The purpose of this manual change transmittal is to announce updates and corrections to the Caltrans Construction Manual. Please note the updates, and print new sections for your manual as needed. Updated sections are published on http://www.dot.ca.gov/hq/construc/constmanual/ and are indicated by the date listed in the right-hand column on that page. Content changes, not including edits for clarity, are enumerated:

**MCT 21-11 [12/28/21]**

**Section 4-39, “Asphalt Concrete”**
The Revised Standard Specifications revise the job mix formula for hot mix asphalt validity from 12 months to 24 months. This will allow the contractor to use the job mix formula within 24 months of proposed hot mix asphalt production for a project. Reference to “recycled pavement” replaces “reclaimed pavement” for consistency with the Standard Specifications. Section 4-3904A (4) clarifies the timing of verification test results and notification to the contractor.

**Section 5-1, “Project Records and Reports”**
Added to the list of forms are Form CEM-1302, “Project Positive Work Zone Protection Determination,” Form CEM-1303, “Positive Work Zone Protection Supplement,” and Form CEM-4403, “Recycled Materials Report.”

**Section 6-1, “Sample Types and Frequencies”**
Changes to Table 6-1.11, reflect changes to Section 30 of the Standard Specifications that use “recycled” in reference to reused pavement, replacing “reclaimed.” Additionally, “full depth recycling with no stabilizer” replaces what was previously referred to as “pulverized roadbed.”
Changes to Table 6-1.16 under Joint Seals Type A and AL require joint seals Type A and AL to be from the Approved Materials List for joint seals Type A and AL and submission of a certificate of compliance for each batch of joint seals 15 or more days before delivery to the job site.
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Section 39  Asphalt Concrete

4-3901  General
Section 39, “Asphalt Concrete,” of the Standard Specifications provides material and construction requirements for hot mix asphalt (HMA) including Type A, rubberized hot mix asphalt-gap graded (RHMA-G), open-graded friction course (OGFC), minor HMA, and hot mix asphalt with warm mix asphalt (WMA) additive technology. Unless WMA is specified, the term “hot mix asphalt” refers to all mixtures of aggregate and asphalt regardless of the mixing or placing temperature. Section 39 also provides construction requirements for work on existing asphalt concrete facilities.

All requirements including smoothness requirements in Section 39, except those in Section 39-3, “Existing Asphalt Concrete,” of the Standard Specifications, apply to all types of HMA.

Construction of Quality Asphalt Pavements (Manual Series No. 22), published for sale by the Asphalt Institute, contains information on the uses of types of asphalts and the design and production of HMA. All personnel responsible for HMA should familiarize themselves with this publication.

4-3901A  Warm Mix Asphalt
WMA technologies allow production plants to produce HMA at Fahrenheit temperatures 45 degrees to 85 degrees lower than the traditional mixing temperature. Reductions in mixing temperature have the benefits of cutting fuel consumption and decreasing the production of greenhouse gases, with engineering benefits of better compaction on the road, the ability to haul paving mix for longer distances, and extending the paving season by being able to pave at lower temperatures.

WMA technologies are divided into two categories—additive technology and water injection technology, or foaming. When a WMA technology is used to aid mixing and compaction of HMA produced at reduced temperatures, it is defined as HMA with WMA technology. The contract allows that both categories of WMA technology may be used for Type A HMA, RHMA-G, and OGFC. The contract may include special provisions that require the use of WMA additive technology. When a WMA technology is used, Section 39-2.01A(1), “Summary,” of the Standard Specifications requires that contractors choose a technology that is on an Authorized Material List for WMA authorized technologies.

4-3901B  Rubberized Hot Mix Asphalt
RHMA is produced by mixing asphalt rubber and aggregate. Asphalt rubber is specified to include 18 percent to 22 percent crumb rubber modifier (CRM) by total mass of the asphalt rubber blend. The CRM must also include 25 percent, plus or minus 2 percent, high natural rubber content scrap rubber by mass of the CRM that
Asphalt concrete may come from scrap tires or other sources. Caltrans requires use of extender oil as an asphalt modifier in asphalt rubber. RHMA includes RHMA-G (gap graded), RHMA-O (open-graded), and RHMA-O-HB (open-graded high binder).

4-3901C Paving Personnel
Producing HMA pavement requires a partnership among Caltrans, the plant producing the HMA, and the contractor placing the HMA. The resident engineer must clearly communicate assignments of responsibility and commensurate authority for all Caltrans personnel, both at the job site and at the plant.

Plant inspection and testing is essential to assure quality HMA. A plant inspector at the HMA plant usually performs the inspection and testing duties for the resident engineer. However, the resident engineer is responsible for enforcing contract specifications at the plant. The resident engineer must be kept informed of test results in a timely manner so appropriate contract administration action can be taken.

The paving inspector should have completed both “Hot Mix Asphalt Basics” and “Hot Mix Asphalt Inspection” training courses before assignment as the HMA paving inspector. In addition, a paving inspector who samples material must also be qualified on California Test 125, “Method of Test for Sampling Highway Materials and Products Used in the Roadway Pavement Structure Sections,” Appendix D, “Bituminous Materials.”

4-3901D Hot Mix Asphalt Quality Assurance Processes
HMA is placed using one of two specified quality assurance processes: The standard process or statistical pay factor (SPF) process. The applicable quality process is defined by the item description.

For the standard process, the quality assurance requirements are defined in Sections 39-2.01, “General”; 39-2.02, “Type A Hot Mix Asphalt,” and 39-2.03, “Rubberized Hot Mix Asphalt–Gap Graded,” of the Standard Specifications.


The SPF process is typically specified on projects in which at least 10,000 tons of HMA Type-A or RHMA-G are specified. The standard process will be specified for all other cases.

4-3901D (1) Standard Quality Assurance Process
Under the standard process, the contractor performs quality control testing and Caltrans performs acceptance testing and inspection. The acceptance decision is based on Caltrans’ test results only.

For most quality control characteristics, the contractor samples and tests at a minimum frequency of once every 750 tons of produced HMA.
For Caltrans acceptance sampling and testing, test at the frequency shown in Section 6-1, “Sample Types and Frequencies,” of this manual. Under the standard process, for most tests, test a minimum of every fifth sample, but not less than once per day.

Under the standard process, HMA represented by a single failed Caltrans test is noncompliant. Each test can represent no more than 750 tons. When Caltrans’ testing or the contractor’s quality control testing indicates two consecutive failures, or three failures in one day, the contractor must stop production, take corrective action, and demonstrate compliance before resuming production. Noncompliant material can be accepted with a change order. For guidance on addressing noncompliant material placed using the standard process, refer to Section 4-3904A (1), “Acceptance Test Results Outside Specified Limits on Non-Statistical Pay Factor Projects,” of this manual. For guidance on stopping production because of two consecutive failures or three failures in one day, refer to Section 4-3904A (2), “Two Consecutive Acceptance Test Results Outside Specification Limits on Non-Statistical Pay Factor Projects,” of this manual.

4-3901D (2) Statistical Pay Factor Quality Assurance Process

Under the SPF process, the contractor performs quality control inspection, sampling and testing. Caltrans performs verification sampling and testing. When Caltrans testing does not verify the contractor’s quality control test results, Caltrans testing is used for acceptance. Caltrans also takes an active role in inspection.

Under the SPF process, acceptance decisions are made on a lot-by-lot basis. A lot of material is typically limited to 15,000 tons of HMA. Each lot is broken into sublots of 750 tons each. A new lot starts when twenty sublots are complete, a new job-mix formula is used, or when production stops for more than 30 days. The contractor controls quality by testing at the frequency defined in the specifications. Most quality characteristics are sampled and tested once per sublot.

