CITY OF LOS ANGELES

Quality Assurance Program
QAP

April 2024

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

Making Conservation
A California Way of Life!

Expiration Date: 04/29/2029 **Status:** ***In Compliance***

Quality Assurance Program REVIEW/ACCEPTANCE Letter

DATE: **4/29/2024**

Name of Agency: **City of Los Angeles**

Address: **2319 Dorris Place Los Angeles , CA 90031**

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Name and Title of person In Charge: **Pedro Garcia Lic# 86244**
Material Testing Engineer

The document will be reviewed for compliance to California Department of Transportation, Quality Assurance (QAP) Manual for Use by Local Agencies (January, 2024 revision) and Federal Highway Administration, 23 CFR 637.

A. Document Reviewed

ITEM NO.	*DESCRIPTION*
1	City of Los Angeles Quality Assurance Program (QAP) dated : 04/29/24
2	Caltrans Local Assistance District: District 7
3	Local Assistance area engineer -Thuraisamy Balasubramaniam, tbalasub@dot.ca.gov, Phone: (213) 266 3646

B. Conditions of acceptance

ITEM NO.	*DESCRIPTION*
1	**Document was reviewed and found to be in <u>COMPLIANCE</u> to our requirements**
2	Acceptance Sampling & Testing: will be done by a certified materials laboratory.
3	Independent Assurance Program: The City of Los Angeles Independent Assurance (IA) Section of the Standards Division will perform IA functions for the projects covered by this QAP.
4	Per section 16.11 of Local Assistance Procedure Manual (LAPM), this QAP must be updated at least every five years.
5	Caltrans District Local Assistance must be notified if there is any change or deviation from this QAP.
6	Caltrans no longer provides source inspection services for projects off the SHS.
7	Provide a signed hard copy to **District 7** area engineer and/or DLAE for archive.

C. Reviewed by

Babak Rezaei. Email: Babak.Rezaei@dot.ca.gov
Caltrans, METS/OMMIA SOUTH - (916) 204-6077

Babak Rezaei IA154 — 4/29/2024

CERTIFIED Independent Assurance Engineer — *DATE.*

QUALITY ASSURANCE PROGRAM

QAP

CITY OF LOS ANGELES

JUNE 2024

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4/25/2024

Pedro Garcia, P.E.
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TABLE OF CONTENTS

1. INTRODUCTION

The purpose of this document is to provide guidelines for quality assurance on Federal Aid construction projects to ensure City-wide uniformity in calibrating testing equipment, certifying testers, sampling and testing materials, preparing materials records, inspection and maintaining project records.

A **Quality Assurance Program (QAP)** is a series of planned and systematic actions which will ensure that the materials and workmanship incorporated into each Federal Aid project are in conformity with the requirements of the approved plans and specifications, including approved changes. The QAP must be updated at least every five years. Copies of the approved QAP must be kept on file and available for state review.

This all-inclusive revised edition of the QAP for the City of Los Angeles is applicable to Federal Aid projects that are part of the **National Highway System (NHS)** and those that are not (i.e., off the NHS). In the City of Los Angeles, the NHS includes all roads on the Interstate System, and roads on the **State Highway System (SHS)**. The QAP for projects on the NHS that are part or wholly on the SHS is presented in Section 2. For NHS projects off the SHS, the QAP is presented in Section 3. And finally, Section 4 presents the QAP for Federal Aid projects off the NHS.

In all cases, the QAP consists of the following elements designated by the **Federal Highway Administration (FHWA**) and the **California Department of Transportation (Caltrans)**:

- Acceptance Testing Program (ATP)
- Independent Assurance Program (IAP)

Quality Control of materials and products is the responsibility of the contractor. The Bureau of Contract Administration and General Services/Standards Division provide management oversight of the **Acceptance Testing Program**. Standards Division also conducts the **Independent Assurance Program**.

Introductory QAP Key Points

Material Acceptance Program

- Acceptance of unprocessed and processed soil and aggregate
- Test data and summary logs
- If failing occurs, sufficient additional acceptance tests must be taken
- Mix design approval and checking (if applicable)

Independent Assurance Program

- Certification of Sampling and Testing Personnel by Caltrans, JTCP or nationally recognized organization such as ACI
- Sampling and Testing Personnel must participate in corroboration sample program (If using CTs)
- Written procedure for dispute resolution (Only if City of Los Angeles does NOT use Caltrans to perform IAP)

Acceptance of Manufactured or Fabricated Materials

- Source Inspection
- Materials Accepted on the Basis of Authorized Materials List
- Materials Accepted by Certificate of Compliance
- Materials Requiring a Buy America Certification

Records

- Project files are the responsibility of the RE
- Project files will be available for 3 years

Project Certification

- Material Certificate shall be completed by RE
- Copy of Material Certificate to DLAE
- Explanations of incorporated nonconformed material

Material Acceptance Program

The QAP for the City of Los Angeles includes a materials acceptance program (herein referred to as the "Acceptance Testing Program", or "ATP") to determine the quality and acceptability of materials and workmanship incorporated into the project. The City's ATP addresses soils and aggregates, and manufactured and fabricated materials as described below, as well as in the applicable portions of Sections 2, 3, and 4 of this QAP manual for the City of Los Angeles.

- Acceptance of unprocessed and processed soil and aggregate

The City's acceptance of processed and unprocessed soils and aggregates includes verification sampling, testing, and inspection, and, in special cases, may include the results of the Contractor's quality control sampling and testing.

Per the City's ATP, the sampling location and testing frequency for processed and unprocessed soils and aggregates is based on the project type, and may be determined by one of the following, as specified in Sections 2, 3.1.2C, or 4.1.2C of this QAP manual:

- Caltrans Construction Manual, Section 6-107
- Caltrans QAP Manual, Appendix D (herein included as Appendix A)
- Caltrans LAPM, Chapter 16.11
- SSPWC ("Greenbook"), as modified by the L.A. "Brownbook", latest City-approved Edition
- Public Works Inspectors Manual (PWIM or "Bluebook") sampling Schedule (Note: as an advisory capacity only)
- Applicable Codes and Reference Documents
- Project Specifications

- Test data and summary logs

The Resident Engineer (or Project Engineer) shall receive acceptance test data and results in a timely manner and in accordance with the applicable timetables specified in Sections 2, 3.3, and 4.3 (Caltrans LAPM Chapter 16.11, or the City of Los Angeles QAP Appendix G). The RE (or Project Engineer) shall keep records of all samples and tests in the project files – as well as a test results summary log for each test method performed more than once – using Caltrans LAPM Exhibit 16-Z2: Acceptance Testing Results Summary Log (See Appendix I) or a similar form.

- If failing occurs, sufficient additional acceptance tests must be taken

As specified in Sections 3.1.1 and 4.1.1 of this QAP manual, in the event of a test failure, sufficient additional samples will be secured for testing in order to locate the area(s) of failure. Failed materials shall be removed, recompacted or replaced until compliance is achieved. Failing test results require retesting of the materials with cross references of the re-test to the initial failing test result previously entered in the "Summary Log". All materials incorporated into the work which did not conform to specifications must be explained and justified on the Materials Certificate, including changes by virtue of change order (See Sections 3.5 and 4.5 of this QAP manual, "Project Certification").

- Mix design approval and checking (if applicable)

Where applicable, the Contractor shall submit mix designs which include at least the following information:

- name of the material plant
- product name
- mix design ID number
- item of work in which it is to be used

The Resident Engineer (or Project Engineer) must review and approve the mix design in writing, and a copy of the approved mix design must be placed in the project file. The

Inspectors working for the Materials Control Section of the Bureau of Contract Administration, the site inspection staff, or a duly approved third party inspection (TPI) agency 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. Site inspection procedures are outlined in detail in Sections 3.1.1 and 4.1.1 of this QAP manual.

Independent Assurance Program

The Independent Assurance Program (IAP) is administered by the Independent Assurance (IA) Section of Standards Division and consists of unbiased and independent evaluation of all the sampling and testing procedures used in the City's ATP. Per LAPM Ch. 16.11, the City's IAP fulfills the requirements of 23 CFR 637:

- Testing equipment be evaluated by using calibration checks and proficiency samples
- Testing personnel be evaluated by observation and proficiency samples

The City's IAP is explained in further detail in Sections 2, 3.2, and 4.2 of this QAP manual.

- Certification of Sampling and Testing Personnel by Caltrans, JTCP or nationally recognized organization such as ACI

In accordance with LAPM Ch. 16.11, all samplers and testers, including project, laboratory, and consultant personnel, shall possess a current certificate of proficiency for the tests performed, and a copy of the certificate will be kept in the project file.

The process for qualifying sampling and testing personnel is detailed in Sections 3.1.2D, 3.2, 4.1.2D, and 4.2 of this QAP manual. Per these sections, personnel may be qualified and/or certified by Caltrans (via JTCP where applicable), nationally recognized

organizations (such as American Concrete Institute (ACI), AASHTO, American Society for Non-Destructive Testing, etc.), or the Director of Standards Division.

- Sampling and Testing Personnel must participate in corroboration sample program (If using CTs)

As described further in Sections 3.1.2B, 3.2, 4.1.2B, and 4.2 of this QAP manual, Standards Division's sampling and testing personnel who perform Caltrans Test Methods participate in the Corroboration Sample Program, in accordance with LAPM Chapter 16.11. Where Caltrans Test Methods are not used, Standards Division fulfills proficiency sample testing program requirements by participation in the AMRL and CCRL reference sample programs.

- Written procedure for dispute resolution (Only if City of Los Angeles does NOT use Caltrans to perform IAP)

For projects where the City of Los Angeles administers the IAP, dispute resolutions shall be performed according to the procedures outlined in the 2021 SSPWC ("Greenbook"), as modified by the LA Brownbook 8th Edition where applicable. Relevant sections include but are not limited to:

- 2021 Greenbook: Section 2-9 ("Changed Conditions")
  Section 2-10 ("Disputed Work")
  Section 7-3 ("Payment")
  Section 7-4 ("Payment for Extra Work")
- Brownbook 8th Ed: Section 2-11 ("Applicable Portions of the Public Contract Code Sections 20104 - 20104.6")
  Section 3-4 ("Authority of Board, Engineer, and Inspector")
  Section 302-5.9.5 ("Dispute Resolution. Construction Materials Dispute Resolution for Rock Products and Asphalt Concrete")

Acceptance of Manufactured or Fabricated Materials

The acceptance of manufactured and fabricated materials is based on one of the following 3 methods:
-Source Inspection
-Authorized Materials List
-Certificate of Compliance

- Source Inspection

Source inspection for NHS projects on the SHS is detailed in Section 2 of this QAP and involves a cooperative agreement between Caltrans and the City of Los Angeles. For projects off the SHS, source inspection is performed by Bureau of Contract Administration Inspectors or a duly approved third-party agency in accordance with Sections 3.1.1 and 4.1.1 of this QAP manual.

- Materials Accepted on the Basis of Authorized Materials List

For projects off the SHS, acceptance of manufactured and fabricated materials shall follow the City's "Approved Products and Construction Materials Lists", as explained in Sections 3.1.1 and 4.1.1 of this QAP manual. For projects on the SHS, in accordance with Caltrans LAPM Chapter 16.11, the Resident Engineer (or Project Engineer) shall verify that the materials procured for the project are on the Caltrans Authorized Materials List available at: https://dot.ca.gov/programs/engineering-services/authorized-materials-lists

- Materials Accepted by Certificate of Compliance

Acceptance of materials based on Certificate of Compliance (COC) is performed in accordance with all provisions of Caltrans LAPM Chapter 16.11, Caltrans Exhibits 16-T1 and 16-T2 (herein included as Appendix J), and Sections 3.1.1 and 4.1.1 of this QAP

manual. A COC for each item is kept in the file of the Resident Engineer (or Project Engineer). An example of COC is provided in Appendix K of this QAP manual.

- Materials Requiring a Buy America Certification

All Federal Financial Assistance (FFA) projects covered by this QAP manual shall adhere to Buy America requirements per 23 CFR 635.410 and Section 70914 of the Build America, Buy America (BABA) Act, as specified in Caltrans LAPM Chapter 16.11, Page 43-44.

Records

For all projects covered by this QAP, recordkeeping is performed in accordance with the provisions of Caltrans LAPM Chapter 16.11 and the procedures outlined in Sections 2, 3.4, and 4.4 of this QAP manual.

- Project files are the responsibility of the RE

In accordance with Caltrans LAPM Chapter 16.11, the Resident Engineer (or Project Engineer) is responsible for the records of all projects covered by this QAP.

- Project files will be available for 3 years

Project files are available for at least three years following the date of final voucher, per LAPM Chapter 16.11. Record retention procedure is specified in Sections 3.4 and 4.4 of this QAP manual.

Project Certification

Project Certification is performed in accordance with the guidelines of Caltrans LAPM Chapter 16.11, “Project Certification”. The procedure is also re-stated in Sections 3.5 and 4.5 of this QAP manual.

- Material Certificate shall be completed by RE

As described in Sections 3.5 and 4.5 of this QAP manual, upon completion of any project covered by this QAP, the Resident Engineer (or Project Engineer) shall complete and sign the Materials Certificate (Caltrans Exhibit 17-G, herein included as Appendix L).

- Copy of Material Certificate to DLAE

Once the Resident Engineer (or Project Engineer) has completed and signed the Materials Certificate, the original is submitted to the DLAE in the Report of Expenditures and a copy is placed in the project file.

- Explanations of incorporated nonconformed material

All materials incorporated into the work which did not conform to specifications must be explained and justified on the Materials Certificate, including changes by virtue of change order (re-stated in Sections 3.5 and 4.5 of this QAP manual).

2. QUALITY ASSURANCE PROGRAM FOR NHS PROJECTS ON THE SHS

The Caltrans Construction Manual outlines the Acceptance Testing (AT) program for Federal-aid projects on the State Highway System (SHS) in California. For projects on the SHS within the boundaries of the City of Los Angeles, the City will have a co-operative agreement in place with Caltrans; this agreement will establish the responsibility for the administration and implementation of the project. This may involve Caltrans delegating to the City responsibility over various aspects of the project.

The City's capability in the area of Materials Inspecting and Sampling is set forth in Section 3.1.1 of this QAP. Alternately, Caltrans' capability is covered in the Construction Manual, Chapter 6, Sampling and Testing, Sections 1, 2 and 3, with special attention given to Table 6-2.1 (Inspection of Fabricated and Manufactured Materials).

