Caltrans Local Assistance

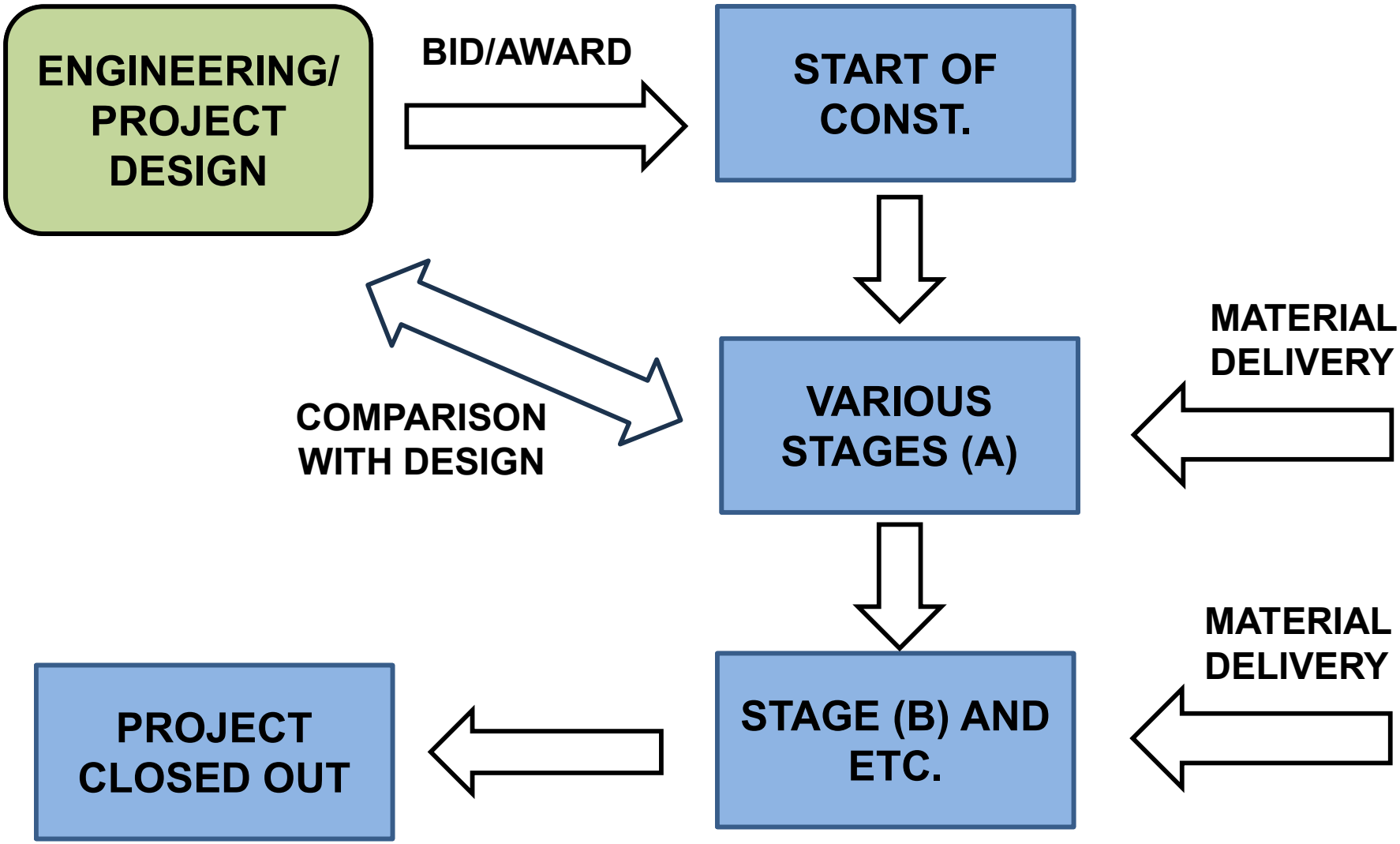
RESIDENT ENGINEER ACADEMY

Module 5

Control of Materials

January 2025

Project Workflow

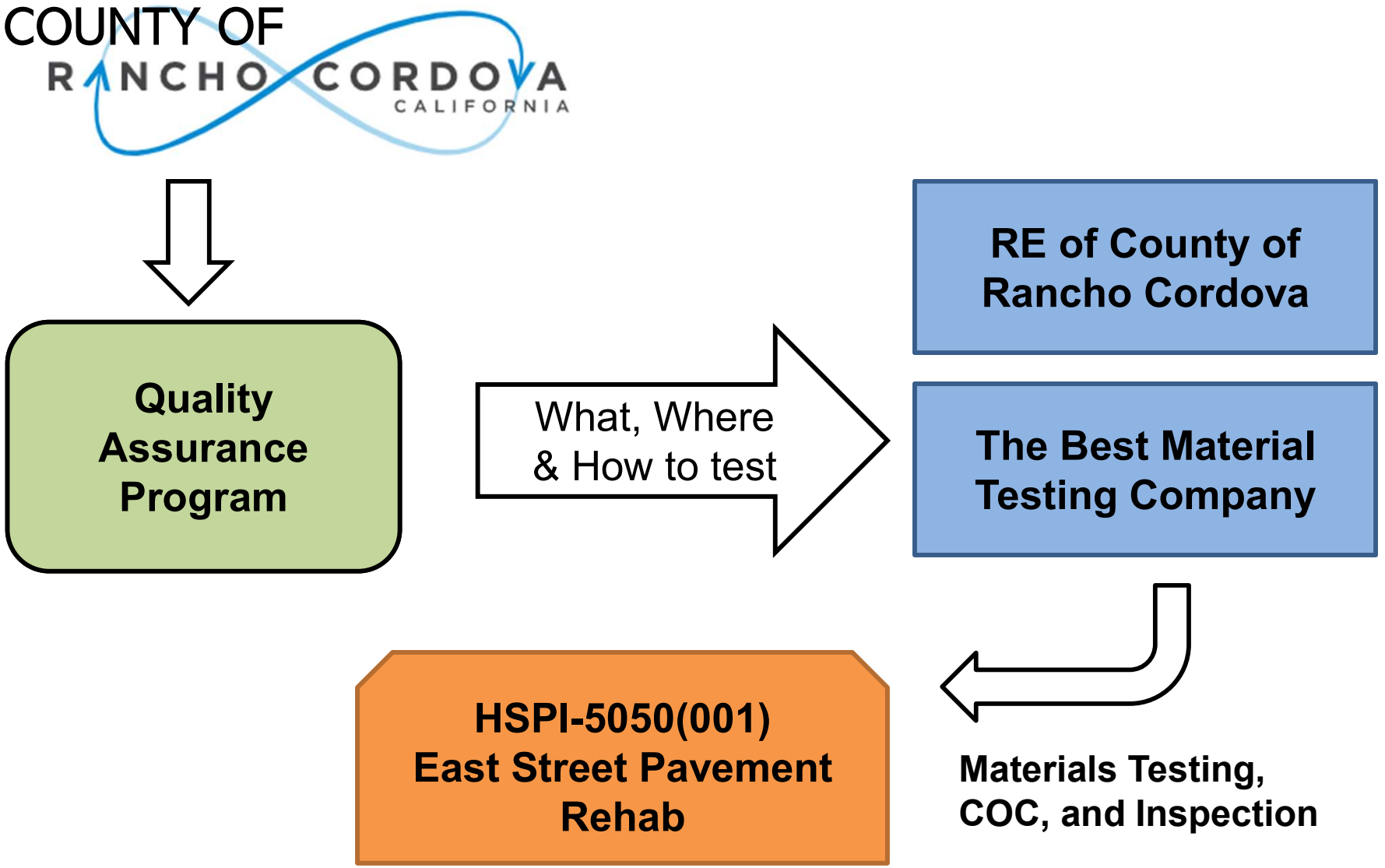


Control of Materials & Quality Assurance Program (QAP)

This module, you will be able to….

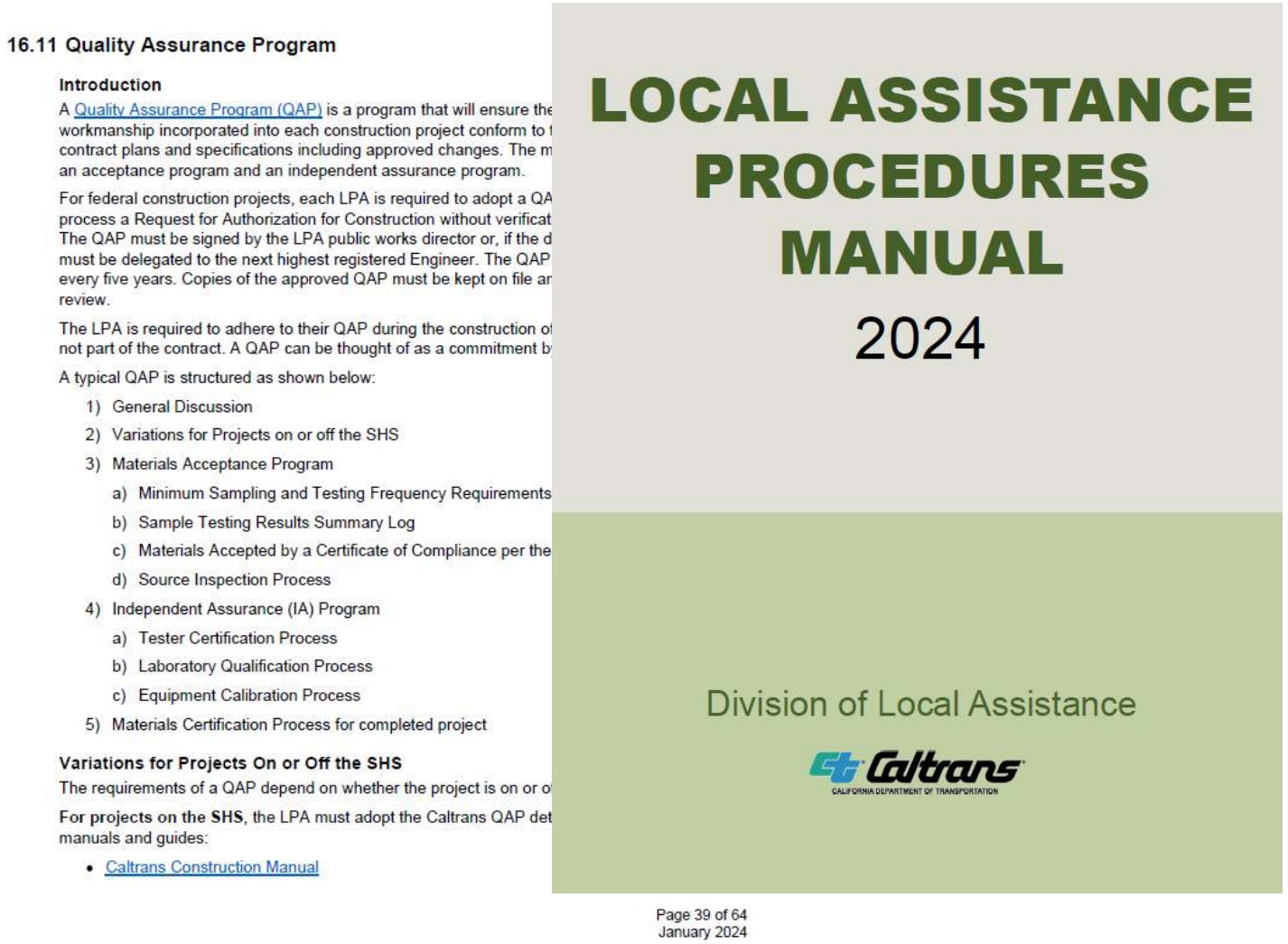
- Find helpful resources
- Know basic materials “concepts”
- Understand the key elements of a QAP
- Update and implement QAP
- Perform proper record keeping

QAP Workflow



Helpful Resources

LAPM 16.11 Quality Assurance Program



16.11 Quality Assurance Program

Introduction

A Quality Assurance Program (QAP) is a program that will ensure the workmanship incorporated into each construction project conform to t contract plans and specifications including approved changes. The m an acceptance program and an independent assurance program.

For federal construction projects, each LPA is required to adopt a QA process a Request for Authorization for Construction without verificat The QAP must be signed by the LPA public works director or, if the d must be delegated to the next highest registered Engineer. The QAP every five years. Copies of the approved QAP must be kept on file ar review.

The LPA is required to adhere to their QAP during the construction o not part of the contract. A QAP can be thought of as a commitment b

A typical QAP is structured as shown below:

1) General Discussion
2) Variations for Projects on or off the SHS
3) Materials Acceptance Program
   a) Minimum Sampling and Testing Frequency Requirements
   b) Sample Testing Results Summary Log
   c) Materials Accepted by a Certificate of Compliance per the
   d) Source Inspection Process
4) Independent Assurance (IA) Program
   a) Tester Certification Process
   b) Laboratory Qualification Process
   c) Equipment Calibration Process
5) Materials Certification Process for completed project

Variations for Projects On or Off the SHS

The requirements of a QAP depend on whether the project is on or o

For projects on the SHS, the LPA must adopt the Caltrans QAP det manuals and guides:

- Caltrans Construction Manual

LOCAL ASSISTANCE PROCEDURES MANUAL

2024

Division of Local Assistance

Caltrans
CALIFORNIA DEPARTMENT OF TRANSPORTATION

Page 39 of 64
January 2024

https://dot.ca.gov/-/media/dot-media/programs/local-assistance/documents/reports/qap-manual.pdf

Helpful Resources

CALIFORNIA DEPARTMENT OF TRANSPORTATION

CONSTRUCTION MANUAL

2023 edition

Caltrans

Chapter 6

Chapter 6 Sampling and Testing

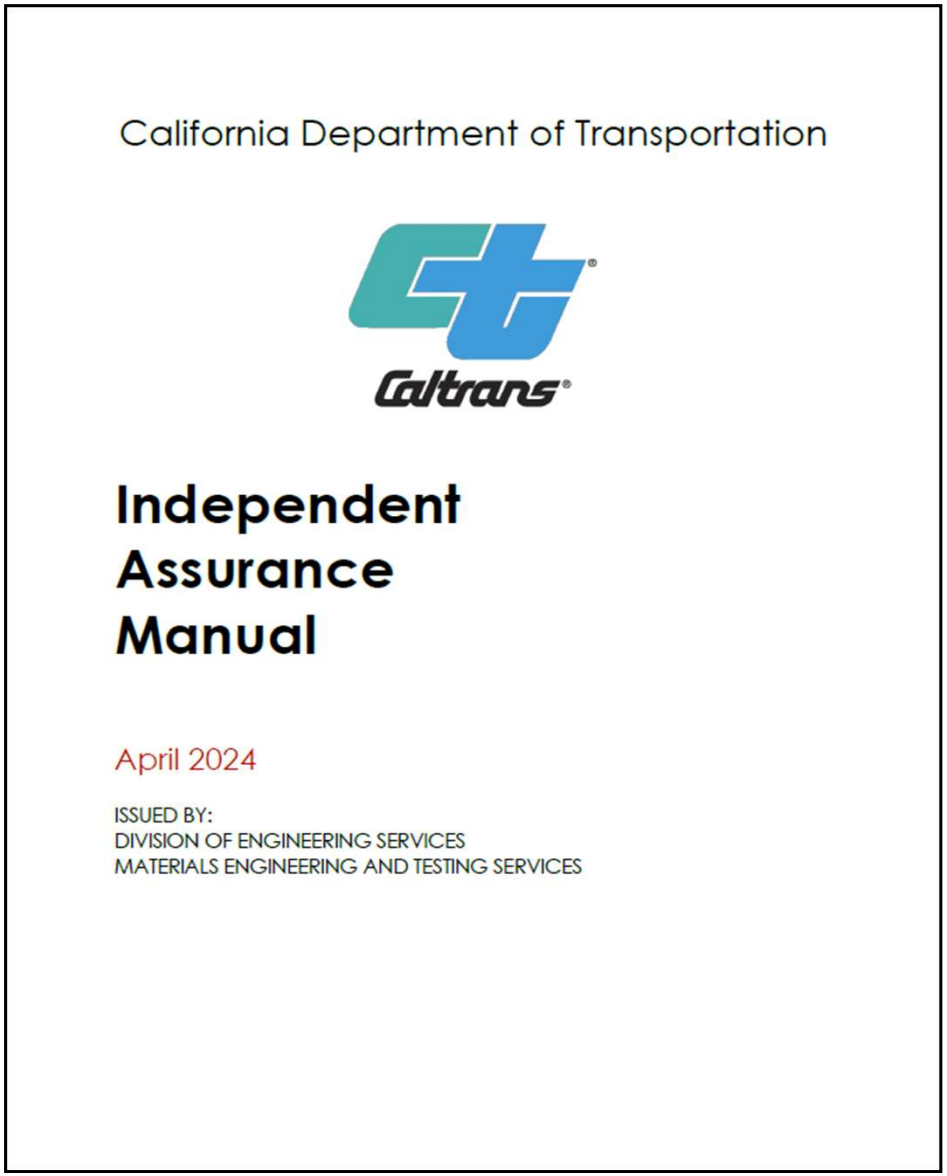
https://dot.ca.gov/-/media/dot-media/programs/construction/documents/policies-procedures-publications/construction-manual/sec6-1.pdf

Helpful Resources

- Tester Qualification
- Laboratory Accreditation
- Reference Sample Program

Google search:
Caltrans IA or Caltrans Independent Assurance

Send request to:
IA.SERVICE.REQUEST@dot.ca.gov



Helpful Resources

6 Key Resources:

1. Local Assistance Procedures Manual (LAPM)
2. Quality Assurance Programs Manual (QAPM)
3. Construction Manual (Ch. 6) of CTSS
4. Independent Assurance Manual
5. Index to California Test Methods (CTM)
6. Standard Specifications/Special Provisions

Basic Materials "Concepts"

Why Do We Sample and Test?

- Establish the quality of materials entering the work
- Ensure all materials incorporated into the work meet contract specifications
- Check other samples, tests, testers, and equipment

Basic Materials “Concepts”

Concept #1

- Failing material tests are **always** the problem of the Contractor.
- Failing material tests are **never** the problem of the RE, provided you take appropriate action in a timely manner.
- If the RE does not act in a timely manner, failing material tests **always** become the problem of the Resident Engineer.

