COUNTY OF SAN MATEO
DEPARTMENT OF PUBLIC WORKS

James C. Porter
Director

County Government Center
555 County Center, 5th Floor
Redwood City, CA 94063
650-363-4100 T
650-361-8220 F
www.smcgov.org

COUNTY OF SAN MATEO

QUALITY ASSURANCE PROGRAM

JANUARY 2015

QUALITY ASSURANCE PROGRAM (QAP)
County of San Mateo

The purpose of this program is to provide assurance that the materials incorporated into the construction projects are in conformance with the contract specifications. This program should be updated every five years, or more frequently, if there are changes of the testing frequencies or to the tests themselves. To accomplish this purpose, the following terms and definitions will be used:

DEFINITION OF TERMS

- Acceptance Testing (AT) – Sampling and testing, or inspection, to determine the degree of compliance with contract requirements.

- Independent Assurance Program (IAP) – Verification that AT is being performed correctly by qualified testers and laboratories.

- Quality Assurance Program (QAP) – A sampling and testing program that will provide assurance that the materials and workmanship incorporated into the construction project are in conformance with the contract specifications. The main elements of a QAP are the AT, and IAP

- Source Inspection – AT of manufactured and prefabricated materials at locations other than the job site, generally at the manufactured location.

MATERIALS LABORATORY

The County of San Mateo (County) will typically use a private consultant materials laboratory to perform AT on Federal-aid and other designated projects. The materials laboratory shall be under the responsible management of a California registered Engineer with experience in sampling, inspection and testing of construction materials. The Engineer shall certify the results of all tests performed by laboratory personnel under the Engineer's supervision. The materials laboratory shall contain certified test equipment capable of performing the tests conforming to the provisions of this QAP.

The materials laboratory used shall provide documentation that the laboratory complies with the following procedures:

1. Correlation Testing Program – The materials laboratory shall be a participant in one or more of the following testing programs:

   a. AASHTO Materials Reference Laboratory (AMRL)
   b. Cement and Concrete Reference Laboratory (CCRL)
   c. Caltrans' Reference Samples Program (RSP)

2. Certification of Personnel – The materials laboratory shall employ personnel who are certified by one or more of the following:

   a. Nationally recognized non-Caltrans organizations such as the American Concrete Institute, Asphalt, National Institute of Certification of Engineering Technologies, etc.

b. Other recognized organizations approved by the State of California and/or recognized by local governments or private associations.

3. Laboratory and Testing Equipment – The materials laboratory shall only use laboratory and testing equipment that is in good working order. All such equipment shall be calibrated at least once each year. All testing equipment must be calibrated by impartial means using devices of accuracy traceable to the National Institute of Standards and Technology. A decal shall be firmly affixed to each piece of equipment showing the date of the last calibration. All testing equipment calibration decals shall be checked as part of the IAP.

ACCEPTANCE TESTING (AT)

AT will be performed by certified materials testing personnel using an accredited materials laboratory. The certifications and accreditations shall be specific to the tests being performed. The tests results will be used to ensure that all materials incorporated into the project are in compliance with the contract specifications.

Currently, the County utilizes the 2006 Caltrans Standard Specifications on all of its Federally-funded, and other, projects.

It is the County's intent that Testing methods will be in accordance with the California Test Methods (CT). When CT test methods are not feasible, or desirable, for a certain test, a national recognized standard (i.e., AASHTO, ASTM, etc.) shall be utilized, **as specified in the contract specifications, and as directed by the Engineer.**

Testing methods, sample locations and frequencies shall be in accordance with the contract specifications. If not so specified in the contract specifications, samples shall be taken at the locations and frequencies, and Testing methods shall be as shown in Attachment #1 ("Acceptance Sampling and Testing Frequencies" of this Quality Assurance Program (QAP)), and as directed by the Engineer.

Relatively minor quantities of construction materials may be accepted, without testing, provided acceptance conforms to the conditions stated below in paragraphs I and 2. Generally, this provides for accepting minor quantities of materials from a commercial source that is known to be a supplier of specification material.

1. The Engineer, on the basis of a visual examination, may accept minor quantities of materials without testing provided the source of the supplies has recently furnished similar materials found to be satisfactory using normal sampling and testing requirements
2. Acceptance of a product may be established on the basis of certification by the manufacturer or supplier that the material furnished complies with all specification requirements

The following list suggests approximate maximum quantities of materials that may be accepted under the conditions indicated above:

• Aggregates, other than for use in Portland Cement Concrete--not to exceed 100 tons per day nor more than 500 tons per project
• Bituminous mixtures--not to exceed 50 tons per day. Sample at Engineer's discretion if project total is less than 500 tons

• Bituminous material--not to exceed 100 gallons per project
• Paint--not to exceed 20 gallons per project. Acceptance to be based on weights and analysis on container
• Masonry items -- check dimensions of products for specification compliance and uniformity of manufacture
• Non-reinforced or clay pipe--not more than 100 lineal feet

INDEPENDENT ASSURANCE PROGRAM (IAP)

IAP may be provided by personnel from Caltrans, the County 's certified materials laboratory, consultant's certified materials laboratory, and/or another recognized entity IAP will be used to verify that sampling and testing procedures are being performed properly and that all testing equipment is in good condition and properly calibrated.