Within California, projects on the SHS require the use of California Test (CT) Methods, unless otherwise authorized by Caltrans. Certain ASTM Test Methods may, under the correct circumstances, be used in place of CT Methods, as per the Caltrans Test Method – ASTM Test Method Conversion Chart, Exhibit 16-S of the Local Assistance Procedures Manual (LAPM), herein presented as Appendix B of this QAP. All CT Methods are available at the following website:
http://www.dot.ca.gov/mets/ctm/

The documents specifying the project's Plans and Specifications are to be compatible with current Caltrans Standard Plans and the current Caltrans Standard Specifications and Standard Special Provisions.

The comprehensive standard governing materials acceptance sampling, testing and frequency is presented in Section 6-107 of the Caltrans Construction Manual. The 15 tables in this section specify the test method, minimum sample size, sampling location and testing frequency required for all material types and applications. The City's guideline for the frequency of materials sampling and testing is that set forth in the

Caltrans Quality Assurance Program (QAP) Manual, Appendix D (reproduced herein as Appendix A of this QAP).

Actual acceptance testing can only be performed by personnel that have successfully completed the Caltrans qualification process, as specified in Section 2.3 “Tester Qualification” in the Caltrans Independent Assurance (IA) Manual. The Caltrans IA Manual outlines the Independent Assurance Program to be followed for NHS projects on the SHS; this requires Caltrans to accredit both the individual Acceptance Testers and the host Laboratory where testing is performed. AT results & frequencies will be documented in the Caltrans Form CEM-3701 “Test Result Summary”. The records on these forms will need to comply with the test result reporting times displayed in Table 6-1.2 (Time Required for Materials Acceptance Tests) of the Caltrans Construction Manual. The City follows the guideline for reporting test results and their timeliness as presented in Sect 16.14, Pg 16-34 of the LAPM Ver.2012 (see Section 3.3 in this QAP). The only requirement affecting record-keeping for SHS projects is the required use of the CT filing index (Sect 16-3, Pg 5, LAPM). All other procedures relating to record-keeping are covered in Sections 3.4 and 4.4 of this QAP. Project Certification will be identical to the protocol outlined in LAPM Sect 16-11, pg. 52.

3. QUALITY ASSURANCE PROGRAM FOR NHS PROJECTS OFF THE SHS

3.1 Acceptance Testing Program (ATP)

The ATP is comprised of periodic unbiased sampling and testing of the construction materials used on Federal-aid projects. Acceptance sampling and acceptance testing, both equally important, constitute the program. Acceptance sampling is done at the manufacturing/processing facility producing the construction material and/or at the construction site where the material is sent for final placement. Such field sampling is done by trained personnel, primarily Construction Inspectors of the Bureau of Contract Administration and/or duly approved third party inspection (TPI) agencies but occasionally by technicians from Standards Division. Acceptance testing is performed

by certified personnel on calibrated testing equipment at Standards Division, a comprehensive and licensed Materials Testing Laboratory.

3.1.1 Materials Inspecting and Sampling

The Materials Control Section of the Bureau of Contract Administration or a duly approved third party inspection (TPI) agency are responsible for the inspection and/or verification of all materials and/or equipment at their source of manufacture or fabrication that are used on Public Works Projects. Included among the materials inspected in the field, sampled and accepted for Acceptance Testing are Asphalt Concrete (AC), Portland Cement Concrete (PCC) and Reinforced Steel. There are a few City agencies (e.g. Bureau of Street Services) that administer their own in-house materials inspection/sampling program that includes coverage of force account work for resurfacing, concrete and other types of force account construction projects. This is done in coordination with General Services/Standards Division and is in full compliance with state and federal regulations and Caltrans/FHWA expectations for force account work.

The following functions are carried out by Inspectors for the Materials Control section, the site inspection staff, or a duly approved third party agency:

1. Approving Asphalt, Concrete and Reinforced Concrete Pipe Plants.
2. Inspecting and sampling of Asphalt Concrete and Recycled Asphalt Concrete at Batch Plants.
3. Field Inspection of Concrete Batch Plants.
4. Inspecting, sampling and witnessing the testing of pre-stressed concrete pipe, wet cast reinforced concrete pipe, machine made concrete pipe, centrifugally spun reinforced concrete pipe, and Polyvinyl Chloride Lined Reinforced Concrete Pipe.
5. Inspecting, sampling and testing Pre-stressed Concrete Street Light Poles. Loading of poles and testing of reinforcing bars.
6. Shop fabrication inspection includes the following:

a. Shop welding of carbon, stainless steel and aluminum. Non-destructive testing of weldments when required by the contract. Standards Division has the right of first refusal for the Acceptance Testing Program. In specific cases where Standards Division decides it is unable to conduct the acceptance testing, a third party agency may be used. The third party agency must be pre-approved by both the Materials Control Section of the Bureau of Contract Administration and the Independent Assurance Section of Standards Division.

b. Pressure Vessels and Storage Tanks. Hydrostatic testing.

c. Inspecting, sampling and testing Gray Iron Castings.

d. Inspecting, sampling and testing Hot Dip Galvanizing and anodizing. Testing is performed when required by the contract.

e. Inspecting, sampling and witnessing the testing of pre-cast and pre-stressed concrete products with regard to strength, durability and appearance.

f. Inspecting, sampling and testing passivation of stainless steel, surface preparation and coating of concrete maintenance hole shafts, cast iron, aluminum, structural and miscellaneous steel. Testing is performed when required by the contract.

g. Inspecting, sampling and testing various electrical and mechanical equipment. Verifying treatment of components before concealment into finished units.

h. Inspecting, sampling and testing fiberglass tanks, ducts and fittings.

i. Frequency of aforementioned sampling and testing is determined by one of the following:

- Caltrans Quality Assurance Program (QAP) Manual, Appdx D (included herein as Appendix A)
- Project Specifications

j. Reviewing all submittals to determine whether shop inspection is required or waived.

k. Reviewing and approving third party inspection companies if the fabricator is located more than 30 miles outside the geographical limits of the City.

l. Answering correspondence from the prime contractors. Assigning inspectors to attend pre-construction and pre-fabrication meetings locally or out of town.

m. Reviewing and distributing the Daily Inspection Reports and test results submitted by third-party inspectors on weekly basis.

The material inspection at the source, or the job site, will utilize CT Methods, their ASTM equivalents, AASHTO or other national standards. The substitution of a CT procedure for the appropriate ASTM method is given in Caltrans Local Assistance Procedures Manual (LAPM) Sect 16 Exh 16-S, and is included herein as Appendix B. Either the Certificate of Compliance (COC), for materials listed in LAPM Sect 16 Exh 16-T, or the “Evidence of Shop Fabrication” sticker (Yellow Tag or approved release by TPI agency), issued by the City of Los Angeles Inspector, may be used to indicate compliance. Examples of forms and markings of approved items are presented in

Appendix C. The official roster of the City's "Approved Products and Construction Materials Lists" is accessible from the following Link http://eng.lacity.org/techdocs/. Trained Construction Inspectors enforce all appropriate federal regulations and specifications at the project site with a high level of quality assurance, specifically construction and safety regulations, codes and plans. Construction Inspectors are responsible to account for the amount of construction materials entering the site daily. Though measured quantities and materials are recorded daily, the general contractor is paid monthly.

All materials and products entering the construction project will be identified by the contractor completing form CEM 3101 "Notice of Materials to be Used" per LAPM, Sect 16 Exh 16-I, (included herein as Appendix D). In addition to completing the CEM 3101, the contractor shall be responsible to schedule all Site, Batch and Shop inspections. The Construction Inspector maintains a material and test "Summary Log" for each material requiring multiple sampling and testing. The "Summary Log", per LAPM Sect 16, Exh 16-Z2, includes appropriate data such as station location, depth of test sample, approximate material quantity represented by the test sample, test results, and the tester. In the event of a test failure, sufficient additional samples will be secured for testing in order to locate the area(s) of failure. Failed materials shall be removed, re-compacted or replaced until compliance is achieved. Failing test results require re-testing of the materials with cross references of the re-test to the initial failing test result previously entered in the "Summary Log".

3.1.2 Materials Testing

AT of the construction materials incorporated in NHS projects ensures compliance with contract specifications. AT is performed by Standards Division, the main materials testing agency for the City of Los Angeles. Several 'in-house' labs perform AT in their specialized fields of testing. The Geotechnical Section operates the Compaction Lab (in-field and lab soil testing for in-place density, relative compaction & lab maximum density, etc.). The Geotechnical Section also runs the Foundation & Classification Lab, where testing is done for parameters like Atterberg limits, direct shear, consolidation, permeability, R-Value, and California Bearing Ratio. The Asphalt Lab of the Roads and

Highways Section tests asphalt based paving materials and conducts internationally recognized SHRP Superpave evaluation. The Physical Lab performs compression strength tests of concrete and masonry products, tensile strength tests of steel products, and D-load tests on concrete pipe. The Special Materials Lab conducts tests on more exotic materials, both in the lab (sewer liner products, high strength bolts, coatings, rubber) and in the field (ultrasonic testing of welds, spark testing of sewer pipe coatings).

A. Test Methods:

The Methodology of testing conducted in these labs is according to the following recognized standards:

- California Test (CT) Methods. All CT Methods are available at the following website: http://www.dot.ca.gov/mets/ctm/
- American Society for Testing and Materials (ASTM) International
- American Association of State Highway and Transportation Officials (AASHTO)

The full extent of testing at Standards Division is shown in Appendix E, listed by lab, material tested and methodology used.

B. Plans and Specifications:

Approved project plans and specifications shall be one of the following:

- Caltrans Standard Plans and Specifications
- AASHTO, ASTM or other nationally - recognized standard.

The City of Los Angeles will attach all applicable Caltrans reference materials to the project plans and specifications and to the Project Engineer's files.

Standards Division, as per the Caltrans QAP Manual, participates in the Correlation Testing Program with:

- **AASHTO re:source (formerly AMRL)**

- **Cement and Concrete Reference Laboratory (CCRL)**
- **Caltrans Reference Samples Program (RSP)**

The laboratory and testing equipment used at Standards was chosen for its suitability to the test methods required. This equipment is maintained in good operating condition and calibrated yearly, or as required by applicable standards (e.g. AASHTO R18). Calibration is done by reputable outside companies, using standards directly traceable to the **National Institute of Standards and Technology (NIST)**. Current files of calibration are kept in each laboratory. A master file of all calibrations and any needed repairs are kept in the Accreditation Section of Standards Division to ensure proper tracking of required calibrations.

Standards Division possesses a current certificate of qualification in accordance with LAPM Ch. 16.11 requirements.

In addition, Standards Division undergoes a rigorous and comprehensive biennial evaluation process to maintain AASHTO re:source accreditation as a certified lab.

C. Sampling Location and Testing Frequency:

The frequency of testing and the location of sampling may be determined by either:

- Caltrans QAP Manual, Appendix D (herein included as Appendix A)
- Project Specifications

For Federally funded force account work, the City of Los Angeles will sample in accordance with the guidelines in the Caltrans QAP Manual and Caltrans LAPM, Chapter 16. Appendix F compares the sampling frequencies of construction materials from the Caltrans QAP, the Standard Specifications for Public Works Construction (SSPWC or “Greenbook”), 2021 edition, and the City of Los Angeles Department of Public Works Additions and Amendments to the Standard Specifications for Public Works Construction (“Brownbook”), 8th Edition. The City will use the most stringent among the latest City-approved edition of these standards.

When sampling products such as Portland Cement Concrete (PCC), Cement-Treated Base (CTB) , Asphalt Concrete (AC) and other such materials, the time of sampling

shall be varied with respect to the time of day insofar as possible, in order to avoid a predictable sampling routine.

D. Certification of Personnel:

Standards Division Acceptance testers are certified by one or more of the following:

- Caltrans District Materials Engineer or the Director of Standards Division
- nationally recognized organizations, such as American Concrete Institute, AASHTO, American Society for Non-Destructive Testing, etc.

The personnel performing AT at Standards shall be qualified by:

- "Certificate of Proficiency as an Acceptance Tester", MR-0111, issued by Caltrans District Materials Engineer or
- by the City of Los Angeles "Certificate of Proficiency in Construction Materials Testing", signed by the Director of Standards Division

  or
- certification by AASHTO re:source

In case of an extreme emergency or unforeseen circumstances, sampling and testing may be performed by trained lab personnel who are not certified. In such an emergency, if Standards Division is unable to conduct the Acceptance Testing, a third party agency may be used after being pre-approved by the Independent Assurance Section of Standards Division. Assurances are made of the sampler and tester's competency and every effort is made to use a certified tester as soon as feasible.

3.2 Independent Assurance Program (IAP)

This program is administered by the Independent Assurance (IA) Section of Standards Division. IA monitors the ATP at periodic intervals by:

- Authenticating the Acceptance sampling and testing done at each separate lab in Standards Division at a frequency of about 10-15% of the total workload, per each testing method employed, per project.

- Evaluating the Acceptance sampling and testing personnel by observation (Witness) and split sample (Comparison) testing of the construction material incorporated into each project.
- Verifying the condition of the testing equipment by calibration checks and maintaining calibration records.
- Maintaining an up-to-date collection of reference materials of the testing methods employed (CT Methods, ASTM, AASHTO, etc)
- Certifying trained lab personnel to perform Acceptance sampling and testing in strict compliance with the accepted test methods

IA personnel, though qualified by the same procedure as Acceptance testers, do not perform acceptance sampling and testing. Likewise, to avoid conflict of interest, acceptance sampling and testing personnel do not perform IA sampling and testing. Each time acceptance sampling and testing is witnessed, a report of the test will be produced, using:

- Form MR-0103, “Report of Witness Test”, LAPM Sect 16, Exh 16-F or
- IA’s own “Witness Test Report” form, customized for each test method.

Any questionable procedure witnessed will be reported immediately to the Project Engineer.

On a random basis, material samples shall be taken at the same point-in-time by both the Acceptance tester and the IA tester. Using similar equipment and procedures, the samples will be separately tested to establish correlation between the two sets of results. Each time such a "Split Sample" test is performed, a report of the test will be produced via

- Form MR-0104, “Corroboration Report”, LAPM, Sect 16, Exh 16-G or
- IA’s own “Comparison Test Report” customized for the test method.

The results of the Acceptance and IA “Split Sample” tests are corroborated. If discrepancies in test results outside the normal statistical variation exist, the cause(s) are determined and corrective action is taken until a reasonable degree of correlation is

established. A report of the findings is placed in the project file and the Director of Standards is notified.

During Witness or Comparison testing, the acceptance testing equipment condition and calibration are checked and the sampling/testing procedures are verified for conformance with project contract specifications. The IA results from Witness or Comparison tests are not used to verify specification compliance on construction projects.

