

CALIFORNIA DEPARTMENT OF TRANSPORTATION



**Independent Assurance Program  
Annual Report  
Calendar Year 2012**

**Division of Engineering Services  
Materials Engineering and Testing Services  
Transportation Laboratory  
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# California Department of Transportation Independent Assurance Program Annual Report Calendar Year 2012

## 1. OVERVIEW

### 1.1. INTRODUCTION

Title 23 of the *Code of Federal Regulations*, Chapter I, Part 637, Subpart B, Section 637.205(a) (23CFR637.205(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. In fulfillment of this requirement, this report is being submitted concerning activities of the Caltrans IA Program for calendar year 2012.



## 1.2. ANNUAL REPORT OVERVIEW

The Caltrans Independent Assurance (IA) Program provides a framework for ensuring that the 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 2012
- A discussion of the current IA Program
- Information on the Reference Sample Program (RSP)

## 1.3. SUMMARY OF ACTIVITIES: CALENDAR YEAR 2012

- **New IA Staff Certification** – No new IA staff were certified by Materials Engineering and Testing Services (METS) in 2012.
- **District IA Staff Recertification** – METS IA staff recertified 35 district IA and local assistance IA staff.
- **The 2012 Annual IA Meeting** - The 2012 Annual IA Meeting was held on December 4, 2012. Issues such as the new Superpave specification, AASHTO accreditation and scale calibration were discussed.
- **District Process Reviews** - METS IA staff conducted district IA process reviews in the 12 districts.
- **Technician Qualification** – Materials Engineering and Testing Services (METS) IA staff, district IA and local assistance staff qualified a total of **2927** technicians in Caltrans, local agencies and commercial laboratories.
- **Laboratory Accreditation** - METS IA staff, district IA staff and local assistance IA staff accredited a total of **440** Caltrans, local agency and commercial laboratories.
- **Equipment Calibration by METS IA Staff** – METS IA staff calibrated large equipment in 13 Caltrans and 17 local agency testing laboratories.
- **Reference Sample Program (RSP)** - The Reference Sample Program sent out fine aggregate proficiency samples to participating laboratories.
- **Local Assistance IA Staff** – Local Assistance IA staff reviewed 7 Quality Assurance Plans (QAP) for cities and counties in 2012.



## 2. CALTRANS INDEPENDENT ASSURANCE (IA) PROGRAM

### 2.1. BACKGROUND

Since 1992, Caltrans has been committed to an IA program. Guidance for the program is outlined in the *Caltrans Independent Assurance Manual*, which can be located at the following website address:

<<http://www.dot.ca.gov/hq/esc/Translab/ofpm/IAP.htm>>

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, and 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. 23CFR63.207(a) provides that this approach removes the necessity of project specific samples.

Caltrans views independent assurance as an important and integral part of its quality assurance program, but separate from individual project quality assurance efforts. Independent assurance is implemented by METS. The Division of Construction ensures individual project quality assurance. Quality assurance at the project level is outlined in the *Construction Manual*, which is located at the following website address:

<<http://www.dot.ca.gov/hq/construc/manual2001/>>

In keeping with the requirements of the IA Program and 23CFR637, Section 6-102C(2) of the *Construction Manual* instructs the construction engineer that:

*All acceptance testers require certification. No tests or samples are to be taken on Caltrans projects unless the tester is certified in the test being performed.*

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District	Accredited Laboratories																							
	Certified IA Staff				Number of Qualified Technicians				Caltrans				Local Agencies				Private Industry				Total			
	2012	2011	2010		2012	2011	2010		2012	2011	2010		2012	2011	2010		2012	2011	2010		2012	2011	2010	
1	3	3	3	62	72	106	11	10	11	1	0	2	5	7	4	16	17	17	17	17	17	17	17	
2	4	4	4	153	142	124	8	8	9	1	1	1	15	16	9	24	25	19	25	25	24	25	19	
3	3	3	3	208	155	248	15	15	17	0	0	0	25	26	16	40	41	33	25	25	40	41	33	
4	4	4	4	347	494	352	8	7	6	0	0	0	17	18	36	25	25	42	17	18	25	25	42	
5	1	1	1	155	173	173	11	11	11	1	2	2	16	19	20	28	32	33	16	19	20	28	33	
6	3	3	1	224	193	202	6	5	6	2	2	3	29	25	26	37	32	35	29	25	26	37	35	
7	3	4	4	304	200	239	17	14	16	6	0	0	19	27	19	42	41	35	19	27	19	42	41	
8	2	2	2	351	369	305	6	6	6	1	1	1	31	37	33	38	44	40	31	37	33	38	44	
9	1	1	1	32	28	32	2	2	2	0	0	0	6	6	6	8	8	8	6	6	6	8	8	
10	2	2	2	219	230	193	5	4	5	0	0	0	16	18	17	21	22	22	16	18	17	21	22	
11	2	2	2	269	288	146	19	19	26	1	1	2	35	35	30	55	56	58	35	35	30	55	56	
12	2	2	2	266	185	196	4	4	4	1	1	1	30	29	25	35	34	30	30	29	25	35	34	
Total of all Districts	30	31	29	2590	2529	2316	112	105	119	14	9	12	244	263	241	369	377	372	244	263	241	369	377	
Total For HQ IA	1	1	1	40	21	25	0	0	2	2	1	0	5	6	0	7	7	2	5	6	0	7	7	
Total for Local Assistance IA	4	4	5	297	305	242	0	0	0	15	17	17	49	53	38	64	70	55	49	53	38	64	70	
Total for Districts and Headquarters	35	36	35	2927	2855	2583	112	105	121	31	27	29	298	322	279	440	454	429	298	322	279	440	454	