HMA quality has two general types of characteristics: pay factor quality characteristics and non-pay factor quality characteristics. The pay factor quality characteristics are used to determine acceptance and applicable payment adjustments. Acceptance and payment adjustments are based on a statistical analysis of the contractor’s verified pay factor quality control test results to determine the amount of material produced and placed within a specified limit. This value is referred to as percent within limits (PWL).

Quality of the produced and placed HMA is actively monitored during production using the contractor quality control testing of both the pay factor and non-pay factor quality characteristics.

There are five pay factor quality characteristics:

1. Core density (percent of theoretical maximum density)
2. Asphalt binder content
3. Air voids at N-design gyrations
4. Percent passing the number 200 sieve
5. Percent passing the number 8 sieve

The remaining quality characteristics are referred to as non-pay factor quality characteristics.

Pay factor quality characteristic tests for each lot are statistically evaluated to determine the PWL after completing each sublot. If the PWL value for any of the pay factor quality characteristics falls below the defined threshold, the contractor must stop production and identify which sublots will be rejected from the lot before continuing production.

The non-pay factor quality characteristics are also continuously tested to control quality but are not used for acceptance. The non-pay factor quality characteristics are used to identify issues with production, when to require corrective action, and for stopping production when corrective actions fail as demonstrated by two consecutive failures of tests from two consecutive sublots, or when three failures occur in a single production shift.

Upon completion and acceptance of each lot, an incentive or disincentive is determined based on the contractor’s verified PWL values. The SPF process is designated for projects with 10,000 tons or more of Type-A HMA or RHMA-G, because the incentives and disincentives encourage the contractor to implement quality controls that produce mix with higher quality standards. The incentives encourage production and use of HMA with reduced variability and at the target values designated by the approved job mix formula.

For additional guidance on the acceptance and payment adjustments, refer to Section 4-3904A (4), “Acceptance of Lots using Statistical Pay Factor Specifications,” of this manual.

4-3902 Before Work Begins

Verify that the contractor submits a job mix formula and a quality control plan (QCP) for HMA production and placement for all types of HMA. Job mix formula and QCP submittals are not required for HMA that is used for miscellaneous areas and dikes.

For HMA placed using the standard process, verify that all elements required by Section 39-2.01A(3)(c), “Quality Control Plan,” of the Standard Specifications, are included.

For HMA placed using the SPF process, verify that the QCP is prepared in accordance with the “Quality Control Manual for Hot Mix Asphalt Using Statistical Pay Factors.” Use the checklist in Appendix K to assist with review of the QCP. The manual is available at:

https://dot.ca.gov/programs/construction/hot-mix-asphalt-construction

The contractor’s laboratories used for testing aggregate and HMA qualities for determining the job mix formula and the independent third-party laboratory performing dispute resolution testing must be qualified under the American Association of State Highway and Transportation Officials (AASHTO) re:source
program, and the Caltrans' Independent Assurance Program (IAP). For the standard process, the contractor’s quality control laboratory is not required to be certified by re:source or IAP, because the tests are not used for acceptance. For the SPF process, the contractor’s quality control laboratory is required to be certified by AASHTO re:source and IAP, because the tests are used for acceptance. Certification is achieved through the Joint Training and Certification Program (JTCP).

Caltrans laboratories performing acceptance testing must be qualified under the AASHTO re:source and IAP. Caltrans’ field laboratories meet the re:source requirements when Caltrans’ central materials laboratory meets the requirement. HMA plants must comply with the Material Plant Quality Program (MPQP) manual guidelines. A link to the manual may be found here:

https://dot.ca.gov/programs/construction/material-plant-quality-program

4-3902A General

Before the work begins, the resident engineer will:

- Determine the type of HMA specified for the project, the specification process, and review the plans and the special provisions. The special provisions specify the type of HMA, aggregate size, and asphalt binder grade.
- Review the project specifications’ measurement and payment clauses and determine what records must be kept.
- The job mix formula requirements are the same for the standard and SPF specification processes.

4-3902B Job Mix Formula Submittal

Review the documents in the contractor’s job mix formula submittal information to verify they are complete. Notify the contractor immediately if the submittal is incomplete. Include:

- Form CEM-3511, “Contractor Job Mix Formula Proposal,” which documents target values for aggregate sieves, percent of asphalt binder, and source information for all HMA component materials. If applicable, Form CEM-3511 will also include the percentage of recycled asphalt pavement and antistrip treatment method.
- Form CEM-3512, “Contractor Hot Mix Asphalt Design Data,” which documents the testing data developed by the mix design laboratory. If Form CEM-3513, “Caltrans Hot Mix Asphalt Verification,” is not attached, the completed mix design data Form CEM-3512 must have been dated within the past 24 months.
- Form CEM-3513, “Contractor Hot Mix Asphalt Verification,” if submitted, documents Caltrans’ verification test results for the proposed job mix formula. Form CEM-3513 must have been signed by an engineer, preferably the district materials engineer, within 24 months of the start of planned HMA production.
• Safety data sheets in accordance with Section 39-2.01A(3)(b), “Job Mix Formula,” of the Standard Specifications.

4-3902C Job Mix Formula Review

The resident engineer must:

• Review the contractor’s proposed job mix formula submitted on Form CEM-3511, “Contractor Job Mix Formula Proposal,” for compliance with Section 39-2, “Hot Mix Asphalt,” of the Standard Specifications and additional requirements in the special provisions. Notify the contractor immediately if the proposed job mix formula does not comply with the specifications.

• Review the contractor’s proposed job mix formula submitted on Form CEM-3511, and verify the asphalt binder supplier is on the Caltrans list of approved suppliers at:

  https://mets.dot.ca.gov/aml/AsphaltBindersList.php

• If the asphalt binder supplier is not on Caltrans’ list of approved suppliers, notify the contractor that asphalt binder supplied for the project must comply with the Division of Engineering Services Asphalt Supplier Certification Program. Visit this page for information on qualifying:


• If WMA technology (additive or water injection foam) or crumb rubber modifier is used, verify it is on the applicable Caltrans Authorized Material List at:

  https://dot.ca.gov/programs/engineering-services/authorized-materials-lists

• If the submitted job mix formula proposal complies with the specifications, notify the contractor within 5 days of submittal that:

  o The job mix formula is accepted if Form CEM-3513, “Caltrans Hot Mix Asphalt Verification,” was issued within 24 months of proposed HMA production. The resident engineer signs and returns Form CEM-3511.

  o The job mix formula must be verified if Form CEM-3513 was not issued within 24 months of proposed HMA production. The resident engineer requests that the contractor give notice when HMA will be produced for verification and notifies the district materials engineer.

  o For open-graded friction course HMA, if Form CEM-3513 was not issued within 24 months of proposed HMA production, the resident engineer requests that the contractor give notice for sampling of aggregate, binder, and additives.
4-3902D Job Mix Formula Verification

4-3902D (1) General

The contractor takes the following steps related to job mix formula verification for all types of mixes.

If the proposed job mix formula has not been verified within 24 months of production, the contractor must furnish material samples in accordance with Section 39-2.01A(3)(b), “Job Mix Formula,” of the Standard Specifications, including:

- Coarse, fine, and supplemental aggregate from stockpiles, cold feed belts, or hot bins. Samples must include at least 120 pounds for each coarse aggregate, 80 pounds for each fine aggregate, and 10 pounds for each type of supplemental fines.
- Recycled asphalt pavement from stockpiles or recycled asphalt pavement system, if used. Samples must be at least 60 pounds.
- Asphalt binder from the binder supplier. Samples must be in two 1-quart cylindrical cans with open top friction lids.
- Asphalt rubber binder with the components blended in the proportions to be used. Samples must be in four 1-quart cylindrical cans with open top friction lids.
- Antistrip additives if used.