The IA Section also certifies personnel for proficiency in a recognized test method by:

- conducting a stringent written test
- executing a performance exam in the presence of IA personnel
- having the candidate engage in a rigorous one-time oral interview with the Director of Standards.

Upon successful completion, the employee is issued a Certificate of Proficiency, signed by the Director of Standards, valid for three years. Records of certification are kept in the project files and in a master file. The sampling and testing performed by these certified testers is periodically reviewed by IA personnel.

3.3 Reporting Test Results

The time period for reporting material test results to the Project Engineer will be in accordance with LAPM Ver. 2012, Sect 16.14, Pg 16-34 “Reporting Test Results”. Specifically for certain materials and locations, the following represents goals in reporting test results:

- When aggregate is sampled at materials plants, test results for Sieve Analysis, Sand Equivalent and Cleanness Value should be submitted to the Project Engineer 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 Project Engineer within 24 hours after sampling.

- When soils and aggregates are sampled at the job site, test results for Sieve Analysis, Sand Equivalent and Cleanness Value should be submitted to the Project Engineer within 72 hours after sampling.
- "R" Value test results for soils and aggregates sampled at the job site, as well as results for Asphalt Concrete Extraction testing, should be submitted to the Project Engineer within 96 hours after sampling.

Acceptance test results will be reported to the Construction Inspector, the Bureau of Street Services Superintendent, or the Project Engineer by e-mail or phone. A hard copy of the final test report, signed by the Director of Standards Division, will also be sent to the respective interested party.

Immediate access to these reports is provided on a City Intranet site, developed by Standards Division, allowing Bureau of Street Services personnel to view reports involving their projects. Another portal, on the internet, was developed as a collaborative effort between the Bureau of Contract Administration, the Bureau of Engineering and Standards Division; here access to AT results: (https://engpermits.lacity.org/LabTestResults/) is available for Inspectors, Project Engineers and even private contractors.

3.4 Records

The Inspector of Public Works is the custodian of all records relating to public works construction contracts awarded by the Board of Public Works and all other construction contracts administered by the Bureau of Contract Administration. Project records relating to all inspection and contract compliance matters are kept by the Bureau of Contract Administration (Con Ad). Separate agencies that administer their own in-house materials control maintain their own records. Records of field tests taken by Con Ad Inspectors are kept at the job site by the Inspector throughout the active term of the contract. The "Summary Log" (as specified in LAMP Sect 16.11) and material certificates are kept in the project files by Con Ad Inspectors. In addition, the project files incorporate all material records of samples and tests, material releases, etc. as per

the LAPM, Sect 16.8 “Engineer’s Daily Reports”. The project files, project specifications, changes to contract, Inspector’s Daily Records, progress payments, recapitulation of contract time and other related correspondence are available for review, upon request, at the project site. The project files are retained for a term that exceeds State and Federal requirements.

Records of Acceptance Testing such as gradation, sub-grade and sub-base compaction, AC samples and cores, reinforcement steel and concrete are kept at Standards Division. All records relating to IA sampling and testing are kept at the Independent Assurance Unit, Standards Division.

3.5 Project Certification

Upon completion of the project, the Resident Engineer or Project Engineer must complete Exhibit 17-G: Materials Certificate. The LPA’s Person in Responsible Charge must sign the certificate. All materials incorporated into the work which did not conform to specifications must be explained and justified on the Materials Certificate, including changes by virtue of change order. The original is submitted to the DLAE in the Report of Expenditures and a copy is placed in the project file.

4. QUALITY ASSURANCE PROGRAM FOR FEDERAL-AID PROJECTS OFF THE NHS

4.1 Acceptance Testing Program (ATP)

The ATP is comprised of periodic unbiased sampling and testing of the construction materials used on Federal-aid projects. Acceptance sampling and acceptance testing, both equally important, constitute the program. Acceptance sampling is done at the manufacturing/processing facility producing the construction material and/or at the construction site where the material is sent for final placement. Such field sampling is done by trained personnel, primarily Construction Inspectors of the Bureau of Contract Administration and/or duly approved third party inspection (TPI) agencies but occasionally by technicians from Standards Division. Acceptance testing is performed

by certified personnel on calibrated testing equipment at Standards Division, a comprehensive and licensed Materials Testing Laboratory.

4.1.1 Materials Inspecting and Sampling

The Materials Control Section of the Bureau of Contract Administration or a duly approved third party inspection (TPI) agency are responsible for the inspection and/or verification of all materials and/or equipment at their source of manufacture or fabrication that are used on Public Works Projects. Included among the materials inspected in the field, sampled and accepted for Acceptance Testing are Asphalt Concrete (AC), Portland Cement Concrete (PCC) and Reinforced Steel. There are a few City agencies (e.g. Bureau of Street Services) that administer their own in-house materials inspection/sampling program that includes coverage of force account work for resurfacing, concrete and other types of force account construction projects. This is done in coordination with General Services/Standards Division and is in full compliance with state and federal regulations and Caltrans/FHWA expectations for force account work.

The following functions are carried out by Inspectors working for the Materials Control section, the site inspection staff, or a duly approved third party agency:

1. Approving Asphalt, Concrete and Reinforced Concrete Pipe Plants.
2. Inspecting and sampling of Asphalt Concrete and Recycled Asphalt Concrete at Batch Plants.
3. Field inspection of Concrete Batch Plants.
4. Inspecting, sampling and witnessing the testing of pre-stressed concrete pipe, wet cast reinforced concrete pipe, machine made concrete pipe, centrifugally spun reinforced concrete pipe, and Polyvinyl Chloride Lined Reinforced Concrete Pipe.
5. Inspecting, sampling and testing Pre-stressed Concrete Street Light Poles. Loading of poles and testing of reinforcing bars.

6. Shop fabrication inspection in compliance with the latest Standard Specification for Public Works Construction (SSPWC or "Greenbook") as Modified by the City of Los Angeles Department of Public Works Additions and Amendments to the Standard Specifications for Public Works Construction ("Brownbook") and Contract Documents, includes the following:

   a. Shop welding of carbon, stainless steel and aluminum. Non-destructive testing of weldments when required by the contract. Standards Division has the right of first refusal for the Acceptance Testing Program. In specific cases where Standards Division decides it is unable to conduct the acceptance testing, a third party agency may be used. The third party agency must be pre-approved by both the Materials Control Section of the Bureau of Contract Administration and the Independent Assurance Section of Standards Division.

   b. Pressure Vessels and Storage Tanks. Hydrostatic testing.

   c. Inspecting, sampling and testing Gray Iron Castings.

   d. Inspecting, sampling and testing Hot Dip Galvanizing and anodizing. Testing is performed when required by the contract.

   e. Inspecting, sampling and witnessing the testing of pre-cast and pre-stressed concrete products with regard to strength, durability and appearance.

   f. Inspecting, sampling and testing passivation of stainless steel, surface preparation and coating of concrete maintenance hole

shafts, cast iron, aluminum, structural and miscellaneous steel. Testing is performed when required by the contract.

g. Inspecting, sampling and testing various electrical and mechanical equipment. Verifying treatment of components before concealment into finished units.

h. Inspecting, sampling and testing fiberglass tanks, ducts and fittings.

i. Frequency of aforementioned sampling and testing is determined by one of the following:

- Caltrans Quality Assurance Program (QAP) Manual, Appdx D (included herein as Appendix A)
- SSPWC ("Greenbook"), as modified by the L.A."Brownbook", latest City-approved Edition
- Public Works Inspectors Manual, (PWIM or "Bluebook") sampling Schedule (Note : as an advisory capacity only)
- Applicable Codes and Reference Documents
- Project Specifications

j. Reviewing all submittals to determine whether shop inspection is required or waived.

k. Reviewing and approving third party inspection companies if the fabricator is located more than 30 miles outside the geographical limits of the City.

l. Answering correspondence from the prime contractors. Assigning inspectors to attend pre-construction and pre-fabrication meetings locally or out of town.

m. Reviewing and distributing the Daily Inspection Reports and test results submitted by third-party inspectors on weekly basis.

The material inspection at the source, or the job site, will utilize CT Methods, their ASTM equivalents, AASHTO, SSPWC ("Greenbook") as modified by the L.A. "Brownbook" or the PWIM ("Bluebook" – as an advisory capacity only). The substitution of a CT procedure for the appropriate ASTM method is given in Caltrans Local Assistance Procedures Manual (LAPM) Sect 16 Exh 16-S, and is included herein as Appendix B. Either the Certificate of Compliance (COC), for materials listed in LAPM Sect 16 Exh 16-T, or the "Evidence of Shop Fabrication" sticker (Yellow Tag or approved release by TPI agency), issued by the City of Los Angeles Inspector, may be used to indicate compliance. Examples of forms and markings of approved items are presented in Appendix C. The official roster of the City's "Approved Products and Construction Materials Lists" is accessible from the following Link http://eng.lacity.org/techdocs/. Trained Construction Inspectors enforce all appropriate federal regulations and specifications at the project site with a high level of quality assurance, specifically construction and safety regulations, codes and plans. Construction Inspectors are responsible to account for the amount of construction materials entering the site daily. Though measured quantities and materials are recorded daily, the general contractor is paid monthly.

All materials and products entering the construction project will be identified by either:

- form CEM 3101 "Notice of Materials to be Used" per LAPM, Sect 16, Exh 16-I, (included herein as Appendix D). In addition to completing the CEM 3101, the contractor shall be responsible to schedule all Site, Batch and Shop inspections. Or
- SSPWC ("Greenbook"), as modified by the L.A. "Brownbook".

In either case the material type and source of supply (where material can be Inspected) will be identified. The contractor shall be responsible for scheduling all site, batch and shop inspections. The Construction Inspector maintains a material and test "Summary

Log" for each material requiring multiple sampling and testing. The "Summary Log", per LAPM Sect 16, Exh 16-Z2, includes appropriate data such as station location, depth of test sample, approximate material quantity represented by the test sample, test results, and the tester. In the event of a test failure, sufficient additional samples will be secured for testing in order to locate the area(s) of failure. Failed materials shall be removed, re-compacted or replaced until compliance is achieved. Failing test results require re-testing of the materials with cross references of the re-test to the initial failing test result previously entered in the "Summary Log".

4.1.2 Materials Testing

AT of the construction materials incorporated in these Federal-Aid projects ensures compliance with contract specifications. AT is performed by Standards Division, the main materials testing agency for the City of Los Angeles. Several 'in-house' labs perform AT in their specialized fields of testing. The Geotechnical Section operates the Compaction Lab (in-field and lab soil testing for in-place density, relative compaction & lab maximum density, etc.). The Geotechnical Section also runs the Foundation & Classification Lab, where testing is done for parameters like Atterberg limits, direct shear, consolidation, permeability, R-Value, and California Bearing Ratio. The Asphalt Lab of the Roads and Highways Section tests asphalt based paving materials and conducts internationally recognized SHRP Superpave evaluation. The Physical Lab performs compression strength tests of concrete and masonry products, tensile strength tests of steel products, and D-load tests on concrete pipe. The Special Materials Lab conducts tests on more exotic materials, both in the lab (sewer liner products, high strength bolts, coatings, rubber) and in the field (ultrasonic testing of welds, spark testing of sewer pipe coatings).

A. Test Methods:

The Methodology of testing conducted in these labs is according to one of the following recognized standards:

- California Test (CT) Methods

- American Society for Testing and Materials (ASTM) International
- American Association of State Highway and Transportation Officials (AASHTO)
- SSPWC "Greenbook", as modified by the L.A. "Brownbook"
- Project related codes/specifications

The full extent of testing at Standards Division is shown in Appendix E, listed by lab, material tested and methodology used.

B. Plans and Specifications:

Approved project plans and specifications shall be one of the following:

- Caltrans Standard Plans and Specifications
- AASHTO, ASTM or other nationally - recognized standard.
- SSPWC ("Greenbook"), as modified by the L.A. "Brownbook"
- Project related codes/specifications

The City of Los Angeles will attach all applicable Caltrans reference materials to the project plans and specifications and to the Project Engineer's files.

Standards Division, as per the Caltrans QAP Manual, participates in the Correlation Testing Program with:

- **AASHTO re:source (formerly AMRL)**
- **Cement and Concrete Reference Laboratory (CCRL)**
- **Caltrans' own Reference Samples Program (RSP)**

The laboratory and testing equipment used at Standards was chosen for its suitability to the test methods required. This equipment is maintained in good operating condition and calibrated yearly, or as required by applicable standards (e.g. AASHTO R18). Calibration is done by reputable outside companies, using standards directly traceable to the **National Institute of Standards and Technology (NIST)**. Current files of calibration are kept in each laboratory. A master file of all calibrations and any needed repairs are kept in the Accreditation Section of Standards Division to ensure proper tracking of required calibrations.

In addition, Standards Division undergoes a rigorous and comprehensive biennial evaluation process to maintain AASHTO re:source accreditation as a certified lab.

C. Sampling Location and Testing Frequency:

The frequency of testing and the location of sampling may be determined by one of the following:

- Caltrans QAP Manual, Appendix D (herein included as Appendix A)
- Project Specifications
- PWIM ("Bluebook"), Plate 28.

For Federally funded force account work, the City of Los Angeles will sample in accordance with the guidelines in the Caltrans QAP Manual and Caltrans LAPM, Chapter 16. Appendix F compares the sampling frequencies of construction materials from the Caltrans QAP, the Standard Specifications for Public Works Construction (SSPWC or "Greenbook"), 2021 edition, and the City of Los Angeles Department of Public Works - Additions and Amendments to the Standard Specifications for Public Works Construction ("Brownbook"), 8th Edition. The City will use the most stringent among the latest City-approved edition of these standards.

When sampling products such as Portland Cement Concrete (PCC), Cement-Treated Base (CTB), Asphalt Concrete (AC) and other such materials, the time of sampling shall be varied with respect to the time of day insofar as possible, in order to avoid a predictable sampling routine.

The City Inspector will make proper selection after consulting with the Project Engineer when there is a frequency number difference between the Caltrans Table and the City PWIM ("Bluebook"), except for force account work, which will have a different protocol than the PWIM ("Bluebook"), but will be in compliance with Caltrans and FHWA expectations for force account work.

D. Certification of Personnel

Standards Division Acceptance testers are certified by one or more of the following:

- Caltrans District Materials Engineer or the Director of Standards Division
- nationally recognized organizations, such as American Concrete Institute, AASHTO, American Society for Non-Destructive Testing, etc.

