

**CITY OF MORENO VALLEY**  
**PUBLICWORKSDEPARTMENT**  
**QUALITY ASSURANCE PROGRAM(QAP)**



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## **QUALITY ASSURANCE PROGRAM (QAP)**

### **CITY OF MORENO VALLEY**

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 frequent 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**

City of Moreno Valley will 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. Caltrans District Materials Engineer
  - b. Nationally recognized non-Caltrans organizations such as the American Concrete Institute, Asphalt, National Institute of Certification of Engineering Technologies, etc.
  - c. 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 a materials laboratory certified to perform the required tests. The tests results will be used to ensure that all materials incorporated into the project are in compliance with the contract specifications.

Testing methods will be in accordance with the Caltrans (CT) Methods or a national recognized standard (i.e., AASHTO, ASTM, etc.) as specified in the contract specifications.

Sample locations and frequencies may be in accordance with the contract specifications. If not so specified in the contract specifications, samples shall be taken at the locations and frequencies as shown in Attachment #1 (Acceptance Sampling and Testing Frequencies).

### **Failing Test**

Whenever failing tests occur, sufficient additional acceptance tests must be taken to isolate the affected work. Documentation of the results of such additional tests must be included in the records, including a description of the corrective measures taken. Corrective action or retesting of failing tests must be noted in the remark's column of the test summary log. Documentation of the reason that materials represented by failing tests were incorporated into the project must be in the project files.

### **Mix Design Approval and Checking**

Mix designs must be submitted by the Contractor and include the name of the material plant, the product name, a mix design ID number, and item of work in which it is to be used. The Resident Engineer (RE) will review and approve the mix design in writing. A copy of the approved mix design must be kept in the files. Field inspectors must verify that the mix delivered to the job site matches the approved mix design. The inspector must place a check mark adjacent to the mix ID shown on the weigh tag and initial the tag. Tags are to be collected at the point of delivery to the jobsite.

### **Acceptance of Minor Quantities of Materials without Testing**

Minor quantities of construction materials may be accepted without testing provided the following 3 conditions are met:

1. Visual examination of the material is performed.
2. The manufacturer or supplier has recently furnished similar materials found to be satisfactory using normal sampling and testing requirements.
3. The manufacturer (or supplier in the case of HMA or concrete) provides certification that the material furnished complies with the contract specifications.

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

1. Aggregates other than for use in Portland Cement Concrete; not to exceed 100 tons per day

nor more than 500 tons per project

2. Bituminous mixtures (includes HMA); not to exceed 50 tons per day (sample at Engineer's discretion if project total is less than 500 tons)
3. Bituminous material (includes Asphalt); not to exceed 100 gallons per project

### **INDEPENDENT ASSURANCE PROGRAM (IAP)**

#### "REQUIRED FOR ALL FEDERAL PROJECTS"

IAP shall be provided by personnel from Caltrans, the City's certified materials laboratory, or consultant's certified materials laboratory. 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 City. 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 following are time periods for reporting material test results to the RE:

- When the aggregate is sampled at material plants, test results for Sieve Analysis, Sand Equivalent and Cleanness Value should be submitted to the RE within 24 hours after sampling.
- When materials are sampled at the job site, test results for compaction and maximum density should be submitted to the RE within 24 hours 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 RE within 72 hours after sampling.
  - (2) Test results for "R" Value and asphalt concrete extraction should be submitted to the RE within 96 hours 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 not performed by the RE's staff, shall be done on an expedited basis such as by email or telephone.

### **TESTING OF MANUFACTURED MATERIALS**

During the Design phase of the project, the Project Engineer may submit a "Source Inspection Request" see

Attachment#2 (Exhibit 16-V of the LAPM) to the City of Moreno Valley, consultant, or Caltrans for inspection and testing of manufactured and prefabricated materials by their materials laboratory.

