CALIFORNIA DEPARTMENT OF TRANSPORTATION

Caltrans

Independent Assurance Program
Annual Report
Calendar Year 2017

Division of Engineering Services
Materials Engineering and Testing Services
Transportation Laboratory
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California Division, Federal Highway Administration
California Department of Transportation
Independent Assurance Program
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1. OVERVIEW

1.1 INTRODUCTION

Title 23 of the Code of Federal Regulations, Chapter I, Part 637, Subpart B, Section 637.205(a) (23 CFR637.205(a)), the Federal Highway Administration’s (FHWA’s) quality assurance procedures for construction require the following:

“Each STD [state transportation department] shall develop a quality assurance program which will assure that the materials and workmanship incorporated into each Federal aid highway construction project on the NHS [National Highway System] are in conformity with the requirements of the approved plans and specifications, including approved changes.”

Key components of this quality assurance program are “acceptance” and “independent assurance.” Independent Assurance (IA) programs may be project or system based. The California Department of Transportation (Caltrans) has chosen to implement a system based IA Program.

Agencies choosing to implement a system based IA Program are required by 23CFR637.207(a)(2)(iv) to submit an annual report to FHWA. In fulfillment of this requirement, this report is being submitted concerning the activities of the Caltrans IA Program for calendar year 2017.

1.2 REPORT OVERVIEW

The Caltrans Independent Assurance (IA) Program provides a framework for assuring that the construction quality assurance program, as outlined in the Caltrans Construction Manual and in project specifications, is supported by qualified technicians and accredited laboratories. The Caltrans IA Program provides periodic evaluation of the performance of sampling and testing personnel, testing equipment, and testing laboratories.

The purpose of this document is to provide:

- A discussion of IA activities from January through December 2017
- 2017 Reference Sample Program (RSP) Information
• Goals for the IA Program for 2018

1.3 SUMMARY OF ACTIVITIES: CALENDAR YEAR 2017

• New IA Staff Certification – Two new District IA staff were certified by Materials Engineering and Testing Services (METS) in 2017.

• District IA Staff Recertification – METS IA staff recertified 35 district IA and Local Assistance IA (LAIA) staff

• 2017 IA Annual Meeting – The 2017 IA Annual Meeting was held on January 11, 2018 in Sacramento, California.

• Technician Qualifications – District IA staff and Local Assistance IA staff qualified a total of 2574 technicians in Caltrans, local agencies, and private laboratories.

• Laboratory Accreditations – District IA staff and Local Assistance IA staff accredited a total of 358 Caltrans, local agency and private laboratories.

• Equipment Calibrations by METS IA Staff – METS IA staff did not perform calibration of major equipment for the 11 Caltrans laboratories. The calibrations were performed by a private calibration company through a service contract managed by METS.

• Reference Sample Program (RSP) – The Reference Sample Program sent out samples for:

  o CT 202 - Method of Test for Sieve Analysis of Fine and Coarse Aggregates (coarse aggregates) (325 laboratories participated)
  o CT 217 - Method of Test for Sand Equivalent (348 laboratories participated)
  o CT 216 - Method of Test for Relative Compaction of Untreated and Treated Soils and Aggregates (234 laboratories participated)

• LA IA staff – Local Assistance IA staff reviewed 42 Quality Assurance Plans (QAP) for cities and counties in 2017.
2. CALTRANS INDEPENDENT ASSURANCE (IA) PROGRAM

2.1 BACKGROUND

Since 1992, Caltrans has been committed to an Independent Assurance Program to fulfill 23 CFR 637 requirements. Procedures for the program are outlined in the 2005 Caltrans Independent Assurance Manual, which can be accessed in the following website address:


In 1994, Caltrans shifted from a project based process for reviewing technicians, equipment and results to a system based process. In the system based process, a technician’s qualifications are ascertained by written examinations, witnessed performance of tests, or results of testing on split samples of materials for corroboration of test results. Caltrans IA staff reviews equipment and laboratories annually; and laboratories participate in a statewide proficiency sampling program. 23 CFR 637.207(a) provides that this approach eliminates the necessity of project specific samples.

Independent Assurance is an important and integral part of the Caltrans Quality Assurance Program, but separate from individual project quality assurance efforts. Independent Assurance is implemented through Materials Engineering and Testing Services (METS) with the assistance of District IA personnel. The Division of Construction ensures individual project quality assurance. Quality assurance at the project level is outlined in the Construction Manual, which can be accessed at the following website address:

http://www.dot.ca.gov/hq/construc/constmanual/

In keeping with the requirement of the IA Program and 23 CFR 637, Section 6-305 of the Construction Manual instructs the engineer that:

“Field personnel who perform tests for compliance with the specifications must be qualified to conduct the proper tests method as indicated by the contract.”

3. CALTRANS IA PROGRAM IN 2017

3.1 NEW INDEPENDENT ASSURANCE STAFF CERTIFICATION

Two new District IA staff were certified in 2017, one in District 1 and one in District 11.