The personnel performing AT at Standards shall be qualified by:

- "Certificate of Proficiency as an Acceptance Tester", MR-0111, issued by Caltrans District Materials Engineer or
- by the City of Los Angeles "Certificate of Proficiency in Construction Materials Testing", signed by the Director of Standards Division
  or
- certification by AASHTO re:source.

In case of an extreme emergency or unforeseen circumstances, sampling and testing may be performed by trained lab personnel who are not certified. In such an emergency, if Standards Division is unable to conduct the Acceptance Testing, a third party agency may be used after being pre-approved by the Independent Assurance Section of Standards Division. Assurances are made of the sampler and tester's competency and every effort is made to use a certified tester as soon as feasible.

4.2 Independent Assurance Program (IAP)

This program is administered by the Independent Assurance (IA) Section of Standards Division. IA monitors the ATP at periodic intervals by:

- Authenticating the Acceptance sampling and testing done at each separate lab in Standards Division at a frequency of about 10-15% of the total workload, per each testing method employed, per project.
- Evaluating the Acceptance sampling and testing personnel by observation (Witness) and split sample (Comparison) testing of the construction material incorporated into each project.

- Verifying the condition of the testing equipment by calibration checks and maintaining calibration records.
- Maintaining an up-to-date collection of reference materials of the testing methods employed (CT Methods, ASTM, AASHTO, etc)
- Certifying trained lab personnel to perform Acceptance sampling and testing in strict compliance with the accepted test methods

IA personnel, though qualified by the same procedure as Acceptance testers, do not perform acceptance sampling and testing. Likewise, to avoid conflict of interest, acceptance sampling and testing personnel do not perform IA sampling and testing. Each time acceptance sampling and testing is witnessed, a report of the test will be produced, using:

- Form MR-0103, “Report of Witness Test”, LAPM Sect 16, Exh 16-F or
- IA’s own “Witness Test Report” form, customized for each test method.

Any questionable procedure witnessed will be reported immediately to the Project Engineer.

On a random basis, material samples shall be taken at the same point-in-time by both the Acceptance tester and the IA tester. Using similar equipment and procedures, the samples will be separately tested to establish correlation between the two sets of results. Each time such a "Split Sample" test is performed, a report of the test will be produced via

- Form MR-0104, “Corroboration Report”, LAPM, Sect 16, Exh 16-G or
- IA’s own “Comparison Test Report” customized for the test method.

The results of the Acceptance and IA “Split Sample” tests are corroborated. If discrepancies in test results outside the normal statistical variation exist, the cause(s) are determined and corrective action is taken until a reasonable degree of correlation is established. A report of the findings is placed in the project file and the Director of Standards is notified.

During Witness or Comparison testing, the acceptance testing equipment condition and calibration are checked and the sampling/testing procedures are verified for conformance with project contract specifications. The IA results from Witness or Comparison tests are not used to verify specification compliance on construction projects.

The IA Section also certifies personnel for proficiency in a recognized test method by:

- conducting a stringent written test
- executing a performance exam in the presence of IA personnel
- having the candidate engage in a rigorous one-time oral interview with the Director of Standards.

Upon successful completion, the employee is issued a Certificate of Proficiency, signed by the Director of Standards, valid for three years. Records of certification are kept in the project files and in a master file. The sampling and testing performed by these certified testers is periodically reviewed by IA personnel.

4.3 Reporting Test Results

The time period for reporting material test results to the Project Engineer will be in accordance with the timetable shown in Appendix G “Timetable for Reporting Test Results”. Specifically for certain materials and locations, the following represents goals in reporting test results:

- When aggregate is sampled at materials plants, test results for Sieve Analysis, Sand Equivalent and Cleanness Value should be submitted to the Project Engineer 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 Project Engineer within 24 hours after sampling.
- When soils and aggregates are sampled at the job site, test results for Sieve Analysis, Sand Equivalent and Cleanness Value should be submitted to the Project Engineer within 72 hours after sampling.

- "R" Value test results for soils and aggregates sampled at the job site, as well results for Asphalt Concrete Extraction testing, should be submitted to the Project Engineer within 96 hours after sampling.

Acceptance test results will be reported to the Construction Inspector, the Bureau of Street Services Superintendent, or the Project Engineer by e-mail or phone. A hard copy of the final test report, signed by the Director of Standards Division, will also be sent to the respective interested party.

Immediate access to these reports is provided on a City Intranet site, developed by Standards Division, allowing Bureau of Street Services personnel to view reports involving their projects. Another portal, on the internet, was developed as a collaborative effort between the Bureau of Contract Administration, the Bureau of Engineering and Standards Division; here access to AT results: (https://engpermits.lacity.org/LabTestResults/) is available for Inspectors, Project Engineers and even private contractors.

4.4 Records

The Inspector of Public Works is the custodian of all records relating to public works construction contracts awarded by the Board of Public Works and all other construction contracts administered by the Bureau of Contract Administration. Project records relating to all inspection and contract compliance matters are kept by the Bureau of Contract Administration (Con Ad). Separate agencies that administer their own in-house materials control maintain their own records. Records of field tests taken by Con Ad Inspectors are kept at the job site by the Inspector throughout the active term of the contract. The "Summary Log" (as specified in LAMP Sect 16.11) or the City Inspector's "Daily Inspection Log" and material certificates (and/or the COC, and/or the "Yellow Tag") are kept in the project files by Con Ad Inspectors, except for force account projects, which follow a different protocol per the procedures established by the City agencies (e.g. Bureau of Street Services) administering their own in-house materials inspection/sampling program. Record-keeping protocol for force account projects will take into consideration the different nature of force account construction and will be in

compliance with Caltrans and FHWA expectations for force account work. In addition, the project files incorporate all material records of samples and tests, material releases, etc. as per the LAPM Sect 16.8 “Engineer’s Daily Reports”. The project files, project specifications, changes to contract, Inspector’s Daily Records, progress payments, recapitulation of contract time and other related correspondence are available for review, upon request, at the project site. The project files are retained for a term that exceeds State and Federal requirements.

Records of Acceptance Testing such as gradation, sub-grade and sub-base compaction, AC samples and cores, reinforcement steel and concrete are kept at Standards Division. All records relating to IA sampling and testing are kept at the Independent Assurance Unit, Standards Division.

4.5 Project Certification

Upon completion of a Federal-aid project, a “Materials Certificate” shall be completed by the Project Engineer. The City shall include a “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 City’s construction records. The Project Engineer shall sign the certificate. All materials incorporated into the work, which did not conform to specifications, must be explained and justified on the “Materials Certificate”, including changes by virtue of contract change orders (as per Appendix K of the Caltrans QAP Manual).

5. REFERENCES

1. Caltrans Construction Manual, July 2017

2. Caltrans Local Assistance Procedures Manual (LAPM), Jan 2019

3. Caltrans Quality Assurance Program (QAP) Manual for use by Local Agencies, Dec 2008 (partially revised Jan 2011)

4. Caltrans Independent Assurance (IA) Manual, July 2005

5. Caltrans Local Assistance Procedures Manual (LAPM) Ver. 2012

6. American Society for Testing and Materials (ASTM) International, 2019 Edition or as referenced

7. American Association of State Highway and Transportation Officials (AASHTO) Standard Specifications for Transportation Materials and Methods of Sampling And Testing, 2018 Edition or as referenced

8. Standard Specification for Public Works Construction, (SSPWC or "Greenbook") 2021 Edition, or as referenced, as modified by City of Los Angeles Department of Public Works, Additions and Amendments to the Standard Specifications for Public Works Construction ("Brownbook"), latest edition.

9. City of Los Angeles Public Works Inspector's Manual (PWIM or "Bluebook"), latest edition.

APPENDIX A

ACCEPTANCE SAMPLING AND TESTING FREQUENCIES

(CALTRANS Q.A.P. MANUAL, APPENDIX D)

Appendix D - 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, CT 422, CT 417 AASHTO R23	If testing appears warranted, test for chlorides and sulfates.

Appendix D (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.	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.	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.	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.	ASTM C138 CT 518 AASHTO T121	This test determines the unit weight of freshly mixed concrete.

Appendix D (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 **(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.	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 **(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.	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.	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.	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.	CT 206	This test determines the cleanness of coarse aggregate.

Appendix D (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.	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.	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.	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.	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.	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.	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.	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.	ASTM D3017 CT 231 AASHTO T239	This test determines the water content using the nuclear gage.

Appendix D (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.	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 **(Testing)**	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 **(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 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.	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.	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.	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.	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.	ASTM D2170 AASHTO T201	This test determines the kinematic viscosity of asphalt @275 degrees F (Centistoke).

Appendix D (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.	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.	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.	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 **(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 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.	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.	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.	ASTM D244 CT 330 AASHTO T59	This test determines the residue @ 325 degrees F evaporation of emulsified asphalt.

Appendix D (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.

Appendix D (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.	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.	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.	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.	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.	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	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	ASTM D2419 CT 217 AASHTO T176	This test determines the Sand Equivalent of aggregates.

Appendix D (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.

APPENDIX B

CALTRANS TEST METHOD – ASTM TEST METHOD

CONVERSION CHART

TESTING PROCEDURES

(CALTRANS LAPM, EXH 16-S)

CALTRANS TEST METHOD - ASTM TEST METHOD CONVERSION CHART
Testing Procedures - for local agency use only

Use this CTM - ASTM conversion chart to assist you in determining acceptance test requirements and frequencies, as detailed in Caltrans *Construction Manual* Chapter 6, "Sampling and Testing." Refer to the Agency, special provisions, contract plans, and applicable standard specifications, for correct sampling and test methods (ASTM-CTM).

CTM	ASTM	Book of Standar	TEST PROCEDURE	NOTES
105			Calculations Pertaining to Gradings and Specific Gravities	*2*
125			Sampling Highway Materials (when approved)	
	D75	4.02	Standard Practice for Sampling Aggregates	*3*
	D979	4.03	Practice for Sampling Bituminous Paving Mixtures	*3*
201			Soil & Aggregate Sample Preparation	
	C702	4.02	Reducing Field Samples of Aggregate to Testing Size	*13*
202			Sieve Analysis of Fine and Coarse Aggregate	
	C136	4.02	Sieve Analysis of Fine and Coarse Aggregate	
	C117	4.03	Material Finer Than 75-um (#200) Sieve in Mineral Aggregates by Washing	
205			Percentage of Crushed Particles	*1*
206			Specific Gravity and Absorption of Coarse Aggregate	
	C127	4.02	Specific Gravity and Absorption of Coarse Aggregate	
207			Specific Gravity and Absorption, Fine Aggregate	
	C128	4.02	Specific Gravity and Absorption, Fine Aggregate	
208			Apparent Specific Gravity of Fine Aggregate	*1*
211			Abrasion of Coarse Aggregate by Use of the Los Angeles Rattler Machine	
	C131	4.02	Resistance to Degradation , Small-Size Coarse Agg. by Abrasion & Impact, L.A. Machine	
213			Organic Impurities in Concrete Sand	
	C40	4.02	Organic Impurities in Fine Aggregate for Concrete	
214			Soundness of Aggregates by Use of Sodium Sulfate	*1*
	C88	4.02	Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate	
216			Relative Compaction of Untreated and Treated, Soils & Aggregates	
	D1556	4.08	Density of Soil In-place by the Sand Cone Method	
	D1557	4.08	Moisture-Density Relations of Soils & Soil-Agg. Mixtures, 10-lb. Rammer, 18-in	*11*
217			Sand Equivalent (only authorized method per Caltrans 07, District Materials	*1,9*
223			Surface Moisture in Concrete Aggregate	*1*
226			Moisture Content in Soils by Oven Drying	
	C566	4.02	Total Moisture Content of Aggregate by Drying	
227			Evaluating Cleanness of Coarse Aggregate	*1*
229			Durability Index	*1*
	D3744	4.03	Aggregate Durability Index	
231			Relative Compaction of Soils by the Area Concept Utilizing Nuclear Gages	*4*
	D2922	4.08	Density of Soil & Soil-Aggregate In-place by the Nuclear Method	*4*

CTM - ASTM Testing Procedures - for local agency use only

Use this CTM - ASTM conversion chart to assist you in determining acceptance test requirements and frequencies, as detailed in Caltrans *Construction Manual* Chapter 6, "Sampling and Testing." Refer to the Agency, special provisions, contract plans, and applicable standard specifications, for correct sampling and test methods (ASTM-CTM).

CTM	ASTM	Book of Standards	TEST PROCEDURE	NOTES
301	D2844	4.08	R-Value of Treated & Untreated, Bases, Subbases & Basement Soils R-Value and Expansion Pressure of Compacted Soils	*1*
302	D1664	4.03	Film Stripping Coating and Stripping of Bitumen-Aggregate Mixtures	
303			Centrifuge Kerosene Equivalent	*1*
304	D1561	4.03	Preparation of Bituminous Mixtures for Testing Prep. of Bituminous Mixture Test Specimens by Means of Calif. Kneading Compactor	*1*
305			Swell of Bituminous Mixtures	*1*
307			Moisture Vapor Susceptibility of Bituminous Mixtures	*1*
308	D1188	4.03	Bulk Specific Gravity and Weight Per Cubic Foot of Bituminous Mixtures Bulk Sp.G. and Density of Compacted Bituminous Mixtures, Paraffin-Coated Specimens	
310	D2172	4.03	Asphalt and Moisture Contents of Bituminous Mixtures by Hot Solvent Extraction of Bitumen from Bituminous Paving Mixtures (Method A, B, or C)	*5* *6,10*
312			Design and Testing of Class "A" and "B" Cement Treated Base	*1*
338			Cement or Lime Content in Treated Aggregate by the Titration Method	*1*
339	D2995	4.03	Determination of Distributor Spread Rate Determining Application Rate of Bituminous Distributors	
362	D2172	4.03	Asphalt Content of Bituminous Mixtures by Vacuum Extraction Quantitative Extraction of Bitumen from Bituminous Paving Mixtures	*5* *6*
366			Stabilometer Value	*1*
367			Recommending Optimum Bitumen Content (OBC.)	*1*
370	D4643	4.08	Determining Moisture Content of Asphalt Mixtures or Mineral Agg., Microwave Ovens Determination of Water (Moisture) Content of Soil by the Microwave Oven	
375	D2950	4.03	In-place Density & Relative Compaction of AC Pavement (nuclear) Density of Bituminous Concrete In-place by the Nuclear Method	*5,7,12* *6,7*
379	D4125	4.03	Asphalt Content of Bituminous Mixtures by use of the Troxler Nuclear Gage Asphalt Content of Bituminous Mixtures by the Nuclear Method	*5,8* *6,8*
405			Chemical Analysis of Water	*1*
415			Chloride Content in Organic Additives for Portland Cement Concrete	*1*

CTM - ASTM Testing Procedures - for local agency use only

Use this CTM - ASTM conversion chart to assist you in determining acceptance test requirements and frequencies, as detailed in Caltrans *Construction Manual* Chapter 6, "Sampling and Testing." Refer to the Agency, special provisions, contract plans, and applicable standard specifications, for correct sampling and test methods (ASTM-CTM).