The resident engineer’s verification process includes:

- Receiving notification from the contractor at least 2 business days before sampling material so that an inspector may be present during the sampling.
- Witnessing the contractor sampling HMA and component materials.
- Shipping the samples immediately to the district materials laboratory. They will be processed according to the instructions included on Form TL-0101, “Sample Identification Card.” The TL-0101 should be marked Priority and include Job Mix Formula Verification Sample under Remarks.
- Providing job mix formula verification results to the contractor on Form CEM-3513, “Caltrans Hot Mix Asphalt Verification,” within 20 days of receiving all samples.

4-3902D (2) Verification Process for Open-Graded Friction Course

For samples of aggregate, asphalt binder, and additives, if applicable:

- Request that the district materials lab determine if the aggregates comply with the contract quality requirements.
- Request that the district materials laboratory determine asphalt binder content under California Test 368, “Method of Test for Optimum Bitumen Content (OBC) for Open Graded Friction Course.”
- Within 20 days of material sampling, Caltrans will determine asphalt binder content and provide the contractor with Form CEM-3513.
Within 20 days of receipt of a complete job mix formula submittal and material sampling, the resident engineer signs and returns the accepted or rejected job mix formula on Form CEM-3511, “Contractor Job Mix Formula Proposal,” with Form CEM-3513 attached, to the contractor immediately following receipt of Form CEM-3513 from the district materials laboratory.

4-3902D (3) Verification Process for Type A and Rubberized Hot Mix Asphalt-Gap Graded

If the contractor’s job mix formula proposal has not been verified, the contractor must provide aggregate and HMA verification samples from the plant that will be used for the project. The contractor samples in accordance with California Test 125, “Method of Test for Sampling Highway Materials and Products Used in the Roadway Pavement Structure Sections.”

Samples are obtained at the following locations:

- Aggregates are sampled from cold feed belts or hot bins.
- Recycled asphalt pavement, if used, is sampled from the recycled asphalt pavement system.
- HMA is sampled at the plant, in a truck, from a windrow, the paver hopper, or on the mat behind a paver.


Make sure the proposed job mix formula is verified by the district materials laboratory within 20 days of sampling HMA or when requested in writing by the contractor within 3 business days for rubberized HMA. Verification is complete after the district materials engineer completes and returns Form CEM-3513, “Caltrans Hot Mix Asphalt Verification,” to the resident engineer. Form CEM-3511, “Contractor Job Mix Formula Proposal,” must also be completed by the resident engineer and returned to the contractor along with Form CEM-3513 within this time frame.

For HMA using WMA technology:

- Obtain the result and a tested sample set for AASHTO T 324, “Standard Method of Test for Hamburg Wheel-Track Testing of Compacted Asphalt Mixtures,” from the contractor.
- Verify the HMA compliance with the mix design requirements for both AASHTO T 324 and AASHTO T 324 (Modified).
- Verify RHMA-G-WMA quality requirements within 5 business days.

4-3902D (4) Unverified Proposed Job Mix Formula

If the district materials laboratory does not verify the proposed job mix formula:

- The resident engineer notifies the contractor in writing on Form CEM-3511, “Contractor Job Mix Formula Proposal,” of the rejected job mix formula, attaching
Form CEM-3513, “Caltrans Hot Mix Asphalt Verification,” with Caltrans’ verification test results.

- The contractor may submit a new job mix formula on Form CEM-3511 with a new Form CEM-3512, “Contractor Hot Mix Asphalt Design Data,” or the contractor may adjust the job mix formula on Form CEM-3511 with allowable adjustments specified in Section 39-2.01A(4)(b), “Job Mix Formula Verification,” of the Standard Specifications.

- If the contractor disputes Caltrans’ verification test results, make sure the contractor complies with Section 39-2.01A(4)(i)(iv), “Dispute Resolution,” of the Standard Specifications.

4-3902D (5) Adjusted Job Mix Formula

The contractor may adjust the job mix formula to meet the specifications. Justification for any adjustments outside the target values shown on Form CEM-3512, “Contractor Hot Mix Asphalt Design Data,” must be listed on the modified Form CEM-3511, “Contractor Job Mix Formula Proposal.”

If the adjusted job mix formula proposal complies with the specifications, arrange with the contractor a time to witness the sampling of plant produced HMA.

Make sure that the proposed job mix formula is verified by the district materials laboratory within 20 days of sampling HMA or when requested in writing by the contractor or within 3 days of sampling rubberized HMA. Verification is done when the district materials engineer completes and returns Form CEM-3513, “Caltrans Hot Mix Asphalt Verification,” to the resident engineer. Form CEM-3511 must also be completed by the resident engineer and returned to the contractor with Form CEM-3513 within 20 days of sampling HMA.

If the district materials laboratory does not verify the adjusted proposed job mix formula, notify the contractor in writing on Form CEM-3511 and attach Form CEM-3513 with Caltrans’ verification test results.

If the adjustment failed to resolve the job mix formula verification problem, the contractor may propose a new job mix formula or dispute Caltrans’ test results in accordance with Section 39-2.01A(4)(i)(iv), “Dispute Resolution,” of the Standard Specifications.

4-3902E Job Mix Formula Renewal

Job mix formula approval is good for only 24 months. The contractor may request a job mix formula renewal before expiration of the approval.

Verify that the contractor takes the following steps for job mix formula renewal:

- Submits the proposed job mix formula on Form CEM-3511, “Contractor Job Mix Formula Proposal,” attaching the previously verified job mix formula on Form CEM-3513, “Caltrans Hot Mix Asphalt Verification,” and the mix design information for previously verified job mix formula on Form CEM-3512, “Contractor Hot Mix Asphalt Design Data.”
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- Notifies the resident engineer before sampling materials.
- Samples materials at the locations and quantities shown in Section 4-3902D, “Job Mix Formula Verification,” of this manual. HMA must be sampled at the location approved in writing by the resident engineer.
- Submits Form CEM-3514, “Contractor Job Mix Formula Renewal.” Contractors use Form CEM-3514 to submit to the resident engineer their test results for renewal of HMA job mix formula.

The resident engineer’s job mix formula renewal process includes:

- Reviewing the proposed job mix formula on Form CEM-3511. Refer to Section 4-3902C, “Job Mix Formula Review,” of this manual. If the submitted job mix formula proposal complies with the specifications, the resident engineer notifies the contractor within 5 days that split-sampled HMA and component materials must be provided.
- Witnessing the contractor sampling HMA and component materials. Take possession of the material samples and hold until receiving contractor test results.
- Reviewing the information on Form CEM-3514 to confirm that the contractor test results comply with the specifications. When the test results indicate that the sampled and tested HMA complies with the specification, request that the district materials laboratory perform HMA verification testing.
- Shipping material samples to the district materials laboratory if the contractor’s test results on Form CEM-3514 comply with the specifications. Samples will be processed according to the instructions on Form TL-0101, “Sample Identification Card.” The TL-0101 should include Job Mix Formula Renewal Verification Sample under Remarks.
- Providing job mix formula verification results to the contractor on Form CEM-3513 within 30 days of receiving Form CEM-3514 from the contractor.

4-3902F Job Mix Formula Acceptance

Job mix formula acceptance requires the resident engineer to review and accept submitted Form CEM-3511, “Contractor Job Mix Formula Proposal,” with Form CEM-3512, “Contractor Hot Mix Asphalt Design Data,” and an accepted Form CEM-3513, “Caltrans Hot Mix Asphalt Verification,” attached. Refer to Section 4-3902C “Job Mix Formula Review,” of this manual for guidelines on reviewing Form CEM-3511.