A list of materials that can be typically accepted on the basis of certificates of compliance during construction is found in Attachment #3 (Appendix F of the QAP Manual). All certificates of compliance shall conform to the requirements of the contract specifications, for examples see Attachment #4 (Appendix J of the QAP Manual).

Should the City request Caltrans to conduct the source inspection, and the request is accepted, all sampling, testing, and acceptance of manufactured and prefabricated materials will be performed by Caltrans' Office of Materials Engineering and Testing Services.

For Federal-aid projects on the National Highway System (NHS), Caltrans will assist in certifying the materials laboratory, and the acceptance samplers and testers. For Federal-aid projects off the NHS, Caltrans may be able to assist in certifying the materials laboratory, and the acceptance samplers and testers.

### **Acceptance of Manufactured or Fabricated Materials**

The acceptance of manufactured and fabricated materials is most frequently based on one of the following 3 methods:

#### **Source Inspection**

Source inspection is the inspection, sampling and testing of manufactured and prefabricated materials at locations other than the job site. It is most commonly performed on materials involving structural integrity or safety to the public, such as precast pre-stressed concrete members, structural steel, and poles for electrical systems. The purpose is to ensure that structural materials comply with contract requirements in regard to raw materials, fabrication processes, personnel certification, and in-process quality control testing.

City of Moreno Valley determines which materials will be source inspected. For a list of manufactured or prefabricated materials that are commonly source inspected for Caltrans projects, see Table 6-2.1, Inspection of Fabricated and Manufactured Materials of the Caltrans Construction Manual. If needed, source inspection is performed by the City of Moreno Valley or a qualified consultant.

Verification at the source of fabrication does not guarantee acceptance at the job site. Table 6-2.1 referenced above also includes items that must be checked or rechecked at the job site to ensure that the materials are acceptable. The RE will inspect the material upon arrival to be sure it meets the requirements of the specifications and is undamaged by shipping and handling. The RE will obtain and file the source inspectors report.

#### **Materials Accepted on the Basis of Authorized Materials List**

The Caltrans Standard Specifications (CTSS) identifies some materials that must be on an authorized materials list. The list is available at: <https://dot.ca.gov/programs/engineering-services/authorized-materials-lists>. For contracts using the CTSS, the RE must verify the materials furnished are shown on the appropriate authorized materials list before the material is used on the project. Materials shown on the authorized materials list may also require a certificate of compliance or sampling and testing for acceptance.

#### **Materials Accepted by Certificate of Compliance**

City of Moreno Valley may permit the use of certain manufactured products, materials or assemblies accompanied by a Certificate of Compliance (COC) prior to sampling and testing, provided these products, materials or assemblies do not involve structural integrity or safety to the public.

Additionally, these items must have a history of having met specifications based upon previous sampling and testing. The manufacturer of the products, materials or assemblies shall sign the Certificate of Compliance and state that the included materials and workmanship conform in all respects to the project specifications. The contract documents will specify which materials require the Contractor to submit a Certificate of Compliance. The RE is responsible for insuring that a Certificate of Compliance is furnished with each lot of these materials delivered to the work site. Exhibit 16-T1: Materials Requiring a Certificate of Compliance Per the Caltrans Standards Specifications and Exhibit 16-T2: Materials Requiring a Certificate of Compliance Per the Greenbook are lists of materials for which the contractor must submit a COC per the respective project specifications. The COC must be furnished before the material is incorporated into the work and include:

1. Project number
2. Certified material lot number matching lot tags affixed or stenciled to the released materials
3. Manufacturer’s signature
4. A statement that the material complies with the specifications of the contract

All materials accepted on the basis of a signed Certificate of Compliance shall be documented in the inspector’s daily reports. Inspect the material upon arrival to be sure it meets the requirements of the specifications and is undamaged by shipping and handling before accepting. Manufactured products, materials or assemblies used on the basis of a Certificate of Compliance may be sampled again at the job site and tested at any time during the life of the contract. Items found not in conformance with contract requirements must be rejected whether in place or not.