Basic Materials "Concepts"

Concept #2

RE has the right to…

- Sample
- Test
- Inspect
- Reject …material at the jobsite

"***The Engineer may reject work that does not comply with the Contract <u>at any time</u>, including after a payment has been made.***"

Section 5-1.01 and 5-1.03 CTSS

Basic Materials "Concepts"

Concept #3

- Not paying for a material that fails to meet a contract requirement, but allowing it to remain in place, is not an acceptable solution.
- Material good enough to be left in place has some value and should be paid for at that value.
- If the material has no value then it is not good enough to be left in the completed work.

Basic Materials “Concepts”

Concept #4

- **All** materials entering the work must meet the *contract requirements* for that item.
- If material that does not meet the contract requirements is to remain in the work, a contract change order (CCO) is required.

What is a Quality Assurance Program

A sampling and testing program that will provide assurance that the *materials and workmanship* incorporated in each roadway/highway construction project are in *conformance with* the *contract specifications.*

Chapter 16.11 LAPM, Quality Assurance Program

Quality Assurance Program (QAP)

- Required for all LPA seeking federal-aided projects
- Signed by public works director or next highest PE
- Updated once every 5 years, or more often
- No E76 “without verification of an adopted QAP”
  - send in QAP to area engineer for verification

What is a Quality Assurance Program

A Quality Assurance Program (QAP) is the document by which an *auditor/reviewer* will determine if adequate testing/QA was performed on your project.

Structure of a Typical QAP

A. General Discussion

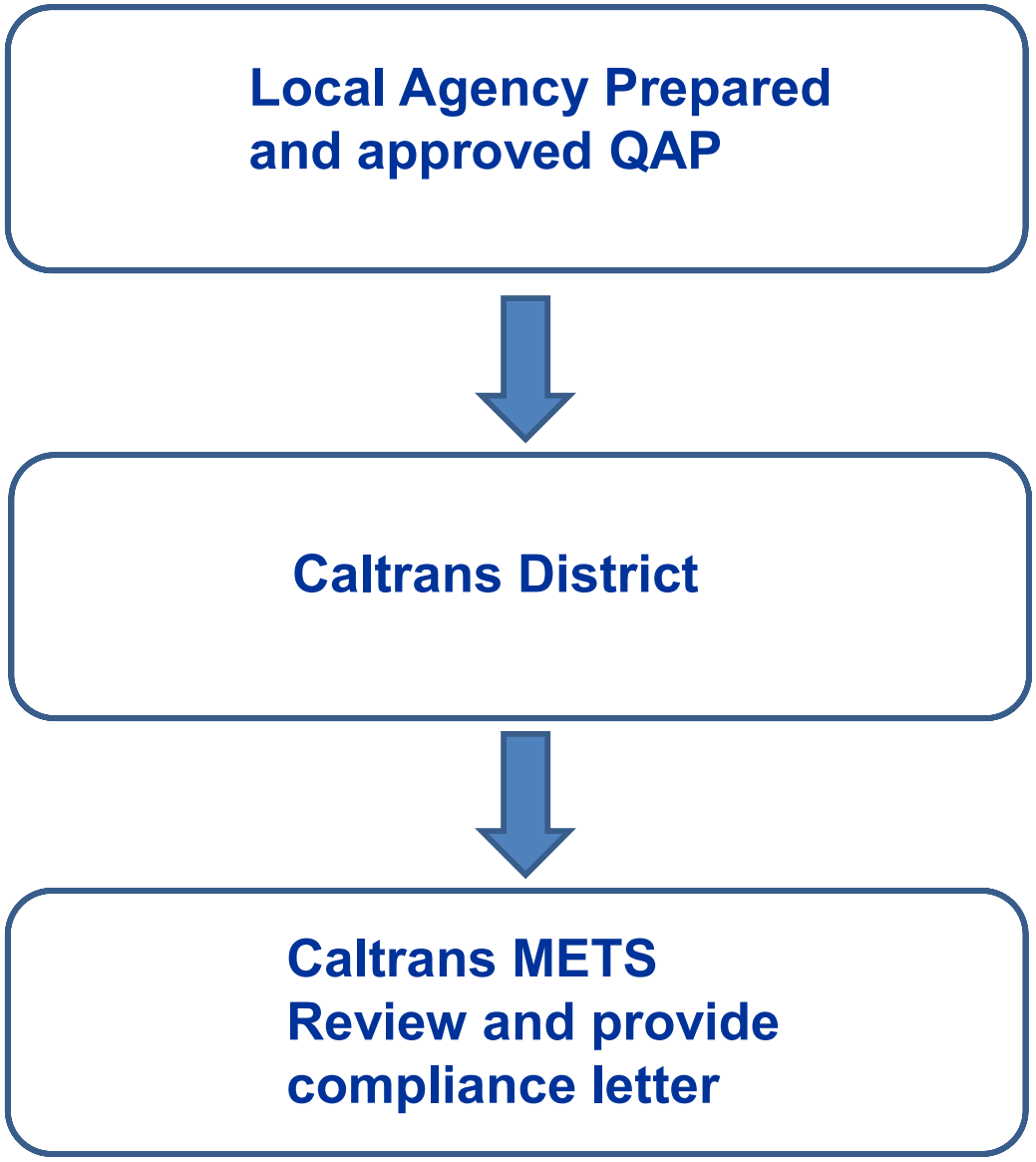
- Variations for SHS, NHS, Non-NHS projects
- Acceptance Program elements
- IA Program elements
- Dispute resolution process
- Filing of QA Documents

Structure of a Typical QAP

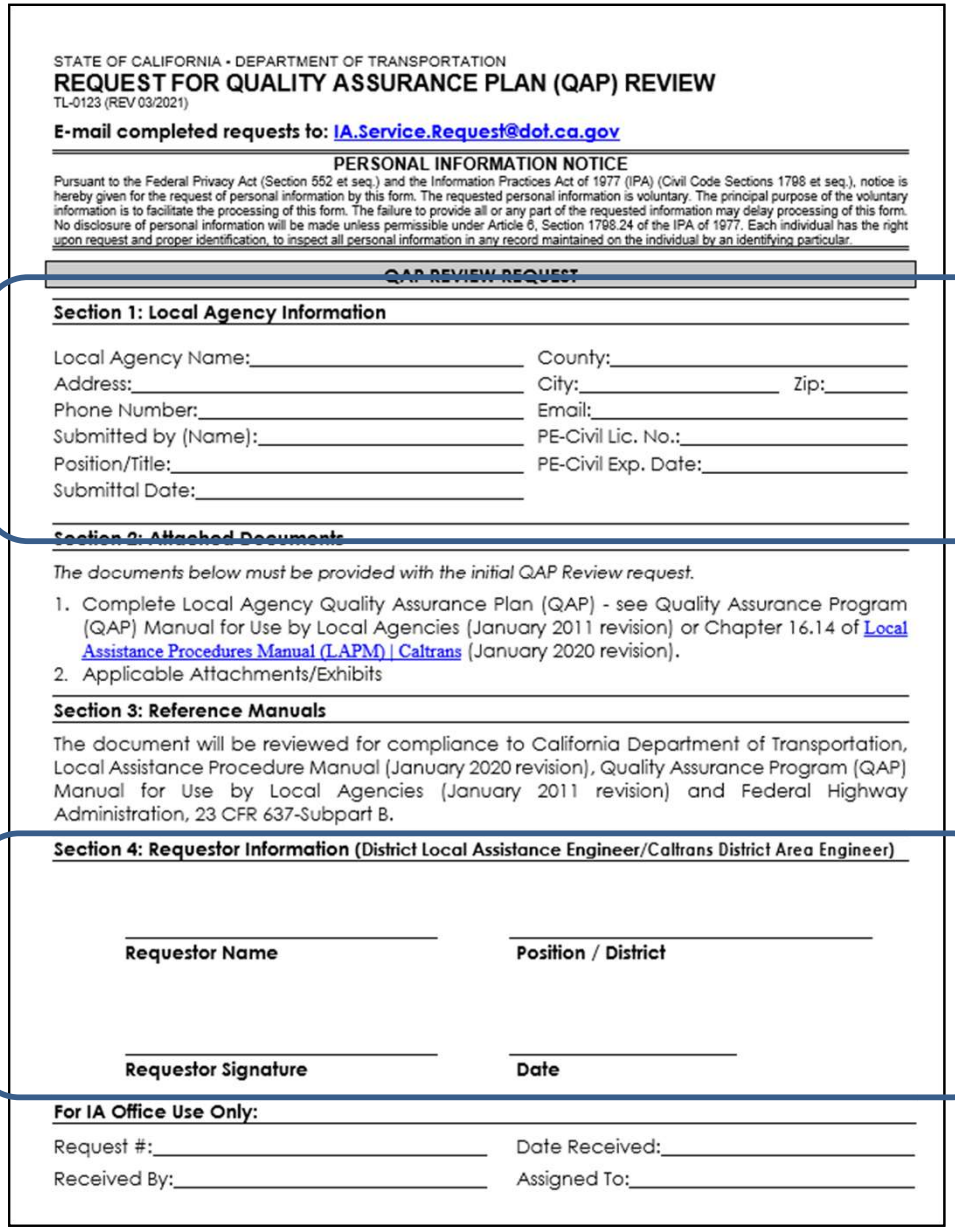
B. Tables and Attachments

- Sampling and Testing Frequency Requirements.
- Materials Accepted by a Certificate of Compliance.
- Testing Results Summary Log.
- QA Filing Index (recommended).

QAP Review Process



QAP Review Request Form



STATE OF CALIFORNIA • DEPARTMENT OF TRANSPORTATION

REQUEST FOR QUALITY ASSURANCE PLAN (QAP) REVIEW

TL-0123 (REV 03/2021)

E-mail completed requests to: IA.Service.Request@dot.ca.gov

PERSONAL INFORMATION NOTICE

Pursuant to the Federal Privacy Act (Section 552 et seq.) and the Information Practices Act of 1977 (IPA) (Civil Code Sections 1798 et seq.), notice is hereby given for the request of personal information by this form. The requested personal information is voluntary. The principal purpose of the voluntary information is to facilitate the processing of this form. The failure to provide all or any part of the requested information may delay processing of this form. No disclosure of personal information will be made unless permissible under Article 6, Section 1798.24 of the IPA of 1977. Each individual has the right upon request and proper identification, to inspect all personal information in any record maintained on the individual by an identifying particular.

QAP REVIEW REQUEST

Section 1: Local Agency Information

Local Agency Name:_____ County:_____

Address:_____ City:_____ Zip:_____

Phone Number:_____ Email:_____

Submitted by (Name):_____ PE-Civil Lic. No.:_____

Position/Title:_____ PE-Civil Exp. Date:_____

Submittal Date:_____

Section 2: Attached Documents

The documents below must be provided with the initial QAP Review request.

1. Complete Local Agency Quality Assurance Plan (QAP) - see Quality Assurance Program (QAP) Manual for Use by Local Agencies (January 2011 revision) or Chapter 16.14 of Local Assistance Procedures Manual (LAPM) | Caltrans (January 2020 revision).
2. Applicable Attachments/Exhibits

Section 3: Reference Manuals

The document will be reviewed for compliance to California Department of Transportation, Local Assistance Procedure Manual (January 2020 revision), Quality Assurance Program (QAP) Manual for Use by Local Agencies (January 2011 revision) and Federal Highway Administration, 23 CFR 637-Subpart B.

Section 4: Requestor Information (District Local Assistance Engineer/Caltrans District Area Engineer)

Requestor Name **Position / District**

Requestor Signature **Date**

For IA Office Use Only:

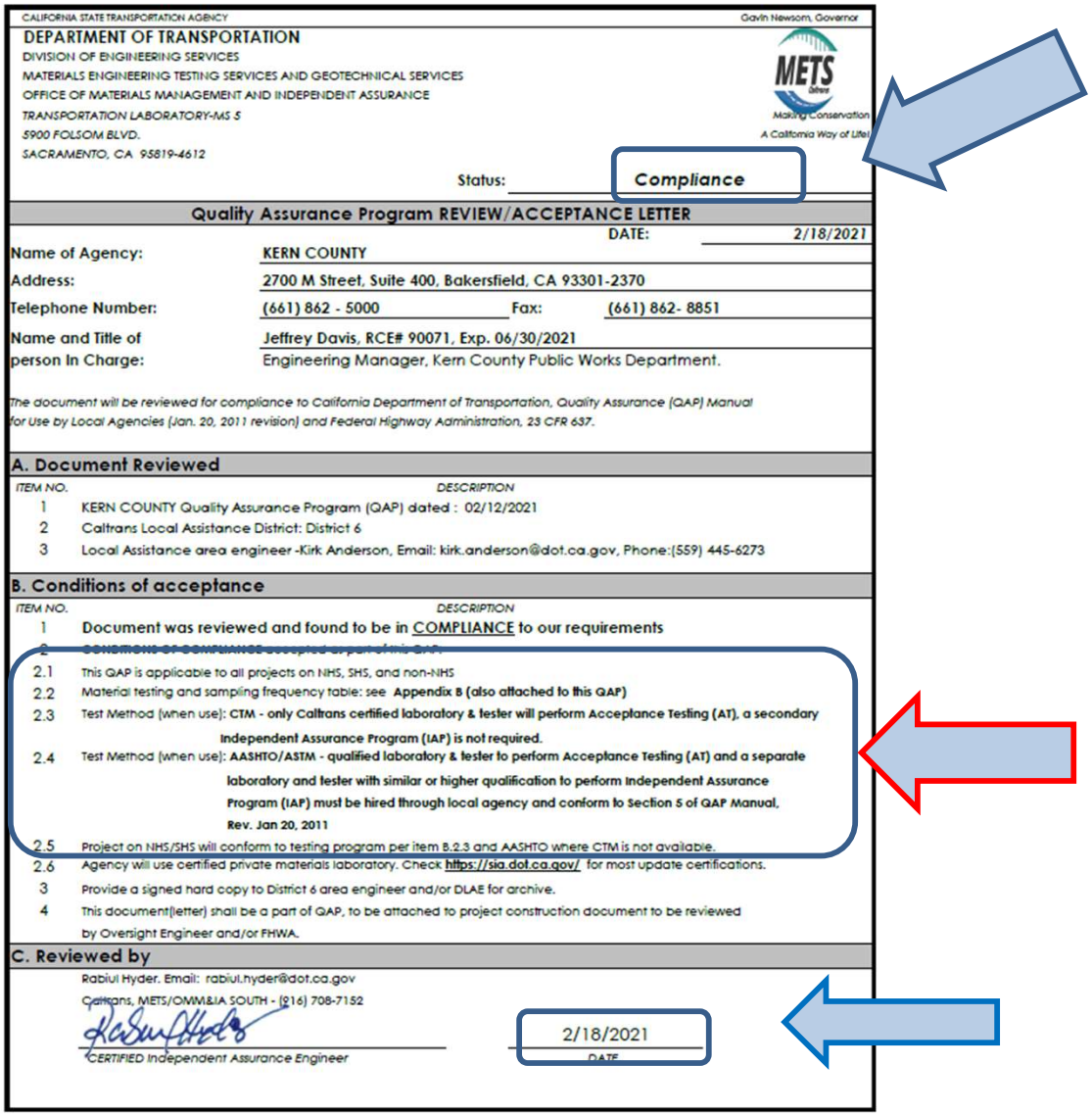
Request #:_____ Date Received:_____

Received By:_____ Assigned To:_____

Local Agency

Caltrans District

QAP Acceptance Letter



CALIFORNIA STATE TRANSPORTATION AGENCY — Gavin Newsom, Governor

DEPARTMENT OF TRANSPORTATION
DIVISION OF ENGINEERING SERVICES
MATERIALS ENGINEERING TESTING SERVICES AND GEOTECHNICAL SERVICES
OFFICE OF MATERIALS MANAGEMENT AND INDEPENDENT ASSURANCE
TRANSPORTATION LABORATORY-MS 5
5900 FOLSOM BLVD.
SACRAMENTO, CA 95819-4612

METS — Making Conservation A California Way of Life

Status: **Compliance**

Quality Assurance Program REVIEW/ACCEPTANCE LETTER

DATE: 2/18/2021

Name of Agency:	KERN COUNTY
Address:	2700 M Street, Suite 400, Bakersfield, CA 93301-2370
Telephone Number:	(661) 862 - 5000 Fax: (661) 862- 8851
Name and Title of person In Charge:	Jeffrey Davis, RCE# 90071, Exp. 06/30/2021 Engineering Manager, Kern County Public Works Department.

The document will be reviewed for compliance to California Department of Transportation, Quality Assurance (QAP) Manual for Use by Local Agencies (Jan. 20, 2011 revision) and Federal Highway Administration, 23 CFR 637.

A. Document Reviewed

ITEM NO.	DESCRIPTION
1	KERN COUNTY Quality Assurance Program (QAP) dated : 02/12/2021
2	Caltrans Local Assistance District: District 6
3	Local Assistance area engineer -Kirk Anderson, Email: kirk.anderson@dot.ca.gov, Phone:(559) 445-6273

B. Conditions of acceptance

ITEM NO.	DESCRIPTION
1	Document was reviewed and found to be in COMPLIANCE to our requirements
2	~~CONDITIONS OF COMPLIANCE accepted as part of this QAP:~~
2.1	This QAP is applicable to all projects on NHS, SHS, and non-NHS
2.2	Material testing and sampling frequency table: see **Appendix B (also attached to this QAP)**
2.3	Test Method (when use): **CTM - only Caltrans certified laboratory & tester will perform Acceptance Testing (AT), a secondary Independent Assurance Program (IAP) is not required.**
2.4	Test Method (when use): **AASHTO/ASTM - qualified laboratory & tester to perform Acceptance Testing (AT) and a separate laboratory and tester with similar or higher qualification to perform Independent Assurance Program (IAP) must be hired through local agency and conform to Section 5 of QAP Manual, Rev. Jan 20, 2011**
2.5	Project on NHS/SHS will conform to testing program per item B.2.3 and AASHTO where CTM is not available.
2.6	Agency will use certified private materials laboratory. Check https://sia.dot.ca.gov/ for most update certifications.
3	Provide a signed hard copy to District 6 area engineer and/or DLAE for archive.
4	This document(letter) shall be a part of QAP, to be attached to project construction document to be reviewed by Oversight Engineer and/or FHWA.