IAP personnel shall be certified in all required testing procedures, as part of IAP, and shall not be involved in any aspect of AT.

IAP shall be performed on every type of materials test required for the project. Proficiency tests shall be performed on Sieve Analysis, Sand Equivalent, and Cleanness Value tests. All other types of IAP shall be witness tests.

Poor correlation between acceptance tester's results and other test results may indicate probable deficiencies with the acceptance sampling and testing procedures. In cases of unresolved discrepancies, a complete review of AT shall be performed by IAP personnel, or an independent materials laboratory chosen by the County. IAP samples and tests are not to be used for determining compliance with contract requirements. Compliance with contract requirements is determined only by AT.

REPORTING ACCEPTANCE TESTING RESULTS

The Resident Engineer will review and initial test results within the following time periods:

- When the aggregate is sampled at material plants, test results for Sieve Analysis, Sand Equivalent and Cleanness Value should be submitted to the Resident Engineer within two (2) working days after sampling.
- When materials are sampled at the job site, test results for compaction and maximum density should be submitted to the Resident Engineer within two (2) working days after sampling.
- When soils and aggregates are sampled at the job site:
  (1) Test results for Sieve Analysis, Sand Equivalent and Cleanness Value should be submitted to the Resident Engineer within three (3) working days after sampling.
  (2) Test results for "R" Value and asphalt concrete extraction should be submitted to the Resident Engineer within four (4) working days after sampling.

When sampling products such as Portland Cement Concrete (PCC), cement-treated base (CTB), hot mix asphalt (HMA), and other such materials; the time of such sampling shall be varied with respect to the time of the day insofar as possible, in order to avoid a predictable sampling routine. The reporting of AT results, if the testing is not performed by the Resident Engineer's staff, shall be done on an expedited basis such as by fax, telephone, or e-mail.

TESTING OF MANUFACTURED MATERIALS

Certificates of Compliance

A list of materials that can be typically accepted on the basis of certificates of compliance (COC) during construction is found in Attachment No. 2 herewith. COC shall be furnished with each material lot delivered to the job site. Certificates of compliance shall conform to the requirements of the contract specifications, and shall include:

- the project number
- the lot-number or mill marking
- Statement that the material complies with the contract specification (name spec by number)
- Signature by the Manufacturer

Source Inspection

For those materials manufactured and prefabricated at locations other than the jobsite (generally at the manufacturer's location) that require testing or inspection, the County will seek to have its materials consultant or designee perform Source Inspection services on such materials.

PROJECT CERTIFICATION

Upon completion of a Federal-aid project, a "Materials Certificate" shall be completed by the Resident Engineer, utilizing Exhibit 17-G in the Local Assistance Procedures Manual The County shall include this Materials Certificate in the Report of Expenditures submitted to the Caltrans District Director, Attention: District Local Assistance Engineer. A copy of the "Materials Certificate" shall also be included in the County's construction records. The Resident Engineer in charge of the construction function for the County shall sign the certificate. All materials incorporated into the work which did not conform to specifications must be explained and justified on the "Materials Certification", including changes by virtue of contract change orders. See Attachment # 3 for a copy of Exhibit 17-G and a sample "Materials Exceptions Table" (from Appendix K of the Caltrans QAP Manual).

RECORDS

All material records of samples and tests, material releases and certificates of compliance for the construction project shall be incorporated into the Resident Engineer's project file. If the construction project is a Federal-aid project:

- The files shall be organized and indexed per the following:
  - Copy of Quality Assurance Plan
  - Independent Assurance
    - Certificates. of Proficiency-Testers and Samplers (Exhibit 16-D TL-0111)
    - Certificate. of Accreditation of Testing Lab (TL-0113)
    - Equipment Calibration Verifications (Nuclear Gauge, etc.)
  - Notice of Material to be Used (Exhibit. 16-I)
  - Acceptance Testing Results and Initial Tests: (*Make a Category for each material)*
    - Summary Log of Acceptance Testing. See Attachment #4 for an example Log Summary Sheet.
    - Test Results/Reports
  - Certificates of Compliance
  - Records for Source Inspection of structural pre-manufactured Material. (collected inspection tags)
  - Buy America Certifications

- Materials Certification (Exhibit. 17-G)

- It is recommended that the complete project file be available at a single location for inspection by Caltrans and Federal Highway Administration (FHWA) personnel.
- The project files shall be available for at least three years following the date of final project reimbursement or through the period of litigation, whichever is later.