A Certificate of Compliance for each item shall be kept in the RE’s file.

Materials Requiring a Buy America Certification

Steel and iron products incorporated into the project must comply with Buy America requirements of the CFRs. All steel and iron products must be delivered with a COC stating all manufacturing processes involved in the production of the products occurred within the United States. These processes include:

- Rolling
- Drilling
- Extruding
- Coating
- Machining
- Welding
- Bending
- Smelting
- Grinding

In addition to the COC requirements mentioned earlier in this section, a Buy America COC must also include the mill markings or heat numbers.

The Buy America requirements apply to the entire construction contract if any federal-aid money has been authorized for any phase of the project, not just the construction phase. A local agency cannot circumvent the Buy America requirement by declaring that the material is being paid for with the non-federal portion of the funding.

Buy America does not apply to temporary steel such as that used in falsework, sheet piling or



**Attachment #1 (Acceptance Sampling and Testing Frequencies).**



## 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 <b>(Sampling only)</b>	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 <b>(Testing Only)</b>	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 <b>(Sampling &amp; Testing)</b>	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 <b>(Sampling &amp; Testing)</b>	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, CT 422, CT 417 AASHTO R23	If testing appears warranted, test for chlorides and sulfates.

## 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 <b>(Sampling &amp; Testing)</b>	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 <b>(Sampling &amp; Testing)</b>	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 <b>(Sampling)</b>	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 <b>(Testing)</b>	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.	ASTM C143 AASHTO T119	This test determines the slump of the freshly-mixed concrete.
Freshly-Mixed Concrete <b>(Testing)</b>	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.	ASTM C360 CT 533	This test determines the ball penetration of the freshly-mixed concrete.
Freshly-Mixed Concrete <b>(Testing)</b>	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.	ASTM C231 CT 504 AASHTO T152	This test determines the air content of freshly-mixed concrete (pressure method).
Freshly-Mixed Concrete <b>(Testing)</b>	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.	ASTM C138 CT 518 AASHTO T121	This test determines the unit weight of freshly mixed concrete.

## 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 or Comments
Freshly-Mixed Concrete <b>(Testing)</b>	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.	ASTM C39 CT 521 AASHTO T22	This test is used to fabricate 6” x 12” concrete cylinders. Compressive strengths are determined, when needed.
Freshly-Mixed Concrete <b>(Testing)</b>	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.	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 <b>(Testing)</b>	One 50-lb. sample	Take one sample for every 500 to 1,000 tons of materials. Test at least one sample per project.	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 <b>(Testing)</b>	One 50-lb. sample	Take one sample for every 500 to 1,000 tons of materials. Test at least one sample per project.	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 <b>(Testing)</b>	One 50-lb. sample	Take one sample for every 500 to 1,000 tons of materials. Test at least one sample per project.	CT 206	This test determines the cleanness of coarse aggregate.

## 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 <b>(Testing)</b>	One 50-lb. sample	Take one sample for every 500 to 1,000 tons of materials. Test at least one sample per project.	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 <b>(Testing)</b>	One 50-lb. sample	Take one sample for every 500 to 1,000 tons of materials. Test at least one sample per project.	ASTM C136 CT 202 AASHTO T27	This test determines the gradation of soils and aggregates by sieve analysis.
Soils and Aggregates <b>(Testing)</b>	One 50-lb. sample	Take one sample for every 500 to 1,000 tons of materials. Test at least one sample per project.	ASTM D2419 CT 217 AASHTO T176	This test determines the Sand Equivalent of soils and aggregates.
Soils and Aggregates <b>(Testing)</b>	One 50-lb. sample	Take one sample for every 500 to 1,000 tons of materials. Test at least one sample per project.	ASTM C117 AASHTO T11	This test determines the gradation for materials finer than the No. 200 sieve (by washing method).
Soils and Aggregates <b>(Testing)</b>	One 50-lb. sample	Take one sample for every 500 to 1,000 tons of materials. Test at least one sample per project.	ASTM D3744 CT 229 AASHTO T210	This test determines the Durability Index of soils and aggregates.
Soils and Aggregates <b>(Testing)</b>	One 50-lb. sample	Take one sample for every 500 to 1,000 tons of materials. Test at least one sample per project.	ASTM D2844 CT 301 AASHTO T190	This test determines the Resistance Value (R-) and expansion pressure of compacted materials.
Soils and Aggregates <b>(Testing)</b>	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.	ASTM D2922 CT 231 AASHTO T238	This test determines field densities using the nuclear gage.
Soils and Aggregates <b>(Testing)</b>	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.	ASTM D3017 CT 231 AASHTO T239	This test determines the water content using the nuclear gage.