4-3902G Plant Operations

HMA plants must be qualified under the MPQP. Refer to Section 3-902E, “Weighing Equipment and Procedures,” of this manual for additional information.

Before production begins, take the following steps related to HMA plant operations:

- Verify with the district weights and measures coordinator that the proposed HMA plant and production equipment for performance grade modified asphalt binder
with CRM is Caltrans-qualified under the MPQP. Batch HMA plants must be qualified annually, and continuous HMA plants must be qualified at least every 6 months, in accordance with Chapter 1, Section II-C, “Frequency,” of the MPQP manual.

- If the HMA plant is not qualified, notify the contractor in writing and provide the contact information for the district weights and measures coordinator. The contractor must give the district weights and measures coordinator 5 business days’ notice to schedule HMA plant qualification.
- Accept HMA for as long as 14 days from a nonqualified plant if start-up approval has been granted in writing by the district weights and measures coordinator.

4-3902H Antistrip Treatment of Aggregates

HMA may be sensitive to moisture damage and require antistrip treatments. The treatment method can be either lime treatment (by dry lime, dry lime with marination, or lime slurry with marination) or liquid antistrip. Regardless of the type of antistrip treatment chosen by the contractor, the HMA must meet the requirements of AASHTO T 283, “Standard Method of Test for Resistance of Compacted Asphalt Mixtures to Moisture-Induced Damage,” and AASHTO T 324, “Standard Method of Test for Hamburg Wheel-Track Testing of Compacted Asphalt Mixtures.”

When the contractor chooses to use antistrip treatment of aggregate, the contractor must test the proposed HMA aggregate blend for plasticity index in accordance with California Test 204, “Method of Tests for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.” When California Test 204 indicates clay is present in the aggregates, the plasticity index is used to determine the type of antistrip treatment. Refer to Section 39-2.01B(2)(b) “Hot Mix Asphalt Treatments,” of the Standard Specifications for the treatment method allowed.

4-3902H (1) Lime Treatment of Aggregates

There are two methods for lime treatment of aggregates:

- Hot mix asphalt aggregate lime treatment—slurry method
- Hot mix asphalt aggregate lime treatment—dry lime method

Using the slurry method, treated aggregates are always marinated. Under the dry lime method, if the plasticity index is 4 through 10, aggregates must be marinated. When marination is required, the lime-treated aggregate must be stockpiled for 24 hours to 60 days before using in HMA.

Recycled asphalt pavement used in the production of HMA does not need to be lime treated.

Quality characteristic acceptance test limits for aggregate properties are based on untreated aggregates. Therefore, aggregate quality control and acceptance testing must be performed on aggregate samples taken before lime treatment.

During lime treatment, the sand equivalent test is used to signal a change in the presence of clays. If sand equivalent values decrease significantly, the plasticity
index of the aggregate blend must be tested to verify that it continues to be in the acceptable range listed in the special provisions.

If clays are present in the aggregate blend, both lime treatment methods must be followed by marination.

For lime-treated aggregates, before lime treatment begins, take the following steps:

- Verify with the district weights and measures coordinator that the proposed lime treatment plant is Caltrans-qualified in accordance with the MPQP.
- Verify the lime proportions for the fine and coarse aggregate or for the combined aggregates shown on the job mix formula.

During lime treatment, take the following steps:

- Obtain aggregate samples from stockpiles in accordance with California Test 125, “Method of Test for Sampling Highway Materials and Products Used in the Roadway Pavement Structure Sections,” to field test for moisture content and sand equivalent at the frequency shown in Table 6-1.13, “Materials Acceptance Sampling and Testing Requirements: Asphalt Concrete,” in Section 6-1, “Sample Types and Frequencies,” of this manual.
- Test aggregate samples for sand equivalent at the frequency shown in Table 6-1.13 of this manual. Combine aggregate from individual stockpiles in the job mix formula proportions to test for sand equivalent. If the sand equivalent test result exceeds the specified limits, immediately notify the resident engineer.
- It is good practice to test aggregate samples for moisture content in accordance with AASHTO T 255, “Total Evaporable Moisture Content of Aggregate by Drying,” or AASHTO T 329, “Standard Method of Test for Moisture Content of Asphalt Mixtures by Oven Method,” because moisture influences proportioning. The plant inspector should confirm that the contractor is performing sampling and testing for moisture content at a frequency shown in Section 39-2.02A(4)(b)(ii), “Aggregates,” of the Standard Specifications.
- Obtain aggregate samples from stockpiles or aggregate belts before lime treatment, in accordance with California Test 125. Sample aggregates at the frequency shown in Table 6-1.13 of this manual for aggregate acceptance testing.

Label each aggregate sample with the contract number, date, type of mix, aggregate gradation (for example, 1/2 inch), aggregate source, HMA producer, and producer’s mix identification number. Indicate the number of tons produced when the sample was taken.

- Test aggregate at the frequency shown in Table 6-1.13. For samples that will be shipped to the district material laboratory or field construction laboratory for testing, complete Form TL-0101, “Sample Identification Card.” Follow the instructions printed in the accompanying booklet and the information in Section 6-103, “Field Sampled Material Identification for Testing,” of this manual. Record the type of mix, the HMA producer, and the producer’s mix identification number.
Check the acceptance tests box on the TL-0101. Under Remarks, identify the tests to be performed:

1. Los Angeles Rattler
2. Percent of crushed particles coarse aggregate
3. Percent of crushed particles fine aggregate
4. Fine aggregate angularity
5. Flat and elongated particles
6. Other aggregate properties specified in the project special provisions, if applicable

If any test results exceed the specified limits, the materials laboratory will immediately notify the resident engineer.

- Verify that the aggregate treatment is adequate by witnessing contractor quality control testing, and be sure the contractor enters into a log the treatment data specified in the special provision.

For each day of aggregate lime treatment, obtain the treatment data log in electronic format for the resident engineer’s project files.

4-3902H (2) Marination of Lime-Treated Aggregates

Marination of the lime-treated aggregates must be done when required in the special provisions or when California Test 204, “Method of Tests for Liquid Limit, Plastic Limit, and Plasticity Index of Soils,” indicates that the plasticity index is 4 through 10.

Lime-treated aggregate must marinate at least 1 day and no more than 60 days before use in HMA production. If rain is anticipated during the marination period, the contractor must protect the stockpiles. If the lime-treated aggregate has been exposed to rain, inspect the stockpiles. If aggregate lime coating has been damaged significantly, reject the aggregate. If only the outside surface of the stockpile has been damaged, require that the contractor remix the piles to redistribute the lime.

4-3902H (3) Liquid Antistrip Treatment

This treatment process requires the addition of the liquid antistrip to asphalt binder during HMA production.