When two or more projects are furnishing identical materials simultaneously from the same plant, it is not necessary to take separate samples or perform separate tests for each project; however, copies of the test reports are to be provided for each of the projects to complete the records.

APPROVED BY: _____ RCE No. C48056, Expires 12-31-15

NAME: James C. Porter DATE: 1-6-15

TITLE: Director of Public Works County of San Mateo

This Quality Assurance Program cancels and supercedes the County's previously submitted Quality Assurance Program (dated September 22, 2009).

Attachments:

Attachment #1: "Acceptance Sampling and Testing Frequencies"
Attachment #2 "Construction Materials Accepted by a Certificate of Compliance"
Attachment #3: Materials Certificates and Sample Materials Exception Log
Attachment #4: Example Log Summary Sheet

Attachment 1 Acceptance Sampling and Testing Frequencies

Note: It may be desirable to sample and store some materials. If warranted, testing can be performed at a later date.

Portland Cement (Hydraulic Cement)

Materials to be Sampled or Tested	Sample Size	Sampling/Testing Frequency	Typical Test Methods	Description or Comments
Cement/fly ash **(Sampling only)**	8-lb. sample	If possible, take a least one sample per job, even if the material is accepted based on a Certificate of Compliance.	ASTM D75, C494 CT 125 AASHTO T127, M85, M295	Standard for sampling hydraulic cement or fly ash.
Cement **(Testing Only)**	8-lb. sample	If the product is accepted based on a Certificate of Compliance, testing is not required. If the product is not accepted using a Certificate of Compliance, test at least once per job.	ASTM C109 CT 515 AASHTO T106	If testing appears warranted, fabricate six 2-in. mortar cubes using the Portland (or hydraulic cement). Test for compressive strength.

Portland Cement Concrete (Hydraulic Cement Concrete)

Materials to be Sampled or Tested	Sample Size	Sampling/Testing Frequency	Typical Test Methods	Description or Comments
Aggregate for Hydraulic Cement Concrete **(Sampling & Testing)**	50-lb. sample	Take one aggregate sample for each 1000 cu. yd. of PCC/HCC concrete. Test at least one sample per job.	ASTM D75 CT 125 AASHTO M6, T2, M80	Sample aggregate from belt or hopper (random basis).
Water **(Sampling & Testing)**	Take a two-quart sample using a clean plastic jug (with lining) and sealed lid. Sample at the point of use.	If the water is clean with no record of chlorides or sulfates greater than 1%, no testing is required. If the water is dirty do not use it. Test only when the chloride or sulfates are suspected to be greater than 1%.	CT 405, CT422, CT 417 AASHTO R23	If testing appears warranted, test for chlorides and sulfates.

G:\Users\design\QAP\Attachment 1 QAP 2014_2.docx

Attachment 1 (continued)

Portland Cement Concrete (Hydraulic Cement Concrete) - Continued

Materials to be Sampled or Tested	Sample Size	Sampling/Testing Frequency	Typical Test Methods	Description of Comments
Air Entraining Admixtures **(Sampling & Testing)**	Take a one-quart sample using a clean, lined can or plastic bottle, if liquid. If powder, take a 2.5 lb. sample.	If the product is accepted based on a Certificate of Compliance, testing is not required. Take one sample per job. Prior to sampling, check with Caltrans (METS) for acceptable brands and dosage rates.	ASTM C233 AASHTO M154,T157, C260	If testing appears warranted, test for sulfates and chlorides Admixtures with sulfates and chlorides greater than 1% should not be used.
Water Reducers or Set Retarders **(Sampling & Testing)**	If liquid, take a 1-qt. sample using a clean plastic can. If powder, take a 2.5 lb. sample.	If the product is accepted based on a Certificate of Compliance, no testing is required. If not, test once per job. Prior to using this product, please check with Caltrans (METS) for acceptable brands and dosage rates.	ASTM C494 AASHTO M194	If testing appears warranted, test for sulfates and chlorides. Admixtures with sulfates and chlorides greater than 1% should not be used.
Freshly-Mixed Concrete **(Sampling)**	Approx. 150lb. (or 1 cu. ft.) near mixer discharge.	When tests are required, take at least one sample for each 500 to 1000 cu. yd. of PCC/HCC.	ASTM C172, C685 CT 539 AASHTO T141, M157	This describes a method to sample freshly-mixed concrete.
Freshly-Mixed Concrete **(Testing)**	Approx. 150 lb/ (or 1 cu. ft.) near mixer discharge.	On projects with 500 cu. yd., or more, test at least one sample per job. (1), (2)	ASTM C143 AASHTO T119	This test determines the slump of the freshly-mixed concrete.
Freshly-Mixed Concrete **(Testing)**	Approx. 150 lb/ (or 1 cu. ft.) near mixer discharge	On projects with 500 cu. yd., or more, test at least one sample per job. (1), (2)	ASTM C360 CT 533	This test determines the ball penetration of the freshly-mixed concrete.
Freshly-Mixed Concrete **(Testing)**	Approx. 150 lb/ (or 1 cu. ft.) near mixer discharge	On projects with 500 cu. yd., or more, test at least one sample per job. (1), (2)	ASTM C231 CT 504 AASHTO T152	This test determines the air content of freshly-mixed concrete (pressure method).
Freshly-Mixed Concrete **(Testing)**	Approx. 150 lb/ (or 1 cu. ft.) near mixer discharge	On projects with 500 cu. yd., or more, test at least one sample per job. (1), (2)	ASTM C138 CT 518 AASHTO T121	This test determines the unit weight of freshly mixed concrete.