## Attachment #1 (continued)

### Asphalt Binder

Materials to be Sampled or Tested	Sample Size	Sampling/Testing Frequency	Typical Test Methods	Description or Comments
Asphalt Binder <b>(Sampling)</b>	One 0.5-gal. sample placed in a clean, sealed can.	Sample once per job 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 <b>(Testing)</b>	One 0.5-gal. sample placed in a clean, sealed can.	Sample once per job at the asphalt concrete plant.	ASTM D92, D117 AASHTO T 48	This test determines the flash point of the asphalt binder (by Cleveland open cup).
Asphalt Binder <b>(Testing)</b>	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.	ASTM D2872 & D92 CT 346 AASHTO T240 &T48	This test determines the rolling thin-film oven test (RTFO).
Asphalt Binder <b>(Testing)</b>	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.	ASTM D2042 AASHTO T44	This test determines the solubility of asphalt material in trichloroethylene.
Asphalt Binder <b>(Testing)</b>	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.	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 <b>(Testing)</b>	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.	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 <b>(Testing)</b>	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.	ASTM D113 AASHTO T51	This test determines the ductility of asphalt @ 77 degrees F.
Asphalt Binder <b>(Testing)</b>	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.	ASTM D2170 AASHTO T201	This test determines the kinematic viscosity of asphalt @275 degrees F (Centistoke).

## 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 <b>(Testing)</b>	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.	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 <b>(Testing)</b>	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.	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 <b>(Sampling)</b>	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.	ASTM D140, D979 CT 125 AASHTO T 40, T168	This test describes the procedure to sample the emulsified asphalt.
Emulsified Asphalt <b>(Testing)</b>	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.	ASTM D244 AASHTO T59	This test determines the sieve retention of emulsified asphalt.
Emulsified Asphalt <b>(Testing)</b>	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.	ASTM D244 AASHTO T59	This test determines the weight per gallon of emulsified asphalt.
Emulsified Asphalt <b>(Testing)</b>	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.	ASTM D244 AASHTO T59	This test determines the penetration of the emulsified asphalt.
Emulsified Asphalt <b>(Testing)</b>	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.	ASTM D244 CT 330 AASHTO T59	This test determines the residue @ 325 degrees F evaporation of emulsified asphalt.

## Attachment #1 (continued)

### 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.	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.	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.	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 paved roadway.	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 for every five cores taken.	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 for every five cores taken.	ASTM D2726, D1188, D5361	This test determines the specific gravity of compacted bituminous mixture dense- graded or non-absorptive.