C. Reviewed by

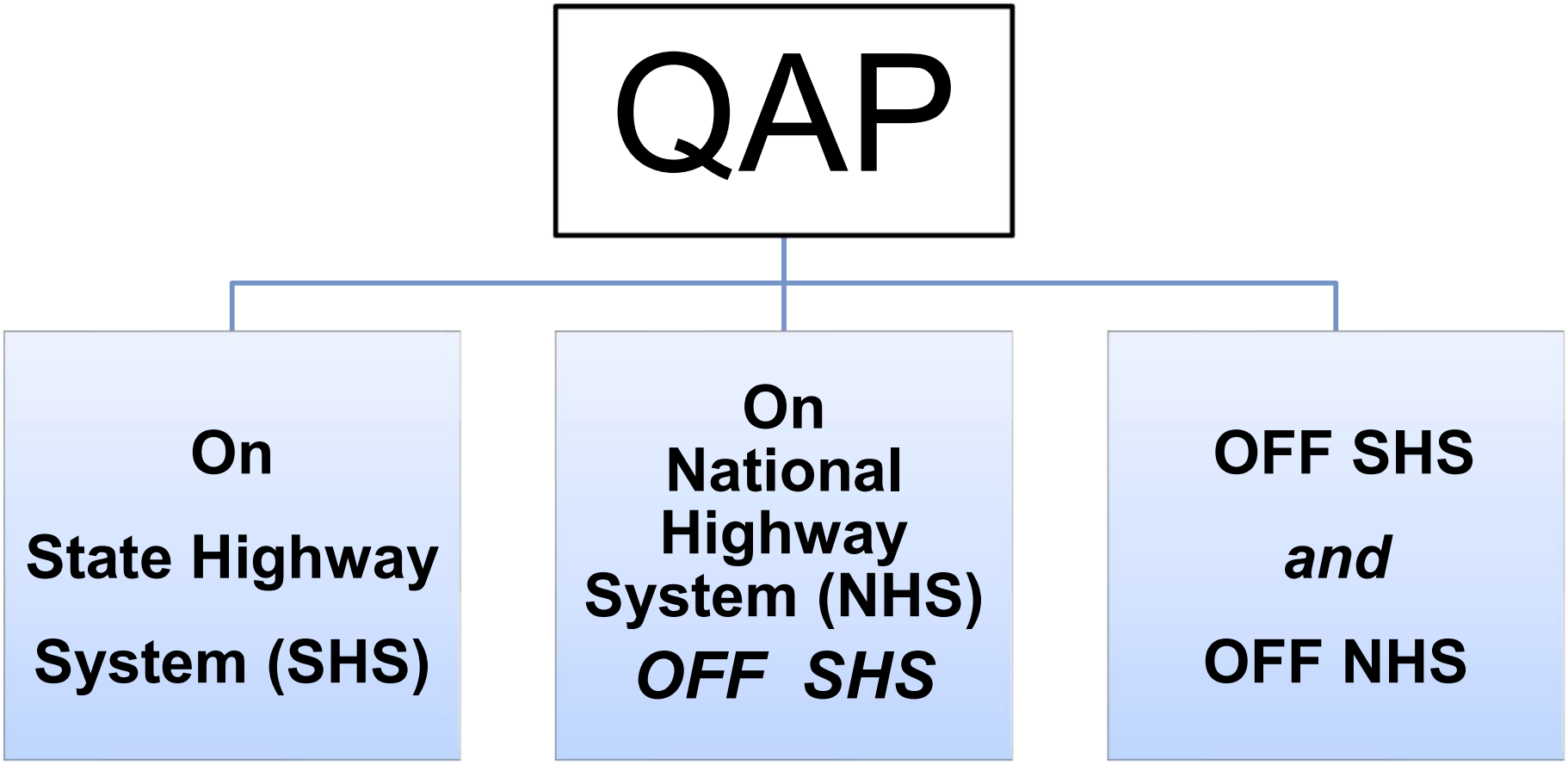
Rabiul Hyder. Email: rabiul.hyder@dot.ca.gov
Caltrans, METS/OMM&IA SOUTH - (916) 708-7152

CERTIFIED Independent Assurance Engineer

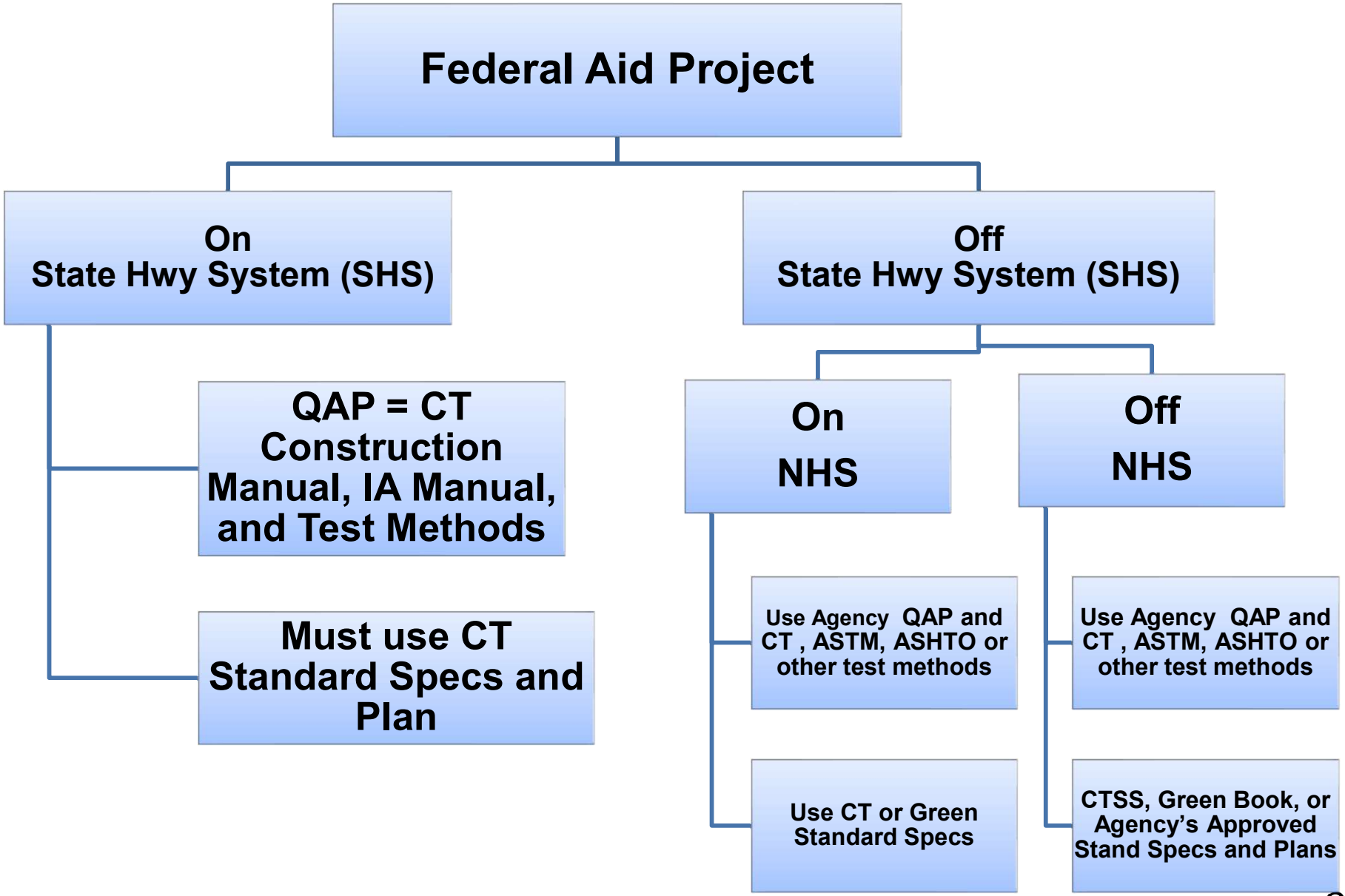
2/18/2021
DATE

Elements of a QAP

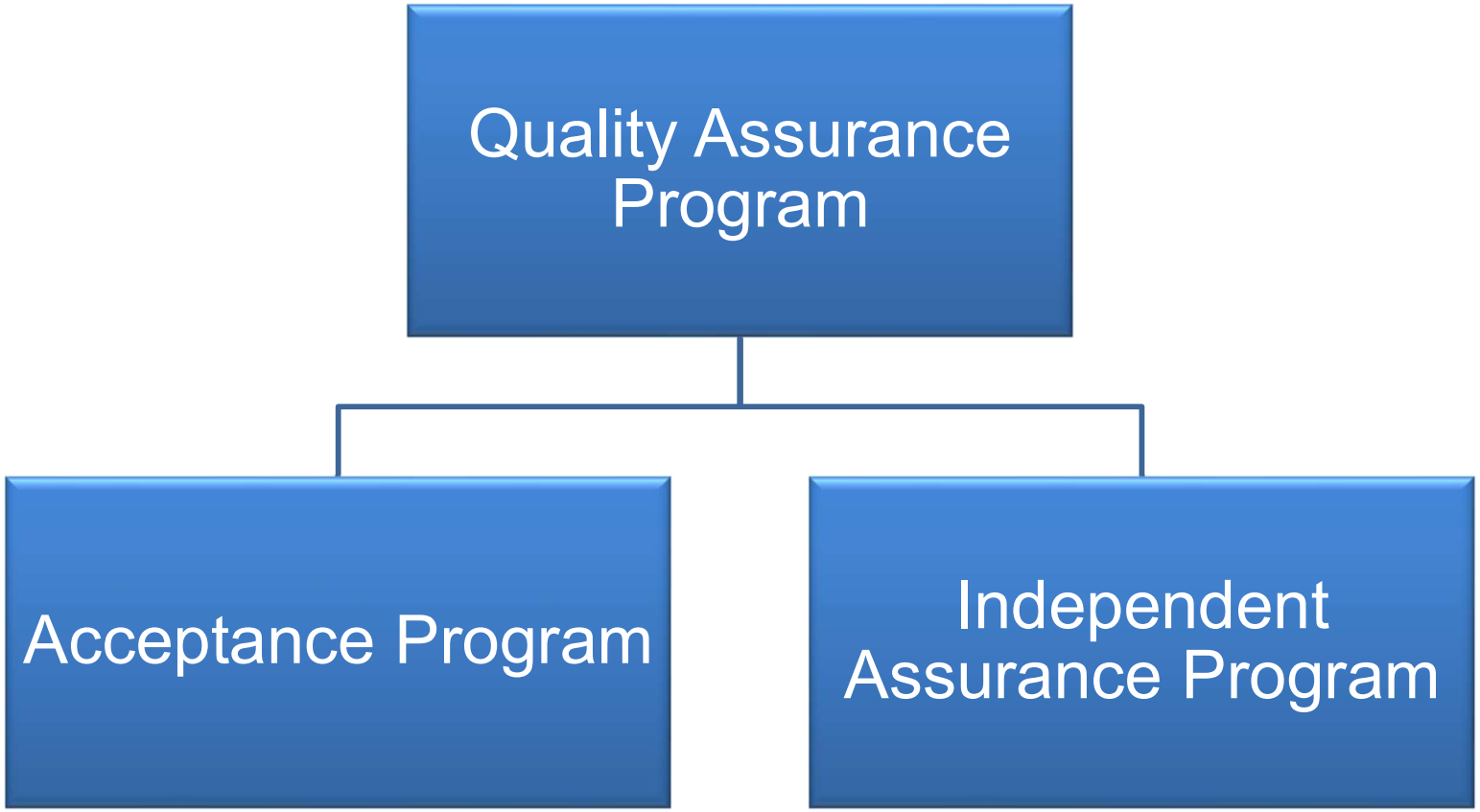
Variations within your QAP:



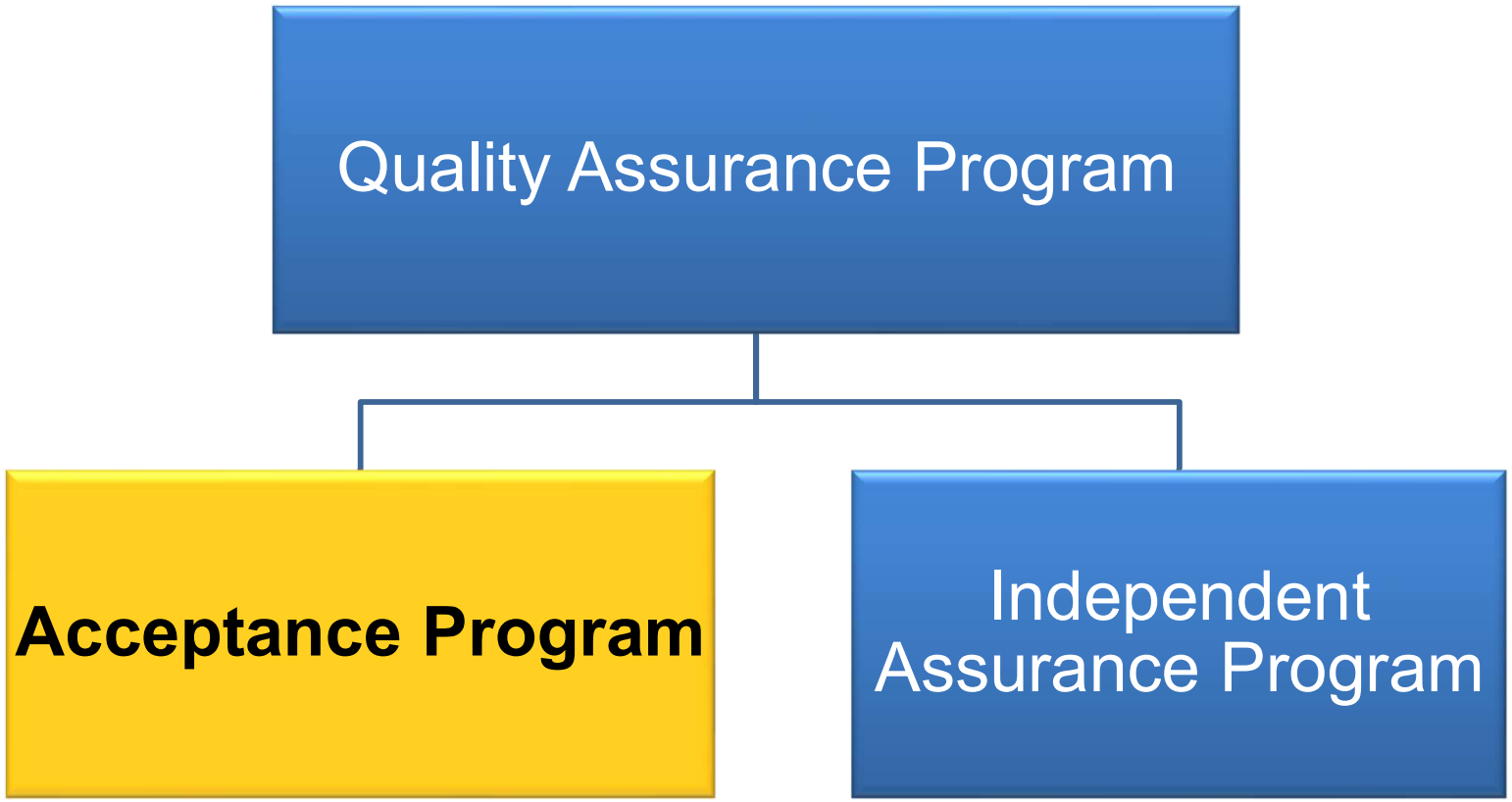
Elements of a QAP



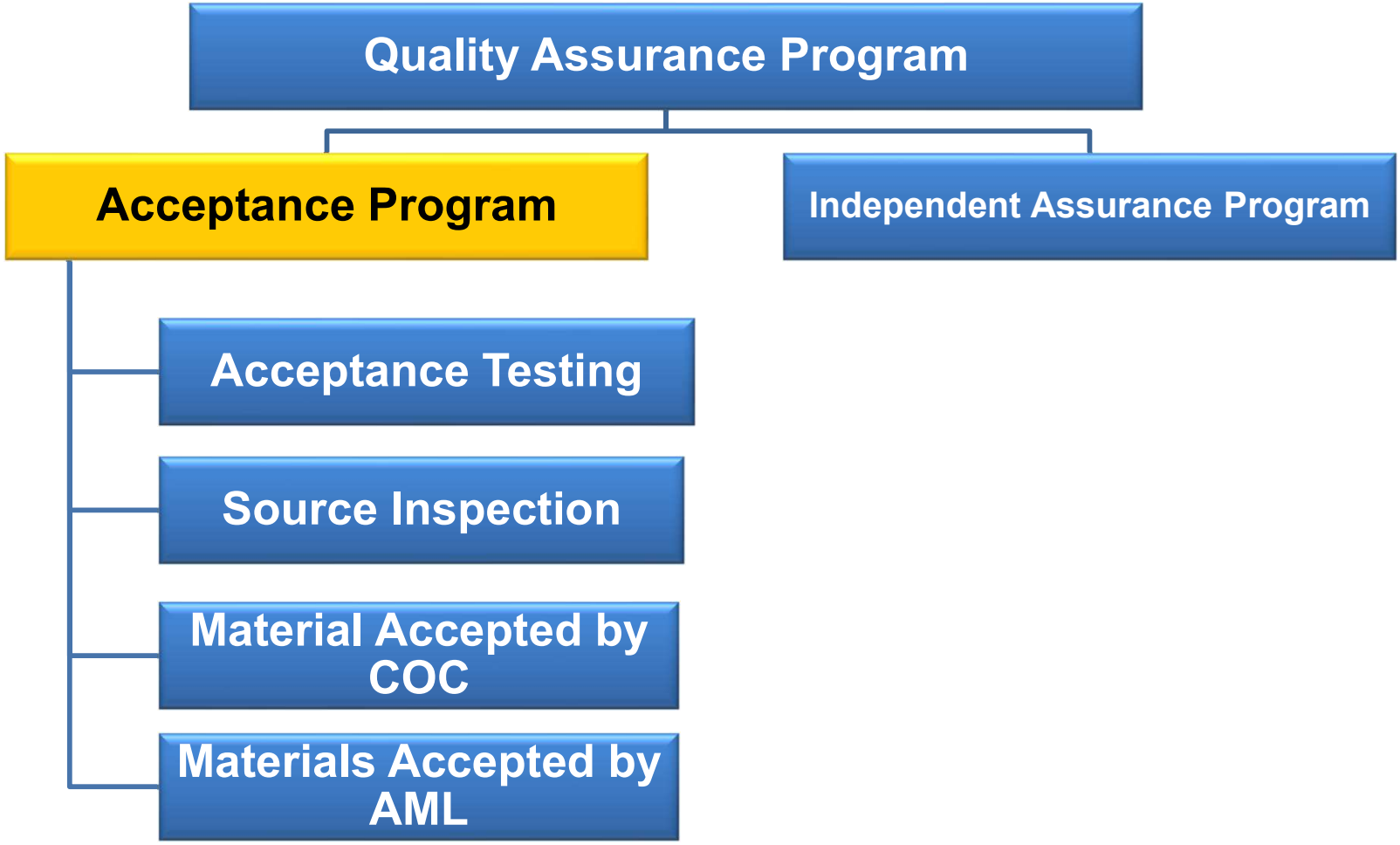
Elements of a QAP



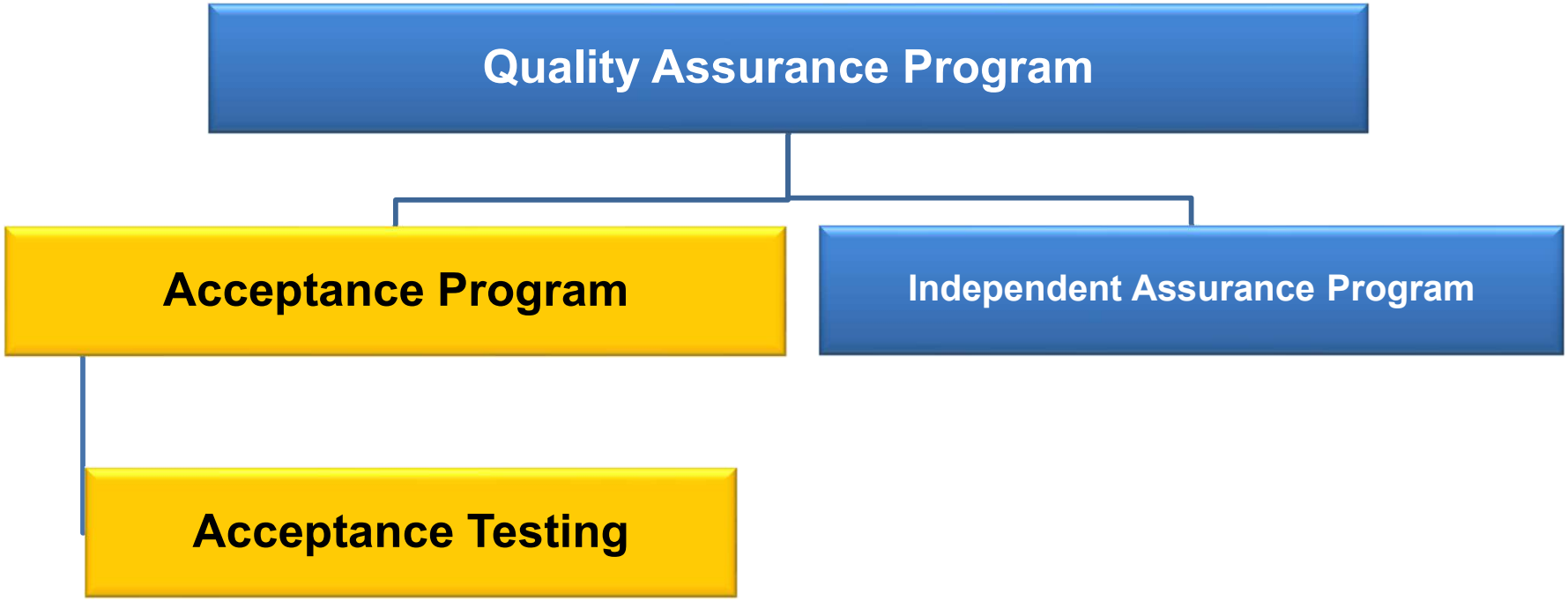
Elements of a QAP



Elements of a QAP



Elements of a QAP



- Verifies the materials and workmanship complies with the contract specs.
- Establishes the minimum number of acceptance tests to be used on each type of material to determine compliance –

Acceptance Program - Testing

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

Test	Test Method	Sample Size & Container Size	Sampling Location (Note 1)	Acceptance Test Frequency	Remarks
STRUCTURE BACKFILL (Section 19-3.02C)					
Sieve Analysis	California Test 202	50 lb	Materials site or stockpile	1 every 3,000 tons or 2,000 cu yd	If uniform material is within specification limits, test frequency may be decreased to 1 per day
Sand Equivalent	California Test 217	50 lb	Materials site or stockpile	1 every 3,000 tons or 2,000 cu yd	If uniform material is within specification limits, test frequency may be decreased to 1 per day
Relative Compaction	California Test 231	Sample for California Test 216	Project site in accordance with California Test 231	1 every 2,000 sq yd and test compaction at every 8 in. of thickness	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	Wet common-composite test maximum value may be used in accordance with California Test 231
PERVIOUS BACKFILL MATERIAL (Section 19-3.02D)					
Sieve Analysis	California Test 202	50 lb	Stockpile	1 every 3,000 tons or 2,000 cu yd	If uniform material is within specification limits, test frequency may be decreased to 1 per day
COMPACTION (Section 19-5)					
R-Value	California Test 301	50 lb	Project site	Test to verify R-value if differing site conditions are encountered	If R-value testing in the materials report is incomplete because of preproject conditions, then test to verify design R-value
Relative Compaction	California Test 231	Sample for California Test 216	California Test 216	1 every 2,000 sq yd	
Maximum Wet Density	California Test 216	35 lb	Relative compaction test site locations	1 every relative compaction test	

Table 6-1.2. Time Required for Materials Acceptance Tests (1 of 4)

Material and Test	Sample to Lab (Note 1) (business days)	Lab Time Priority (Note 2) (business days)	Lab Time Normal (Note 2) (business days)	Reporting to Contractor (Note 3) (business days)	Total (business days)
SOILS					
Gradation (CT 202)	1 to 2	1	3	2	4 to 7
Sand Equivalent (CT 217)	1 to 2	1	3	2	4 to 7
Relative Compaction (CT 231/216)	1 to 2	1	2	2	4 to 6
Plasticity Index (Geosynthetic Reinforced Embankment)	1 to 2	3	7	2	6 to 11
pH (Geosynthetic Reinforced Embankment)	1 to 2	2	3	2	5 to 7
Percentage Crushed Particles (Shoulder Backing – CT 205)	1 to 2	2	5	2	5 to 9
Durability Index (Shoulder Backing – CT 229)	1 to 2	2	5	2	5 to 9
R-value (Imported Borrow – CT 301)	1 to 2	4	6	2	7 to 10
SUBBASES AND BASES					
Relative Compaction (CT 231/216)	1 to 2	1	2	2	4 to 6
Gradation (CT 202)	1 to 2	1	3	2	4 to 7
Sand Equivalent (CT 217)	1 to 2	1	3	2	4 to 7
R-value (CT 301)	1 to 2	4	6	2	7 to 10
Durability Index (CT 229)	1 to 2	2	5	2	5 to 9
Compressive Strength (Cement-treated base [CTB] aggregate – CT 312)	-	Age based	Age based	2	Age +2

[CT Construction Manual Ch. 6 pdf]

Acceptance Program - Testing

SUBGRADE (DISTURBED BASEMENT SOIL) OR EMBANKMENT

Quality Characteristic	Test Method	Minimum Sampling and Testing Frequency	Location/Time of Sampling
Maximum Density and Relative Compaction	CT 216/CT 231	1 Min. Test per 5000 sq ft under vehicle traveled way and shoulder 1 Min. Test Per 300 linear foot under sidewalk	Random locations as determined by the Engineer in place after compaction.

AGGREGATE BASES AND SUBBASES, IMPORTED BORROW

Quality Characteristic	Test Method	Minimum Sampling and Testing Frequency	Location/Time of Sampling
Sieve Analysis	CT 202	1 Min. Test Per Material Source	Sample from site stockpile/plant prior to placement.
R-Value	CT 301		
Sand Equivalent	CT 217		
Maximum Density and Relative Compaction	CT 216/CT 231	1 Min. Test per 5000 sq ft	Random locations as determined by the Engineer in place after compaction.

STRUCTURE BACKFILL, SELECT BACKFILL

Quality Characteristic	Test Method	Minimum Sampling and Testing Frequency	Location/Time of Sampling
Sieve Analysis	CT 202	1 Min. Test Per Material Source	Sample from site stockpile/plant prior to placement
R-Value	CT 301		
Sand Equivalent	CT 217		
Maximum Density and Relative Compaction	CT 216/CT 231	1 Min. Test Per 2 Vertical Lifts of Placement	Random locations as determined by the Engineer in place after compaction.

Exhibit 16-R

Exhibit 16-R Sampling and Testing Frequency Table

for projects OFF the SHS

Acceptance Program - Testing

Acceptance Test Methods

Caltrans
California Test Methods (CTM) | Caltrans

AASHTO
Samples Types and Tests (aashtoresource.org)

ASTM
Book of Standards - Products & Services (astm.org)

Accreditation Body

	CTM	AASHTO	ASTM
Laboratory	Caltrans IA	AASHTO re:source And JTCP (portion)	AASHTO re: source
Technician /Tester	Caltrans IA and JTCP (portion)	JTCP (portion)	ASTM Personnel Cert.

Acceptance Program - Testing

Minor Quantities Accepted Without Testing Allowed, if:

1. Meets the criteria of Section 16-11 of the LAPM
   A. The source has recently furnished similar materials that passed testing requirements.
   B. The manufacturer will certify it meets the specs.

Must indicate in your QAP and accepted by METS

Acceptance Program - Testing

Only for “minor” quantities:

- Aggregates of PCC:

  <100 tons/day, < 500 tons/project

- Bituminous mixtures (Hot Mix AC)

  < 50 tons/day, also at RE’s discretion if job < 500 ton

- Bituminous Material (Asphalts)

  < 20 gallons/project

- Non-reinforced or clay pipe

  < 100 feet/project

Acceptance Program - Testing

Mix Design Approval

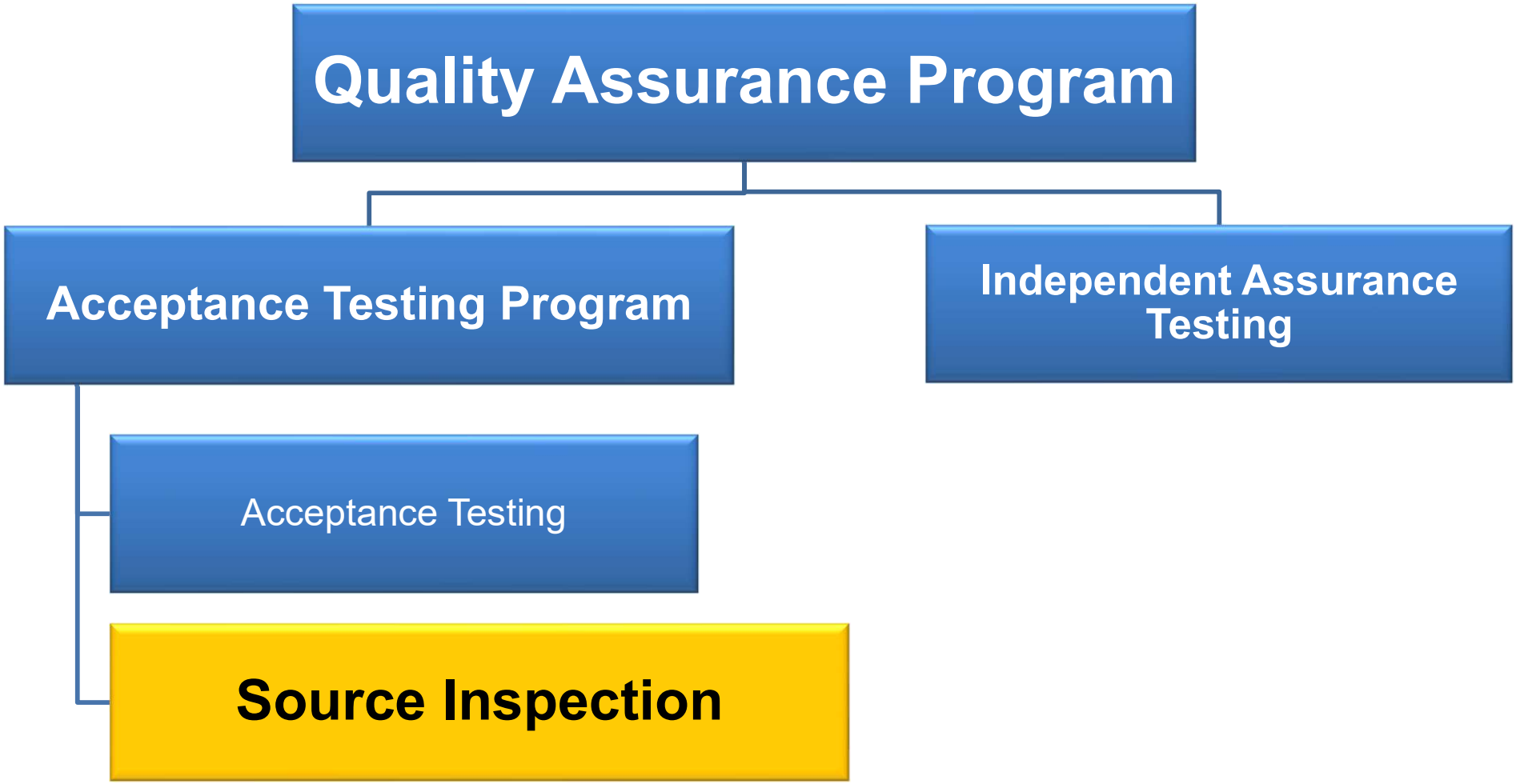
Submittal by contractor

- Source (plant)
- Product
- Mix design number
- Specify area/location or item of work

Reviewed and approved by RE

- Approve in writing
- Specifies what work it may be used in
- Copy in file

Acceptance Program - Source Inspection

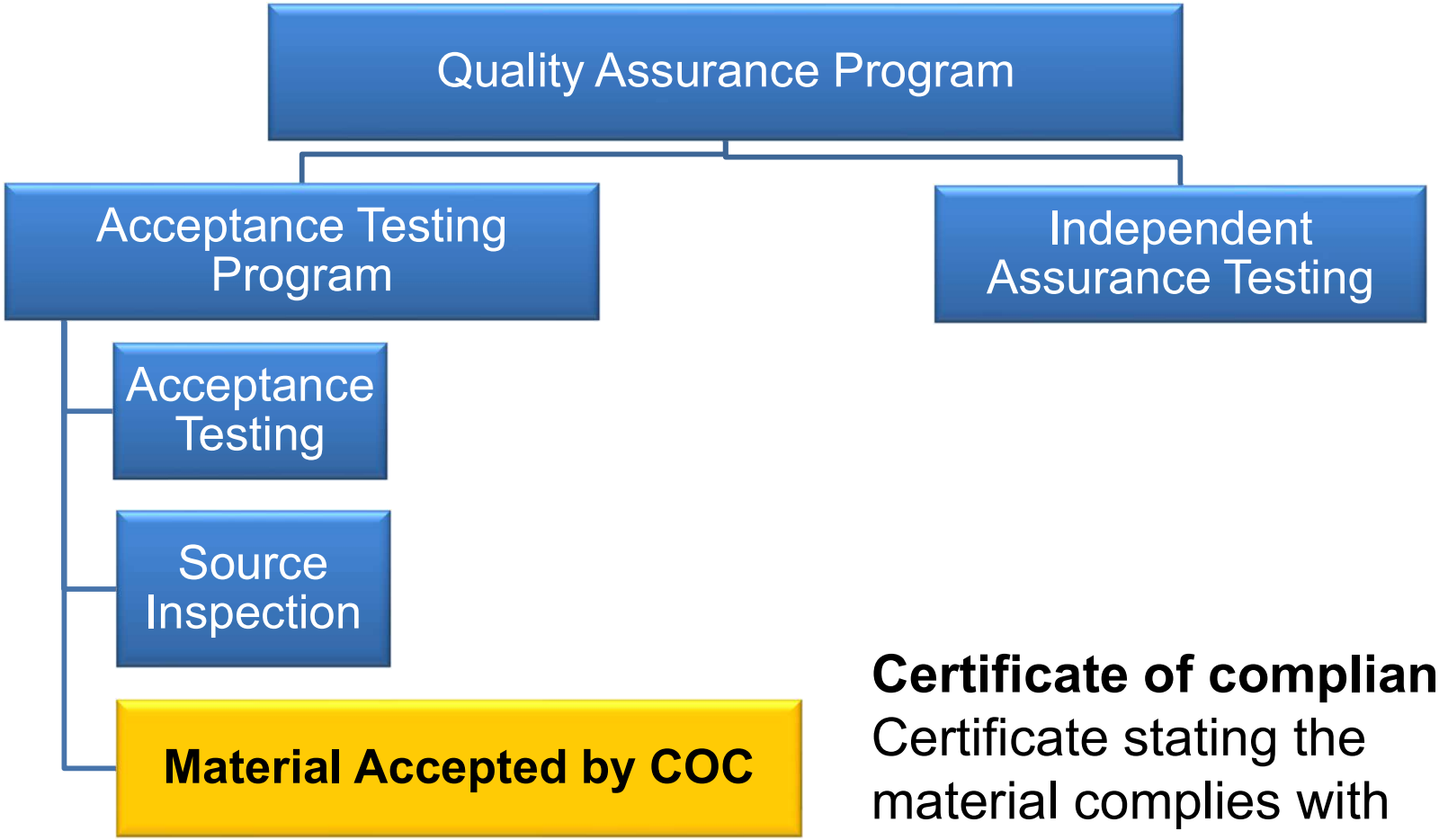


Acceptance Program - Source Inspection

Source Inspection

- Used for manufactured and prefabricated materials at locations other than the job site
- Performed by agency or consultant lab staff
- Documentation is key!

Elements of a QAP



Certificate of compliance: Certificate stating the material complies with the Contract.

1-1.07 DEFINITIONS, CTSS

Materials Accepted by COC

When specified in the contract

Submit a certificate:

- **Before** material is incorporated.
- For each lot and identify lot on the COC.
- Signed by producer of the material.
- Stating the material complies with the contract.

6-2.03C Certificates of Compliance, CTSS
4-1.5 General, Greenbook

Materials Accepted by COC

- LAPM Chapter 16 - Exhibit 16-T1
- Table 6-2.3 Materials Accepted by Certificate of Compliance

BLUE CIRCLE CORP.
7520 MONROE STREET
PARAMOUNT, CALIFORNIA 90723-4922
(562) 531-2711 FAX(562) 531-8537

Certification of Compliance

For Miscellaneous Materials

☐ *Box Checked if for CHC STOCK*

I certify that the materials listed below comply in all respects with the material and workmanship requirements of STANDARD PLANS & SPECIFICATIONS OF SECTION 86-2.03 of the STATE OF CALIFORNIA BUSINESS AND TRANSPORTATION AGENCY, DEPARTMENT OF TRANSPORTATION.

