation, are executed by: *[check all that apply]*
  - LPA designated independent assurance person  
(this person must not perform any acceptance testing)
  - Caltrans
  - Consultant  
(this consultant must be different from acceptance testing consultant)
- Independent assurance samples and tests are not to be used for determining compliance with contract requirements.
- Testing with only ASTM/AASHTO material testing will require the LPA hire a separate laboratory to perform independent assurance (see LAPM 16.11.2: Independent Assurance (IA) Program).

#### Laboratory Accreditation

- The acceptance testing materials laboratory must participate and comply with one or more of the following Correlation Testing Programs
  - AASHTO re:source (formerly AMRL)
  - Cement and Concrete Reference Laboratory (CCRL)
  - Caltrans Reference Samples Program (RSP)
- The Acceptance Testing Laboratory Accreditation occurs annually or per issuance agency.

- A current copy of the laboratory’s accreditation certificate is kept in the project records.

### Tester Certification

- Sampling and testing personal are certified for a maximum of 5 years by one or more of the following Personnel Certification Programs: *[check all that apply]*
  - CT METS IA Representative (at JTCP or outside of JTCP for other test methods)
  - American Concrete Institute
  - National Institute of Certification of Engineering Technologies
  - Other nationally recognized organization: \_\_\_\_\_
- LPA’s designated and qualified independent assurance person (independent assurance person may not perform acceptance testing)
- Proficiency tests are performed for testers to be certified on Sieve Analysis, Sand Equivalent, and Cleanness Value tests; all other types are witness tests.
- A copy of each tester’s current and applicable certifications is kept in the project files.

### Equipment Calibration

Laboratory testing equipment will be:

- Capable of performing the tests required.
- Be in good working order.
- Be calibrated at least *once each year*, and *more frequently* if required by test method or manufacturer’s recommendation.
- Be calibrated by impartial means using devices of accuracy traceable to the National Institute of Standards and Technology.
- Have a *decal* firmly affixed to each piece of equipment showing:
  - Equipment Identification Number
  - Calibration Date
  - Calibration Expiration/Due
  - Calibrator Name/Company Name

## IV. Project QAP Records

Project records will have on file pertinent quality assurance documents which may include, but not limited to (see LAPM 16.3.1: Organization of Project Records for more details):

- Copy of Quality Assurance Plan
- Certificates of Proficiency
- Certificate of Accreditation for Testing Laboratory
- Notice of Materials to be Used
- Acceptance Testing Summary Logs and Test Results
- Certificates of Compliance (Buy America certification requirements as applicable; see LAPM)
- Source inspection records and reports
- Final Materials certification

All project records will be available in a single location for inspection by auditors and reviewers:

- At any time during the project
- For three years following the date of the final project voucher

## V. Attachments

Attachment No. 1: Acceptance Sampling and Testing Frequencies

Sample provided at: <https://dot.ca.gov/-/media/dot-media/programs/local-assistance/documents/coe/sampling-and-testing-frequency-table.pdf>

Attachment No. 2: Test Results Summary Log

Sample provided at: <https://dot.ca.gov/-/media/dot-media/programs/local-assistance/documents/coe/16z2e.xlsx>

Attachment No. 3: List of Materials Accepted by Certificate of Compliance

*[Choose the "Attachment No. 3" option that corresponds with the standard specifications used by the LPA. If none apply to the LPA standard specifications, create and attach a list of materials accepted by certificate of compliance.]*

Caltrans Standard Specifications: <https://dot.ca.gov/-/media/dot-media/programs/local-assistance/documents/coe/materials-requiring-coc-caltrans.pdf>

Greenbook: <https://dot.ca.gov/-/media/dot-media/programs/local-assistance/documents/coe/materials-requiring-coc-greenbook.pdf>