Before production begins, take the following steps:

- Verify with the district weights and measures coordinator that the proposed liquid antistrip metering device and storage tank are Caltrans-qualified under the MPQP.
- Verify that the liquid antistrip is the same type and brand as shown on the accepted job mix formula.
4-3902I  Preparing Conference

Before work begins, the resident engineer holds a preparing conference with the contractor to discuss HMA production and placement:

- Review the accepted job mix formula and check that Form CEM-3513, “Caltrans Hot Mix Asphalt Verification,” has been signed by Caltrans within the past 24 months.
- Confirm that the accepted job mix formula has not changed.
- Discuss with the contractor what atmospheric and pavement temperatures the contractor has chosen that would result in a notification to stop production of HMA at the plant.
- Discuss method of incorporating WMA technology.
- Discuss with the contractor pavement areas to receive tapered edge and construction methods to be used.
- Discuss with the contractor pavement areas to receive shoulder backing and construction methods to be used.
- If crumb rubber modifier is to be used, discuss the requirement that the crumb rubber usage reports are submitted monthly and at the end of the contract.
- Verify if the contractor intends to use a tapered notch wedge device to construct the longitudinal joint. A tapered notch wedge can be used only on a divided highway and when the special provisions do not include a requirement that adjacent traveled-way lanes be squared up from 5 feet to 10 feet at the end of each work shift.
- Discuss the minimum taper requirements for temporary joint tapers when a transverse joint greater than 0.04 foot cannot be avoided before opening to traffic.
- Verify that the type of spreading equipment proposed by the contractor has the necessary attributes for the project. Permit wing-type spreading equipment only for areas not requiring an asphalt paver, and then only for such widths, typically less than 5 feet, that will not adversely affect the surfacing on the traffic lane.
- Verify that rollers have the specified attributes. For method process, make sure the specified number of rollers will be used based on the type of HMA being placed.
- For SPF projects, discuss the requirement that the resident engineer and contractor’s quality control manager use copies of a common spreadsheet to enter and evaluate quality control test data from each lot. Discuss the requirement that the contractor enter test data after each sublot and export the data and submit it daily to the resident engineer. The engineer does not share verification data until completion of the lot.
- Where the SPF process is specified, discuss the requirement that both the contractor and Caltrans sample using their own stratified random sampling plans. Contractors sample randomly from each sublot in accordance with the random
plan included in their quality control plan. Caltrans obtains verification samples as defined in the Caltrans stratified random sampling plan. For guidance on developing the engineer’s stratified random sampling plan, refer to section 4-3902K, “Stratified Random Sampling Plan” of this manual.

- When the SPF process is specified, discuss the requirement that Caltrans not share its stratified random sampling plan or verification test results with the contractor until the contractor submits all quality control test data for the completed lot.
- When the SPF process is specified, discuss the three-day look-ahead HMA production and paving schedule submittal. This submittal is required to communicate HMA production and paving schedules to the Caltrans samplers to facilitate the scheduling of their verification sampling. The three-day look-ahead schedule must be submitted after completing each shift and include the following items for each of the next three paving shifts:
  1. Contract number
  2. Job mix formula number
  3. HMA plant location
  4. Paving location; including county, route number and approximate postmiles
  5. Lot and sublot numbers planned to be placed each shift
  6. Total tonnage planned to be produced each shift including start and finish times of production

When the standard process is specified, discuss the requirement to pull density cores from random locations determined by the engineer and that cores must be pulled in the engineer’s presence and provided to the engineer at least once every 5 business days.

- When the SPF process is specified, discuss the requirement to pull contractor quality density cores from locations defined in the contractor’s random sampling plan, and to pull verification cores where defined in the engineer’s stratified random sampling. The contractor will take possession of the cores used for quality control testing, and the engineer will take possession of the cores used for verification testing and potential independent assurance testing. Discuss the requirement that both parties not locate the random core locations until after completing the compaction operations.
- If there is a bid item for data cores, discuss the requirements for pulling the data cores and the requirements for submitting the data core summary and photographic record to the engineer and Coring@dot.ca.gov.

- Discuss the contractor’s method to produce smooth pavement that meets the specifications.
- If cold planing is required, discuss the requirement that the cold planer be equipped with automatic controls, such as a ski device or averaging system. Discuss what practices will be used to promote a smooth cold-planed surface.
For requirements, refer to Section 39-3.04C(2), “Grade Control and Surface Smoothness,” of the *Standard Specifications*.

- Discuss how smoothness quality control will be accomplished.
- Discuss the requirements for submitting smoothness submittals to the secure file sharing system and for registering for the secure file sharing system by sending an email to *Asphalt.Smoothness@dot.ca.gov*.
- If the contract includes prepaving grinding:
  1. Emphasize that prepaving grinding work is only applicable to existing asphalt concrete surfaces that have not been cold planed or replaced.
  2. Remind the contractor that replaced asphalt concrete surfacing must meet the 12-foot straightedge specification. Corrective grinding on replaced asphalt concrete surfacing is part of the replace asphalt concrete surfacing work, not part of the prepaving grinding work.
- Discuss how corrective grinding locations will be determined, whether the contractor will use the ProVAL smoothness assurance module or an alternate method. Refer to Section 4-3602C, “Pavement Smoothness,” of this manual, for additional information on ProVAL computer software.
- Discuss how locations identified in inertial profiles will be located in the field. Will the contractor be laying out locations using distance measurement instrumentation (DMI) tied to the beginning of the project, DMI measurement from intermediate fixed locations tied to “events” in the inertial profile, inertial profile stationing converted to global positioning system coordinates, or a combination of methods?
- Determine early if the contractor plans to perform inertial profiling as a means to control quality of smoothness or when the paving is completed.
- In areas where smoothness must meet the 12-foot straightedge requirement, discuss if the contractor will have a straightedge available, and who on the paving crew is responsible for using it.
- Suggest use of a rolling straightedge device for comparison in ProVAL, which will assist in identifying locations that should physically be checked with a 12-foot straightedge.
- Discuss contingency plans to minimize or eliminate delamination of cold-planed surfaces. Discuss what criteria and methods will be used to identify and record locations where the contractor and engineer mutually agree may reflect through to the final surface.
- Discuss the contractor’s plans for determining where corrective grinding will occur on the final surface.
- Discuss the contractor’s plans for scheduling paving after cold planing to meet the time requirements specified in Section 39-3.04, “Cold Planing Asphalt Concrete Pavement,” of the *Standard Specifications*. 
• Discuss the contractor’s plans for assuring that material transfer vehicles (MTVs), or other types of heavy paving equipment that exceed the California Vehicle Code, Division 15, “Size, Weight, and Load,” weight limits for vehicles on highways, are prevented from crossing a structure without written authorization. The authorization may be from Caltrans Transportation Permits office or from the engineer. Requests for authorization are subject to a 15-day review.

• Determine the type of tack coat the contractor has chosen to use, based on expected atmospheric conditions, tack coat material type availability, and local experience. Discuss the requirement to submit calculations for minimum spray rates required to achieve the minimum residual rate before the tack coat is applied. Also, discuss how far in advance of the paving operation the tack coat will be placed. For additional information about tack coats and the website for Tack Coat Guidelines, refer to Section 4-3908A, “References,” of this manual, and to the Minimum Tack Coat Spray Rates at:

  https://dot.ca.gov/programs/construction/hot-mix-asphalt-construction

• Emphasize that public traffic will not be allowed on pavement with tack coat and discuss how the contractor will apply additional tack coat to damaged areas immediately before placing HMA.

• Confirm that the trucks used for tack coat application have the specified attributes. For distributor attributes, refer to Section 37-1.03B, “Equipment,” of the Standard Specifications.

Discuss:
• The contractor’s quality control plan.
• The contractor’s communication between the quality control manager and production and placement personnel.
• How the contractor will transmit required quality control testing reports.
• How the resident engineer will transmit required acceptance test results.

With the contractor, discuss who has responsibility in the field to:
• Monitor HMA temperatures.
• Monitor atmospheric temperatures.
• Monitor pavement temperatures.
• Direct HMA truck drivers when loads must be tarped.
• Define the length of windrow, if applicable.
• Direct the HMA plant to slow or stop loading trucks because of truck queuing.
• Stop production when two consecutive quality control test results do not comply with the specifications, or when three in a single day do not comply with the specifications as applied to:

  1. All quality characteristics of HMA placed using the standard process. For guidance on standard process projects, refer to Section 4-3904A (2), “Two
Consecutive Acceptance Test Results Outside Specification Limits on Non-Statistical Pay Factor Projects" of this manual.