CTM	ASTM	Book of Standards	TEST PROCEDURE	NOTES
504	C231	4.02	Air Content of Freshly Mixed Concrete by the Pressure Method Air Content of Freshly Mixed Concrete by the Pressure Method	
515			Relative Mortar Strength of Portland Cement Concrete Sand	*1*
518	C138	4.02	Unit Weight of Fresh Concrete Unit Weight, Yield, and Air Content (Gravimetric) of Concrete	
521	C39	4.02	Compressive Strength of Molded Concrete Cylinders Compressive Strength of Cylindrical Concrete Specimens	
523	C293 C78	4.02 4.02	Flexural Strength of Concrete (using simple beam with center-point loading) Flexural Strength of Concrete (using simple beam with center-point loading) Flexural Strength of Concrete (using simple beam with third-point loading)	*1*
528			Freeze Thaw Resistance of Aggregates in Air-Entrained Concrete	*1*
529			Proportions of Coarse Aggregate in Fresh Concrete	*1*
530			Determining the Effect of H_2O-Reducing and Set-Retard. Admix. Drying Shrinkage PCC	*1*
533	C360 C143	4.03 4.02	Ball Penetration in Fresh Portland Cement Concrete Ball Penetration in Fresh Portland Cement Concrete Slump of Freshly Mixed PCC	
539	C172	4.02	Sampling Fresh Concrete Sampling Freshly Mixed Concrete	
540	C31	4.02	Making, Handling, & Storing Concrete Compressive. Test Specimens in the Field Making & Curing Concrete Test Specimens in the Field	
541			Flow of Grout Mixtures (flow cone method)	*1*
543	C173	4.02	Air Content of Freshly Mixed Concrete by the Volumetric Method Air Content of Freshly Mixed Concrete by the Volumetric Method	
548			Evaluation of Aggregate for Lean Concrete Base (LCB.)	*1*

Notes

1. **Use the CALTRANS Method.**
2. **Use the methods of calculation within the applicable test method first. Refer to CTM 105 as necessary.**
3. **Use the Caltrans Construction Manual procedures as necessary when ASTM D75 or D979 do not adequately cover the item to be sampled.**
4. **Use the direct transmission method only, the air gap method shall not be used. All nuclear gages must have local Caltrans District calibration within the last year. The data sheets provided by the local Caltrans District shall be used when determining the in-place density.**
5. **Sample from the job site, across the mat, immediately behind the paving machine (Caltrans Construction Manual).**
6. **Sample per ASTM D 979 paragraph 4.2.3., sample from the job site, across the mat, immediately behind the paving machine.**
7. **All nuclear gages used for this test must be calibrated on the six (6) DNTM&R AC Standard Blocks. The Data sheets provided by the local Caltrans District shall be used when determining the in-place density.**
8. **Recommended Percent (%) AC method for Rubberized Bituminous Paving mixtures.**
9. **The hand method of shaking is not authorized and shall not be used. An electro-mechanical or hand- operated mechanical. Sand Equivalent shaker must be utilized for this test.**
10. **This Method covers hot solvent, centrifuge, and vacuum extraction.**
11. **Compaction Apparatus shall be calibrated in accordance with ASTM D 2168, Method B (ASTM Book 4.08).**
12. **Test Maximum Density (TMD) shall be performed by Caltrans Test Method 375, Section F. Test Max. Density.**
13. **Splitters must be of the fixed riffle type (no adjustable splitters).**

APPENDIX C

FORMS AND MARKINGS OF APPROVED MATERIALS

Batch Plant Inspector's Daily Report Form (Asphalt Plant)

Form 1007-B—8-76

Department of Public Works

CITY OF LOS ANGELES

Bureau of Contract Administration

ASPHALT PLANT INSPECTOR'S DAILY REPORT

JOB TITLE		
		JOB NO.
DATE	MATERIAL SOURCE SAND	PLANT NAME
SPEC. NO.	ROCK	PLANT LOCATION
TYPE OF MATERIAL	FILLER	CONTRACTOR
TOTAL TONS	L.A.	FIELD INSP.

PLANT INSP.	HRS.	SCALE INSP.	HRS.

SCREEN ANALYSIS

	No. 4 Bin	No. 3 Bin	No. 2 Bin	No. 1 Bin	Filler	Total Agg.	A. C.
% of Mix						100%	%
Wt. in Lbs.							
% Passing 1½ Inch	100	100	100	100	100	Mix %	Ideal 100%
1"		100	100	100	100		
¾"		100	100	100	100		
½"			100	100	100		
⅜"			100	100	100		
No. 4				100	100		
No. 8					100		
No. 30					100		
No. 50					100		
No. 200							

ASPHALT

PLANT SAMPLE TANK NO.

CERTIFICATE OR B.L. No.

CERTIFIED VISCOSITY

TRUCK MIX SAMPLE LOAD NO.

Notes:

Batch Plant Inspector's Daily Report Form (Concrete Plant)

Form 1007-A

CITY OF LOS ANGELES

Department of Public Works — **Bureau of Contract Administration**

JOB NO.

DATE

CONCRETE PLANT INSPECTORS DAILY REPORT

JOB TITLE

SUPPLIER & PLANT LOCATION | CONCRETE CONTRACTOR

MATERIAL SOURCE: | CEMENT | SAND | ROCK

MIX DATA | SPECS. | CONCRETE CLASS | TOTAL C.YDS. PRODUCED:

ADMIXTURE; BRAND & QUANTITY

Aggregate per C.Y.	No. 2	No. 3	No. 4	Sand	Total Mix	WATER (Gals.)
% of mix					100%	MAX. ALLOWABLE
# Dry Weight						IN AGGREGATE
% Moisture						MAX. ADDED
# Moisture						CEMENT
# Batch Weight						

SCREEN ANALYSIS (% Passing) | DATE LAST ANALYSIS:

						SPECS. 100% MIN. MAX.
2 Inch	100	100	100	100		
1½ Inch		100	100	100		
1 Inch			100	100		
¾ Inch			100	100		
⅜ Inch				100		
No. 4						
No. 8						
No. 16						
No. 30						
No. 50						
No. 100						
No. 200						

CEMENT SAMPLE | FIELD INSPECTOR

Notes | PLANT INSPECTOR | HOURS

SEIU

Notes Over ( )

Concrete & Asphalt Batch Plant Form #1101 (both sides)

Form 1101 (Rev. 4/76)

City of Los Angeles
DEPARTMENT OF PUBLIC WORKS
Bureau of Contract Administration

PLANT INSPECTOR'S REPORT TO FIELD INSPECTOR

INSTRUCTIONS TO PLANT INSPECTOR:

Fill out, attach to load ticket and send to Field Inspector with first load.

PLANT NAME

DATE

PLANT LOCATION

CLASS OF CONCRETE OR TYPE OF ASPHALT PAVING MIX

FOR CONCRETE MIXTURES

BRAND OF ADMIXTURE	AMOUNT OF ADMIXTURE PER SACK

PLANT INSPECTOR

REMARKS

INSTRUCTIONS TO FIELD INSPECTOR: FILL OUT REVERSE SIDE AND RETURN TO PLANT INSPECTOR IMMEDIATELY.

INSTRUCTIONS TO FILED INSPECTOR:

Fill out this side and return to Plant Inspector immediately.

JOB TITLE

JOB NO.	LETTER CODE	SPECIFICATIONS

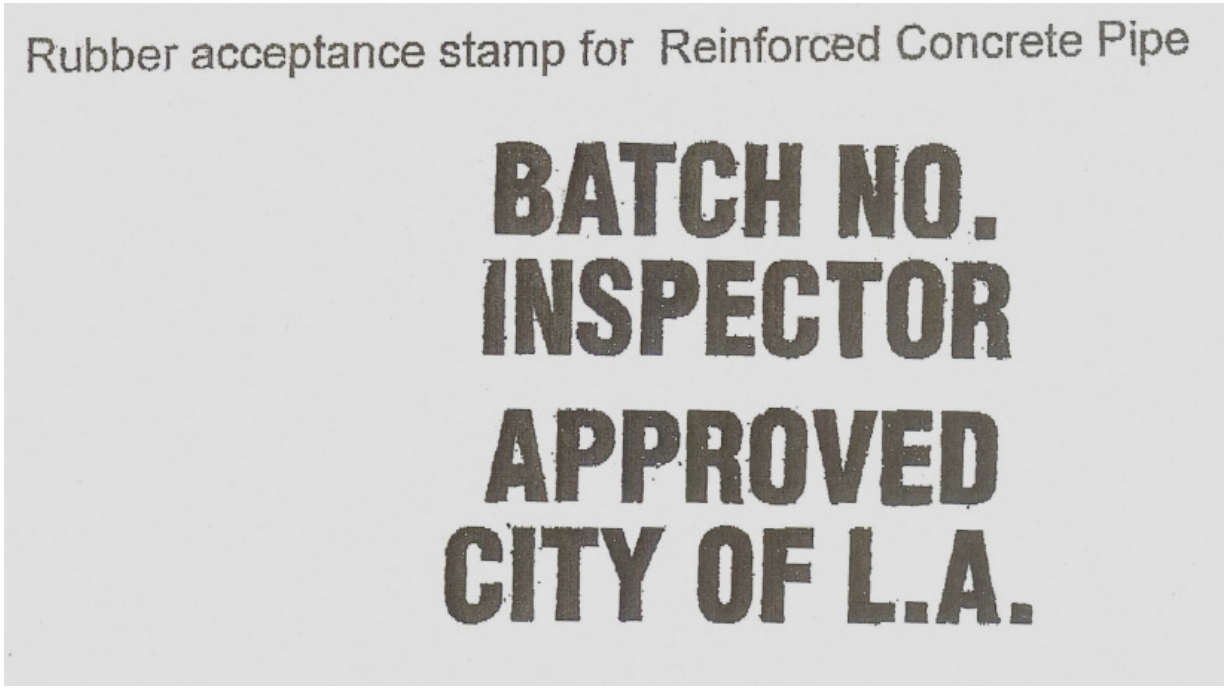
(CONCRETE) (ASPHALT) USED FOR —

CONTRACTOR

FIELD INSPECTOR

NOTES

Rubber acceptance stamp for Reinforced Concrete Pipe



Indent stamp for cast iron Maintenance Holes rings & covers

Rubber acceptance stamp for precast concrete products i.e. Maintenance Holes shafts, Street light & Traffic signal pullboxes, Street light Poles.

APPROVED
CITY OF L.A.

Rubber acceptance stamp for miscellaneous coated & galvanized items. Each shop inspector has a different number

"Evidence of Shop Inspection" sticker (Yellow Tag). Indicates the approval of the item(s) for release to the Project site.

78–1316a (R 2/93)

CITY OF LOS ANGELES

BUREAU OF CONTRACT ADMINISTRATION

INSPECTED

Nº 58937

W.O. No. _____

FABRICATION ☐ WELDED ☐ COATING ☐

GALVANIZED ☐ ANODIZED ☐ OTHER ☐

DESCRIPTION OF ITEMS

_____

_____

_____

_____

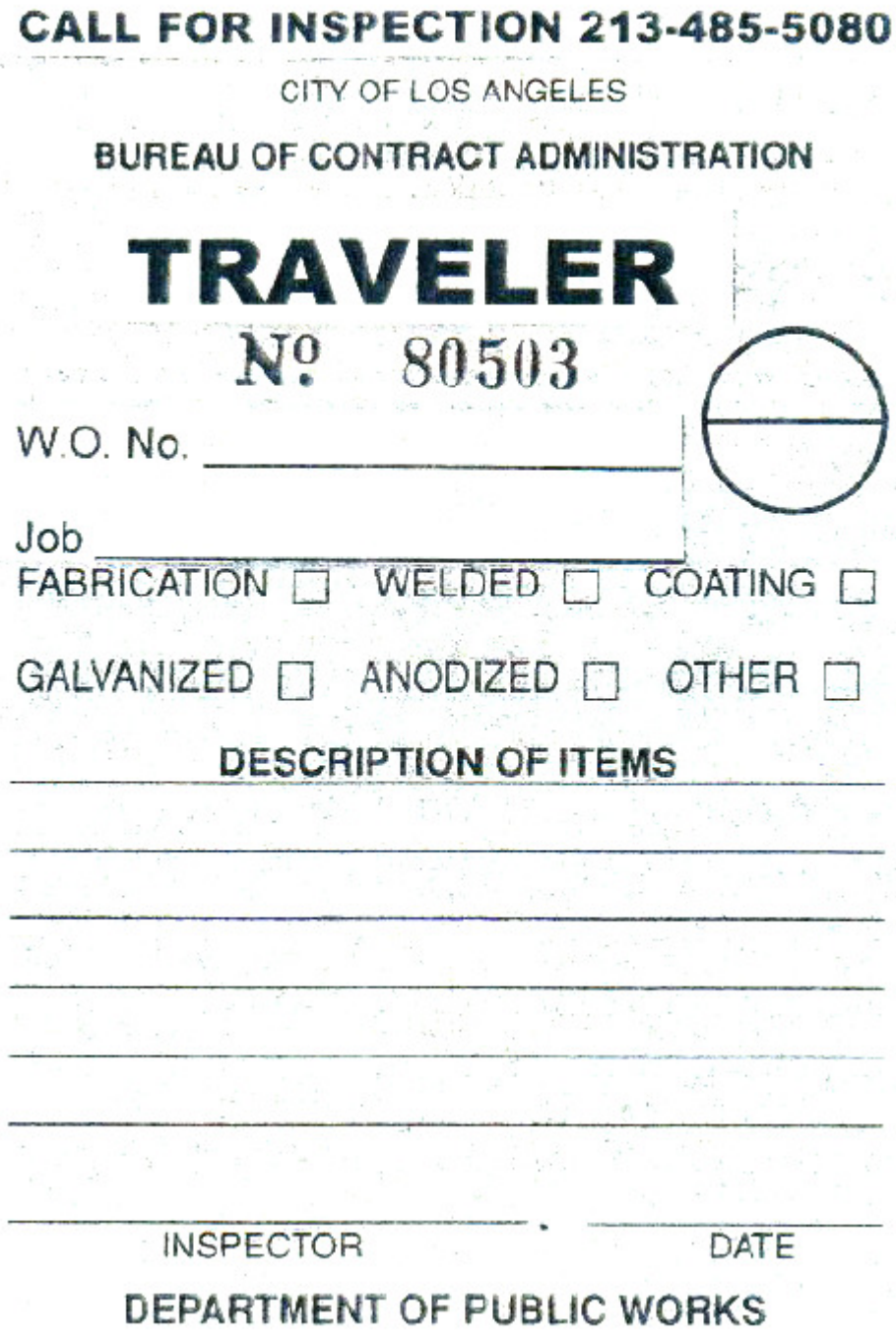
_____

_____ _____

INSPECTOR DATE

DEPARTMENT OF PUBLIC WORKS

Traveler Tag (Green Tag) to release item(s) under fabrication to the next stage of fabrication (i.e. from welding shop to galvanizer)



CALL FOR INSPECTION 213-485-5080

CITY OF LOS ANGELES

BUREAU OF CONTRACT ADMINISTRATION

TRAVELER

Nº 80503

W.O. No. _____

Job _____

FABRICATION ☐ WELDED ☐ COATING ☐

GALVANIZED ☐ ANODIZED ☐ OTHER ☐

DESCRIPTION OF ITEMS

_____

_____

_____

_____

_____

_____ _____

INSPECTOR DATE

DEPARTMENT OF PUBLIC WORKS

APPENDIX D

NOTICE OF MATERIALS TO BE USED

(CALTRANS LAPM,EXH 16-I)

EXHIBIT 16-I NOTICE OF MATERIALS TO BE USED

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

NOTICE OF MATERIALS TO BE USED

CEM-3101 (REV 09/2015)

ADA Notice

For individuals with sensory disabilities, this document is available in alternate formats. For alternate format information, contact the Forms Management Unit at (916) 445-1233, TTY 711, or write to Records and Forms Management, 1120 N Street, MS-89, Sacramento, CA 95814.