(1) Testing only required if Material Certifications or Certificates of Compliance are not accepted or approved by the County.
(2) The County has the option to obtain additional samples if tests fail.

Portland Cement Concrete (Hydraulic Cement Concrete) - Continued

Materials to be Sampled or Tested	Sample Size	Sampling/Testing Frequency	Typical Test Methods	Description or Comments
Freshly-Mixed Concrete **(Testing)**	Approx. 150 lb/ (or 1 cu. ft.) near mixer discharge	Fabricate at least two concrete cylinders per project. Test for compressive strength at least once for each 500 to 1,000 cu. yd. of structural concrete. (2)	CT 521	This test is used to fabricate 6" x 12" concrete cylinders. Compressive strengths are determined, when needed.
Freshly-Mixed Concrete **(Testing)**	Approximately 210 lb. of concrete are needed to fabricate three concrete beams.	One sample set for every 500 to 1,000 cu. yd. of concrete. (2)	ASTM C78 CT 31 AASHTO T97 & T23	This test is used to determine the flexural strength of simple concrete beams in third-point loading

Soils and Aggregates

Materials to be Sampled or Tested	Sample Size	Sampling/Testing Frequency	Typical Test Methods	Description or Comments
Aggregate **(Sampling)**	One 50-lb. sample	Take one sample for every 500 to 1,000 tons of materials. Test at least one sample per project.	ASTM D75 CT 125 AASHTO T2	This test describes the procedures to sample aggregate from the belt or hopper (random basis).
Fine Aggregates **(Testing)**	One 50-lb. sample	Take one sample for every 500 to 1,000 tons of materials. Test at least one sample per project. (1)	ASTM C128 CT 208 AASHTO T84	This test determines the apparent specific gravity of fine aggregates for bituminous mixes, cement treated bases and aggregate bases.
Fine Aggregate **(Testing)**	One 50-lb. sample	Take one sample for every 500 to 1,000 tons of materials. Test at least one sample per project. (1)	ASTM C128 CT 207 AASHTO T84	This test determines the bulk specific gravity (SSD) and the absorption of material passing the No. 4 sieve.
Coarse Aggregate **(Testing)**	One 50-lb. sample	Take one sample for every 500 to 1,000 tons of materials. Test at least one sample per project. (1)	ASTM C127 CT 206	This test determines the cleanness of coarse aggregate.

(1) Testing only required if Material Certifications or Certificates of Compliance are not accepted or approved by the County.
(2) The County has the option to obtain additional samples if tests fail.

Attachment 1 (continued)

Soils and Aggregates - Continued

Materials to be Sampled or Tested	Sample Size	Sampling/Testing Frequency	Typical Test Methods	Description or Comments
Coarse Aggregate **(Testing)**	One 50-lb. sample	Take one sample for every 500 to 1,000 tons of materials. Test at least one sample per project. (1)	ASTM C127 CT 227 AASHTO T85	This test determines the specific gravity and absorption of coarse aggregate (material retained on the No. 4 sieve).
Soils and Aggregates **(Testing)**	One 50-lb. sample	Take one sample for every 500 to 1,000 tons of materials. Test at least one sample per project. (1)	ASTM C136 CT 202 AASHTO T27	This test determines the gradation of soils and aggregates by sieve analysis.
Soils and Aggregates **(Testing)**	One 50-lb. sample	Take one sample for every 500 to 1,000 tons of materials. Test at least one sample per project. (1)	ASTM D2419 CT 217 AASHTO T176	This test determines the Sand Equivalent of soils and aggregates.
Soils and Aggregates **(Testing)**	One 50-lb. sample	Take one sample for every 500 to 1,000 tons of materials. Test at least one sample per project. (1)	ASTM C117 AASHTO T11	This test determines the gradation for materials finer that the No. 200 sieve (by washing method).
Soils and Aggregates **(Testing)**	One 50-lb. sample	Take one sample for every 500 to 1,000 tons of materials. Test at least one sample per project. (1)	ASTM D3744 CT 229 AASHTO T210	This test determines the Durability Index of soils and aggregates.
Soils and Aggregates **(Testing)**	One 50-lb. sample	Take one sample for every 500 to 1,000 tons of materials. Test at least one sample per project. (1)	ASTM D2844 CT 301 AASHTO T190	This test determines the Resistance Value (R-) and expansion pressure of compacted materials.
Soils and Aggregates **(Testing)**	One random location for every 2,500 sq. ft.	Take one sample for every 500 to 1,000 tons of materials. Test at least one sample per project. (2)	ASTM D2922 CT 231 AASHTO T238	This test determines field densities using the nuclear gage.
Soils and Aggregates **(Testing)**	One random location for every 2,500 sq. ft.	Take one sample for every 500 to 1,000 tons of materials. Test at least one sample per project. (1)	ASTM D3017 CT 231 AASHTO T239	This test determines the water content using the nuclear gage.