3.2 ANNUAL RECERTIFICATION OF STATEWIDE IA STAFF

METS IA staff recertifies statewide IA staff on an annual basis. In 2017, METS IA staff recertified 35 district IA staff and Local Assistance IA staff.
3.3 2017 INDEPENDENT ASSURANCE ANNUAL MEETING

The Statewide IA Annual Meeting was held on January 11, 2018 in Sacramento, California. All IA staff were in attendance. Some District Materials Engineers (DMEs) also attended. The following topics below were presented and discussed in the meeting.

- New IA staff introductions
- State Materials Engineer’s Message
- Three Cs of IA Program (Communication, Consistency, and Collaboration)
- 2016 IA Annual Meeting action item recap
- Overview of the IA program in 2017
- Overview of the Reference Sample Program in 2017
- IA Database development and deployment – Updates
- Joint Training and Certification Program – Implementation Plan
- FHWA Update
- IA Manual Revision – Plan & Updates
- District and Local Assistance IA issues – Roundtable discussion

3.4 LABORATORY ACCREDITATION

In 2017, statewide IA accredited a total of 358 Caltrans, local agency and private laboratories. This is an 8% decrease from 389 laboratories in 2016 and a 10% decrease from 2015.

In 2017, there were no revocation of laboratory accreditations.

3.5 TECHNICIAN QUALIFICATION

Statewide IA staff qualified a total of 2574 technicians in 2017. This is an increase of approximately 15% from 2237 technicians in 2016 and an increase of 11% from 2015.

There were a total of 12 technician disqualifications in 2017. District 8 had 3 disqualification and District 12 had 9 disqualifications, respectively.

A summary of laboratory accreditation and technician qualification both current and past has been provided below in Table 1.
<table>
<thead>
<tr>
<th>District</th>
<th>Certified IA Staff</th>
<th>Number of Technicians Qualified</th>
<th>Accredited Laboratories</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>3 3 2</td>
<td>30 61 36</td>
<td>10 9 11</td>
</tr>
<tr>
<td>2</td>
<td>4 4 3</td>
<td>138 129 116</td>
<td>8 10 9</td>
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<td>1 1 1</td>
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<td>132 160 141</td>
<td>7 6 6</td>
</tr>
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<td>11</td>
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<td>Total for all Districts</td>
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<td>Total for HQ IA</td>
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<td>0 0 0</td>
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<tr>
<td>Total for Local Assistance IA</td>
<td>4 4 4</td>
<td>368 419 437</td>
<td>1 1 0</td>
</tr>
<tr>
<td>Total for Districts and Headquarters</td>
<td>35 36 35</td>
<td>2574 2237 2317</td>
<td>77 95 93</td>
</tr>
</tbody>
</table>
3.6 CALTRANS LABORATORIES – EQUIPMENT AND CALIBRATION

METS provided a calibration service contract to perform calibration on larger testing equipment in the district laboratories.

For smaller testing equipment, District IA or LAIA staff are responsible for verifying the calibration of all testing equipment in accredited Caltrans laboratories. In some districts, District IA staff maybe directly responsible for calibrating equipment in the district and field laboratories. In other districts, District IA staff reviews the calibration records and may verify equipment calibration of district and field laboratories whose equipment are calibrated by private calibration companies.

Calibration records are reviewed by IA staff, whether they are directly responsible for calibration of the equipment or not, at the time of laboratory accreditation.

3.7 2017 CALTRANS REFERENCE SAMPLE PROGRAM (RSP)

The Caltrans Independent Assurance Manual, Section 2.3.4, “Proficiency Testing” states,

“The laboratory shall participate in all required proficiency sample programs to be accredited.”

It is the laboratory’s responsibility to maintain active status in proficiency testing of reference samples by testing and reporting the results. Reference sample results are statistically evaluated to determine the numerical ratings of each test results as identified in the Caltrans Independent Assurance Manual.

In April 2017, proficiency samples for CT 202, “Method of Test for Sieve Analysis of Fine and Coarse Aggregates” were distributed. There were 325 laboratories that participated for this round of testing. The report was finalized and posted on the Independent Assurance Webpage in April 2018.

In September 2017, proficiency samples for CT 217, “Method of Test for Sand Equivalent” were distributed. There were 348 participating laboratories for this round of testing. The report was finalized and posted on the Independent Assurance Webpage in April 2018.

In December 2017, proficiency samples for CT 216 “Method of Test for Relative Compaction of Untreated and Treated Soils and Aggregates” were distributed. There were 234 laboratories that participated. The initial statistical analysis is in progress. It is anticipated that the final report will be posted by June 2018.