## 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 <b>(Testing)</b>	One 30-lb sample	Obtain one sample for every 1,000 tons of asphalt concrete.	ASTM D1559 AASHTO T245	This test determines the resistance to plastic flow of prepared mixes as determined by the Marshall Method.
Asphalt Concrete <b>(Testing)</b>	One 30-lb sample	Obtain one sample for every 1,000 tons of asphalt concrete.	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 Con- crete) <b>(Testing)</b>	One 12 ft. x 3 ft. sample	Obtain one sample per job.	ASTM D4632 AASHTO M288	This test determines the weight per sq. yd. and grabs strength of geotextile fabrics.
Asphalt Concrete <b>(Testing)</b>	Sample any test location (random basis)	Obtain one sample for every 1,000 tons of asphalt concrete.	ASTM D2950 CT 375	This test determines the nuclear field density of in-place asphalt concrete.
Asphalt Concrete <b>(Testing)</b>	One 10-lb sample	Obtain one sample during every day of production.	ASTM D1560, D1561 CT 366 AASHTO T246, T247	This test determines the stability value of asphalt concrete.
Slurry Seals <b>(Sample)</b>	One 0.5 gal. sample in a clean, dry plastic container.	Obtain one sample per truck	ASTM D979 CT 125 AASHTO T 40, T168	This test describes the procedure for sampling the slurry seal.
Aggregate for Slurry Seals <b>(Testing)</b>	One 30-lb. sample.	Obtain at least one sample per project from the belt or hopper or stockpile and test for Sand Equivalent	ASTM D2419 CT 217 AASHTO T176	This test determines the Sand Equivalent of aggregates.



## Attachment #1 (continued)

### 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.	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.	ASTM D3910	This test determines the Wet Track Abrasion Test (2) (WTAT).

### 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.	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.	ASTM A615, A370 AASHTO T244	This test determines the steel reinforcement bar tensile strength and bend capability.

**Attachment#2 (Exhibit 16-V of the LAPM)**

**SAMPLE COVER MEMO SOURCE  
INSPECTION REQUEST FROM  
LOCAL AGENCY TO  
CALTRANS' DISTRICT LOCAL ASSISTANCE ENGINEER**  
*(Prepared By Applicant On Applicant Letterhead)*

To: (DLAE name)

Date: \_\_\_\_\_

Caltrans' District Local Assistance Engineer  
Caltrans' Local Assistance Office  
(District office Address)

Federal-aid Project Number: \_\_\_\_\_

Project Description: \_\_\_\_\_

Project Location: \_\_\_\_\_

Subject: (Source Inspection for Project Name, County)

We are requesting that Caltrans provide Source Inspection (reimbursed) services for the above mentioned project. We understand we are responsible for paying for this service provided for by the State. Listed below are the materials for which we are requesting Caltrans' Source Inspection (reimbursed) services.

Materials that will require source inspection:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Justification for request: (Based on the requirements in Section 16.14 under "Source Inspection") \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

Any question you might have about the above materials should be directed to:

**Approved:**

\_\_\_\_\_  
*(Applicant Representative Name)*

\_\_\_\_\_  
*(DLAE name)*  
District Local Assistance Engineer

\_\_\_\_\_  
*(Title)*

\_\_\_\_\_  
*(Date)*

\_\_\_\_\_  
(Local agency, name & address)

**Attachment #3 (Appendix F of the OAP Manual)**



## Appendix F - Construction Materials Accepted by a Certificate of Compliance\*

Soil Amendment  
Fiber  
Mulch  
Stabilizing Emulsion  
Plastic Pipe  
Lime  
Reinforcing Steel  
Structural Timber and Lumber  
Treated Timber and Lumber  
Timber and Lumber  
Culvert and Drainage Pipe Joints  
Reinforced Concrete Pipe  
Corrugated Steel Pipe and Corrugated Steel Pipe Arches  
Structural Metal Plate Pipe Arches and Pipe Arches  
Perforated Steel Pipe  
Polyvinyl Chloride Pipe and Polyethylene Tubing  
Steel Entrance Tapers, Pipe Down drains, Reducers, Coupling Bands and Slip Joints  
Aluminum Pipe (Entrance Tapers, Arches, Pipe Down drains, Reducers, Coupling Bands and Slip Joints)  
Metal Target Plates  
Electrical Conductors  
Portland Cement  
Minor Concrete  
Waterstop

" If Caltrans Standard Specifications May 2006 is part of contract specifications.