(1) Testing only required if Material Certifications or Certificates of Compliance are not accepted or approved by the County.
(2) The County has the option to obtain additional samples if tests fail.

Attachment 1 (continued)

Asphalt Binder

Materials to be Sampled or Tested	Sample Size	Sampling/Testing Frequency	Typical Test Methods	Description or Comments
Asphalt Binder **(Sampling)**	One 0.5-gal. sample placed in a clean, sealed can.	The Country has the option whether or not to sample at the asphalt concrete plant.	CT 125 ASTM D 979 AASHTO T 168, T48	This procedure describes the proper method to sample the asphalt binder.
Asphalt Binder **(Testing)**	One 0.5-gal. sample placed in a clean, sealed can.	Sample once per job at the asphalt concrete plant. (1)	ASTM D92, D117 AASHTO T 48	This test determines the flash point of the asphalt binder (by Cleveland open cup).
Asphalt Binder **(Testing)**	One 0.5-gal. sample placed in a clean, sealed can.	Obtain one sample at the asphalt concrete plant for each 1,000 tons of asphalt concrete placed. (1)	ASTM D2872 & D92 CT 346 AASHTO T240 &T48	This test determines the rolling thin-film oven test (RTFO).
Asphalt Binder **(Testing)**	One 0.5-gal. sample placed in a clean, sealed can.	Obtain one sample at the asphalt concrete plant for each 1,000 tons of asphalt concrete placed. (1)	ASTM D2042 AASHTO T44	This test determines the solubility of asphalt material in trichloroethylene.
Asphalt Binder **(Testing)**	One 0.5-gal. sample placed in a clean, sealed can.	Obtain one sample at the asphalt concrete plant for each 1,000 tons of asphalt concrete placed. (1)	ASTM D2171 AASHTO T202	This test determines the dynamic viscosity, (absolute viscosity of asphalt @ 140 degrees F by the Vacuum Capillary Viscometer Poises).
Asphalt Binder **(Testing)**	One 0.5-gal. sample placed in a clean, sealed can.	Obtain one sample at the asphalt concrete plant for each 1,000 tons of asphalt concrete placed. (1)	ASTM D5 AASHTO T49	This test determines the penetration of bituminous material @ 77 degrees F and percentage of original penetration from the residue.
Asphalt Binder **(Testing)**	One 0.5-gal. sample placed in a clean, sealed can.	Obtain one sample at the asphalt concrete plant for each 1,000 tons of asphalt concrete placed. (1)	ASTM D113 AASHTO T51	This test determines the ductility of asphalt @ 77 degrees F.
Asphalt Binder **(Testing)**	One 0.5-gal. sample placed in a clean, sealed can.	Obtain one sample at the asphalt concrete plant for each 1,000 tons of asphalt concrete placed. (1)	ASTM D2170 AASHTO T201	This test determines the kinematic viscosity of asphalt @275 degrees F (Centistoke).

(1) Testing only required if Material Certifications or Certificates of Compliance are not accepted or approved by the County.

Attachment 1 (continued)

Asphalt Binder - Continued

Materials to be Sampled or Tested	Sample Size	Sampling/Testing Frequency	Typical Test Methods	Description or Comments
Asphalt Binder **(Testing)**	One 0.5-gal. sample placed in a clean, sealed can.	Obtain one sample at the asphalt concrete plant for each 1,000 tons of asphalt concrete placed. (1)	ASTM D2171 AASHTO T202	This test determines the dynamic viscosity. (absolute viscosity of asphalt @ 140 degrees F by the Vacuum Capillary Viscometer Poises).
Asphalt Binder **(Testing)**	One 0.5-gal. sample placed in a clean, sealed can.	Obtain one sample at the asphalt concrete plant for each 1,000 tons of asphalt concrete placed. (1)	ASTM D36 AASHTO T53	This test determines the softening point of asphalt.