All posted Reference Sample Program Reports can be viewed at the following website address:

http://dot.ca.gov/hq/esc/Translab/ormt/IA_reports/index.htm
3.7.1 2018 RSP GOALS

Table 2 below gives an approximate time line for the 2018 RSP sample distribution:

<table>
<thead>
<tr>
<th>2018</th>
<th>Test Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>January - May</td>
<td>AASHTO T324 (Hamburg Wheel Track)</td>
</tr>
<tr>
<td>March - August</td>
<td>CT 202 (Sieve Analysis – fine aggregate)</td>
</tr>
<tr>
<td>September - December</td>
<td>CT 309 (Theoretical Maximum Density of HMA)</td>
</tr>
</tbody>
</table>

3.8 LOCAL ASSISTANCE INDEPENDENT ASSURANCE

In accordance with Chapter 16, Section 16.14, “Quality Assurance Program,” of the Caltrans Local Assistance Procedure Manual, Caltrans will accredit/certify a local agency’s laboratory and acceptance testers if the project is federally funded and off the National Highway System (NHS). In order to fill this need, five Local Assistance IA staff positions were filled in December 2008 with implementation beginning in March 2009.

The accreditation statistics for the Local Assistance IA staff are found in Table 1 above. In addition to providing the typical IA services, the Local Assistance IA staff reviews local agency Quality Assurance Program (QAP) manuals for compliance with Caltrans Local Assistance requirements. In 2017, 42 local agency QAP manuals were reviewed by Local Assistance IA staff.

4. 2017 INDEPENDENT ASSURANCE HIGHLIGHTS

4.1 INDPEPENDENT ASSURANCE MANUAL REVISIONS

The Caltrans Independent Assurance Manual revisions is an ongoing process with the updated manual expected to be released in 2018. The highlights of the manual changes are as follows:

- Clarification on materials covered by Independent Assurance Program
- Plain language for consistency with Caltrans recent specification revisions
- Two-year qualification period for testers
- Modification to the dispute resolution process
- Usage of internet for accessing the Caltrans Independent Assurance Manual and supporting documents, e.g., QA-related references, glossary, appendices, forms, etc.
- Clarification on miscellaneous processes/procedures based on stakeholder feedback
- Incorporation of the Joint Training and Certification Program
4.2 ACCREDITATIONS OF CALTRANS DISTRICT LABORATORIES

In the past, the main Transportation Laboratory in Sacramento was accredited by AMRL and CCRL, and the district laboratories were under the umbrella of the Sacramento Accreditation. Caltrans is moving towards having all districts and regional laboratories receive AASHTO accreditation. In 2017, Districts 1, 2, 3, 5, 6, 9, 10 and SRL (7, 8 & 12) are AASHTO accredited. Districts 4 is currently not AASHTO accredited as the laboratory is not functioning and District 11 is not AASHTO accredited due to staffing concerns.

4.3 STATEWIDE INDEPENDENT ASSURANCE DATABASE

In the absence of a statewide IA Database, each District developed their own electronic and/or hard copy systems for tracking IA records. As such, no uniform system existed to track or distribute these records. In July of 2016, a scoping document was signed and resources provided to create a Statewide Independent Assurance Database to ensure our certification and accreditation standards are consistently met statewide.

On March 2017, the Statewide Independent Assurance Database (SIAD) was released. The database will provide consistency, transparency, and efficiency that will benefit the IA program and its stakeholders. As it stands, the database is continuously improved based on feedback from stakeholders (IA’s, testers and laboratories). Efforts are being made to incorporate the JTCP and RSP to the IA database as future functionalities. The IA database is now being utilized by District and Local Assistance IA staff. METS IA is continuously conducting outreach to laboratories and testers to promote the SIAD.

4.4 JOINT TRAINING AND CERTIFICATION (JTCP)

In 2017, key aspects of the program were completed which are identified in the bulleted items below.

- Hired a permanent Program Manager
- Established the Advisory Council for the program
- Procured equipment for both Northern (SJSU) and Southern (CSULB) California training locations
- Developed certification materials
- Collaborated with district IA staff for certification process
- Conducted pilot classes in both SJSU and CSULB training locations
- Continued outreach to stakeholders, i.e. (laboratories, testers, HQ and District construction, IA staff, Local Assistance, and Industry)

The expected inaugural class for JTCP will be on early 2018 in CSULB.

4.5 MISCELLANEOUS CERTIFICATIONS IN 2017
4.5.1 INERTIAL PROFILERS

In 2017, METS took over managing the Inertial Profiler (IP) certification program. IA staff, in collaboration with UCPRC staff continue providing certification to Inertial Profilers and Inertial Profiler Operators. Over the course of the year, METS IA staff certified 51 inertial profiler units and 133 operators.

4.5.2 CT 233: GAMMA-GAMMA LOGGING

In 2017, METS IA continued its support of the Office of Structure Construction and Office of Geotechnical Support by accrediting 3 laboratories and certifying 15 testers in CT 233.

4.5.3 CA PORTABLE SKID TESTER

In 2017, METS IA certified 2 portable skid tester operator. METS staff also performed maintenance and calibration for 5 District portable skid testers.

5. CALTRANS INDEPENDENT ASSURANCE GOALS FOR 2018

The METS IA Program staff will be working on the following endeavors in 2018:

- Complete revision of the Independent Assurance Manual
- Continued functionality updates to the Statewide IA Database
- Continue update written exams for CT and AASHTO test methods
- Incorporate Joint Training and Certification Program into the Caltrans Independent Assurance Program
- Develop precision and bias statement for AASHTO T324 based on RSP results