Furthermore, I certify that I am an official representative for the manufacturer of these materials, and where physical and/or chemical test requirements are part of the material specification, the manufacturer has performed the necessary quality controls to substantiate this certification.

BUY AMERICA PROVISION

I certify the steel used in the manufacture of anchor bolts and nuts conforms to the California Standard Specifications and all manufacturing processes for the steel in this material occurred in the United States.

Quantity (PER ATTACHED)

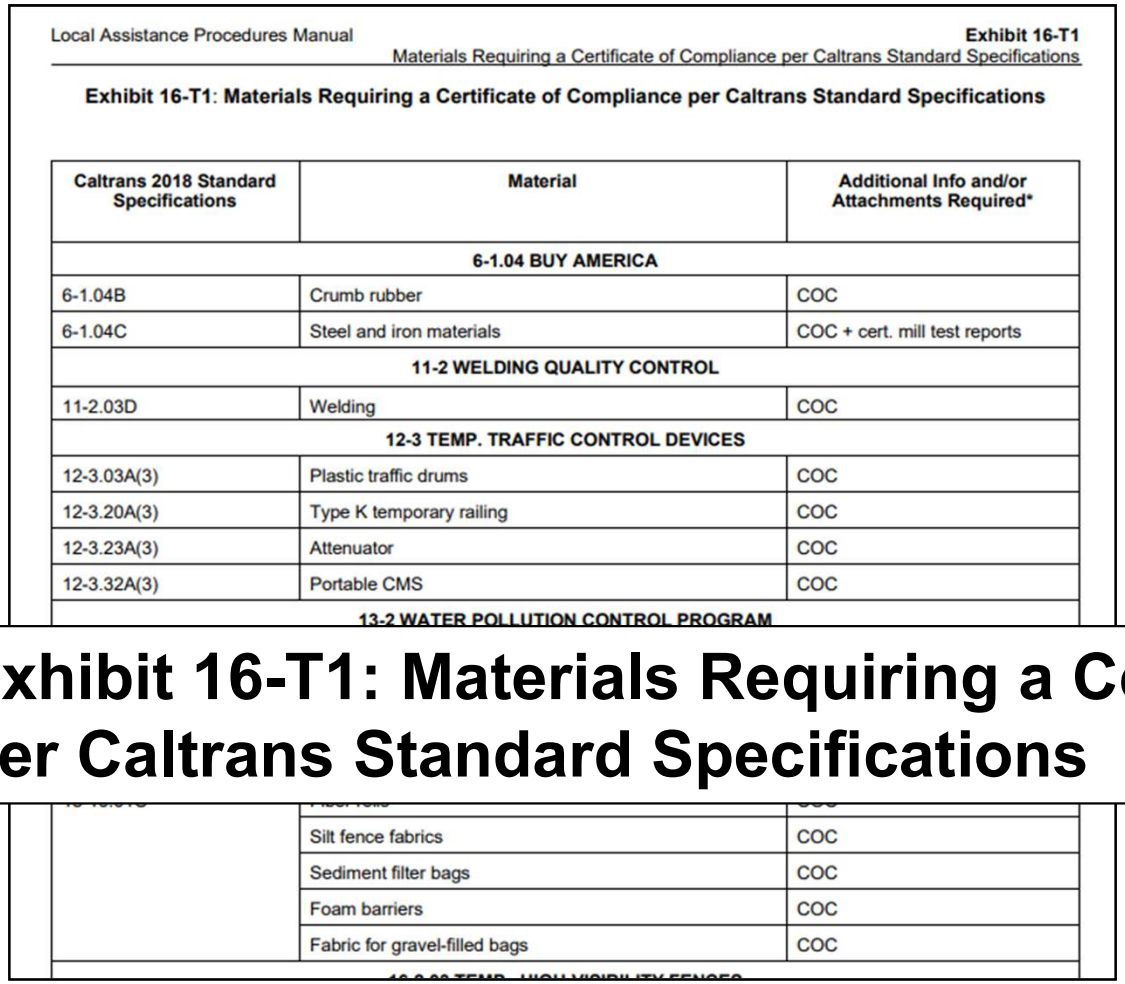
Material Description

SERVING THE STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
INSPECTION RELEASE TAG
S2-0624 (Rev. 02/2021)
Anchor Bolts
S2 LOT No. S2133-001-21
CONTRACT No. 07-220504
RELEASED (*) BY: Rigoberto Marin DATE: 02/10/2021
* Based upon selective sampling

CONTRACT # 07-19-A-OP-3162 Bid Item #124

Materials Accepted by COC

Materials Accepted by a Certificate of Compliance – LAPM Exh. 16-T1



Local Assistance Procedures Manual — Exhibit 16-T1
Materials Requiring a Certificate of Compliance per Caltrans Standard Specifications

Exhibit 16-T1: Materials Requiring a Certificate of Compliance per Caltrans Standard Specifications

Caltrans 2018 Standard Specifications	Material	Additional Info and/or Attachments Required*
6-1.04 BUY AMERICA		
6-1.04B	Crumb rubber	COC
6-1.04C	Steel and iron materials	COC + cert. mill test reports
11-2 WELDING QUALITY CONTROL		
11-2.03D	Welding	COC
12-3 TEMP. TRAFFIC CONTROL DEVICES		
12-3.03A(3)	Plastic traffic drums	COC
12-3.20A(3)	Type K temporary railing	COC
12-3.23A(3)	Attenuator	COC
12-3.32A(3)	Portable CMS	COC
13-2 WATER POLLUTION CONTROL PROGRAM		
	Silt fence fabrics	COC
	Sediment filter bags	COC
	Foam barriers	COC
	Fabric for gravel-filled bags	COC

Exhibit 16-T1: Materials Requiring a Certificate of Compliance per Caltrans Standard Specifications

(5.1 Handout pages 2-9)

Materials Accepted by COC

Materials Requiring a Certificate of Compliance – Greenbook 2018

Exhibit 16-T2
Materials Requiring a Certificate of Compliance per the Greenbook

Greenbook 2018
Materials Requiring a Certificate of Compliance or Certified Test Reports

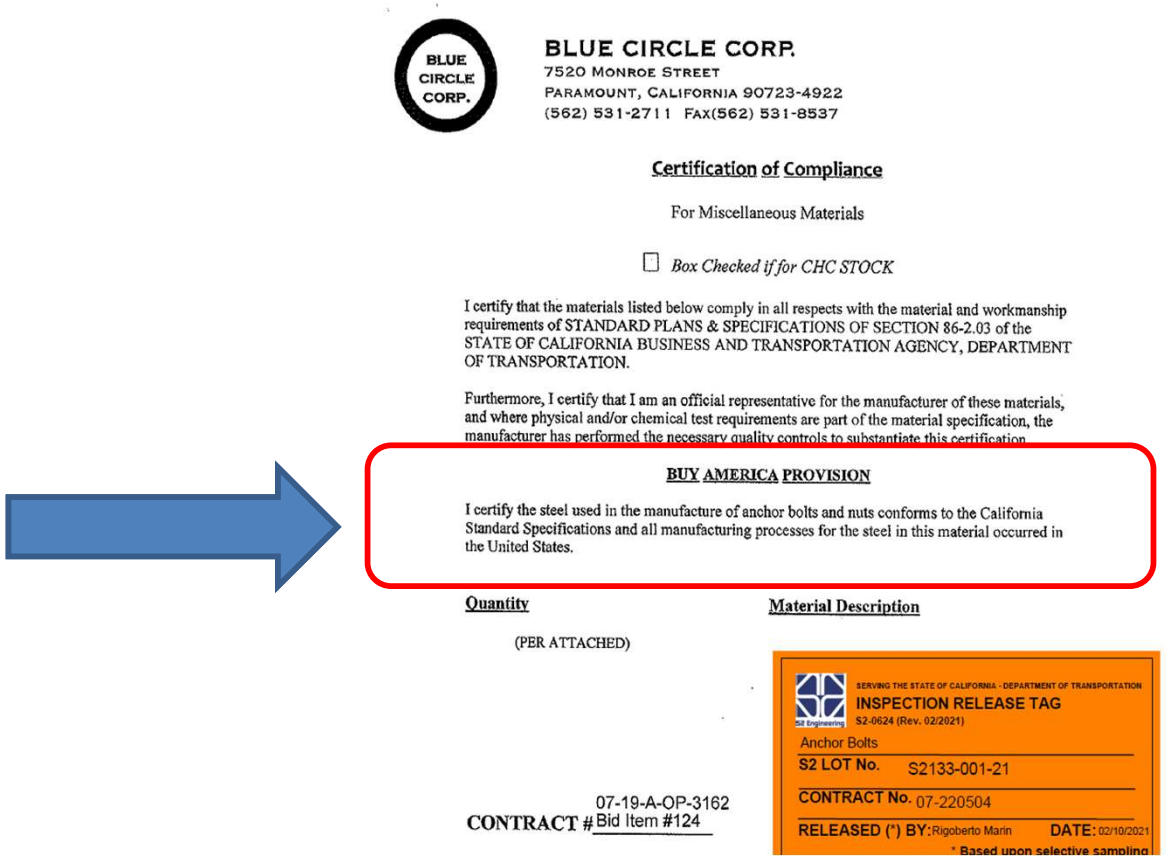
	Material	Section #	Section Title	Additional Comments
1		4-5	Certificate of Compliance	General Requirements
2	Weighing and Metering Equip.	4-7	Weighing and Metering Equipment	Engineer to "approve" prior to operation.
3	Cement	201-1.21	Cement	
4	Fly Ash	201-1.2.5.3	Fly Ash	Specific language/info required on the COC. Must also submit test data upon request.
5	Pozzolans	201-1.2.5.4	Class N Pozzolans	Specific language/info required on the COC. Must also submit test data upon request.
6	Joint Sealant , Type E	201-3.9	Test Report and Certification	Specific language/info required on certified test reports.
7	Curing Compound	201--4.3	Test Report and Certification	Must submit certified test report upon request.
8	Paving Asphalt	203-1.3	Test Report and Certification	Specific language/info required on certified test reports.
9	Liquid Asphalt	203-2.2	Test Report and Certification	Specific language/info required on certified test reports.
10	Microsurfacing Emulsion (MSE)	203-3.5	Certificate of Compliance	With each load. Must also submit test data upon request.
11	Latex	203-10.2.2	Latex	Specific language/info required on the COC.

(5.1 Handout pages 10-11)

Materials Accepted by COC

Buy America Certification

(A type of certificate of compliance)



BLUE CIRCLE CORP.
7520 MONROE STREET
PARAMOUNT, CALIFORNIA 90723-4922
(562) 531-2711 FAX(562) 531-8537

Certification of Compliance

For Miscellaneous Materials

☐ *Box Checked if for CHC STOCK*

I certify that the materials listed below comply in all respects with the material and workmanship requirements of STANDARD PLANS & SPECIFICATIONS OF SECTION 86-2.03 of the STATE OF CALIFORNIA BUSINESS AND TRANSPORTATION AGENCY, DEPARTMENT OF TRANSPORTATION.

Furthermore, I certify that I am an official representative for the manufacturer of these materials, and where physical and/or chemical test requirements are part of the material specification, the manufacturer has performed the necessary quality controls to substantiate this certification.

BUY AMERICA PROVISION

I certify the steel used in the manufacture of anchor bolts and nuts conforms to the California Standard Specifications and all manufacturing processes for the steel in this material occurred in the United States.

Quantity (PER ATTACHED)

Material Description

SERVING THE STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
INSPECTION RELEASE TAG
S2-0624 (Rev. 02/2021)
Anchor Bolts
S2 LOT No. S2133-001-21
CONTRACT No. 07-220504
RELEASED (*) BY: Rigoberto Marin DATE: 02/10/2021
* Based upon selective sampling

CONTRACT # 07-19-A-OP-3162 Bid Item #124

Materials Accepted by COC

Buy America Requirements

apply to steel and iron, manufactured products, and construction materials permanently incorporated into the project.

23 CFR 635.410 & 23 U.S.C. 313, 2 CFR 184

Chapter 12 LAPM and 6-1.04 CTSS

- Crumb Rubber (Pub Res Code § 42703(d))
- Steel and Iron Materials
- Manufactured Products
- Construction Materials
  - Non-ferrous metals, plastic and polymer-based products, glass, fiber optic cable, optical fiber, lumber, engineered wood and drywall

(5.1 Handout pages 12-22)

Materials Accepted by COC

Buy America applies:

- To the **entire** construction contract even if there is only $1 in federal money in the project.
- And if project is under a NEPA document with no federal money on the project.
- *An Agency cannot "avoid" the Buy America requirement by declaring that the material is being paid for with the non-Federal portion of the funding.*

Materials Accepted by COC

Buy America Certification

Furnish steel and iron materials with:

- COC for each shipment
  - Must also state, “All melting and manufacturing processes for these materials, including any application of a coating, occurred in the United States”
- Certified Mill Test Report for each heat and size.
  - Mill test report must indicate where the steel and iron were melted and manufactured

Materials Accepted by COC

Buy America Certificate of Compliance must:

- Accompany all construction material applicable
- Specify project number
- Specify lot number or mill marking
- State that the material complies with the contract specifications.
- Signed by the manufacturer (not the contractor)

Materials Accepted by COC

Buy America does *not* apply to:

A. Temporary steel and construction material
   - Falsework
   - Sheet piling
   - Shoring

B. Minimal use of all foreign iron and steel in which the total delivered cost to the project site is less than $2,500 or 0.1 percent of the contract amount, whichever is greater.
   - Supported by invoices
   - Includes cost of transportation
   - Keep records in your project files

Materials Accepted by COC

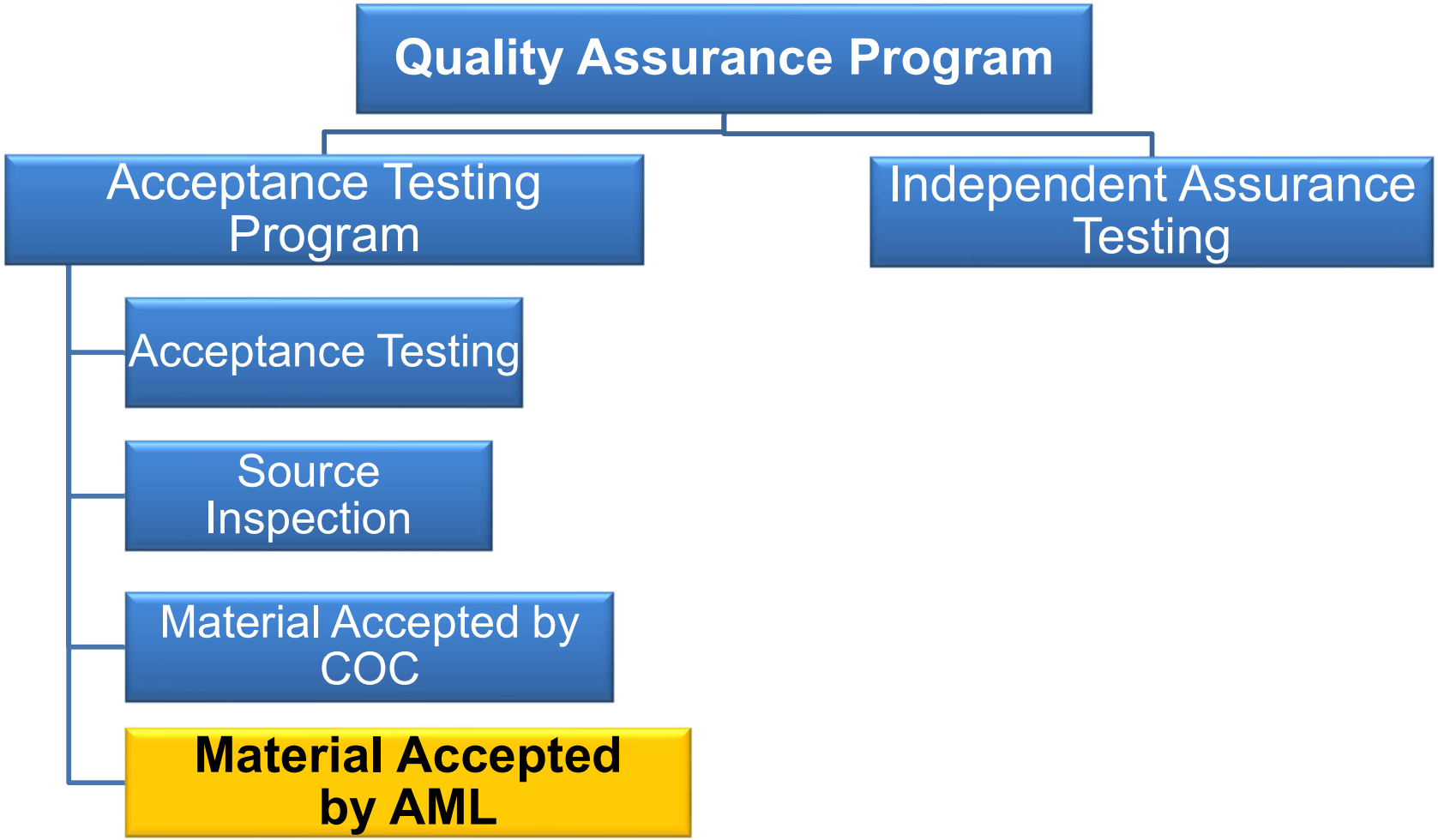
Buy America Act 2.0 Requirements

(aka BABA - all must be manufactured and produced in USA)