Note: Usually these items are inspected at the site of manufacture or fabrication and re-inspected after delivery to the job site.

ATTACHMENT #3

**Attachment #4 (Appendix J of the QAP Manual)**



### Appendix J.1 - Example of a Vendor's Certificate of Compliance

No. 583408

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION  
**VENDOR'S CERTIFICATE OF COMPLIANCE**  
 MR-0543 (REV. 5/93) #CT-7541-6020-2

PRECAST CONCRETE PRODUCTS OR  SOUNDWALL

TO: BILL SYNDER

STATE HIGHWAY ENGINEER  
RESIDENT ENGINEER - CITY OF FLATLAND

We certify that the portland cement, chemical and mineral admixtures contained in the material described below are brands stated and comply with specifications for:

CONTRACT NUMBER:

CEMENT BRAND <u>XYZ CEMENT CO.</u>	MILL LOCATION <u>MIDLAND, CALIFORNIA</u>
TYPE <u>II MODIFIED</u>	

CHEMICAL ADMIXTURE

1. BRAND <u>ABC. ADMIXTURE</u>	MANUFACTURER <u>XYZ SUPPLIER</u>
TYPE <u>WATER REDUCER</u>	
2. BRAND	MANUFACTURER
TYPE	

CHECK BOX IF A CHEMICAL ADMIXTURE WAS NOT USED

MINERAL ADMIXTURE

MANUFACTURER <u>POZZ. INC.</u>	CLASS <u>F</u>
-----------------------------------	-------------------

CHECK BOX IF A MINERAL ADMIXTURE WAS NOT USED

DELIVERY DATE (Ready-Mix) <u>7/7/07</u>	DATES OF FABRICATION (Precast)
--------------------------------------------	--------------------------------

LIST PRODUCTS TO WHICH CERTIFICATE APPLIES. (Show size and lin. ft. of pipe, etc., delivery slip numbers for ready-mix.)

Portland Cement  
Flyash  
Water Reducer

MANUFACTURER OF CONCRETE PRODUCTS

A. & B. READY MIX

By: AUTHORIZED REPRESENTATIVE SIGNATURE  
Joe Anderson

FM 93 1839

Original to Res. Engr. Retain Duplicate.

OSP 01 55624



## Appendix J.2 - Example of a Certificate of Compliance for Portland Cement (continued)

This is to certify that the

Portland Cement

Supplied by ABC Cement Company complies with all requirements for Type II Portland Cement when tested in accordance with ASTM C - 494.

Local Agency Project No.

HP21L - 5055 - 111

*Albert Howakowa*

Quality Assurance Engineer  
ABC Cement Company

Date: 07/07/07



**Attachment # 5 (Appendix K of the OAP Manual)**



## **Appendix K - Examples of Materials Certificates/Exceptions (Signed by the Resident Engineer at the Completion of the Project)**

Federal-aid Project No.: Project HP21L – 5055 – 111

**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.

All materials exceptions to the plans and specifications on this project are noted below.

No exceptions were found to the plans and specifications on this project.

Bill Sanders  
Resident Engineer (Print Name)

*Bill Sanders*  
Resident Engineer (Signature)

7/7/07  
(Date)

**Note:** The signed original of this certificate is placed in the Resident Engineer's project files and one copy is mailed to the DLAE and filed under "Report of Expenditures."