Resident Engineer: _____ Date: _____

Materials required for use under contract number (1):

District: _____ County: _____ Route: _____ Post Miles: _____

will be obtained from the following sources:

Contract Bid Item Number (2)	Item Code (3)	Contract Item Description (4)	Item Component (5)	Manufacturer/Provider Name and Address (6)	Manufacturer/Provider Email Address (6)

It is requested that the contractor arrange for sampling, testing, and inspection of materials prior to delivery in accordance with Section 6 of the Standard Specifications. It is understood that source inspection does not relieve the prime contractor of the full responsibility for incorporating into the work, materials that comply in all respects with the contract plans and specifications, nor does it preclude the subsequent rejection of materials found to be unsuitable.

Contractor		
Address		
Business Phone	Business Fax	E-Mail Address

Distribution: 1. Lab Manager 2. Project File

NOTICE OF MATERIALS TO BE USED
INSTRUCTIONS TO CONTRACTOR

Section 6 of the Standard Specifications states that, "Before the preconstruction conference, submit material source information on a "Notice of Materials to Be Used form".

In order to avoid delay in approval of materials, the Department of Transportation must receive, in a timely manner, Form CEM-3101, "Notice of Materials to Be Used." When filing this form, please comply with the following instructions:

1. The Contract Number and job limits should be the same as they appear on the special provisions.

2. The column headed "Contract Bid Item Number" refers to the sequential item number of the contract.

3. The column headed "Item Code" refers to the number for which the material is to be used. It is a six-digit number.

4. The column headed "Contract Item Description" refers to an item description of the material as described in the special provisions.

5. The column headed "Item Component" refers to the specific description of material to be used, not necessarily the name of the contract item.

For example:

Contract Bid Item Number	Item Code		Contract Item Description	Item Component
01	520101		Bar reinforcing steel	Coupler (service splice)

6. The column headed "Manufacturer/Provider" refers to the manufacturer/fabricator of the item. List the name, address and e-mail address of the Manufacturer/Fabricator. Also, list the name and address of the location here inspection will occur, if different from the Manufacturer/Fabricator.

7. Form CEM-3101, "Notice of Materials to Be Used," must be submitted to the resident engineer (RE). The RE will email Form CEM-3101 to the materials administrator to, MaterialsAdministratorMETS@dot.ca.gov or fax to (916) 227-7084, Attn: Materials Administrator or postal mail to: Material Engineering & Testing Services, 5900 Folsom Blvd., Sacramento, CA 95819, MS-5.

If the sources of materials are not known at the beginning of a contract, submit a Form CEM-3101, "Notice of Materials to Be Used," for a given bid item as soon as a provider is known. Multiple submittals may be necessary. Resubmit a Form CEM-3101, "Notice of Materials to be Used," for all changes or revisions.

When placing orders for materials that require inspection prior to shipment, be sure to indicate on your request form that state inspection is required before shipment.

APPENDIX E

EXTENT OF TESTING

PHYSICAL LABORATORY (Concrete, Masonry and Steel):

Test Method		Material
Calif. Test 205	Method for Determining Percentage of Crushed Particles	Aggregate
Calif. Test 207	Specific Gravity and Absorption of Fine Aggregate	Aggregate
Calif. Test 214	Soundness of Aggregate by Use of Sodium Sulfate	Aggregate
Calif. Test 515	Method of Testing Relative Mortar Strength of Portland Cement Concrete Sand	Aggregate
Calif. Test 670	Method of Tests for Mechanical and Welded Reinforcing Splices	Steel Splices
ASTM A370	Standard Test Methods and Definitions for Mechanical Testing of Steel Products	Steel Products
ASTM A416	Standard Specification for Steel Strand, Uncoated Seven-Wire for Pre-stressed Concrete	Steel Wire
ASTM A496	Standard Specification for Steel Wire, Deformed, for Concrete Reinforcement	Steel Wire
ASTM A615*	Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement*	Steel Bars
ASTM A617	Standard Specification for Axle-Steel Deformed and Plain Bars for Concrete Reinforcement	Steel Bars
ASTM A706*	Standard Specification for Low-Alloy Steel Deformed Bars for Concrete Reinforcement *	Steel Bars
ASTM A722	Standard Specification for Uncoated High-Strength Steel Bar for Pre-stressing Concrete	Steel Bars
Calif. Test 521	Compressive Strength of Molded Concrete Cylinders	Concrete
Calif. Test 533	Ball Penetration in Fresh Portland Cement Concrete	Concrete
Calif. Test 539	Sampling Fresh Concrete	Concrete
Calif. Test 540	Making, Handling & Storing Concrete Compressive Test Specimens in the Field	Concrete
Calif. Test 556	Method of Test for Slump of Fresh Portland Cement Concrete	Concrete
Calif. Test 557	Method of Test for Temperature of Freshly Mixed Portland Cement Concrete	Concrete
ASTM C31	Making and Curing Concrete Specimens in the Field	Concrete
ASTM C39*	Compressive Strength of Cylindrical Concrete Specimens*	Concrete
ASTM C40	Organic Impurities in Fine Aggregate	Aggregate
ASTM C42	Standard Method of Obtaining and Testing Drilled Cores and Sawed Beams of Concrete	Concrete

*Physical Laboratory participates in the Cement and Concrete Reference Laboratory (CCRL) Proficiency Samples Program.

PHYSICAL LABORATORY (Concrete, Masonry and Steel) Continued:

Test Method		Material
ASTM C88	Standard Test Method for Soundness of Aggregate by use of Sodium Sulfate or Magnesium Sulfate	Aggregate
ASTM C90	Standard Specification for Hollow Load Bearing Concrete Masonry Units	Concrete Masonry Block
ASTM C109	Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2 inch cube specimens)	Cement
ASTM C117	Materials Finer than 75 mm (No. 200) Sieve in Mineral Aggregates by Washing	Aggregate
ASTM C127	Specific Gravity and Absorption of Coarse Aggregate	Aggregate
ASTM C131	Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine	Aggregate
ASTM C136	Sieve Analysis of Fine and Coarse Aggregate	Aggregate
ASTM C140	Method of Sampling and Testing Concrete Masonry Units	Masonry
ASTM C143	Slump of Hydraulic Cement Concrete	Concrete
ASTM C172	Sampling Freshly Mixed Concrete	Concrete
ASTM C192	Standard Practice for Making and Curing Concrete Test Specimens in the Laboratory	Concrete
ASTM C289	Method for Potential Reactivity of Aggregate (Chemical Method)	Aggregate
ASTM C301	Standard Methods of Testing Vitrified Clay Pipe	Sewer Pipe
ASTM C497	Standard Test Methods for Concrete Pipe, Manhole Sections, or Tile	Concrete Pipe
ASTM C617	Capping Cylindrical Concrete Specimens	Concrete
ASTM C702	Standard Practice for Reducing Field Samples of Aggregate to Testing Size	Aggregate
ASTM C1019	Standard Test Method for Sampling and Testing Grout	Grout
ASTM C1107	Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Non-shrink)	Grout
ASTM C1314	Standard Test Method for Compressive Strength of Masonry Prisms	Masonry

SOILS LABORATORY (Compaction, Classification and Foundation):

Test Method		Material
Calif. Test 105	Calculations Pertaining to Gradings & Specific Gravities	Soils/ Aggregate
Calif. Test 106	Definitions of Terms Relating to Specific Gravity	Soils/ Aggregate
Calif. Test 125	Sampling Highway Materials and Products used in the Roadway Pavement Structure Sections	Soils/ Aggregate
Calif. Test 201	Soil and Aggregate Sample Preparation	Soils/ Aggregate
Calif. Test 202	Sieve Analysis of Fine and Coarse Aggregates	Aggregates
Calif. Test 203	Mechanical Analysis of Soils	Soils
Calif. Test 204	Plasticity Index of Soils	Soils
Calif. Test 209	Specific Gravity of Soils	Soils
Calif. Test 216	Relative Compaction of Untreated Soils and Aggregates	Soils/ Aggregate
Calif. Test 217	Sand Equivalent	Soils
Calif. Test 219	Consolidation of Soils	Soils
Calif. Test 220	Permeability of Soils	Soils
Calif. Test 221	Unconfined Compression of Soils	Soils
Calif. Test 227	Method of Test for Evaluating Cleanness of Coarse Aggregate	Aggregate
Calif. Test 231	Relative Compaction of Untreated/Treated Soils and Aggregate (Area Concept Utilizing Nuclear Gauges)	Soils/ Aggregates
Calif. Test 301	Resistance “R” Value of Treated and Untreated Bases, Subbases and Basement Soils (Stabilometer)	Soils/ Bases
ASTM C117	Standard Test Method for Materials Fined than 75-µm (No. 200) Sieve in Mineral Aggregates by Washing	Aggregates
ASTM C127 AASHTO T85	Standard Test Method for Density, Relative Density (Specific Gravity) and Absorption of Coarse Aggregates	Aggregates
ASTM C128 AASHTO T84	Standard Test Method for Density, Relative Density (Specific Gravity) and Absorption of Fine Aggregates	Aggregates
ASTM C136	Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates	Aggregates

SOILS LABORATORY (Compaction, Classification and Foundation) Continued:

Test Method		Material
ASTM C702	Standard Practice for Reducing Field Samples of Aggregate to Testing Size	Aggregates
ASTM D75	Standard Practice for Sampling Aggregates	Aggregates
ASTM D422	Standard Test Method for Particle-Size Analysis of Soils	Soils
ASTM D558	Standard Test Methods for Moisture-Density (Unit Weight) Relations of Soil-Cement Mixtures	Soil-Cement
ASTM D1556	Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method	Soils
ASTM D1557	Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft^3 (2,700 kN-m/m^3))	Soils
ASTM D2216	Standard Test Methods for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass	Soils
ASTM D2419 AASHTO T176	Standard Test Method for Sand Equivalent Value of Soils and Fine Aggregate	Soils
ASTM D2435	Standard Test Methods for One-Dimensional Consolidation Properties of Soils Using Incremental Loading	Soils
ASTM D2487	Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System)	Soils
ASTM D3080	Standard Test Method for Direct Shear Test of Soils Under Consolidated Drained Conditions	Soils
ASTM D4318	Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils	Soils
ASTM D4718	Standard Practice for Correction of Unit Weight and Water Content for Soils containing Oversize Particles	Soils
ASTM D4829	Standard Test Method for Expansion Index of Soils	Soils
ASTM D6938	In-Place Density and Water Content of Soil and Soil Aggregate by Nuclear Methods (Shallow Depth)	Soils/Soil Aggregate
City of L.A.	Moisture Density Relations of Standard Plan Soils S-610	Soils/ Aggregate

SOILS LABORATORY (Drilling):

Test Method		Material
ASTM D420	Standard Guide to Site Characterization for Engineering, Design, and Construction Purposes	Soils/Rock
ASTM D653	Standard Terminology Relating to Soil, Rock, and Contained Fluids	Soil/Rock
ASTM D1452	Standard Practice for Soil Exploration and Sampling by Auger Borings	Soils
ASTM D1586	Standard Test Method for Standard Penetration Test (SPT) and Split-Barrel Sampling of Soils	Soils
ASTM D1587	Standard Practice for Thin-Walled Tube Sampling of Soils for Geotechnical Purposes	Soils
ASTM D2937	Standard Test Method for Density of Soil in Place by the Drive-Cylinder Method	Soils
ASTM D3550	Standard Practice for Thick Wall, Ring-Lined, Split Barrel, Drive Sampling of Soils	Soils

ASPHALT LABORATORY (Asphalt Cement and Concrete, Emulsified Asphalt, Slurry, and Recycling Agent):

Test Method		Material
AASHTO T30*	Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates*	Aggregates
ASTM D70* AASHTO T228*	Standard Test Method for Density of Semi-Solid Bituminous Materials (Pycnometer Method)	Asphalt Cement Recycling Agent
ASTM D88 AASHTO T72	Standard Test Method for Saybolt Viscosity	Emulsified Asphalt
ASTM D92* AASHTO T48*	Standard Test Method for Flash and Fire Point by Cleveland Open Cup Tester	Asphalt Cement Recycling Agent
ASTM D244 AASHTO T59	Standard Test Methods and Practices for Emulsified Asphalts	Emulsified Asphalt
ASTM D1188 AASHTO T275	Standard Test Method for Specific Gravity and Density Of Compacted Bituminous Mixtures Using Coated Specimens	Asphalt Concrete
ASTM D2041* AASHTO T209*	Standard Test Method for Theoretical Maximum Specific Gravity and Density of Hot-Mix Asphalt Paving Mixtures	Asphalt Concrete