Asphalt Emulsified

Materials to be Sampled or Tested	Sample Size	Sampling/Testing Frequency	Typical Test Methods	Description or Comments
Emulsified Asphalt **(Sampling)**	One 0.5-gal. sample placed in a clean, sealed can.	The Country has the option whether or not to sample at the asphalt concrete plant.	ASTM D140, D979 CT 125 AASHTO T 40, T168	This test describes the procedure to sample the emulsified asphalt. If collected, obtain one sample at the asphalt concrete plant for each 1,000 tons of asphalt concrete placed. (1)
Emulsified Asphalt **(Testing)**	One 0.5-gal. sample placed in a clean, sealed can.	Obtain one sample at the asphalt concrete plant for each 1,000 tons of asphalt concrete placed. (1)	ASTM D244 AASHTO T59	This test determines the sieve retention of emulsified asphalt.
Emulsified Asphalt **(Testing)**	One 0.5-gal. sample placed in a clean, sealed can.	Obtain one sample at the asphalt concrete plant for each 1,000 tons of asphalt concrete placed. (1)	ASTM D244 AASHTO T59	This test determines the weight per gallon of emulsified asphalt.
Emulsified Asphalt **(Testing)**	One 0.5-gal. sample placed in a clean, sealed can.	Obtain one sample at the asphalt concrete plant for each 1,000 tons of asphalt concrete placed. (1)	ASTM D244 AASHTO T59	This test determines the penetration of the emulsified asphalt.
Emulsified Asphalt **(Testing)**	One 0.5-gal. sample placed in a clean, sealed can.	Obtain one sample at the asphalt concrete plant for each 1,000 tons of asphalt concrete placed. (1)	ASTM D244 CT 330 AASHTO T59	This test determines the residue @ 325 degrees F evaporation of emulsified asphalt.

(1) Testing only required if Material Certifications or Certificates of Compliance are not accepted or approved by the County.

Asphalt Emulsified - Continued

Materials to be Sampled or Tested	Sample Size	Sampling/Testing Frequency	Typical Test Methods	Description or Comments
Emulsified Asphalt **(Testing)**	One 0.5-gal. sample placed in a clean, sealed can.	Obtain one sample at the asphalt concrete plant for each 1,000 tons of asphalt concrete placed. (2)	ASTM D4402 AASHTO T201	This test determines the Brookfield viscosity.
Emulsified Asphalt **(Testing)**	One 0.5-gal. sample placed in a clean, sealed can.	Obtain one sample at the asphalt concrete plant for each 1,000 tons of asphalt concrete placed. (2)	ASTM D88 AASHTO T72	This test determines the Saybolt-Furol viscosity of emulsified asphalt @ 77 degrees F (seconds).

Hot Mix Asphalt (Asphalt Concrete) - Concrete

Materials to be Sampled or Tested	Sample Size	Sampling/Testing Frequency	Typical Test Methods	Description or Comments
Asphalt Concrete **(Sampling)**	Obtain one 30-lb. sample each day of production	Obtain one sample at the asphalt concrete plant for each 5,000 tons of asphalt concrete placed. (2)	ASTM D75, D140, D979 CT 125 AASHTO T 40, T168	This test describes the procedure to sample the asphalt concrete.
Asphalt Concrete **(Testing)**	4" x 8" cores	Take one 4" x 8" core for every 500 ft of new pavement. (2)	ASTM D1188, D1560, D1561, D5361 CT 304 AASHTO T246, T247	This test determines the field density of street samples.
Asphalt Concrete **(Testing)**	Obtain one 30-lb. sample for each day of production	Obtain one sample per project. (2)	ASTM D1188, D1560, D1561, D5361 CT 304 AASHTO T246, T247	This test determines the laboratory density and relative compaction of asphalt concrete.
Asphalt Concrete **(Testing)**	4" x 8" cores	Obtain one sample per project. (2)	ASTM D2726, D1188, D5361	This test determines the specific gravity of compacted bituminous Mixture dense-graded or non-absorptive.

(2) The County has the option to obtain additional samples if tests fail.