TABLE 1: IA PROGRAM DATA FOR 2012



### **3. CALTRANS IA PROGRAM IN 2012**

Shown in Table 1 is a summary of certified Caltrans IA staff, qualified technicians, and accredited laboratories for 2012.

#### **3.1. NEW INDEPENDENT ASSURANCE STAFF CERTIFICATION**

No new IA staff was certified in 2012.

#### **3.2. ANNUAL RECERTIFICATION OF STATEWIDE IA STAFF**

METS IA staff recertifies statewide IA staff on an annual basis. In 2012, METS IA staff recertified 35 district IA staff and Local Assistance IA staff. Statewide IA staff reviewed and were given exams in AASHTO T312-11, “Preparing and Determining the Density of HMA Specimens by Means of the Superpave Gyrotory Compactor” and AASHTO T324-11, “Standard Method of Test for Hamburg Wheel-track Testing of Compacted HMA.” In 2014, Caltrans anticipates a full transition from Hveem mix design to Superpave mix design. AASHTO T312-11 and 324-11 are new test methods for the IA staff, therefore it was determined the test methods were a good topic of review and testing for the annual recertification exercise.

#### **3.3. 2012 INDEPENDENT ASSURANCE ANNUAL MEETING**

The IA Annual Meeting was held on December 4, 2012. FHWA, METS, district IA staff, local assistance IA staff and District Materials Engineers were in attendance. Attendance by district IA staff is mandatory for IA recertification.

The following topics were covered:

- Overview of IA program in 2012
- Caltrans transition to Superpave mix design
- 2012 Reference Sample Program
- Scale Calibration
- AASHTO T335
- District and Local Assistance IA issues

#### **3.4. DISTRICT IA PROCESS REVIEW/DISTRICT LAB REVIEWS**

The *Independent Assurance Manual* requires an annual process/peer review to verify district compliance with Caltrans policies regarding independent assurance. The review consists of an examination of IA documents, records and procedures. METS IA staff conducts the review of the district IA program implementation. These reviews are intended to promote statewide uniformity in the Caltrans IA Program.

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Districts were reviewed by METS IA staff in 2012. In general, all districts have improved their filing systems. METS IA staff will continue to conduct process reviews in 2013.

Additionally, it was recommended in the 2011 FHWA process review that METS staff conduct audits/reviews of the District Materials Laboratories. METS IA staff reviewed the files, equipment and calibration records in Districts 1, 5, 6, 9, 10 and 11. District 2 was not reviewed since this laboratory was recently AMRL accredited. The Southern Regional lab was not reviewed since it is in the process of setting up and preparing for AMRL accreditation in 2013. District 12 does not have a main laboratory. The District 3 and 4 laboratories will be reviewed in early 2013.

### **3.5. TECHNICIAN QUALIFICATION**

District IA staff, METS IA staff and local assistance IA staff qualified a total of 2927 technicians in 2012. This is an increase from the 2855 technicians accredited in 2011.

#### **3.5.1 TECHNICIAN DISQUALIFICATIONS**

Thirty two (32) technicians were disqualified by statewide IA staff due to use of improper test procedures. In most cases, the technician qualifications were suspended until a deficiency was corrected. After the correction was made, the qualification was reinstated.



### 3.6 WRITTEN EXAM AND PRACTICAL STATISTICS

The 2012 data provided for the written exams and practical exams is shown in Table 2.

