



City of Sonoma
Quality Assurance Program
Rev. 4/15/2014

1.0 Purpose

This Quality Assurance Program (QAP) is a sampling and testing program that will provide assurance that the materials and workmanship incorporated into the City's street and highway construction projects are in conformance with the contract specifications. The main elements of the QAP are procedures for:

- Acceptance Testing (AT)
- Independent Assurance Sampling and Testing (IAST)
- Testing of Manufactured Materials

2.0 Applicability

This QAP applies to Federal aid local agency projects off the National Highway System (NHS).

2.1 On-NHS system projects are governed by Caltrans' FHWA-approved QAP, found in Section 16.14 of the Local Assistance Procedures Manual, Chapter 16 - Administer Construction Contracts, Section 14 - Quality Assurance Program ("LAPM-16.14").

2.2 Off-NHS system, federally-funded projects are governed by the procedures in the City of Sonoma, Special Provisions of the Project Specifications. Its use is mandatory for Federal-aid projects and is recommended for other City street and projects. This local QAP is based upon the requirements for local QAP's contained in the LAPM Section 16.14. Federally-funded projects that mix on-and-off-NHS sites should utilize the Caltrans QAP.

3.0 Approval

This local QAP has been approved by the City of Sonoma City Engineer, who is a registered civil engineer. It shall be kept on file and available for Caltrans review.

4.0 Testing Required

This local QAP describes procedures for three types of required testing, described as follows:

- a. Acceptance Testing - procedures for regular testing of materials entering a construction project to verify that the materials, or products, comply with contract specifications or standards.



- b. Independent Assurance Sampling and Testing - procedures to verify that acceptance testing is being performed correctly by:
- 1) Verifying that equipment used for acceptance testing is properly calibrated and in good working condition.
 - 2) Witnessing sampling and testing by the Acceptance Tester.
 - 3) Splitting material samples and comparing the test results between the Acceptance Tester and Independent Assurance Sampler and Tester.
- c. Testing of Manufactured Materials - procedures for inspecting, accepting and testing of manufactured and prefabricated materials either by source inspection, job site inspection, or certificate of compliance.

5.0 General Procedures and Requirements

Conduct of the sampling and testing shall follow these general procedures:

5.1 **Construction Documents.** Because the City does not provide its own testing and inspection of materials, provision of such services must be arranged prior to advertising a project and addressed appropriately in the construction documents.

5.2 **Sampling and Testing Options.** The City may select from the following sources to perform sampling and testing:

- Another agency's laboratory
- Private consultant laboratory

Non-Caltrans laboratories shall have a QAP that meets LAPM-16.14 requirements.

5.3 **Engineering Charge.** All laboratories shall be under the responsible engineering management of a California registered professional engineer who shall certify results of tests performed under his supervision.

5.4 **Contractor Influence.** The contractor shall not select or exercise any authority over the laboratory utilized.

5.5 **Certification of Laboratory Personnel.** The certification requirements of LAPM-16.14 shall apply. Generally:

- Current certification is required for the following sampling and testing personnel construction management/inspection, local agency, consultant laboratory and their subconsultants.



For off-NHS projects, certification of personnel for AT and IAST shall be either Caltrans (MR-0111 or MR-0100), NICET, or similar certificate acceptable to the City Engineer. For off-NHS projects, certification of personnel for AT and IAST shall be either Caltrans (MR-0111 or MR-0100), NICET, or similar certificate acceptable to the City Engineer.

- Certificates for personnel on a project shall be retained in the private consultant's and/or laboratory's files and presented to the City upon demand by the Resident Engineer (RE) or City Engineer.
- Sampling and testing by an uncertified person is acceptable only in extreme, unforeseen emergencies, upon assurance by the RE that the uncertified person is competent to perform the work.

5.6 Laboratory Equipment Calibration. The laboratory shall document its calibration of its equipment in accordance with LAPM-16.14 and nationally recognized calibration standards. The laboratory is responsible for performing the calibrations and providing such records to the City upon demand by the RE or City Engineer.

Calibration of laboratory equipment and field test equipment (e.g. sand cones, scales, moisture test, slump cones, air meters) shall occur prior to use on a construction project and on regular, appropriate intervals not exceeding one year.

5.7 Cost Recovery. Materials testing and sampling costs are eligible to be charged to the construction-engineering phase of the project.

5.8 Compliance. Failure to comply with the local agency QAP may result in loss of Federal funds.

5.9 Records. City's QAP and consultant's QAP material records of samples and tests, material releases, and certificates of compliance for a project shall be incorporated into the RE's project file. For Federally funded projects, records shall be retained for a period of three years.

5.10 Project Certification. Upon project completion, the RE shall complete and sign a "Materials Certificate" (Caltrans LAPM Exhibit 17-G). The Certificate shall be submitted to the Caltrans Local Assistance Engineer (for Federally funded projects) and retained in the project construction files. All non-conforming materials must be explained and justified on the Certificate.

6.0 Acceptance Sampling and Testing

6.1 Definition. Acceptance Testing ("AT") is defined as regular testing of materials entering a construction project to verify compliance with contract specifications or standards.