**See the attachment (next page)**

ATTACHMENT #5



### Appendix K (continued)

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	Hot Mix Asphalt	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 42007

Date

**Attachment # 6 (Appendix H of the OAP Manual)**



## Appendix H - Example of a Log Summary Sheet

### Subgrade Materials

Date	CT	Station	Elevation	Test Results	Minimum Spec.	Passed or Failed	Action Taken
5/15101	231	1+00 (30' L)	99.00	93	90 or greater	Passed	NIA
5/16101	231	1+ 50 (20' R)	100.50	94	90 or greater	Passed	NIA
5/11107	231	2+25 (25' R)	101.00	96	90 or greater	Passed	NIA
5/18107	231	1+ 50 (30' L)	101.50	95	95 or greater	Passed	NIA
5/19101	231	2+ 50 (20' L)	102.00	92 *	95 or greater	Failed	See Note 1
5/19107	231	2+ 50 (20' L)	102.00	95	95 or greater	Passed	NIA

CT 231 = Compaction (Nuclear Gage)

\* Note 1: The Contractor used a water tank to dampen the soil surface at the failed subgrade location. Using a sheep's foot compactor, he reworked the subgrade (making at least 10 passes) from Station 2+ 00 to Station 3+ 00. After approximately 30 minutes, another compaction test was taken. This time the relative compaction was 95.

### Aggregates and Base Materials

Date	CT	Station	Elevation	Test Results	Minimum Spec.	Passed or Failed	Action Taken
6/20/07	202	1+ 00 (10' R)	102.50	See data sheet	See data sheet	Passed	NIA
6/20/07	202	2+ 00 (20' L)	102.50	See data sheet	See data sheet	Passed	NIA
6/22/07	217	1+ 00 (10' R)	102.50	75	25 or greater	Passed	NIA
6/22/07	217	2+ 00 (20' L)	102.50	83	25 or greater	Passed	NIA
6/20/07	227	1+ 00 (20' R)	102.50	86	71 or greater	Passed	NIA
6/20/07	227	1+ 50 (20' L)	102.50	85	71 or greater	Passed	NIA
6/24/07	231	2+ 00 (20' R)	102.50	98	95 or greater	Passed	NIA
6/24/07	231	2+ 50 (20' L)	102.50	97	95 or greater	Passed	NIA

CT 202 = Sieve Analysis,    CT 217 = Sand Equivalent,    CT 227 = Cleanness Value,  
 CT 231 = Compaction (Nuclear Gage)



## Appendix H (continued)

### Hot Mix Asphalt

Date	CT	Station	Elevation	Test Results	Minimum Spec.	Passed or Failed	Action Taken
7110107	339	1+00 (JO'R)	103.00	0.08 gal/ sq yd	0.05 -0.10 gal/sq yd	Passed	NIA
7110107	366	2+00 (20' L)	103.00	32	>23	Passed	NIA
711 0107	366	1+00 (JO' R)	103.00	41	>23	Passed	NIA
711 0107	375	2+ 00 (20' L)	103.00	94	RC= 93 to 97	Passed	NIA
7115 107	375	1+00 (20' R)	103.00	96	RC= 93 to 97	Passed	NIA
7115 107	375	1+ 50 (20' L)	103.00	95	RC= 93 to 97	Passed	NIA

CT 339 = Distributor Spread Rate,    CT 366 = Stabilometer Value  
 CT 375 = In-Place Density & Relative Compaction

### Portland Cement Concrete

Date	CT	Station	Elevation	Test Results	Minimum Spec.	Passed or Failed	Action Taken
9125107	504	10 + 50 (50' R)	102.50	6.5%	>6.0%	Passed	NIA
9125107	533	12 + 50 (50' R)	102.50	1.5"	<2"	Passed	NIA
9125107	518	11 +50 (50' R)	102.50	15 I lb/cu ft	> 145 lb/cu ft	Passed	NIA
9125107	521	10 + 50 (50' R)	102.50	28 day = 4200 psi	>3800 psi	Passed	NIA
9/28/07	521	11 + 50 (50' R)	102.50	28 day = 4290 psi	>3800 psi	Passed	NIA
9130107	521	12 + 50 (50' R)	102.50	28 day = 4160 psi	>3800 psi	Passed	NIA

CT 504 = Air Content,    CT 518 = Unit Weight,    CT 521 = Compressive Strength,  
 CT 533 = Ball Penetration