Stop production on SPF projects when any pay factor except the number 8 sieve falls below 0.90. Stop production if the pay factor for the number 8 sieve falls below 0.75.

Discuss the type of action that will be taken by the contractor when:

- The HMA plant shuts down unexpectedly.
- The HMA paver breaks down.
- The HMA compaction equipment breaks down.
- Atmospheric or pavement temperature drops.

Make sure that the contractor has coordinated any necessary cold-planing operations; signs for construction area drop-offs, shoulder, and uneven pavement; and temporary pavement delineation, if applicable.

Review with the contractor the production start-up evaluation requirements for the first 750 tons of mix. Except for AASHTO T 324 (Modified), “Hamburg Wheel-Track Testing of Compacted Asphalt Mixtures,” and AASHTO T 283, “Resistance of Compacted Asphalt Mixtures to Moisture-Induced Damage” test results, the contractor and engineer must report test results within 5 business days of sampling, and for AASHTO T 324 (Modified) and AASHTO T 283 test results within 15 days of sampling.

4-3902J Paving Operations

Before work begins, take the following steps related to HMA paving operations:


- Make sure that the subgrade has been prepared as specified. If any HMA leveling is required to smooth an existing irregular surface, inform the contractor and determine the method of payment.

- Determine if crack sealing or dig outs (removing and replacing existing pavement) are required to repair small areas. When contract items are not included, inform the contractor of any extra work for crack sealing or dig outs.

- Review the accepted contractor’s quality control plan.

- If resurfacing under structures will result in reduced clearance, follow the procedures in Section 3-703B, “Permanent Clearance and Bridge Permit Rating Changes," of this manual.
Verify that personnel who will be taking mat acceptance samples and witnessing core sampling are qualified for California Test 125, “Method of Test for Sampling Highway Materials and Products Used in the Roadway Pavement Structure Sections.”

Coordinate requests for authorization for a vehicle exceeding the weight limits established by California Vehicle Code, Division 15, to cross a structure with the project’s structure representative. If the project has not been assigned a structure representative, coordinate the review with the bridge construction engineer. Structure construction personnel will review the overload proposal in accordance with the Bridge Construction Records and Procedures manual, Vol. 2, Bridge Construction Memo 150-1.0, “Weight Overload Guidelines for Bridges on Construction Projects.”

4-3902K Stratified Random Sampling Plan

For HMA placed using the SPF process, develop a stratified random sampling plan to redefine your verification sampling milestones for each of the five pay factor quality characteristics. For a general discussion on the purpose of this plan, refer to Section 4-3901D, “Hot Mix Asphalt Quality Assurance Processes,” of this manual.

Use the spreadsheet titled “Caltrans Stratified Random Sampling Plan” available at: https://dot.ca.gov/programs/construction/hot-mix-asphalt-construction

Obtain verification samples reasonably close to the milestone locations defined in the random sampling plan. When a verification sampling milestone is missed, document the reason, the difference in tonnage, and steps taken to pull a replacement random sample free of intentional or unintentional bias.

Keep your stratified random sampling plan and the verification test results confidential until completion of the lot. You may share the results of the non-pay factor quality characteristics test results with the contractor at any time. If you share gradation results, do not share the percentage passing the number 8 or number 200 sieves because they are pay factor quality characteristics.

If a lot runs short of the planned quantity and there are fewer than 3 verification samples, then when there is a previous lot using same JMF, combine tests with the previous lot, and verify the short lot using the test results from both lots. Once verified, adjust each lot based on its own contractor quality control test results. If there is no previous lot using the same JMF, use test results from the next 5 sublots on the following lot. Once verified, adjust each lot based on its own contractor quality control test results.

When neither of preceding options is viable to obtain at least 3 verification test results, test randomly selected remaining verification samples that are not reserved for future independent third party dispute resolution testing.

For field compaction verification, report the day’s theoretical maximum density (Rice value) using the average of two tests from one split of a single sample pulled at a random time during the shift the verification core is pulled. Do not attempt to time the sampling of the HMA with the locations the cores are to be obtained. Randomly
locate three density cores aligned longitudinally 1 to 2 feet apart from each 250-ton part of a randomly determined 750-ton contractor sublot. Retain two cores, one for verification testing and one for independent third-party testing. Provide the third core to the contractor. The contractor may not use this core as part of their reported quality control testing.

Determine the percentage of theoretical maximum density of each of verification core using the core density and the theoretical maximum density (Rice value) determined from the date the HMA was placed at the site of the core. Do not use average theoretical maximum density (Rice values) determined from previous shifts. Report the percentage of theoretical maximum density of the verification test as the average of the 3 “percent of theoretical maximum density” values determined from the 3 cores.

4-3903 During the Course of Work

4-3903A General

Quality production and placement of HMA requires a quality assurance process that consists of quality control by the contractor and acceptance by Caltrans. While some of these functions may seem redundant, each serves a separate purpose.

The contractor is responsible for providing a quality control plan (QCP). Verify that the contractor follows the QCP, and when required, makes any necessary changes to the QCP.

4-3903A (1) Quality Control

Quality control, sometimes called process control, is the testing performed by the contractor to make sure that the HMA being produced or placed meets the requirements of the specifications. Quality control testing of aggregates and HMA quality characteristics must be performed at a specified minimum frequency. Sampling should be performed at locations such as plant, windrow, or mat to assure that quality control test results are not influenced by sampling location. Sampling must be random and must not be split samples of Caltrans’ acceptance or verification samples.

The contractor will want to know early on how closely the contractor’s quality control test results replicate the quality acceptance test results. The job mix formula verification and production start-up evaluation both offer early opportunities for the contractor to compare quality control test results with acceptance test results. Unlike the comparison of contractor’s quality control and Caltrans’ acceptance test results during production and placement, the verification and production start-up evaluation test results are on the same split samples. Therefore, the results are a direct measure of the variation between the laboratories.

The contractor performs quality control testing for asphalt rubber binder, gradation, and fabric content of crumb rubber modifier; aggregate and recycled asphalt pavement moisture; and recycled asphalt pavement gradation and binder contents.
4-3903A (1a) Hot Mix Asphalt Density
The contractor is required to conduct quality control testing regularly. The specifications give required intervals in the quality control table of the specifications. If the total layer thickness is at least 0.15 foot, the contractor is required to conduct density testing. Do not allow the contractor to break a layer thickness of a single type of HMA into lifts less than 0.15 feet.

Under the standard process, the contractor is required to perform quality control density testing using a nuclear gauge that has been calibrated to cores taken on the first day of production.

Under the SPF process, the contractor is required to perform quality control density testing in accordance with the contractor’s approved quality control plan.

Under both standard and SPF specifications, if the total layer thickness is less than 0.15 foot, the contractor must follow the requirements of the method process listed in Section 39-2.01C(15)(b), “Method Compaction,” and the “Construction” sections of the applicable type of HMA: 39-2.02C for Type A; 39-2.03C for RHMA-G; or 39-2.04C for OGFC, of the Standard Specifications.

4-3903A (1b) Method Process
The contractor must comply with the specifications for placement, such as temperature and roller requirements. Depending on the type of HMA, the minimum compaction’s temperatures may be reduced when WMA additive technology is used, but not when WMA water injection technology is used. Caltrans’ inspection process should include documenting and reporting surface temperatures and roller passes to assure that compaction operations meet the method specification requirements.