6.2 **Timing.** Sampling should begin as soon as materials are placed on a project. Testing should be performed promptly to enable data evaluation and necessary measures to be taken by the RE and contractor.

6.3 **Test Methods.** Both California and Americana Society of Testing and Materials (ASTM) test methods are acceptable.

6.4 **Frequency.** Sampling and testing shall occur in accordance with Caltrans "Frequency Tables" (LAPM Exhibit 16-R), except as modified in writing and as approved by the City Engineer for a specific project. The tables are intended as a guide; the actual quality of materials tested may justify decreasing or increasing the frequency of subsequent similar samples and tests.

6.5 **Tests to be Performed.** The tests to be performed shall be in accordance with Caltrans' "Frequency Tables" (LAPM Exhibit 16-R), and the Caltrans Standard Specifications as modified by the project Special Provisions, except as modified in writing and as approved by the City Engineer.

As a guideline, the following tests comprise a minimum scope of commonly used materials:

Aggregate Base - Sieve Analysis, Sand Equivalent, and R-value for each new source.

Aggregate Subbase - Sieve Analysis, Sand equivalent, and R-Value.

Asphalt Concrete - Sieve Analysis for aggregate sampled at the plant. Asphalt content, Maximum Density, and In-Place Density for AC sampled at the site. (A Certificate of Compliance may be accepted for Liquid Asphalt.)

Soil - Maximum Density, In-Place Density (relative Compaction) at the site.

Concrete - Sieve Analysis for aggregate sampled at the plant. (A Certificate of Compliance may be accepted for aggregate Cleanliness, aggregate Sand Equivalent Admixtures, and Portland Cement concrete.) Compressive Strength (Cylinders).

6.6 **Test Result Reporting Guidelines.** Results should be submitted to the City Inspector within 3 working days of sampling, or as dictated by the construction schedule. Results may be expedited by using fax, telephone, or e-mail.

6.7 **Summary Logs.** "Material Testing Summary Logs" shall be maintained by the City Inspector for each material requiring multiple sampling and testing. Log data shall include, for example, station location, test sample depth, approximate quantity of sample materials, test result, and tester.



6.8 **Minor Quantities.** Relatively minor quantities of materials from a known, reliable source may be accepted without testing if:

- a. The City Inspector performs visual examination of materials, or
- b. The manufacturer or supplier certifies that the material furnished complies with specification requirements.

Such records of acceptance shall be placed in the City Inspector's project files with related inspection notes.

Examples of maximum "minor quantities" include (from LAPM-16.14):

- Aggregates used for other than Portland Cement concrete: 100 tons per day or 500 tons per project.
- Bituminous mixtures: 50 tons per day or 500 tons per project.
- Bituminous material: 100 gallons per project.
- Paint: 20 gallons per project.

6.9 **Re-testing.** Failing test results require re-testing to isolate the failed area. The Log Summary shall cross-reference the retest to the initial failed test.

7.0 **Independent Assurance Sampling and Testing (IAST)**

7.1 **Definition.** The purpose of these procedures is to verify that Acceptance Testing is being performed correctly and reliably, and to ensure that equipment is properly calibrated.

7.2 **Applicability.** IAST procedures are required for Federally funded projects on and off the NHS system. For on-NHS projects, LAPM-16.14 procedures apply. For off-NHS projects, the City will verify that its consultant laboratory's QAP includes IAST procedures for "testing its own testers." IAST procedures are optional, and may be required at the discretion of the City Engineer for non-Federally funded projects.

7.3 **IAST Testers.** Laboratory personnel or consultant testers shall have its own industry-standard QAP and employ personnel who are certified by recognized materials testing organizations as approved by the City Engineer. Testers shall be free of conflict of interest if also performing other testing work.

7.4 **Frequency of IAST.** The IAST frequency shall be as specified in the consultant laboratory's QAP for each project where IAST is required.



8.0 Testing of Manufactured and Assembled Materials

8.1 **Definition.** This procedure provides methods for inspecting, accepting, and testing materials that are manufactured or prefabricated off the project site.

8.2 **Certificate of Compliance.** The City may accept manufactured products, materials, or assemblies if accompanied by a Certificate of Compliance, provided they do not involve structural integrity or public safety. Such Certificate shall be signed by the manufacturer and shall state that materials and workmanship conform to the specific project specifications.

8.3 **Source Inspection.** As an alternative to a Certificate of Compliance, the City or its consultant may request Caltrans to do a Source Inspection in accordance with LAPM-16.14 procedures.

8.4 **Applicable Materials.** Contract documents shall specify which materials require a Certificate of Compliance (or optional Source Inspection). Typical materials are listed in LAPM Exhibit 16-T.

8.5 **Responsibility.** The City Inspector shall ensure that Certificates are furnished with material deliveries and are kept in the City Inspector's project file.

8.6 **Documentation.** The certified material's lot number and project number shall be identified on the certificate and on lot tags or stenciled on the material. In addition, this data shall be referenced on the inspector's daily logs and laboratory reports.

8.7 **Re-testing.** Certified materials may be sampled and tested again on the job site, and rejected for cause whether in place or not.

Local Agency Approval:

Dan Takasugi, P.E.
Public Works Director/City Engineer