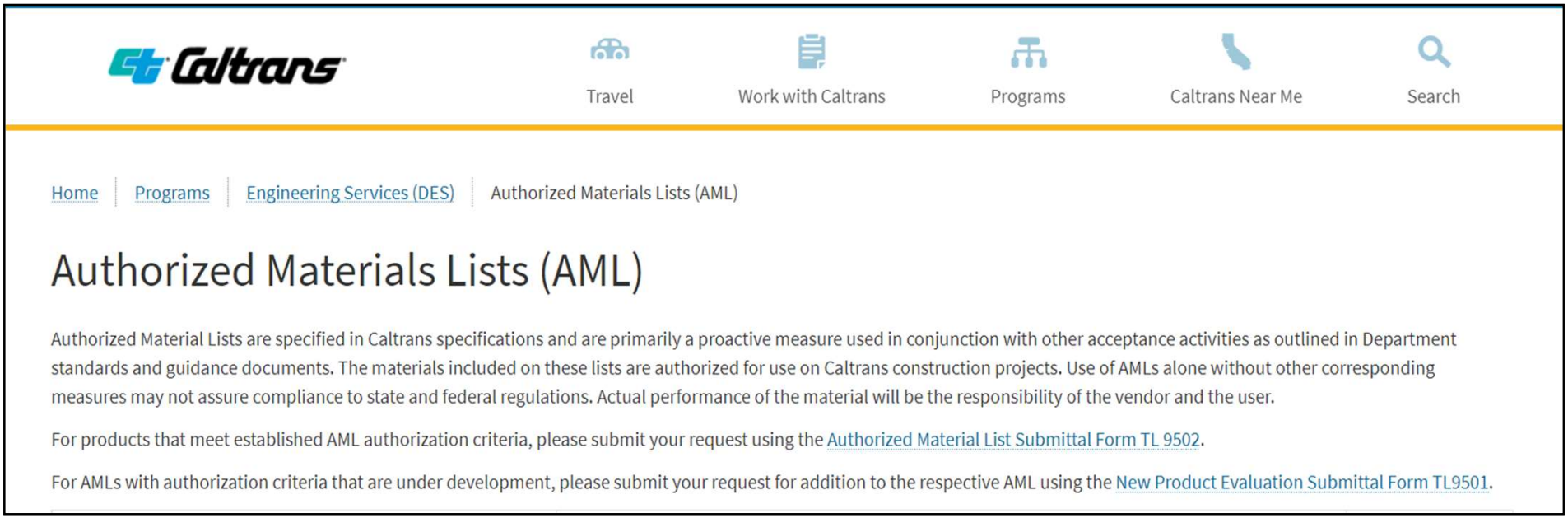
- ❑ All iron and steel
  (exception:0.1% of project or $2,500 maximum)
- ❑ All manufactured products
- ❑ All construction materials

https://www.whitehouse.gov/wp-content/uploads/2023/10/M-24-02-Buy-America-Implementation-Guidance-Update.pdf

Elements of a QAP



Material Accepted by AML

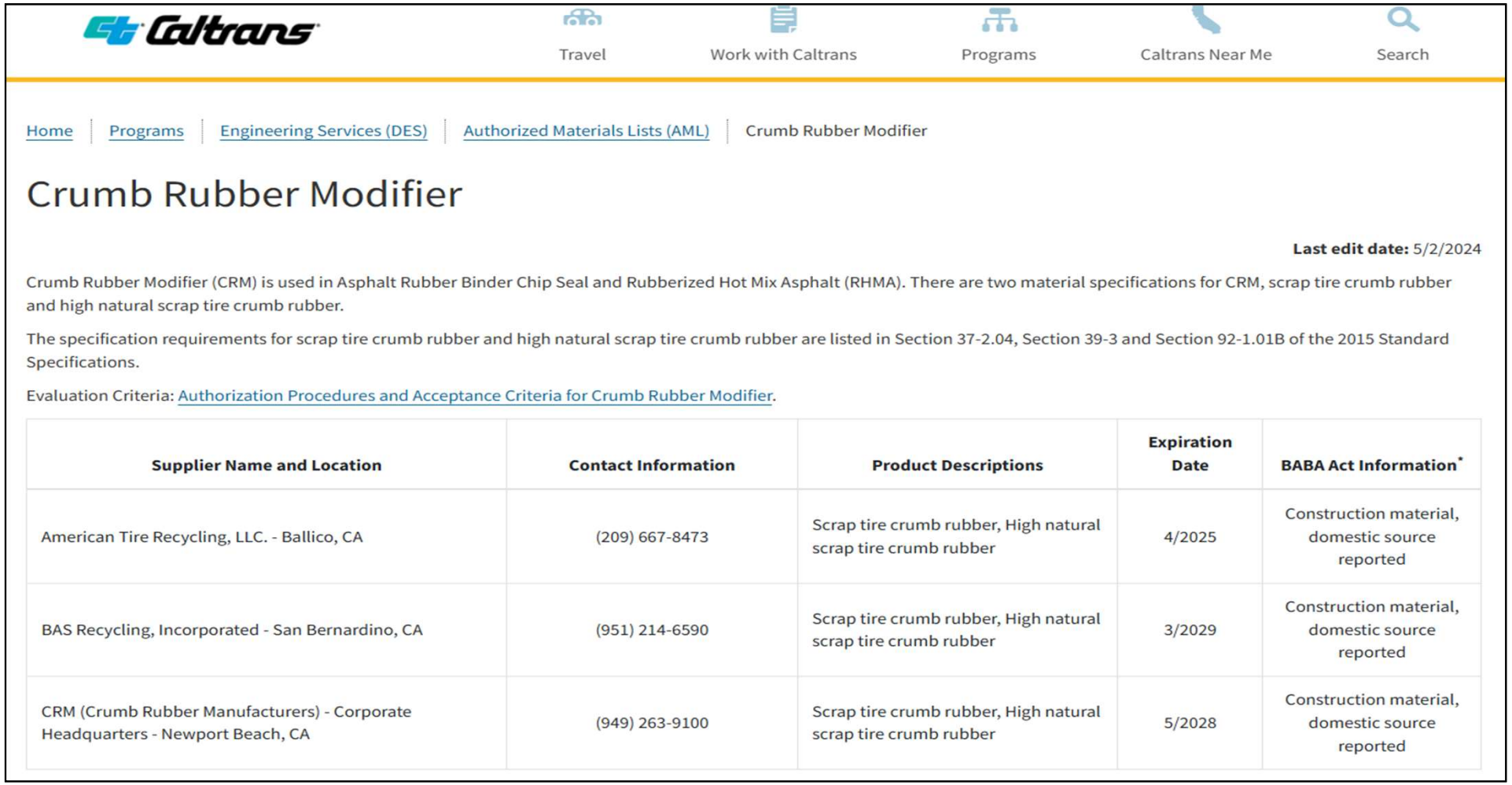


Complete List of AML:
https://dot.ca.gov/programs/engineering-services/authorized-materials-lists

5.1 Handout pages 55-59

Material Accepted by AML

Example of AML product



Caltrans | Travel | Work with Caltrans | Programs | Caltrans Near Me | Search

Home | Programs | Engineering Services (DES) | Authorized Materials Lists (AML) | Crumb Rubber Modifier

Crumb Rubber Modifier

Last edit date: 5/2/2024

Crumb Rubber Modifier (CRM) is used in Asphalt Rubber Binder Chip Seal and Rubberized Hot Mix Asphalt (RHMA). There are two material specifications for CRM, scrap tire crumb rubber and high natural scrap tire crumb rubber.

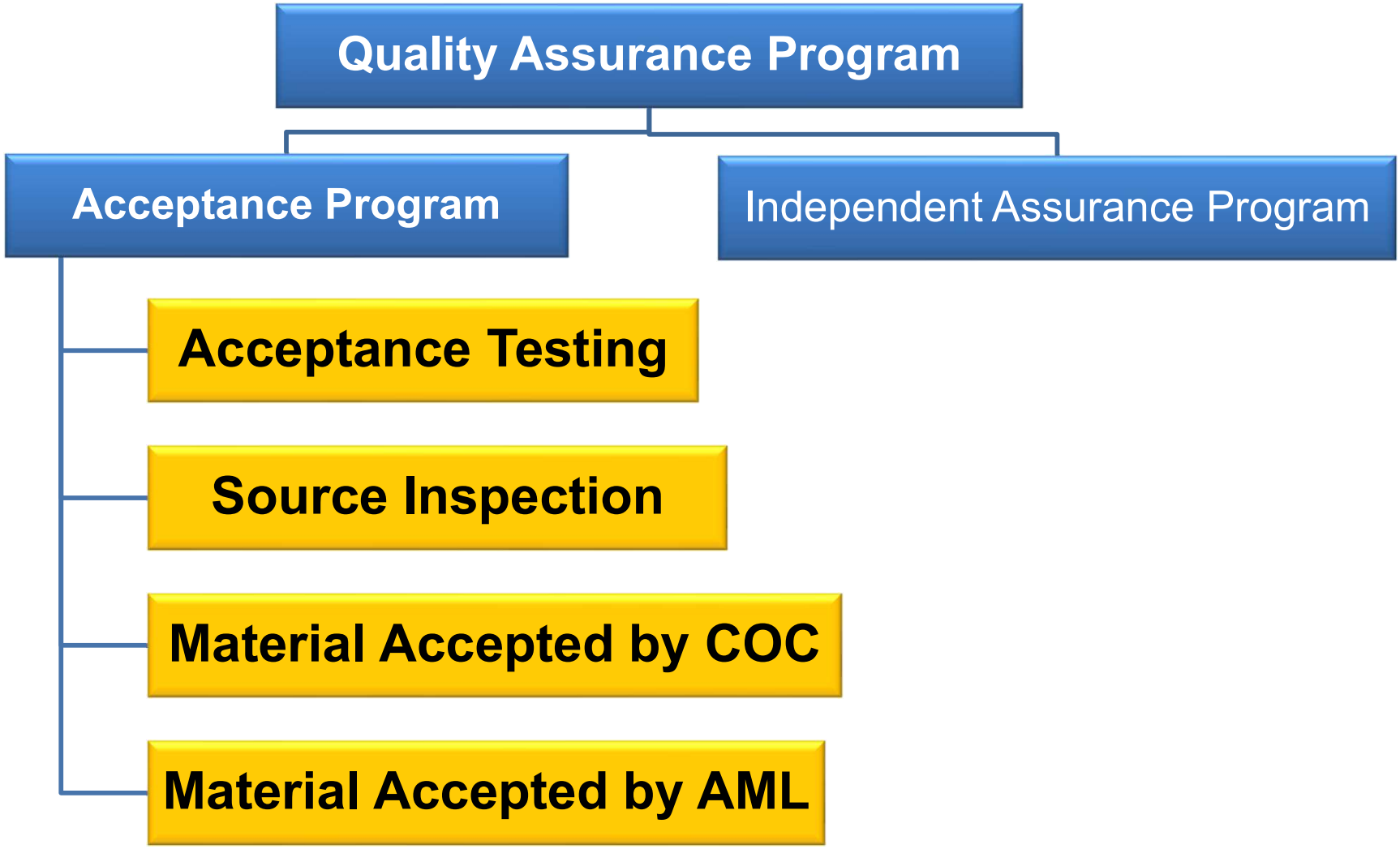
The specification requirements for scrap tire crumb rubber and high natural scrap tire crumb rubber are listed in Section 37-2.04, Section 39-3 and Section 92-1.01B of the 2015 Standard Specifications.

Evaluation Criteria: Authorization Procedures and Acceptance Criteria for Crumb Rubber Modifier.

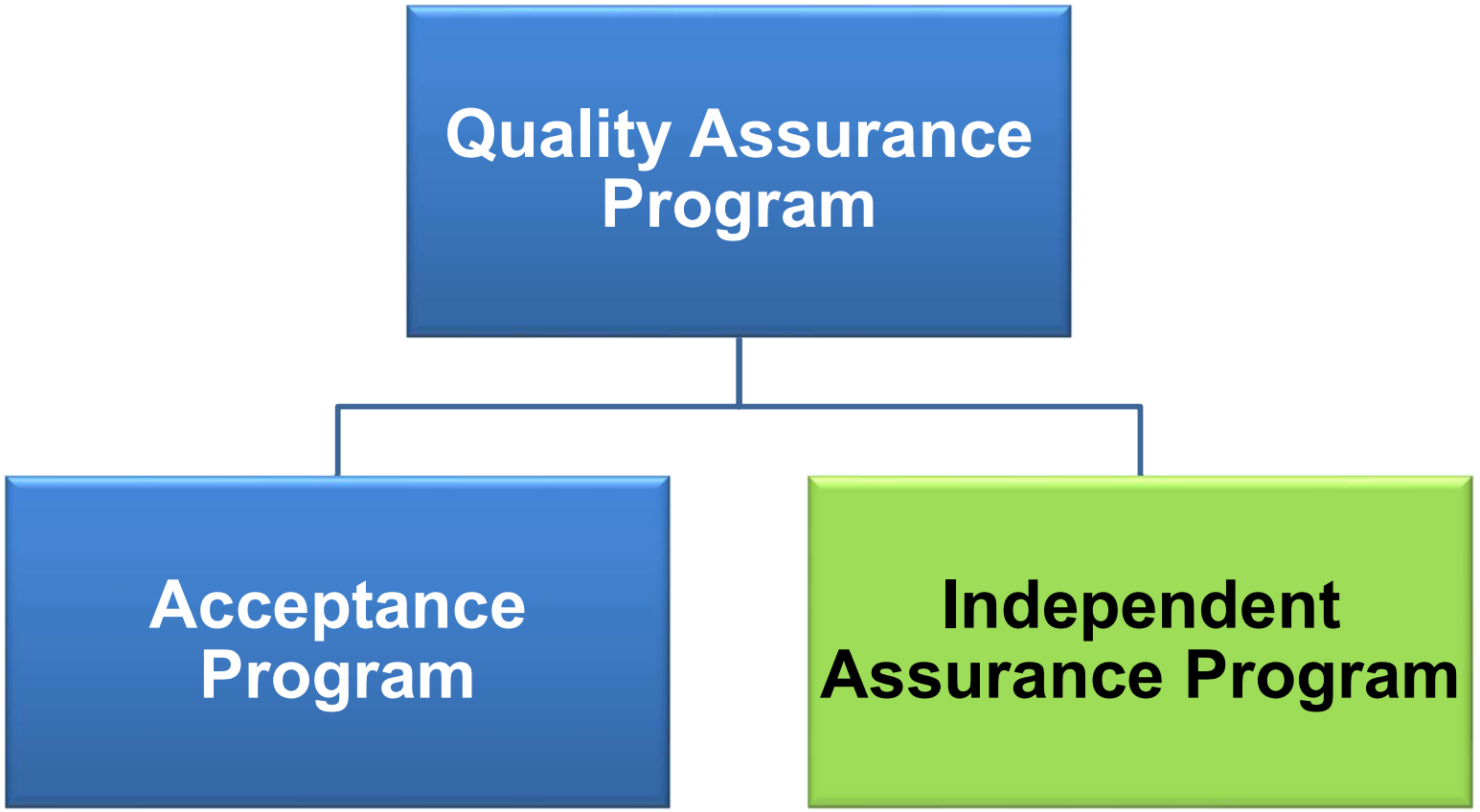
Supplier Name and Location	Contact Information	Product Descriptions	Expiration Date	BABA Act Information*
American Tire Recycling, LLC. - Ballico, CA	(209) 667-8473	Scrap tire crumb rubber, High natural scrap tire crumb rubber	4/2025	Construction material, domestic source reported
BAS Recycling, Incorporated - San Bernardino, CA	(951) 214-6590	Scrap tire crumb rubber, High natural scrap tire crumb rubber	3/2029	Construction material, domestic source reported
CRM (Crumb Rubber Manufacturers) - Corporate Headquarters - Newport Beach, CA	(949) 263-9100	Scrap tire crumb rubber, High natural scrap tire crumb rubber	5/2028	Construction material, domestic source reported

https://dot.ca.gov/programs/engineering-services

Elements of a QAP



Elements of a QAP



Elements of a QAP

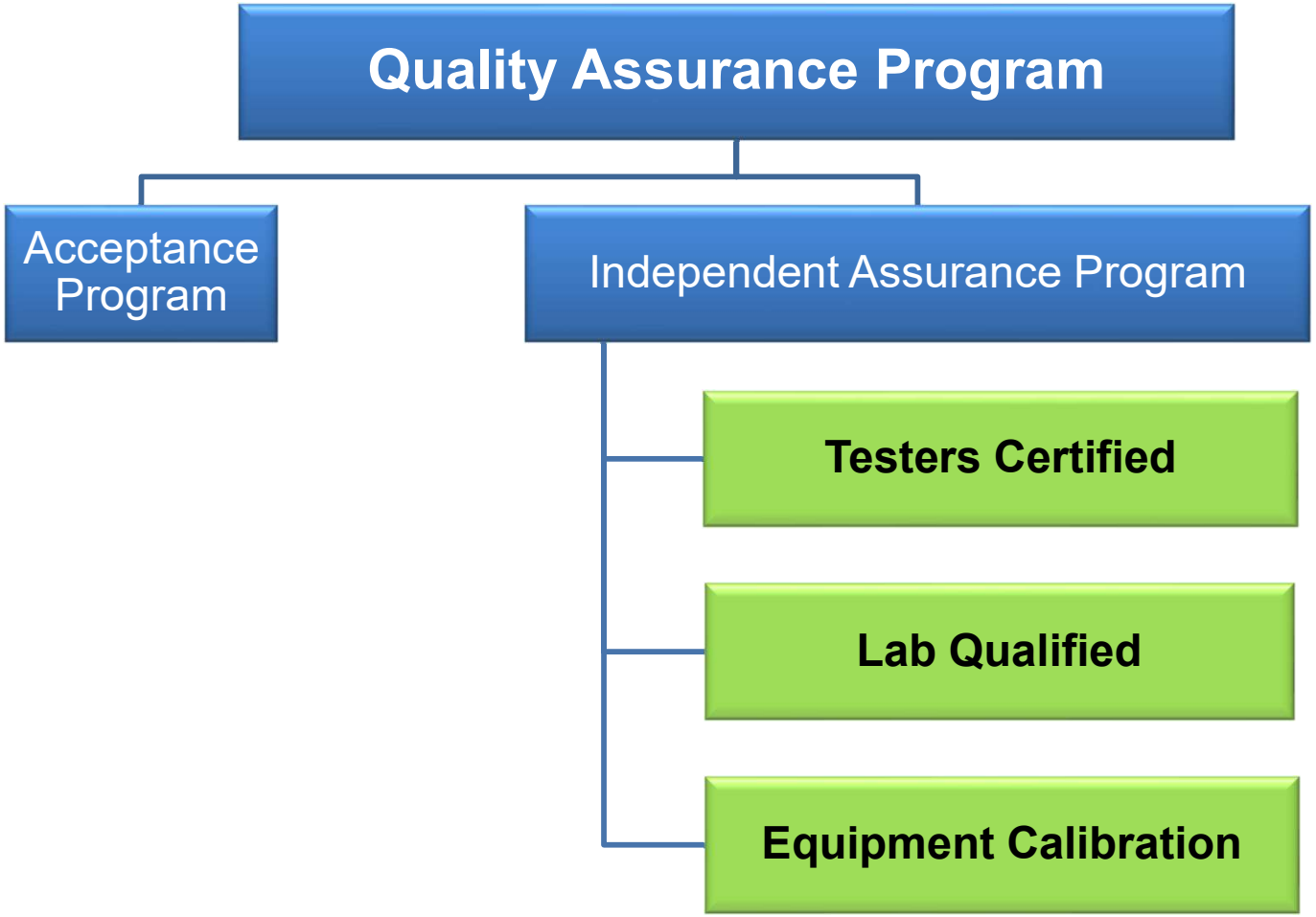
Independent Assurance Program

Verifies that the acceptance testing is being performed correctly.