Attachment 1 (continued)

Hot Mix Asphalt (Asphalt Concrete) - Continued

Materials to be Sampled or Tested	Sample Size	Sampling/Testing Frequency	Typical Test Methods	Description or Comments
Asphalt Concrete **(Testing)**	One 30-lb sample	Obtain one sample for every 1,000 tons of asphalt concrete. (1)	ASTM D1559 AASHTO T245	This test determines the resistance to plastic flow of prepared mixes as determined by the Marshall Method.
Asphalt Concrete **(Testing)**	One 30-lb sample	Obtain one sample for every 1,000 tons of asphalt concrete. (1)	ASTM C117, D2172 (use Method B) AASHTO T164	This test determines the screen analysis of aggregates recovered from asphalt materials.
Geotextile Fabric (Placed Under the Asphalt Concrete) **(Testing)**	One 12 ft. x 3 ft. sample	Obtain one sample per job. (1)	ASTM D4632 AASHTO M288	This test determines the weight per sq. yd. and grabs strength of geotextile fabrics.
Asphalt Concrete **(Testing)**	Sample any test location (random basis)	Obtain one sample for every 1,000 tons of asphalt concrete. (1), (2)	ASTM D2950 CT 375	This test determines the nuclear field density of in-place asphalt concrete.
Asphalt Concrete **(Testing)**	One 10-lb sample	Obtain one sample during every day of production. (1), (2)	ASTM D1560, D1561 CT 366 AASHTO T246, T247	This test determines the stability value of asphalt concrete.
Slurry Seals **(Sample)**	One 0.5 gal. sample in a clean, dry plastic container.	Obtain one sample per truck. (1)	ASTM D979 CT 125 AASHTO T 40, T168	This test describes the procedure for sampling the slurry seal.
Aggregate for Slurry Seals **(Testing)**	One 30-lb. sample.	Obtain at least one sample per project from the belt or hopper or stockpile and test for Sand Equivalent. (1)	ASTM D2419 CT 217 AASHTO T176	This test determines the Sand Equivalent of aggregates.

(1) Testing only required if Material Certifications or Certificates of Compliance are not accepted or approved by the County.
(2) The County has the option to obtain additional samples if tests fail.

Slurry Seals

Materials to be Sampled or Tested	Sample Size	Sampling/Testing Frequency	Typical Test Methods	Description or Comments
Aggregate for Slurry Seals **(Testing)**	One 30-lb. sample.	Obtain at least one sample per project from the belt, hopper, or stockpile and test for sieve analysis of fine sand. (1)	ASTM C117 AASHTO T11	This test determines the sieve analysis of fine sand (gradation of materials finer than No. 200 sieve by wash grading).
Slurry Seals **(Testing)**	One 0.5 gal. sample in a clean, dry - plastic container.	Test one sample per project and test for Abrasion. (1)	ASTM D3910	This test determines the Wet Track Abrasion Test (WTAT). (2)

Steel

Materials to be Sampled or Tested	Sample Size	Sampling/Testing Frequency	Typical Test Methods	Description or Comments
Steel Strand **(Testing)**	Sample strand at various sizes.	This item may be accepted using a Certificate of Compliance. Sample and test at least two steel strands per job when a Certificate of Compliance is not used. (1)	ASTM A370, A416, E328 AASHTO T244	This test determines the tensile strength of uncoated seven-wire stress-relieved strand for pre-stressed concrete.
Steel Rebar **(Testing)**	Sample rebar at various sizes.	This item may be accepted using a Certificate of Compliance. Sample and test at least two steel rebar per job when a Certificate of Compliance is not used. (1)	ASTM A615, A370 AASHTO T244	This test determines the steel reinforcement bar tensile strength and bend capability.

(1) Testing only required if Material Certifications or Certificates of Compliance are not accepted or approved by the County.
(2) The County has the option to obtain additional samples if tests fail.

Attachment 1 (continued)

Cement Treated Base (CTB)

Materials to be Sampled or Tested	Sample Size	Sampling/Testing Frequency	Typical Test Methods	Description or Comments
Completed Base **(Testing)**	One random location as per CT 375.	Take one sample for every 3,000 tons or 2,000 cu. yds. Test at least one sample per project. (3)	CT 231	This test determines field densities using the nuclear gage.
Completed Base **(Testing)**	See CT 338, Part 1.	As necessary for compliance.	CT 338	This test determines the cement content by titration.

(3) If material is uniform and well within specification limits, the frequency is decreased to 1 a day unless source is changed. Adjustments to testing frequencies shall be documented in the project files.