TABLE 2: 2012 EXAM STATISTICS												
DIST.	INITIAL WRITTEN EXAM FOR QUALIFICATION				INITIAL PRACTICAL EXAM FOR QUALIFICATION				WITNESS OR CORROBORATION TEST FOR REQUALIFICATION			
	# OF TOTAL EXAMS	# FAIL 1ST TIME	# FAIL 2ND TIME	# FAIL 3RD TIME	TOTAL EXAMS	# FAIL 1ST TIME	# FAIL 2ND TIME	# FAIL 3RD TIME	TOTAL EXAMS	# FAIL 1ST TIME	# FAIL 2ND TIME	# FAIL 3RD TIME
1	170	10	6	0	140	6	1	0	409	1	0	0
2	490	43	4	0	345	4	0	0	1259	32	4	0
3	752	104	10	0	549	4	0	0	1043	0	0	0
4	515	39	1	0	497	30	2	0	601	20	1	0
5	394	72	7	3	265	23	1	0	506	26	3	0
6	1386	337	24	4	1211	96	6	0	645	6	0	0
7	661	103	14	3	395	7	1	0	2158	9	0	0
8	894	144	24	4	416	8	0	0	1954	2	1	0
9	122	14	1	0	99	3	0	0	199	0	0	0
10	701	129	9	1	460	24	1	0	1188	8	0	0
11	839	102	1	0	600	50	0	0	797	0	0	0
12	450	94	2	0	248	4	3	0	687	3	0	0
METS IA	141	15	0	0	135	7	0	0	228	0	0	0
LIA 1,2,3	254	27	1	0	210	12	0	0	203	201	2	0
LIA 4,CR	650	81	3	2	494	6	0	0	652	4	0	0
LIA 6, SR	406	27	1	0	367	1	0	0	380	10	0	0
LIA 11,12	169	32	0	0	94	0	0	0	172	0	0	0

Note: NR SR – Northern Region Structures staff covering District 1, 2 and 3  
 LIA 1, 2, 3 – Local Assistance IA staff covering District 1, 2 and 3  
 LIA 4, CR – Local Assistance IA staff covering District 4 and Central Region  
 LIA 6, SR – Local Assistance IA staff covering southern District 6, 7, 8 and 9

These numbers have decreased significantly in D-1, 4, and 9 compared to the 2011 numbers. This is due to the 2011 implementation of two year qualifications for testers that have demonstrated several years of consistent proficiency in a test method.

In 2011, the Southern Regional lab merged the area of coverage for the IA staff in D-7, D-8 and D-12. Therefore, staff in these districts may qualify testers in other two districts. The numbers reported represent the exams given to testers in any of the three districts by the D-7, D-8 and D-12 IA staff assigned to the Southern Regional lab.



### **3.6.1 PRACTICAL EXAMS FOR TECHNICIAN QUALIFICATION**

The 2012 data for the practical exams have also decreased in D-1, 4 and 9 compared to 2011. Again, this is due to the implementation of two year qualifications for testers that have demonstrated proficiency in a test method.

## **3.7 LABORATORY ACCREDITATION**

In 2012, METS IA, district IA staff and local assistance IA staff accredited a total of 440 Caltrans, local agency and commercials laboratories. This is a slight decrease from the 454 laboratories accredited in 2011.

### **3.7.1 LABORATORY ACCREDITATION, REVOCATION AND DISPUTE RESOLUTION**

Section 2.5, “Dispute Resolution” of the *Caltrans Independent Assurance Manual* states:

“A tester or laboratory may have its entire qualification or accreditation or its qualification or accreditation for specific test methods suspended or revoked if it is found not to conform to IA accreditation requirements.”

In 2012, four laboratories had their accreditation suspended due to improper testing procedures and equipment. Once the deficiencies were corrected, the laboratory accreditation was reinstated.

## **3.8 CALTRANS LABORATORIES— EQUIPMENT AND CALIBRATION**

Since 2002, METS has been instrumental in providing funding for testing equipment for the District Laboratories and Construction field laboratories throughout the state. Funding was provided by METS to the districts in 2012 to purchase gyratory compactors and Hamburg Wheel Track test machines in the move toward Superpave mix design implementation.

### **3.8.1 PROPER CALIBRATION OF TESTING EQUIPMENT**

A METS IA staff person calibrates all large testing equipment in the district laboratories. In addition, METS IA staff performs calibration of presses and compactors for Caltrans and local agencies on an annual basis. This ensures that all Caltrans’ local agency large testing equipment is being calibrated uniformly.

In 2012, METS IA staff calibrated large equipment in 13 Caltrans and 17 local agency laboratories. The staff person responsible for large equipment calibration in the district labs and local agency laboratories will be retiring in 2013. METS will no longer perform this function,

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therefore district labs and local agencies will be required to find an outside vendor to calibrate all large testing equipment in mid 2013.

For smaller equipment, local IA staff is responsible for verifying the calibration of all testing equipment in accredited field laboratories. In some districts, IA staff is responsible for calibration of equipment in the district and field laboratories. In other districts, IA staff reviews the calibration records for district and field laboratories from private calibration services. Overall, all calibration records are reviewed by district IA staff, whether they are directly responsible for calibration of the equipment or not. The *Independent Assurance Manual* covers calibration procedures for equipment such as larger presses and scales.