4-3903A (2) Department Acceptance
Department acceptance of HMA consists of material acceptance testing and both plant and paving inspection. The resident engineer is responsible for coordinating necessary field personnel and taking contract administration action when required. Verify that Caltrans personnel who sample or test have met the requirements of the Caltrans Independent Assurance Program and are qualified to perform the sampling or testing. For more information, go to:

https://dot.ca.gov/programs/engineering-services/independent-assurance-program

Material acceptance sampling frequencies and material acceptance testing frequencies, shown in Table 6-1.13 of this manual, are not the same. Caltrans limited the risk to the contractor by specifying in Section 39, “Asphalt Concrete,” of the Standard Specifications that no single test result may represent more than the smaller of 750 tons or one day’s production, whichever is less, except AASHTO T 283, “Resistance of Compacted Asphalt Mixtures to Moisture-Induced Damage,” and AASHTO T 324 (Modified), “Hamburg Wheel-Track Testing of Compacted Asphalt Mixtures.” Therefore, during the work, it is important to split all acceptance sample materials. Use one sample for acceptance testing and one for dispute resolution.
Test the samples in a field construction laboratory or ship them to a district materials laboratory to be tested at the minimum testing frequency shown in Section 6-1, “Sample Types and Frequencies,” of this manual. Store the remaining samples in case additional acceptance testing is necessary.

When HMA is produced and placed using the standard process, the contractor may request that the resident engineer split acceptance samples. If requested, split acceptance samples into four parts: test one, provide one to the contractor, and store two for dispute resolution.

When HMA is produced and placed using the SPF process, the sampling requirements for pay factor and non-pay factor quality characteristics differ.

For pay factor quality characteristics, always split verification samples into four parts: test one, provide one to the contractor when requested, and retain two for dispute resolution.

For non-pay factor quality characteristics, always pull at least two samples from two consecutive sublots. Split each of the two samples into four parts, keep two parts, provide one part to the contractor and provide one part to the independent third party.

Dispute resolution testing of the first of two consecutive non-pay factor samples is optional and can be requested by the contractor or the engineer, but must be requested before the engineer starts testing of the first sample. Dispute testing on the second of the two consecutive samples is always required, but testing is only performed when the first sample fails.

When dispute resolution testing on either the first or second of the two consecutive non-pay factor quality characteristics samples is performed, the engineer, contractor and independent third party are required to test their splits of the sample. The sample is considered failed when two of the three split samples fail or when the engineer’s split sample fails and any of the remaining two split samples tests are not yet reported.

Refer to section 4-3904A (5), “Monitoring Non-Pay Factor Quality Characteristics using Statistical Pay Factor Specifications,” of this manual for guidance on this dispute resolution process.

When dispute resolution testing is required on a non-pay factor quality characteristic sample, and only one of the engineer’s or independent test results indicates a failure, and contractor’s test results are not submitted in a reasonable amount of time, direct the contractor to stop production until a passing test result is submitted.

On standard and SPF process contracts, quality assurance must be performed regularly, and verification and acceptance tests must be processed in a timely fashion. The resident engineer must make every effort to conduct the necessary inspection, make sure that sampling and testing staff are available, and have samples processed as quickly as possible so acceptance or verification decisions can be made as soon as possible.
Ship or transport acceptance samples to testing laboratories within the timeframes provided in Section 6-102C, “Acceptance Samples and Tests,” of this manual. Assure the proper chain of custody is maintained throughout the process, including delivery to and receipt from a commercial shipping service. Use Form CEM-3701, “Test Result Summary,” to summarize acceptance test frequency and results on each material. Use this form to record the dates samples were taken, shipped to laboratory, test result received from laboratory, and the contractor notified of test results. Monitor timeliness of material testing turnaround against Table 6-1.2, “Time Required for Materials Acceptance Tests,” of this manual and make sure corrective actions are taken and documented where deficiencies are encountered.

Notify the contractor of all acceptance test results within 2 business days of receipt from laboratory, except when using the SPF process. Do not share the verification test results for pay factor quality characteristics until the contractor has completed the lot and submitted the results of pay factor quality characteristic test results in the lot.

Quality pavement is obtained by strictly enforcing the specifications and notifying the contractor of failed tests as soon as possible. When a single quality assurance test for a single quality characteristic indicates that material does not comply, under the standard process, follow guidance in Section 4-3904A (1), “Acceptance Test Results Outside Specified Limits on Non-Statistical Pay Factor Projects,” of this manual. Under the SPF process, for non-pay factor quality characteristics, follow the guidance in Section 4-3904A (5), “Monitoring Non-Pay Factor Quality Characteristics Using Statistical Pay Factor Specifications” of this manual.

For the SPF process, Caltrans samples and tests for verification of pay factor quality characteristics in accordance with stratified random sampling plans developed by the engineer. See Section 4-3902K, “Stratified Random Sampling Plan” of this manual for guidance on developing the sampling plans.

For the SPF process, Caltrans samples and tests non-pay factor quality characteristics at frequencies shown in Section 6-1, “Sample Types and Frequencies.”

For HMA placed using the SPF process, once a lot has been completed and you have received all of the contractor’s test results, immediately share your verification test results with the contractor.

Use Caltrans’ SPFPay spreadsheet to verify the contractor’s quality control test results and determine the applicable payment adjustment. The spreadsheet is available at:

https://dot.ca.gov/programs/construction/hot-mix-asphalt-construction

Except for pay factor quality characteristics using the SPF process, when two consecutive acceptance tests for a single quality characteristic do not comply with the specifications:

- Immediately notify the contractor to stop production.
- Verify that the contractor takes corrective action.
After the corrective action has been taken and the contractor has quality control test results showing conformance, witness the contractor taking and splitting samples (into four parts) for the resident engineer’s tests. The contractor must test one part for compliance with the specifications and submit three parts to the resident engineer, who tests one part for compliance with the specifications and stores two parts.

4-3903A (3)  Dispute Process


The dispute resolution process for HMA placed using the SPF process is specified in Section 39-2.09A(4)(c)(v)(A), “Dispute Resolution” for Type A HMA and in Section 39-2.10A(4)(c)(v)(A), “Dispute Resolution” for RHMA-G of the project’s special provisions. Within each of these specifications, there are different dispute resolution processes for pay factor and non-pay factor quality characteristics.

For pay factor quality characteristics, when the engineer does not verify the contractor’s quality control test results, the resident engineer notifies the contractor of the failed verification. The resident engineer uses Caltrans’ test results to determine acceptance and the applicable payment adjustment.

If the contractor disputes Caltrans’ determination of a non-verification, the specification requires the contractor to formally request dispute resolution. The first step of the dispute resolution process requires that the resident engineer and contractor share each other’s tests results, supporting calculations, and together investigate why the difference exists.

If a reason for the difference cannot be found and corrected, and the contractor continues to dispute Caltrans’ test results, the resident engineer provides to the independent third party split samples from Caltrans’ samples used to produce the test results. The independent results are then compared to the contractor’s test results to determine whether the contractor’s quality control test results are compliant.

If the independent third-party test results verify the contractor’s test results, the contractor’s test results are used for acceptance and determination of the applicable adjustment. Caltrans pays for the independent third-party testing costs.

If the independent third-party does not verify the contractor’s test results, the independent results are used for acceptance and determination of the payment adjustment, and the contractor pays for the independent testing costs.

For dispute of non-pay factor tests results, refer to Section 4-3904A (5), “Monitoring Non-Pay Factor Quality Characteristics Using Statistical Pay Factor Specifications” of this manual.

A contractor disputing the acceptance test results must notify the resident engineer within 5 business days of receiving a test result. Caltrans may also dispute the contractor’s test results. To resolve disputed test results, the specifications require
the use of an independent third party to perform referee testing. If the contractor disputes Caltrans’ acceptance test results, and the resident engineer is satisfied with acceptance test results, before using the independent third party, suggest that the contractor test one of the split samples from the material in question. If the contractor agrees to perform this test, it would be good practice to have a tester or a district independent assurance representative witness the contractor’s testing.