* AASHTO re:source certified Asphalt Laboratory to perform this Test Method

ASPHALT LABORATORY (Asphalt Cement and Concrete, Emulsified Asphalt, Slurry, and Recycling Agent) Continued:

Test Method		Material
ASTM D2170 AASHTO T201	Standard Test Method for Kinematic Viscosity of Asphalts (Bitumens)	Asphalt Cement Recycling Agent
ASTM D2171* AASHTO 202*	Standard Test Method for Viscosity of Asphalt by Capillary Viscometer	Asphalt Cement
ASTM D2726* AASHTO T166*	Standard Test Method for Determining Bulk Specific Gravity of Compacted Hot-Mix Asphalt Using Saturated Surface-Dry Specimens	Asphalt Concrete
ASTM D2872* AASHTO T240* Calif. Test 346	Standard Test Method for Effect of Heat and Air on Moving Film of Asphalt (Rolling Thin-Film Oven Test)	Asphalt Cement Recycling Agent
ASTM D2950	Standard Test Method for Density of Bituminous Concrete in Place by Nuclear Methods	Asphalt Concrete
ASTM D3203* AASHTO T269*	Standard Test Method for Percent Air Voids in Compacted Dense and Open Asphalt Mixtures	Asphalt Concrete
ASTM D3910	Standard Practices for Design and Construction of Slurry Seal	Slurry
ASTM D4402* AASHTO T316*	Standard Test Method for Viscosity Determination of Asphalt at Elevated Temperatures Using a Rotational Viscometer	Asphalt Cement
ASTM D4694 ASTM D4695	Standard Guide for General Pavement Deflection Measurements	Pavement Testing
ASTM D5444* AASHTO T30*	Standard Test Method for Mechanical Analysis of Extracted Aggregate	Asphalt Concrete
ASTM D6307* AASHTO T308* Calif. Test 382	Standard Test Method for Determining the Asphalt Binder Content of Hot-Mix Asphalt (HMA) by the Ignition Method	Asphalt Concrete
ASTM D6521* AASHTO R28*	Standard Practice for Accelerated Aging of Asphalt Binder Using a Pressurized Aging Vessel (PAV)	Asphalt Cement
ASTM D6648* AASHTO T313*	Standard Test Method for Determining the Flexural Creep Stiffness of Asphalt Binder Using the Bending Beam Rheometer (BBR)	Asphalt Cement
ASTM D6752 AASHTO T331	Standard Test Method for Bulk Specific Gravity and Density of Compacted Bituminous Mixtures Using Automatic Vacuum Sealing Method	Asphalt Concrete

* AASHTO re:source certified Asphalt Laboratory to perform this Test Method

ASPHALT LABORATORY (Asphalt Cement and Concrete, Emulsified Asphalt, Slurry, and Recycling Agent) Continued:

Test Method		Material
ASTM D6925* AASHTO T312*	Preparing and Determining the Density of Hot-Mix Asphalt (HMA) Specimens by Means of the Superpave Gyratory Compactor	Asphalt Concrete
ASTM D6926* AASHTO R68*	Standard Test Method for Resistance to Plastic Flow of Bituminous Mixtures Using Marshall Apparatus, (Marshall Compaction)	Asphalt Concrete
ASTM D6927* AASHTO T245*	Standard Test Method for Resistance to Plastic Flow of Bituminous Mixtures Using Marshall Apparatus, (Stability and Flow)	Asphalt Concrete
ASTM D7175* AASHTO T315* Calif. Test 381	Standard Test Method for Determining the Rheological Properties of Asphalt Binder Using a Dynamic Shear Rheometer (DSR)	Asphalt Cement
AASHTO M320	Standard Specification for Performance Graded Asphalt	Asphalt Cement
AASHTO M323	Standard Specification for Superpave Volumetric Mix Design	Asphalt Concrete
AASHTO R18*	Establishing and Implementing a Quality System for Construction Materials Testing Laboratory	Quality Assurance
AASHTO R47*	Reducing Samples of Hot-Mix Asphalt to Testing Size	Asphalt Concrete

* AASHTO re:source certified Asphalt Laboratory to perform this Test Method

SPECIAL TESTING AND RESEARCH LABORATORY:

Test Method		Material
Calif. Test 342	Method of Test for Surface Skid Resistance with the California Portable Skid Testing	AC/PCC Pavement and Other Driving Surface
ASTM A36	Tensile Testing of Carbon Structural Steel	Steel
ASTM A82	Standard Specification for Steel Wire, Plain, for Concrete Reinforcement	Steel Wire
ASTM A90	Weight of Coating on Zinc-Coated Iron or Steel Articles	Zinc
ASTM A185	Standard Specification for Steel Welded Wire, Fabric	Steel Wire
ASTM A307	Mechanical Testing of Carbon Steel Bolts and Studs	Steel Bolts

SPECIAL TESTING AND RESEARCH LABORATORY:

Test Method		Material
ASTM A325	Mechanical Testing of High Strength, Heavy Hex Structural Steel Bolts	Steel Bolts
ASTM A370	Mechanical Testing of Steel Products	Steel
ASTM A500	Testing of Cold-Formed, Carbon Steel Structural Tubing	Steel
ASTM A572	Testing of High Strength Low-Alloy Structural Steel	Steel
ASTM A648	Mechanical Testing of High Strength Steel Wire for Prestressed Concrete Pipe	Steel
ASTM A992	Tensile Testing of Rolled Steel Structural Shapes	Steel
ASTM B136	Measurement of Stain Resistance of Anodic Coatings on Aluminum	Aluminum
ASTM B137	Measurement of Mass of Coating on Anodically Coated Aluminum	Aluminum
ASTM B244	Measurement of Thickness of Anodic Aluminum Coatings on Aluminum and of Other Non-Conductive Coatings on Non-Magnetic Basis Metals with Eddy-Current Instrument	Aluminum
ASTM C1028	Standard Test Method For Determining The Static Coefficient of Friction of Ceramic Tile and Other Like Surfaces By The Horizontal Dynamometer Pull-Meter Method	Ceramic Tile
ASTM D395	Rubber Property-Compression Set	Rubber
ASTM D412	Vulcanized Rubber and Thermoplastic Rubbers and Thermoplastic Elastomers-Tension	Rubber
ASTM D570	Water Absorption of Plastics	Plastic
ASTM D638	Tensile Properties of Plastics	Plastic
ASTM D790	Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulation Materials	Plastic
ASTM D1238	Flow Rates of Thermoplastics by Extrusion Plastometer	Thermoplastic
ASTM D1400	Non-Destructive Measurement of Dry Film Thickness of Non-Conductive Coatings applied to a Nonferrous Metal Base	Coatings
ASTM D2240	Rubber Property-Durometer Hardness	Rubber
ASTM D2412	Determination of External Loading Characteristics of Plastic Pipe by Parallel-Plate Loading	Plastic Pipe
ASTM D2444	Impact Resistance of Thermoplastic Pipe Fittings by Means of a Tup	Thermoplastic
ASTM D2584	Ignition Loss of Cured Reinforced Resins	Resins
ASTM D3359	Measuring Adhesion by Tape Test	Coatings
ASTM E8	Tension Testing of Metallic Materials	Metals

SPECIAL TESTING AND RESEARCH LABORATORY Continued:

Test Method		Material
ASTM E605	Thickness and Density of Sprayed Fire-Resistive Material Applied to Structural Members	Fire-Resistive Material
ASTM F606	Mechanical Properties of Externally and Internally Threaded Fasteners, Washers, and Rivets	Hardware
ASTM G62	Standard Test Method for Holiday Detection in Pipeline Coatings	Pipeline Coating
AWD D1.1	Structural Welding Code – Steel U.T.	Steel

APPENDIX F

FREQUENCY OF SAMPLING OF CONSTRUCTION MATERIALS

Frequency of Sampling of Construction Materials

ASPHALT MATERIALS			
Work Description	**Caltrans QAP Rev. 2011**	**Green Book 2021 Edition**	**Brown Book 8th Edition**
Asphalt Binder (Original/RTFO/PAV)	1 sample per job at the plant for each 1000 tons of AC placed	**x**	1 sample per each lot or sub lot (1200 ton) per 302-5.9.2
Asphalt Emulsions	1 sample per job at the plant for each 1000 tons of AC placed	**x**	x
AC Mix Evaluations	1 sample per 1000 tons of AC	**x**	6 samples every 1200 tons per class, per source, per day per 302.5.1
Additives	Not Specified	**x**	Shall comply with 302-5.9.2 and submit a sample upon delivery
Evaluation of Pavement Compaction by Nuclear Test Method	1 test every 1000 tons of AC	**x**	Min. 20 Nuclear test per project or unit per 302-5.9.3.1
Evaluation of Pavement Compaction by Coring	1 core per every 500 ft.	**x**	Min. four cores per project or unit per 302-5.9.3.1
Asphalt Aggregates Plants 1 & 2	One sample for every 500 to 1000 tons	**x**	**x**
Slurry Seal	1 sample per project	2 samples min. per slurry mixer per separate loads per day per 302-4.9.1	As specified in Green Book.
PORTLAND CONCRETE CEMENT			
Work Description	**Caltrans QAP Rev. 2011**	**Green Book 2021 Edition**	**Brown Book 8th Edition**
Consistency Test	Appendix D, Page 23, at least one sample per job.	**x**	**x**
Compressive Strength	Appendix D, page 24, "Fabricate at least two concrete cylinders per project "	Sec. 201-1.1.5 "The Engineer will determine the frequency of sampling"	As specified in Green Book.
SOILS			
Work Description	**Caltrans QAP Rev. 2011**	**Green Book 2021 Edition**	**Brown Book 8th Edition**
Soil Compaction Test	Appendix D, page 25 "One random location for every 2,500 sq. ft."	**x**	**x**

Note X- As required by the Inspector, Superintendent or Project Engineer

APPENDIX G

TIMETABLE FOR REPORTING TEST RESULTS

Material	Test	Time
Soils base, fill, CMB, CAB, etc.	Sieve Analysis Sand Equivalent and Compaction	1 working day
Aggregate-AC	Sieve Analysis (Wet & Dry)	1 working day
Soils	Atterberg Limits and Sieve Analysis	2 working days
Asphalt Concrete	Marshall Volumetric Analysis	2 working days
Aggregate-PCC	Sieve Analysis (Wet & Day), Specific Gravity, LA Rattler, Organic Impurities, Sand Equivalent	2 working days
Asphalt-Slurry Seal	Slurry Seal Design & Tests	3 working days
Soils-Subgrade & Base	“R” Value	4 working days
Concrete Cylinders, Mortar, Grout, etc.	Compressive Strength	5 working days
Steel Reinforcing Bars, Wire Cables, Couplers, etc.	Tensile Strength	5 working days

APPENDIX H

NEW CALTRANS CERTIFICATION LIST

*Summary of Certificates:

CT 105	Calculations Pertaining to Gradings and Specific Gravities
CT 125	Method of Test for Sampling Highway Materials and Products Used in the Roadway Structural Sections
CT 201	Method of Test for Soil and Aggregate Preparation
CT 202	Method of Test for Sieve Analysis of Fine and Coarse Aggregate
CT 205	Method of Test for Determining Percentage of Crushed Particles
CT 216	Method of Test for Relative Compaction of Untreated and Treated Soils and Aggregate
CT 217	Method of Test for Sand Equivalent
CT 226	Method of Test for Determination of Moisture Content of Soils and Aggregates by Oven Drying
CT 227	Method of Test for Evaluating Cleanness of Coarse Aggregate
CT 229	Method of Test for Durability Index
CT 231	Method of Test for Relative Compaction of Untreated and Treated Soils and Aggregates Using Nuclear Gages
CT 308	Method of Test for Determining Bulk Specific Gravity and Density of Compacted Hot Mix Asphalt
CT 309	Method of Test for Determining Theoretical Maximum Specific Gravity and Density of Hot Mix Asphalt
CT 375	Determining the In-Place Density and Relative Compaction of Hot Mix Asphalt Pavement Using Nuclear Gages
CT 382	Determination of Asphalt Content of Bituminous Paving Mixtures by the Ignition Method
CT 504	Method of Test for Determining Air Content of Freshly Mixed Concrete by the Pressure Method
CT 518	Method of Test for Unit Weight of Fresh Concrete
CT 521	Compressive Strength
CT 523	Method of Test for Flexural Strength of Concrete
CT 539	Method of Test for Sampling Fresh Concrete
CT 540	Method of Test for Making and Curing Concrete Test Specimens in the Field
CT 543	Method of Test for Determining Air Content of Freshly Mixed Concrete by the Volumetric Method
CT 556	Method of Test for Slump of Fresh Portland Cement Concrete
CT 557	Method of Test for Temperature of Freshly Mixed Portland Cement Concrete
AASHTO T166	Standard Method of Test for Bulk Specific Gravity (Gmb) of Compacted Asphalt Mixtures Using Saturated Surface-Dry Specimens
AASHTO T209	Standard Method of Test for Theoretical Maximum Specific Gravity (Gmm) and Density of Asphalt Mixtures
AASHTO T269	Standard Method of Test for Percent Air Voids in Compacted Dense and Open Asphalt Mixtures
AASHTO T275	Standard Method of Test for Bulk Specific Gravity (Gmb) of Compacted Asphalt Mixtures Using Paraffin-Coated Specimens
AASHTO T308	Standard Method of Test for Determining the Asphalt Binder Content of Asphalt Mixtures by the Ignition Method
AASHTO T312	Standard Method of Test for Preparing and Determining the Density of Asphalt Mixture Specimens by Means of the Superpave Gyratory Compactor

APPENDIX I

ACCEPTANCE TESTING RESULTS SUMMARY LOG

Exhibit 16-Z2 Acceptance Testing Results Summary Log

Test Method Name: _____ Test Method Number: _____ Project Name: _____ Contract Number: _____

Test Number	Date Sampled	Name of Sampler or Tester		Production		Test Results			Remarks
		Tester Certification on file?	✓	Location (Stations, depths, etc)	Production Quantity Represented	Required Result	Actual Result	Pass/Fail	Include action taken for any failing test result; note test number of any retest.
1									
2									
3									
4									
5									
6									
7									
8									
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25									

APPENDIX J

LIST OF MATERIALS REQUIRING A CERTIFICATE OF COMPLIANCE

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		
13-9 TEMP. CONCRETE WASHOUTS		
13-9.01C	Fabric bags for gravel-filled bags	COC
	Plastic liner	COC
13-10 TEMP. LINEAR SEDIMENT BARRIERS		
13-10.01C	Fiber rolls	COC
	Silt fence fabrics	COC
	Sediment filter bags	COC
	Foam barriers	COC
	Fabric for gravel-filled bags	COC
16-2.03 TEMP. HIGH-VISIBILITY FENCES		
16-2.03A(3)	High-visibility fabric	COC
18 DUST PALLIATIVES		
18-1.01C	Dust suppressant	COC
	Dust control binders	COC
	Fibers	COC
20 LANDSCAPE		
20-2 IRRIGATION		
20-2.08A(3)	Polyethylene pipe	COC
	Plastic pipe supply line	COC

* For those materials requiring additional information on or with the COC, see specification.