"…*an unbiased and independent evaluation of all the sampling and testing procedures used in the acceptance program.*"

23 CFR 637.203

Elements of a QAP



Elements of a QAP

The Independent Assurance program shall also:

- Include a schedule of frequency for IA evaluation
- Maintain records of tester certificates of proficiency and lab accreditation

5.1 Handout page 23-31

FHWA Tech Brief: Independent Assurance Programs

Elements of a QAP

IA: Tester Certificates of Proficiency

1. Name of tester
2. Methods certified
3. Expiration date

SIAD TL-0111: CT CERTIFICATION

CALIFORNIA DEPARTMENT OF TRANSPORTATION

Presents this CERTIFICATE to

Derek Carrington

who is certified to perform the following tests:

Test Method	Expiration Date	IA Responsible	Associated Laboratory
CT 105	2024-05-28	Soroosh Amelian	Lab 1
CT 106	2023-06-30	David Jones	Lab 1
CT 125 AGG	2024-05-28	Soroosh Amelian	Lab 1
CT 125 HMA	2024-05-28	Soroosh Amelian	Lab 1
CT 201	2022-09-06	Sarbjit Grewal	Lab 1
CT 202	2022-09-06	Sarbjit Grewal	Lab 1
CT 205	2022-09-06	Sarbjit Grewal	Lab 1
CT 216	2022-09-06	Sarbjit Grewal	Lab 1
CT 217	2022-09-06	Sarbjit Grewal	Lab 1
CT 226	2022-09-06	Sarbjit Grewal	Lab 1
CT 227	2022-09-06	Sarbjit Grewal	Lab 1
CT 229	2022-09-06	Sarbjit Grewal	Lab 1
CT 306	2024-05-28	Soroosh Amelian	Lab 1
CT 389	2022-06-23	Ashley Shaw	Lab 1

Lab 1: District 9 Construction, 500 S. Main St., Bishop

Certified Independent Assurance (IA)
Date issued: 08/31/2021
Tester ID: 00782

Note: This certificate is valid as long as the Tester complies with applicable requirements in Caltrans Independent Assurance Program Manual.
Please verify tester certifications by visiting the SIAD website at https://sia.dot.ca.gov/
Page 1/1

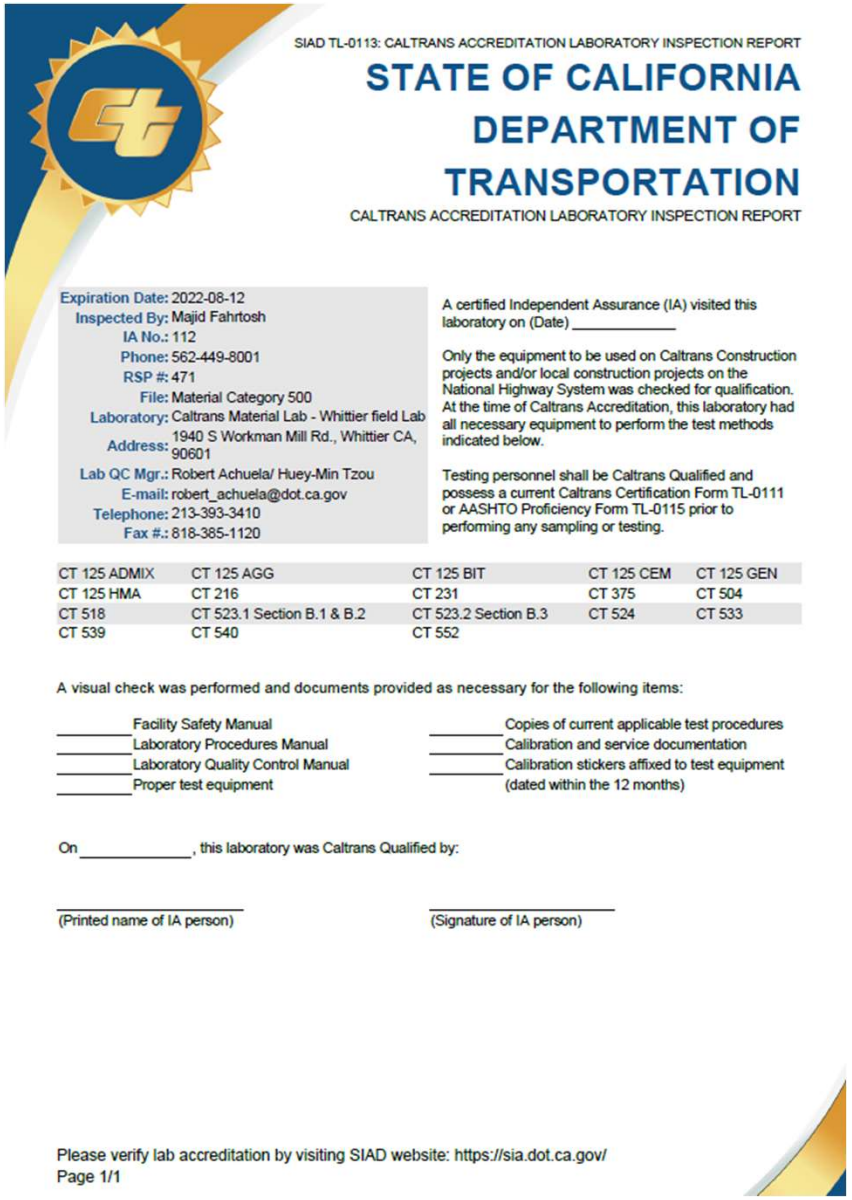
5.1 Handout page 32

Elements of a QAP

IA: Laboratory Accreditation

1. Lab name and location
2. Test methods
3. Expiration date

5.1 Handout page 33



SIAD TL-0113: CALTRANS ACCREDITATION LABORATORY INSPECTION REPORT

STATE OF CALIFORNIA
DEPARTMENT OF
TRANSPORTATION

CALTRANS ACCREDITATION LABORATORY INSPECTION REPORT

Expiration Date: 2022-08-12
Inspected By: Majid Fahrtosh
IA No.: 112
Phone: 562-449-8001
RSP #: 471
File: Material Category 500
Laboratory: Caltrans Material Lab - Whittier field Lab
Address: 1940 S Workman Mill Rd., Whittier CA, 90601
Lab QC Mgr.: Robert Achuela/ Huey-Min Tzou
E-mail: robert_achuela@dot.ca.gov
Telephone: 213-393-3410
Fax #.: 818-385-1120

A certified Independent Assurance (IA) visited this laboratory on (Date) _____

Only the equipment to be used on Caltrans Construction projects and/or local construction projects on the National Highway System was checked for qualification. At the time of Caltrans Accreditation, this laboratory had all necessary equipment to perform the test methods indicated below.

Testing personnel shall be Caltrans Qualified and possess a current Caltrans Certification Form TL-0111 or AASHTO Proficiency Form TL-0115 prior to performing any sampling or testing.

CT 125 ADMIX	CT 125 AGG	CT 125 BIT	CT 125 CEM	CT 125 GEN
CT 125 HMA	CT 216	CT 231	CT 375	CT 504
CT 518	CT 523.1 Section B.1 & B.2	CT 523.2 Section B.3	CT 524	CT 533
CT 539	CT 540	CT 552		

A visual check was performed and documents provided as necessary for the following items:

_____ Facility Safety Manual
_____ Laboratory Procedures Manual
_____ Laboratory Quality Control Manual
_____ Proper test equipment
_____ Copies of current applicable test procedures
_____ Calibration and service documentation
_____ Calibration stickers affixed to test equipment (dated within the 12 months)

On _____, this laboratory was Caltrans Qualified by:

_____ (Printed name of IA person)

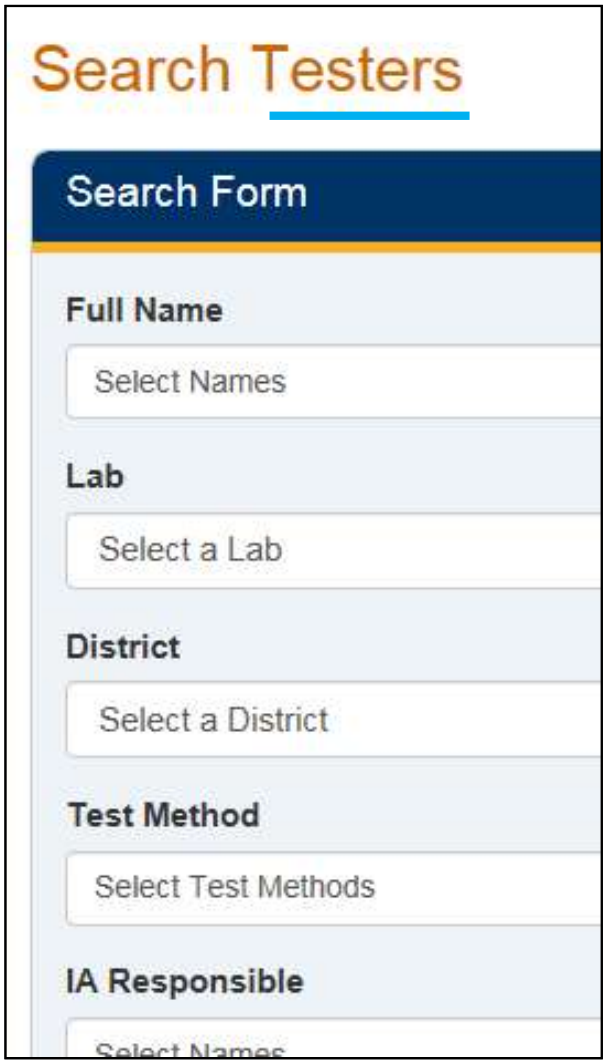
_____ (Signature of IA person)

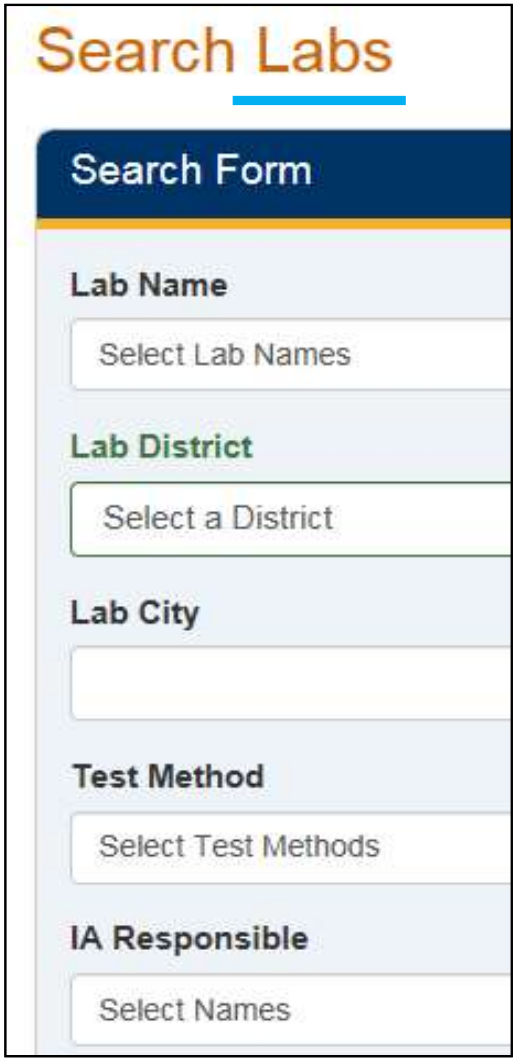
Please verify lab accreditation by visiting SIAD website: https://sia.dot.ca.gov/
Page 1/1

Elements of a QAP

Statewide Independent Assurance Database (SIAD)

https://sia.dot.ca.gov





Sampling and Testing Certification

Joint Training and Certification Program

Four Certifications Offered:

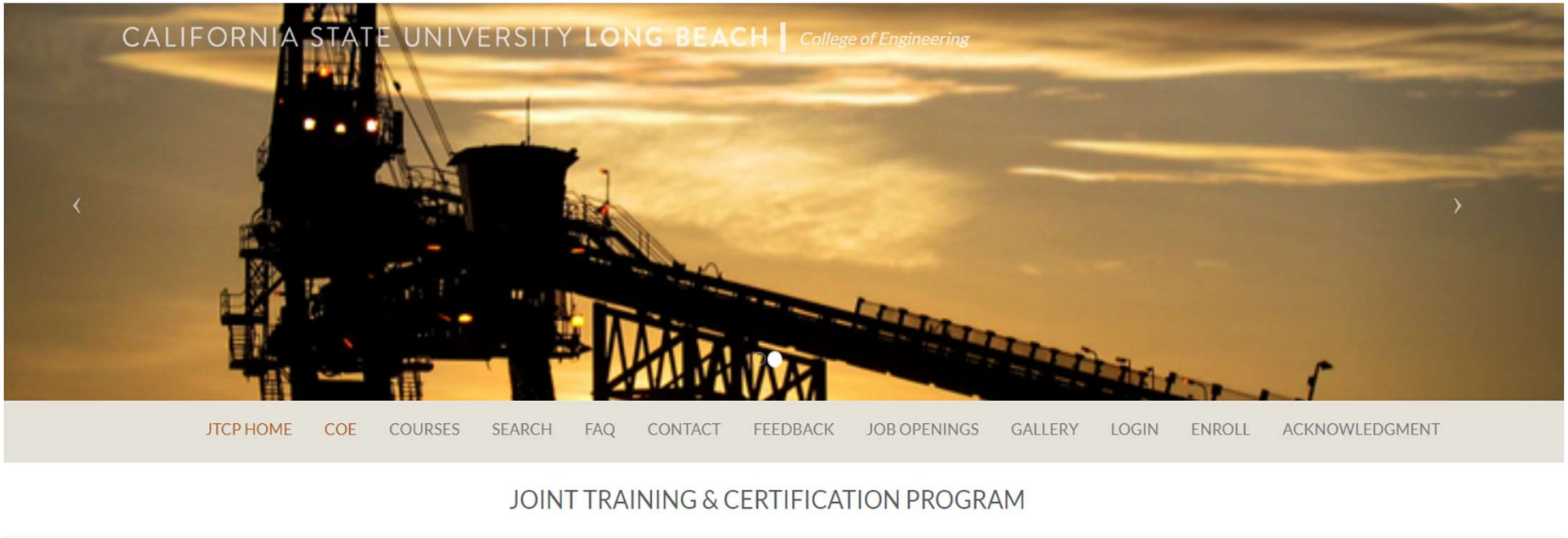
- HMA I (3 yrs)
- HMA II (3 yrs)
- Soils and Aggregate (S&A) (3 yrs)
- Portland Cement Concrete
  (ACI Field Tech. – Grade I) (5 yrs)

Partnership with CSU Long Beach and San Jose State University

https://dot.ca.gov/programs/engineering-services/joint-training-certification-program-jtcp

Sampling and Testing Certification

Joint Training and Certification Program



https://dot.ca.gov/programs/engineering-services/joint-training-certification-program-jtcp

Sampling and Testing Certification

Hot Mix Asphalt I (HMA I)

Hot Mix Asphalt I (HMA I)

The HMA I training module is a 4-day course: The first 3 days include classroom review and discussion of test methods followed by hands-on learning in the lab. The fourth day is a certification day consisting of written and practical exams.

Test Methods Included in the Hot Mix Asphalt I Module

CT 105: Calculations Pertaining to Gradings and Specific Gravities

CT 125 AGG: Sampling Highway Materials and Products Used in the Roadway Structural Section (Appendix A: Aggregates, Soils and Lime)

CT 125 HMA: Sampling Highway Materials and Products Used in the Roadway Structural Section (Appendix B: Hot Mix Asphalt)

CT 306/ AASHTO R 47: Reducing Samples of Asphalt Mixtures to Testing Size

AASHTO R 76: Reducing Samples of Aggregate to Testing Size

AASHTO T 11: Sieve Analysis for Materials Finer than 75 - µm (No. 200) Sieve in Mineral Aggregates by Washing

AASHTO T 27: Sieve Analysis of Fine and Coarse Aggregates

AASHTO T 176: Plastic Fines in Graded Aggregates and Soils by Use of the Sand Equivalent Test

AASHTO T 255: Total Evaporable Moisture Content of Aggregate by Drying **AASHTO T 329:** Moisture Content of Asphalt Mixtures by Oven Method **AASHTO T 335:** Percentage of Fracture in Coarse Aggregate

Sampling and Testing Certification

Hot Mix Asphalt II (HMA II)

Hot Mix Asphalt II (HMA II)

The HMA II training module is a 3-day course: The first 2 days include classroom review and discussion of test methods followed by hands-on learning in the lab. The third day is a certification day consisting of written and practical exams.

Test Methods Included in the Hot Mix Asphalt II Module

AASHTO T 166: Bulk Specific Gravity of Compacted Asphalt Mixtures Using Saturated Surface-Dry Specimens Asphalt

AASHTO T 209: Theoretical Maximum Specific Gravity and Density of Asphalt Mixtures

AASHTO T 269: Percent Air Voids in Compacted Dense and Open Asphalt Mixtures **AASHTO T 275:** Bulk Specific Gravity of Compacted Asphalt Mixtures Using Paraffin-Coated Specimens

AASHTO T 308: Asphalt Binder Content (AC) of Asphalt Mixtures by the Ignition Method

Sampling and Testing Certification

Soils & Aggregates

Soils and Aggregates

The Soils & Aggregates training module is a 4-day course: The first 3 days include classroom review and discussion of test methods followed by hands-on learning in the lab. The fourth day is a certification day consisting of written and practical exams.

Test Methods Included in the Soils & Aggregates Module

CT 105: Calculations Pertaining to Gradings and Specific Gravities

CT 125 AGG: Sampling Highway Materials and Products Used in the Roadway Structural Sections (Appendix A: Aggregates, Soils, and Lime)

CT 201: Soil and Aggregate Sample Preparation

CT 202: Sieve Analysis of Fine and Coarse Aggregate

CT 205: Percentage of Crushed Particles

CT 216: Relative Compaction of Untreated and Treated Soils and Aggregate

CT 217: Sand Equivalent

CT 226: Moisture Content of Soils and Aggregate by Oven Drying

CT 227: Cleanness Value of Coarse Aggregate

CT 229: Durability Index

Sampling and Testing Certification

Portland Cement Concrete

Portland Cement Concrete (PCC)

The PCC training module is a 2-day course: The first day includes classroom review and discussion of test methods followed by hands-on learning in the lab. The second day is a certification day consisting of written and practical exams.