### 3.9 CALTRANS REFERENCE SAMPLE PROGRAM (RSP) IN 2012

The *Independent Assurance Manual*, Section 2.4.4, “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 evaluated using a statistical evaluation system for determining the numerical ratings of each test method as detailed in the *Independent Assurance Manual*.

In 2012, samples of fine aggregate were distributed to participating laboratories. There were fewer samples distributed than planned in 2012, due to a decrease in staffing in 2011 and early 2012.

The full report for the 2012 Reference Sample Program is located in Appendix A.

#### 3.9.1 GOALS FOR REFERENCE SAMPLE PROGRAM IN 2013

The technician staff in the RSP lab was increased in late 2012. This will allow the RSP program to distribute more samples in 2013. The following table gives an approximate timeline for the 2013 reference sample program:

2013	Sample Type
First quarter	Coarse Aggregate
Second quarter	HMA
Third quarter	Portland Cement Concrete



### **3.10 LOCAL ASSISTANCE INDEPENDENT ASSURANCE PROGRAM**

Chapter 16, Section 16.14, “Quality Assurance Program,” of the Caltrans Local Assistance Procedures Manual, states “**local agencies must follow Caltrans Quality Assurance Procedures (QAP) for all projects on the NHS**”. Therefore, for local agency projects on the NHS, Caltrans IA staff is responsible for providing IA services to local agencies.

Five local assistance IA staff positions were filled in December 2008. Implementation of the Local Assistance IA program began in March 2009. Local Assistance IA staff interacts on a regular basis with the district local assistance engineer (DLAE).

In addition to providing IA services, the Local Assistance IA staff reviews local agency Quality Assurance Program (QAP) manuals for compliance with Caltrans Local Assistance requirements. In 2012, 7 local agency QAP manuals were reviewed by Local Assistance IA staff.

QAP manuals are required to be updated every five years. Local assistance IA staff began the QAP manual review in 2009, so it is anticipated that a majority of the QAP manuals will require renewal in 2014.

## **4.0 CALTRANS INDEPENDENT ASSURANCE HIGHLIGHTS FOR 2012**

### **4.1 SUPERPAVE MIX DESIGN IMPLEMENTATION BY 2014**

In early 2012, Caltrans began its transition from Hveem mix design to Superpave mix design through the development of a Hot Mix Asphalt (Superpave) specification for use on pilot projects throughout the state. To support Superpave implementation, Superpave Gyratory compactors and Hamburg Wheel Track Testing devices were purchased by METS for all the District Materials laboratories. Also in 2012, METS staff began training the district laboratory materials staff and IA personnel on the use of the Superpave Gyratory compactor and Hamburg Wheel Track Testing device.

In 2012, 6 pilot projects included the new Hot Mix Asphalt (Superpave) specification. In 2013, an additional 10 to 12 projects will include the new Superpave specification. Full implementation of the use of Superpave mix design on all hot mix asphalt projects is anticipated by 2014.

### **4.2 INDEPENDENT ASSURANCE MANUAL REVISIONS**

As a result of lessons learned from the implementation of the 2005 *Independent Assurance Manual*, changes are needed to the current manual. Revisions to the manual are planned for 2013.

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### **4.3 FOLLOW-UP VISIT - QUALITY ASSURANCE (QA) STEWARDSHIP REVIEW IN 2012**

In 2004, representatives for the Federal Highway Administration (FHWA) conducted a quality assurance review of Caltrans. The objective of the review was to review Caltrans Quality Assurance practices and procedures. Since the Independent Assurance program is an integral component of the Quality Assurance Program, there was also a review of the IA program practices and procedures.

In 2011, FHWA staff returned to California as follow-up to its 2004 review. Caltrans Quality Assurance program practices were reviewed in Headquarters, District 4 and District 10. As a result of the 2011 review, it was recommended by FHWA that the FHWA Division Office and Caltrans conduct a follow-up review in District 4. The purpose of the follow-up visit was to see if timely sampling and testing was completed on federal-aid highway project.

Caltrans field testing laboratories and resident engineer's offices were visited and the records for sixteen projects throughout District 4 were reviewed. With few exceptions, the testing turnaround times were within or near the standards found in the Caltrans Construction Manual.

### **4.4 AASHTO ACCREDITATION OF CALTRANS DISTRICT MATERIALS LABORATORIES**

As Caltrans moves towards implementing national standards, the issue of AASHTO accreditation of district materials laboratories has come to the attention of METS management. In the past, the main Transportation Laboratory in Sacramento was accredited by AMRL and CCRL, and the district labs were under the umbrella of the Sacramento accreditation.

In 2012, the District 2 Materials laboratory received AASHTO accreditation. In 2013, the District 6 Materials laboratory and the Southern Regional laboratory are preparing for AASHTO accreditation.

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