Caltrans 2018 Standard Specifications	Material	Additional Info and/or Attachments Required*
20-3 PLANTING		
20-2.08A(3)	Sod	COC
	Soil amendment	COC
20-5 LANDSCAPE ELEMENTS		
20-5.03A(1)(c)	Filter fabric	COC + product data
20-5.03D(1)(c)	Solidifying emulsion	COC + product data & samples
20-5.04A(3)	Wood mulch	COC + sample & authorization
21-2 EROSION CONTROL WORK		
21-2.01C(1)	Straw	COC
	Weed-free straw	COC + cert. of quarantine
	Fiber	COC
	RECP	COC
	Fasteners	COC
	Hydraulically applied erosion control materials	Submit records
21-2.01C(2)	Compost	Submit reports
21-2.01C(3)	Seed	Submit reports
21-2.01C(4)	Tackifier	COC
	Bonded fiber matrix	COC
24 STABILIZED SOILS		
24-1.01C(1)	Stabilizing agent	COC + sample
24-3 CEMENT STABILIZED SOIL		
24-3.01C	Cement	COC + sample
36-2 BASE BOND BREAKER		
36-2.01C	Base bond breaker	COC
37 BITUMINOUS SEALS		
37-1.01C	Asphalt binder	COC + test results
	Asphalt emulsion	COC + test results
37-3 SLURRY SEALS AND MICRO-SURFACINGS		
37-3.01A(3)	Asphaltic emulsion	COC + samples & test results
	Polymer modified asphaltic emulsion	COC + samples & test results
	Micro-surfacing emulsion	COC + sample & test results
37-2.04 ASPHALT RUBBER BINDER CHIP SEALS		
37-2.04A(3)	Asphalt rubber binder ingredients	COC + permits & submittals

* For those materials requiring additional information on or with the COC, see specification.

Caltrans 2018 Standard Specifications	Material	Additional Info and/or Attachments Required*
37-5 PARKING AREA SEALS		
37-5.01C	Parking area seal material	COC + sample & test results
37-6 CRACK TREATMENTS		
37-6.01C	Crack treatment materials	COC or sample & test results
39-2 HOT MIX ASPHALT		
39-2.01A(3)(f)	Liquid antistrip	COC + sample & production data
39-2.03A(3)(c)	Crumb rubber modifier	COC + test results
	Asphalt modifier	COC + test results
39-2.05A(1)(c)	Asphaltic emulsion	COC + test results
40 CONCRETE PAVEMENT		
40-1.01C(2)	Tie bars	COC
	Splice couplers for threaded bars	COC
	Dowel bars	COC
	Tie bar baskets	COC
	Joint filler	COC
	Epoxy-powder coating	COC
41 EXISTING CONCRETE PAVEMENT		
41-5 JOINT SEALS		
41-5.01C	Liquid joint sealant	COC + SDS & instructions
	Backer rods	COC + SDS & instructions
	Compression joint seal	COC + SDS & instructions
	Lubricant adhesives	COC + SDS & instructions
41-10 DRILL AND BOND BARS		
41-10.01C	Tie bars	COC
	Dowel bars	COC
	Dowel bar lubricant	COC
	Chemical adhesive	COC
	Epoxy powder coating	COC
48-2 FALSEWORK		
48-2.01C(1)	Structural composite lumber	COC + submittals
49-2 DRIVEN PILING		
49-2.02A(3)(d)	Steel pipe piles	COC + tests & mill reports
49-2.03A(3)	Structural shape steel piling	COC + test reports

* For those materials requiring additional information on or with the COC, see specification.

Caltrans 2018 Standard Specifications	Material	Additional Info and/or Attachments Required*
51 CONCRETE STRUCTURES		
51-1.01C(3)	Bonding materials	COC or sample & authorization
51-2 JOINTS		
51-2.01A(3)	Polyethylene material for snowplow deflectors	COC
51-2.02B(1)(c)	Sealant	COC + test reports & samples
51-2.02C(1)(c)	Elastomeric joint seal	COC + test reports
	Lubricant-adhesive	COC + test reports
51-2.02D(1)(c)	Joint seal materials	COC + authorization
51-2.02E(1)(c)(iii)	Joint seal assembly materials	COC
51-2.02F(1)(c)(iv)	Material used in the joint seals	COC + test reports
51-2.04A(3)	Waterstop material	COC + a statement
51-3 BEARINGS		
51-3.02A(3)(c)	Elastomer for bearing pads	COC + test reports
51-4 PRECAST CONCRETE MEMBERS		
51-4.01C(1)	Concrete box culvert	COC
52 REINFORCEMENT		
52-1.01C(3)	Reinforcement (rebar)	COC + mill test report
52-2 EPOXY-COATED REINFORCEMENT		
52-2.02A(3)(c)	Epoxy-coated reinforcement	COC + submittals
	Patching material	COC + a statement
52-5.01C(4)	Headed bar reinforcement	COC + test reports
52-6 SPLICING		
52-6.01C(5)	Service or butt splice material	COC + submittals
54 WATERPROOFING		
54-3 PREFORMED MEMBRANE WATERPROOFING		
54-3.01C	Preformed membrane sheet	COC + report
54-5 DECK SEAL		
54-5.01C	Preformed membrane sheet	COC + report
57-2 WOOD STRUCTURES		
57-2.01A(3)	Timber and lumber	COC + report
	Glued laminated timbers/decking	COC
57-3 PLASTIC LUMBER STRUCTURES		
57-3.01C(1)	Plastic lumber	COC + test report & sample

* For those materials requiring additional information on or with the COC, see specification.

Caltrans 2018 Standard Specifications	Material	Additional Info and/or Attachments Required*
58-2 MASONRY BLOCK		
58-2.01C(7)	CMUs	COC
	Aggregate for grout	COC
	Grout	COC
59 STRUCTURAL STEEL COATINGS		
59-1.01C	Blast cleaning material	COC + SDS
59-5 THERMAL SPRAY COAT STRUCTURAL STEEL		
59-5.01C(1)	Wire feedstock	COC
60-3.04B POLYESTER CONCRETE OVERLAYS		
60-3.04B(1)(c)	Methacrylate resins	COC + samples & test report
	Polyester resins	COC + samples & test report
	Aggregates	COC + samples & test report
61-2 CULVERT AND DRAINAGE PIPE JOINTS		
61-2.01C	Joint systems	COC + test results & reports
	Couplers	COC
64 PLASTIC PIPE		
64-1.01C	Plastic pipe	COC + report
65-2 REINFORCED CONCRETE PIPE		
65-2.01C	RCP, direct design method	COC + report
66 CORRUGATED METAL PIPE		
66-1.01C	Corrugated steel materials	COC
	Corrugated aluminum materials	COC
67-3 METAL LINE PLATE PIPE		
67-3.01C	Metal liner plate pipe	COC + mill test reports
68 SUBSURFACE DRAINS		
68-1.01C	Subsurface drain	COC
68-2 UNDERDRAINS		
68-2.01C	Pipe	COC
	Tubing	COC
	Fittings	COC
68-7 GEOCOMPOSITE DRAIN SYSTEMS		
68-7.01C	Geocomposite drain	COC + flow capability graph

* For those materials requiring additional information on or with the COC, see specification.

Caltrans 2018 Standard Specifications	Material	Additional Info and/or Attachments Required*
69 OVERSIDE DRAINS		
69-1.01C	Steel pipe piles	COC
	Aluminum	COC
	Plastic	COC
70-6 GRATED LINE DRAINS		
70-6.01C	Grated line drains	COC + docu. & inspec. report
71-3.09 MACHINE SPIRAL WOUND PVC PIPELINERS		
71-3.09A(1)(c)	Reel of PVC strip	COC + report
72-16 GABIONS		
72-16.01C	Gabion basket	COC
	PVC coating	COC + identify
75-3 MISCELLANEOUS BRIDGE METAL		
75-3.01C(1)	Anchorage devices	COC
75-3.01C(2) BRIDGE DECK DRAINAGE SYSTEM		
75-3.01C(2)	Fiberglass pipe and fittings	COC
80-3 CHAIN LINK FENCES		
80-3.01C	Protective coating system	COC
	Posts and braces	COC + test results
81 MISCELLANEOUS TRAFFIC CONTROL DEVICES		
81-2 DELINEATORS		
81-2.01C	Metal target plates	COC
	Enamel coating	COC
81-3 PAVEMENT MARKERS		
81-3.01C	Pavement markers	COC
82 SIGNS AND MARKERS		
82-2 SIGN PANELS		
82-2.01C	Aluminum sheeting	COC
	Retroreflective sheeting	COC
	Screened-process colors	COC
	Nonreflective, opaque, black film	COC
	Protective overlay film	COC

* For those materials requiring additional information on or with the COC, see specification.

Caltrans 2018 Standard Specifications	Material	Additional Info and/or Attachments Required*
82-5 MARKERS		
82-5.01C	Metal target plates	COC
	Enamel coating	COC
	Retroreflective sheeting	COC
83-3 CONCRETE BARRIERS		
83-3.01C	Type 60K portable concrete barrier	COC or test reports
84-2 TRAFFIC STRIPES AND PAVEMENT MARKINGS		
84-2.01C	Thermoplastic	COC + autho., SDS & data sheet
	Paint	COC + autho., SDS & data sheet
	Glass beads	COC + autho., SDS & data sheet
	Thermoplastic primer	COC + test results
DIVISION X ELECTRICAL WORK		
86-1.01C(6)	Signal heads	COC + test data
	Visors	COC + test data
87-2 LIGHTING SYSTEMS		
87-2.01C	High mast lighting luminaires	COC + test data
90 CONCRETE		
90-1.01C(3)	Cementitious materials	COC + app. signature
	Blended cement	COC + app. signature
90-1.01C(4)	Admixture	COC + authorization
90-1.01C(5)	Curing compound	COC + test samples
90-2 MINOR CONCRETE		
90-2.01C	Minor concrete	COC + weighmaster cert
90-3 RAPID STRENGTH CONCRETE		
90-3.01C(3)	Aggregate	COC + certified weight
	Cementitious materials	COC + certified weight
	Admixtures	COC + certified weight
90-4 PRECAST CONCRETE		
90-4.01C(2) and 90-4.01D(2)(a)	Cementitious materials	COC + app. signature
	Precast members (each)	COC + app. signature
	Curing compound	COC + test samples
94 ASPHALTIC EMULSIONS		
94-1.01C	Asphaltic emulsion	COC + reports

* For those materials requiring additional information on or with the COC, see specification.

Caltrans 2018 Standard Specifications	Material	Additional Info and/or Attachments Required*
95 EPOXY		
95-1.01C	Epoxy	COC
96 GEOSYNTHETICS		
95-1.01C(1)	Geosynthetic	COC + test samples

* For those materials requiring additional information on or with the COC, see specification.

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.
12	Asphalt Rubber Hot Mix (ARHM)	203-11.2	Materials	Must also submit test reports with the COC.
13	Crumb Rubber Modifier (CRM)	203-11.2.3.1	General (Crumb Rubber Modifier)	Specific language/info required on the COC.
14	Treated Wood	204-2.4	Quality Control	Specific language/info required on the COC.
15	Structural Steel , Rivets, Bolts, Pins	206-1.1.2	Certification	Specific language/info required on certified test reports.
16	Gray Iron and Ductile Iron Castings	206-3.4.2.1	General (Tensile Testing)	Must also submit test reports with the COC.
17	Gray Cast Iron Castings	206-3.4.2.2	Gray Cast Iron Castings	Specific language/info required on the COC and must submit certified test results.
18	Ductile Iron Castings	206-3.4.2.3	Ductile Iron Castings	Specific language/info required on the COC and must submit certified test results.
19	Corrugated Steel Pipe, pipe arches.	207-11.2.1	General (Materials)	

20	Structural Steel Products	207-12.2.1	General (Materials)	Specific language/info required on the COC.
21	Structural Aluminum Products	207-14.2.1	General (Materials)	Specific language/info required on the COC.
22	PVC Pipe	207-17.4.1	General (Test Requirements)	
23	PolyPropylene Pipe	207-25.6.1	General (Man. Facility Testing)	
24	Materials used in Sewers	211-2	Chemical Resistance (Pickle Jar) Test	Specific language/info required on the COC.
25	Viscometer Calibration	211-4.2	Calibration	
26	Engineering Geosynthetics	213-1	General (Engineering Geosynthetics)	Specific language/info required on the COC.
27	Traffic Paint, Thermo and Markers	214-2	Test Reports And Cert. of Compliance	Specific language/info required on certified test reports OR COC
28	Precast Reinforced Concrete Box	216-8	Basis of Acceptance	
29	Fiberglass Standards	700-3.3.4	Fiberglass Standards	Specific language/info required on the COC and test reports.
30	Conductors for Series Circuits, 5000V	700-4.2.2	Conductors for Series Circuits	
31	Conductors and Cable	700-5.3.1	General (Conductors and Cable)	
32	Lamp Receptable Conductors	700-5.5.7	Electrical Components	COC Required if required information is not marked on the insulation.
33	LED Signal Modules	700-5.5.11.8	Certificate of Compliance	
34	LED Pedestrian Signal Module	700-5.6.6.7	Certificate of Compliance	

APPENDIX K

EXAMPLE OF CERTIFICATE OF COMPLIANCE

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: XYZ CEMENT CO.	MILL LOCATION: MIDLAND, CALIFORNIA
TYPE: II MODIFIED	

CHEMICAL ADMIXTURE

1. BRAND: ABC ADMIXTURE	MANUFACTURER: XYZ SUPPLIER
TYPE: WATER REDUCER	
2. BRAND:	MANUFACTURER:
TYPE:	

☐ CHECK BOX IF A CHEMICAL ADMIXTURE WAS NOT USED

MINERAL ADMIXTURE

MANUFACTURER: POZZ. INC.	CLASS: F

☐ CHECK BOX IF A MINERAL ADMIXTURE WAS NOT USED

DELIVERY DATE (Ready-Mix): 7/7/07	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
Fly ash
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 .

APPENDIX L

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)