Test Methods Included in the PCC (ACI Field Grade I) Module

ASTM C 31 (Equivalent CT 540): Making and Curing Concrete Test Specimens in the Field

ASTM C 138 (Equivalent CT 518): Density (Unit Weight), Yield, and Air Content (Gravimeter) of Fresh Concrete

ASTM C 143 (Equivalent CT 556): Slump of Fresh Portland Cement Concrete

ASTM C 172 (Equivalent CT 539): Sampling Freshly Mixed Concrete

ASTM C 173 (Equivalent CT 543): Air Content of Freshly Mixed Concrete by the Volumetric Method

ASTM C 231 (Equivalent CT 504): Air Content of Freshly Mixed Concrete by the Pressure Method

ASTM C 1064 (Equivalent CT 557): Temperature of Freshly Mixed Portland Cement Concrete

Different Methods of Certification

	CTM	AASHTO	ASTM
Laboratory	Caltrans lA	AASHTO re:source And JTCP (portion)	AASHTO re:source
Technician/ Tester	Caltrans lA And JTCP (portion)	JTCP (portion)	ASTM Personnel Cert.

Costs associate with Certification

	CTM	AASHTO (JTCP)	AASHTO	ASTM
Laboratory	No Fee (by Caltrans)	No Fee (by Caltrans)	$$$ to AASHTO re:source	$$$ to AASHTO re:source
Technician /Tester	No Fee (by Caltrans)	$$$ to JTCP (CSU Long Beah & SJ)		$$$ to ASTM Personnel Cert.

Elements of a QAP

IA: Equipment Calibration –

All local agency's and/or consultant's equipment must have been calibrated on NIST traceable blocks and have current calibration stickers.

Implement Your QAP

1. RE's and Inspectors

- **Know your contract and your contract items!**
- Anticipate…
  - What types and how much material will be arriving
- Know…
  - What tests methods must be used (Contract Docs)
  - How often or how many tests are needed (QAP)

Implement Your QAP

2. Materials Testing Lab (agency or consultants)

Must:

- Have a copy of agency's approved QAP
- Prepare a project testing plan - what tests, how many
- Have lab accreditations, tester certifications
- Maintain ongoing logs of acceptance testing results

Update Your QAP

It's your QAP…

- If you are not doing it, take it out
- Edit to customize for your agency
- Helpful Template - **5.1 Handout**

QUALITY ASSURANCE PROGRAM (QAP)

City of Perfect Projects
DEPARTMENT OF PUBLIC WORKS
(Change name of city and department as appropriate)

The purpose of this program is to provide assurance that the materials incorporated into each construction project conform to the contract specifications.

- This QAP shall be *updated* every *five years* minimum
- This QAP shall be updated if changes are made such to the test methods or to the testing sampling and frequencies.
- This QAP is incomplete without attachments 1 through 3.

Approved By: _____ *Date:* _____

_____
Name and Title

New QAP Template 2015

5.1 Handout

Page 34-54

Update Your QAP

Sample for Local Agency QAPs

Sampling and Testing Frequency Table
for projects OFF the SHS.

HOT MIX ASPHALT (HMA) / ASPHALT CONCRETE (AC)

Quality Characteristic	Test Method	Minimum Sampling and Testing Frequency	Location/Time of Sampling
Aggregate Gradation (Sieve)	CT 202	1 Per 1000 Tons or Part Thereof ; Minimum 1 per day during production/placement of at least 300 tons per day.	At Plant Per CT 125 (a)
Sand Equivalent	CT 217		
Asphalt Binder Content	CT 382		Loose Mix Behind Paver Per CT 125
In-Place Density and Relative Compaction (Nuclear)	Nuclear (b)	1 Per 1000 Tons or Part Thereof ; Minimum 1 per day during production/placement of at least 300 tons per day. (b)	Random Locations Per CT 375 (c
	CT 375 or ASTM D2950 (c		
Theoretical Maximum Specific Gravity and Density (Rice)	CT 309	1 Per Day During Production/Placement of At Least 300 Tons Per Day	Loose Mix Behind Paver Per CT 125
HMA Moisture Content	CT 226 or CT 370		
Stabilometer Value (d)	CT 366		
Asphalt Binder	Sample per Section 92	Sample 1 min. per day for production over 300 tons per day; See (f) regarding testing.	At Plant Per CT 125
Smoothness	12-foot Straightedge	As necessary to confirm contract compliance.	Final Pavement Surface

(a) Exact tonnage of sample location to be determined by Random Sampling Plans
(b) Compaction determined by Neclear Density Device. Core testing required if compaction fails the neclear test
(c Correlation between core densities and nuclear device required only if compaction fails the nuclear test
(d) Report the average of 3 tested briquettes from a single split source
(e) Use CT 309 to determine maximum theoretical density in lieu of CT 367 calculated maximum theoretical density
(f) No testing required unless warranted by concern ; sample and store until completion of project

5.1 Handout page 47

Update Your QAP

SUBGRADE (DISTURBED BASEMENT SOIL) OR EMBANKMENT

Quality Characteristic	Test Method	Minimum Sampling and Testing Frequency	Location/Time of Sampling
Maximum Density and Relative Compaction	CT 216/CT 231	1 Min. Test per 5000 sq ft under vehicle traveled way and shoulder 1 Min. Test Per 300 linear foot under sidewalk	Random locations as determined by the Engineer in place after compaction.

AGGREGATE BASES AND SUBBASES, IMPORTED BORROW

Quality Characteristic	Test Method	Minimum Sampling and Testing Frequency	Location/Time of Sampling
Sieve Analysis	CT 202	1 Min. Test Per Material Source	Sample from site stockpile/plant prior to placement.
R-Value	CT 301		
Sand Equivalent	CT 217		
Maximum Density and Relative Compaction	CT 216/CT 231	1 Min. Test per 5000 sq ft	Random locations as determined by the Engineer in place after compaction.

STRUCTURE BACKFILL, SELECT BACKFILL

Quality Characteristic	Test Method	Minimum Sampling and Testing Frequency	Location/Time of Sampling
Sieve Analysis	CT 202	1 Min. Test Per Material Source	Sample from site stockpile/plant prior to placement
R-Value	CT 301		
Sand Equivalent	CT 217		
Maximum Density and Relative Compaction	CT 216/CT 231	1 Min. Test Per 2 Vertical Lifts of Placement	Random locations as determined by the Engineer in place after compaction.

5.1 Handout pages 48

Update Your QAP

Test Result Log

Test Method Name and Number: ____CT 231 Compaction_____

Project Name: ___Main St. Rehab_____

Contract Number: _____5376(056)_____

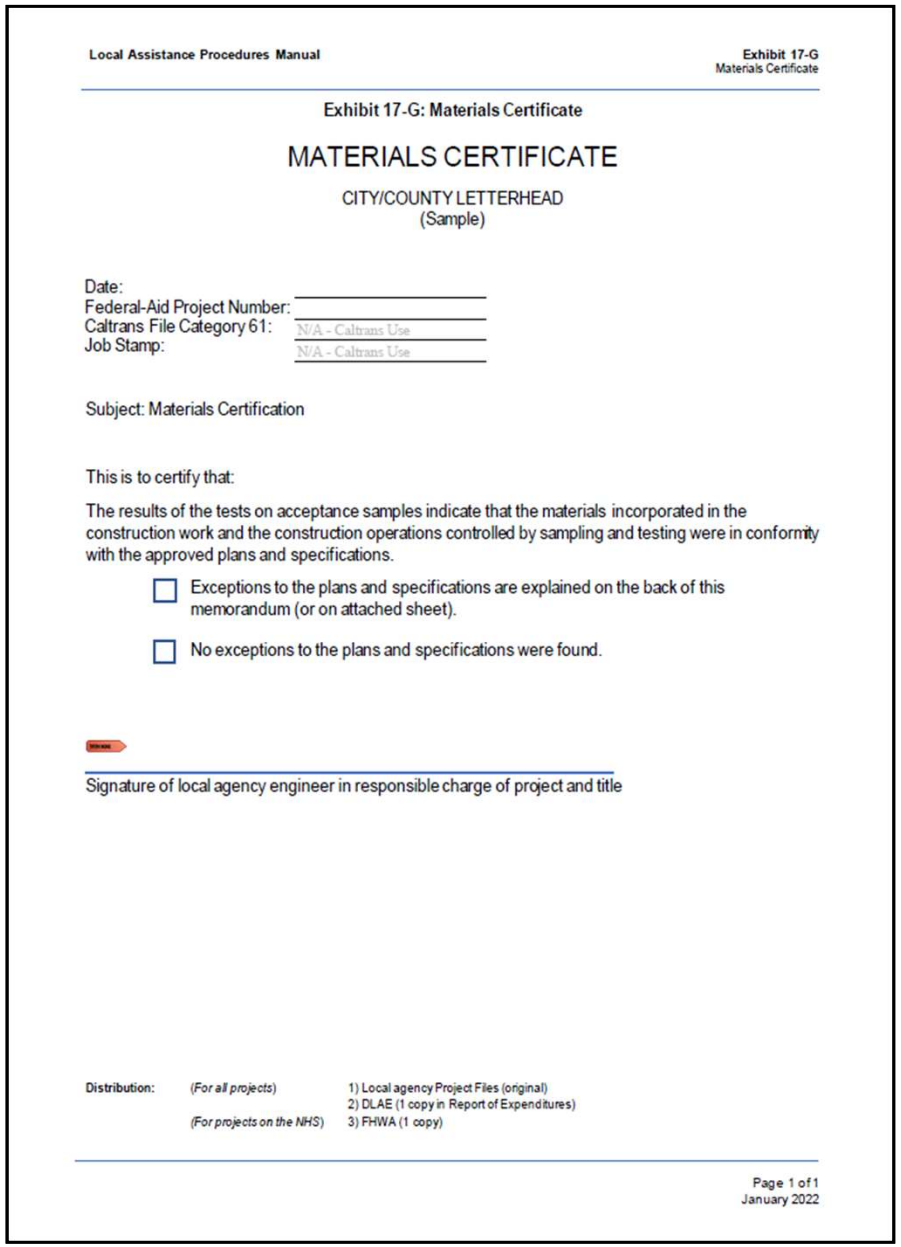
Test Number	Date Sampled	Name of Tester/ Company		Production			Test Results			Remarks
		Tester Certification of file?		Location	Elevation	Production Quantity Represented	Required Result	Actual Result	Pass/Fail	Include action taken for any failing test result; note test number of any retest.
1	9/9/2014	Doug Hole/ County Lab	x	Retaining Wall #3, backfill	4' below Top of Wall	1400 sy	95	96	P	
2	9/10/2014	Rusty Bridges/ County Lab	x	Retaining Wall #3, backfill	2' below Top of Wall	1400 sy	95	94	F	see test 3 for retest
3	9/10/2014	Reid Enright/ County Lab	x	Retaining Wall #3, backfill	2' below Top of Wall	1400 sy	95	95	P	
4										
5										
6										
7										

5.1 Handout page 53

Materials Certificate

- Appendix K (QAP Manual)
- RE signs off that "materials …conform to the approved plans and specifications"
- Materials which did not conform to specifications must be explained and justified on materials certificate
- Submitted to Caltrans with final report of expenditures at end of project
- Copy in construction file

5.1 Handout page 54



Local Assistance Procedures Manual — Exhibit 17-G Materials Certificate

Exhibit 17-G: Materials Certificate

MATERIALS CERTIFICATE

CITY/COUNTY LETTERHEAD
(Sample)

Date:
Federal-Aid Project Number:
Caltrans File Category 61: N/A - Caltrans Use
Job Stamp: N/A - Caltrans Use

Subject: Materials Certification

This is to certify that:

The results of the tests on acceptance samples indicate that the materials incorporated in the construction work and the construction operations controlled by sampling and testing were in conformity with the approved plans and specifications.

☐ Exceptions to the plans and specifications are explained on the back of this memorandum (or on attached sheet).

☐ No exceptions to the plans and specifications were found.

Signature of local agency engineer in responsible charge of project and title

Distribution: (For all projects) 1) Local agency Project Files (original)
2) DLAE (1 copy in Report of Expenditures)
(For projects on the NHS) 3) FHWA (1 copy)

Page 1 of 1
January 2022

Record Keeping

Sample QA filing system for small projects:

a. Copy of Quality Assurance Program

b. Independent Assurance

   i. Certs. of Proficiency-Testers and Samplers (Exh. 16-D TL-0111)

   ii. Cert. of Accreditation of Testing Lab (TL-0113)

c. Notice of Material to be Used (Exh. 16-I)

d. Approved Mix Designs

Record Keeping

Recommended filing system for small projects (continued):

e. Acceptance Testing Results and Initial Tests: (*Make a Category 6d for each material…6d.1, Cl 2 base, 6d.2, AC etc..Include items below for each.)*

   i. Test Result Summary Log

   ii. Test Results (field/lab data records, not just summary of results)

f. Certificates of Compliance (include Exh. 16-T)

g. Source Inspection Records/Report of Inspection of Material

h. Buy America Certifications

i. Material Certification (Exh. 17-G)

METS Contacts

Independent Assurance

METS offers free Tester Certification and Lab Accreditation for Federal-aid projects that use California Test Methods.

District	Area Senior	Phone	Email
IA North/JTCP	Richard Hibbard	(916) 926-7459	Richard.Hibbard@dot.ca.gov
IA Central	Biplab Bhattacharya	(916) 813-3658	biplab.bhattacharya@dot.ca.gov
IA South	Mehdi Galavi	(916) 926-7452	mehdi.galavi@dot.ca.gov
IA Service Request		IA.Service.Request@dot.ca.gov	

https://sia.dot.ca.gov/index.php?r=iastaff%2Fcontact_list

Search for Laboratory & Material Testers

Examples of how to search using:

California Test Methods (CTM)

American Association of State Highway and Transportation Officials (AASHTO)

American Society for Testing and Materials (ASTM)

Example – Quality Laboratory

Search using California Test Method (CTM)

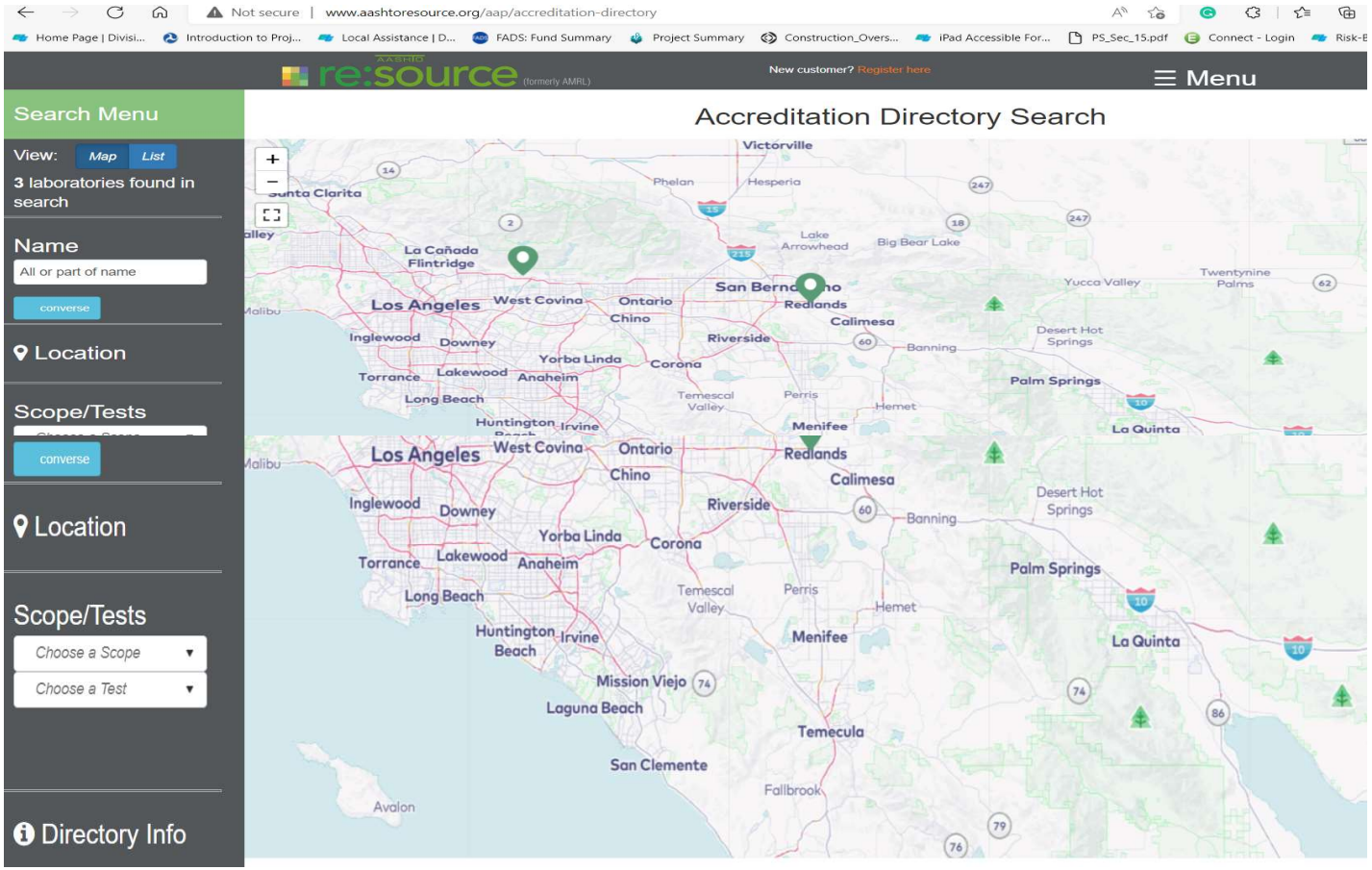
https://sia.dot.ca.gov/

Example – Material Testers

Search using California Test Method (CTM)

Example – Quality Laboratory

Search using AASHTO/ASTM



https://aashtoresource.org/aap/accreditation-directory

Example – Material Testers

Search using AASHTO/ASTM

Remember…

Be able to:

- Find helpful resources
- Know basic materials “concepts”
- Understand the key elements of a QAP
- Update and implement QAP
- Perform proper record keeping