ATTACHMENT NO. 2

CONSTRUCTION MATERIALS ACCEPTED BY A CERTIFICATE OF COMPLIANCE
(based on 2006 Caltrans Standard Specifications)

Section	Material
94-1.05	Asphaltic Emulsion
51-1.12H(1&2)	Bearing Pads (Elastomeric)
90-2.01	Cement
90-4.03	Concrete Admixtures
83-2.02D(1)	Concrete Barrier, (for the Concrete)
66-2.02	Corrugated Aluminum Pipe
66-3.02	Corrugated Steel Pipe and Corrugated Steel Pipe Arches
61-1.02	Culvert and Drainage Pipe Joints
88-1.01	Engineering fabric
95-1.03	Epoxy
20-2.03	Erosion Control and Highway Planting: Soil Amendment
20-2.07	Erosion Control and Highway Planting: Fiber
20-2.08	Erosion Control and Highway Planting: Mulch
20-2.11	Erosion Control and Highway Planting: Stabilizing Emulsion
20-2.15B(1)	Erosion Control and Highway Planting: Plastic Pipe- Supply Line
20-2.15B(2)	Erosion Control and Highway Planting: Plastic Pipe- Irrigation Line
51-1.12F(2)	Joint Seals (Type A, AL and B)
24-1.02	Lime
93-1.02	Liquid Asphalt
82-1.02D	Markers: Post Marker and Object Marker Metal Target Plates
90-10.03	Minor Concrete
84-3.02	Paint (traffic stripe)
64-1.02	Plastic Pipe (culverts, drains, conduits)
65-1.02A(2)	Reinforced Concrete Pipe
52-1.04	Reinforcing Steel (bar, wire, welded wire fabric, epoxy coating)
52-1.02B	Reinforcement (epoxy-coating patching material)
86-2.08	Signal Lighting and Electrical Systems: Conductors
86-2.16	Signal Lighting and Electrical Systems: Steel Service Equipment Enclosures (coating)
86-4.01C	Signal Lighting and Electrical Systems: Conductors, Diode Signal Modules
86-4.07D(4)	Signal Lighting and Electrical Systems: Light Emitting Diode Ped Signal Modules
86-6.01A	Signal Lighting and Electrical Systems: Luminaire Lamp Ballast
86-6.05	Signal Lighting and Electrical Systems: Sign Lighting Lamp Ballast
86-6.065	Signal Lighting and Electrical Systems: Internally Illuminated Street Name Signs
49-5.01	Steel Piles
55-1.03	Structural Steel
57-1.02A	Structural Timber and Lumber
51-1.06A	Structural Composite Lumber (use in falsework)
67-1.02	Structural Metal Plate Pipe Arches and Pipe Arches
68-1.02J	Subsurface Drains: Perforated Steel Pipe
68-1.02J	Subsurface Drains: Aluminum under drain pipe and fittings
68-1.02K	Subsurface Drains: Polyvinyl Chloride Pipe (PVC) and Polyethylene Tubing
12-3.08	Temporary Railing (Type K)
58-1.03	Treated Timber, Lumber, and Piling
69-1.02A	Overside Drains: Steel Entrance Tapers, Down Drains, Reducers, Coupling Bands and Slip Joints
69-1.02F	Overside Drains: Aluminum Entrance Tapers, Arches, Down Drains, Reducers, Couplings, Slip Joints

COUNTY OF SAN MATEO
DEPARTMENT OF PUBLIC WORKS

James C. Porter
Director

County Government Center
555 County Center, 5th Floor
Redwood City, CA 94063
650-363-4100 T
650-361-8220 F
www.smcgov.org

Attachment #3

Local Assistance Procedures Manual
EXHIBIT 17-G MATERIALS CERTIFICATE

Materials Certificate

Date: _____
Federal-Aid Project No.: _____
Caltrans File Category 61: _____
Job Stamp _____

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.

Resident Engineer (Print Name)	Resident Engineer (Signature)	Date

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)

Attachment #3
Example

Attachments: Materials Exceptions (Acceptance Testing)

Type of Test	Description of Work	Total Tests Performed On the Project	Number of Failed Tests	Action Taken
Slump Test	Concrete Sidewalk	8	1	When the measured slump exceeded the maximum limit, the entire concrete load was rejected.
Sand Equivalent	Aggregate for Structural Concrete	10	1	The tested S.E. was 70 and the contract compliance specification was 71 minimum. However, the concrete 28-day compressive strength was 4800 psi. The concrete was considered adequate and no materials deductions were taken.
Compaction	Sub grade Material	12	1	One failed test was noted. The failed area was watered and reworked. When this was completed, a retest was performed. The retest was acceptable.
Compaction		12	1	One failed area was noted. It was reworked and retested. The second test met specifications.

Bill Sanders — Resident Engineer (Print Name)

Bill Sanders — Resident Engineer (Signature)

July 4, 2014 — Date

ATTACHMENT 4
Example Log Summary Sheet

San Mateo County
Department of Public Works

TEST RESULT SUMMARY LOG

Material Tested: Subgrade Materials

DATE STAMPLED	Name of Tester	Test Number (CT, ASTM)	Sample Location	Quantity Represented	Test Results	Minimum Specification	Pass or Fail	Action Taken	Remarks
5/15/2007	Jones	CT 231	Sta. 1+00, 30' L		93%	≥ 90 %	Pass	N/A	CT 231 = Compaction (Nuclear Gage)