The specifications require the testing of split samples of disputed material. If split samples of the material tests being disputed are not available, the third party uses any available material representing the disputed HMA for evaluation. Caltrans must retain possession of the split samples. Caltrans may discard stored split samples 5 days after the contractor has received the associated acceptance test results.

4-3903B Production Start-Up Evaluation

Section 39-2.01A(4)(h)(v), “Production Start-Up Evaluation,” of the Standard Specifications applies to all construction processes. The production start-up evaluation allows:

- The contractor to compare quality control test results against Caltrans’ acceptance test results on split sample material.
- Caltrans to verify early in the project that the aggregate properties and HMA comply with the job mix formula and specifications.
- Both parties to examine results of tests performed on split sample material.

Split samples are used only for job mix formula verification, for production start-up evaluation, and when the contractor is demonstrating compliance with the specifications if production has been stopped for out-of-specification material. In all other circumstances, acceptance samples must always be taken independently of contractor’s quality control samples.

4-3903C Plant Operations

Before shift production begins, the plant inspector generally takes the following steps related to HMA plant operations:

- Verifies that the security seal has not been tampered with. If tampering is suspected, contact the district weights and measures coordinator.
- Verifies that the portioning equipment is interlocked as specified in the MPQP.
- Makes sure the job mix formula being used by the contractor is specific to the project and that no changes have been made to:
  1. Target asphalt binder percentage
  2. Asphalt binder supplier
  3. Asphalt rubber binder supplier
  4. Component materials or percentage of any component material used in asphalt rubber binder
5. Combined aggregate gradation

6. Aggregate sources

7. Substitution rate for recycled asphalt pavement aggregate of more than 5 percent

8. Any material in the job mix formula
   - Notifies the resident engineer if there are changes in the job mix formula and asks if a new job mix formula will be required from the contractor before production can be started.
   - Makes certain that the asphalt binder supplier is on the Caltrans approved supplier list or that asphalt binder samples have been taken from each truckload and tested in accordance with the Division of Engineering Services Job Mix Formula Prequalification Program. Notifies the contractor and resident engineer if asphalt binder testing has not been completed for a supplier not on the approved supplier list.
   - Makes sure that aggregate is stored separately, according to proposed sizes by comparing the material from each bin with Chapter 2, Section II-E, “Aggregate Storage,” of the MPQP manual. If any segregation, degradation, or intermingling occurs, require that the contractor empty the storage facility and dispose of or re-screen the material.
   - Checks that supplemental fine aggregate remains dry and is stored separately as specified in MPQP guidelines.

During production, the plant inspector generally takes the following steps related to HMA plant operations:

- Records daily HMA plant production information on Form CEM-3501, “Hot Mix Asphalt Production Report.”
- Documents on Form CEM-4601, “Assistant Resident Engineer’s Daily Report,” additional information about plant production, including instructions to contractor’s personnel.

The plant inspector performs the following additional duties:

1. Verifies that contractor personnel who sample or witness the contractor sampling at the hot mix asphalt plant are qualified to perform California Test 125, “Method of Test for Sampling Highway Materials and Products Used in the Roadway Pavement Structure Sections.”

2. Obtains HMA samples for acceptance testing every 750 tons and tests at least once for every 5 samples or a minimum of once per day. Material samples must be split into two parts, one sample for potential acceptance testing and one for potential dispute resolution testing.

3. Samples for aggregate gradation at least once for every 750 tons, and tests at least once for every 5 samples or a minimum of once per day. Material
samples must be split into two parts, one sample for potential acceptance testing and one for potential dispute resolution testing.

4. Monitors the contractor’s HMA plant inspection for compliance with the contractor’s quality control plan. Notifies the resident engineer of any noncompliance issues.

4-3903C (1) Antistrip Treatment of Aggregates and Hot Mix Asphalt

The HMA may be sensitive to moisture damage and may require one of the following antistrip treatments:

- Hot mix asphalt aggregate treatment—slurry method
- Hot mix asphalt aggregate treatment—dry lime method
- Liquid antistrip method

4-3903C (1a) Marinated Lime-Treated Aggregate

Aggregate that has been lime treated and stockpiled for marination is handled in the HMA production process in the same manner as untreated aggregates. Refer to Section 4-3902H (1), “Lime Treatment of Aggregates,” of this manual for lime treatment plant operation requirements.

For aggregates that have been lime treated and stockpiled:

- Verify that aggregate quality characteristic acceptance samples and tests were performed and the aggregate meets the contract specifications.
- Do not perform sampling and testing for sand equivalent or aggregate quality characteristics as shown in Section 4-3903C (3), “Hot Mix Asphalt Production,” of this manual.
- Verify that the lime marination was performed within the past 60 days.

Recycled asphalt pavement used in the production of HMA does not need to be lime treated.

4-3903C (1b) Hot Mix Asphalt Aggregate Treatment—Slurry Method

If an HMA production facility is using this process without marination, contact the Materials Engineering and Testing Services (METS) Office of Flexible Pavement for assistance.

4-3903C (1c) Hot Mix Asphalt Aggregate Treatment—Dry Lime Method

The quality characteristic acceptance test limits for aggregate properties are based on untreated aggregates. Aggregate testing must be performed on aggregate samples taken before lime treatment.

During lime treatment, the plant inspector takes the following steps:

- Obtains aggregate samples from stockpiles or from the aggregate belts before lime treatment for moisture content and sand equivalent testing at the frequency shown in Table 6-1.13, “Materials Acceptance Sampling and Testing
Tests aggregate samples for sand equivalent at the frequency shown in Table 6-1.13 of this manual. If the aggregates are not combined before sampling, combines aggregate from individual stockpiles or belts in the job mix formula proportions to test for sand equivalent.

Tests aggregate samples for moisture content in accordance with AASHTO T 255, “Total Evaporable Moisture Content of Aggregate by Drying,” or AASHTO T 329, “Moisture Content of Asphalt Mixtures by Oven Method,” because moisture influences proportioning. For lime slurry aggregate treatment, the plant inspector confirms that the contractor is performing sampling and testing for moisture content at least once every 2 hours of treatment. For lime-treated aggregate, the plant inspector confirms that the contractor is performing sampling and testing for moisture content at a frequency shown under the quality control section applicable to the type of HMA.

Compares the contractor’s aggregate moisture quality control test results against the CalTrans test results. Notifies both the contractor and the resident engineer if the test results are significantly different.

Verifies that the contractor is adjusting the HMA plant controller based on the contractor’s aggregate moisture quality control test results.

Obtains aggregate samples from stockpiles or aggregate belts before lime treatment in accordance with California Test 125. Samples aggregates at the frequency shown in Table 6-1.13 of this manual for aggregate acceptance testing.

Tests aggregate for acceptance quality characteristics at the frequency shown in Table 6-1.13 of this manual for the following aggregate acceptance tests:

1. Los Angeles Rattler
2. Percent of crushed particles coarse aggregate
3. Percent of crushed particles fine aggregate
4. Fine aggregate angularity
5. Flat and elongated particles
6. Other aggregate properties specified in the project special provisions if applicable

If samples will be shipped to a district materials laboratory or to a construction laboratory, complete Form TL-0101, “Sample Identification Card,” following the instructions in the accompanying booklet and the information in Section 6-103, “Field Sampled Material Identification for Testing,” of this manual. Record the type of mix, the HMA producer, and the producer mix identification number. Check the box on the sample TL-0101 for acceptance test. Ship the samples to the district materials laboratory or construction laboratory.
laboratory or field construction laboratory for testing. If any test results exceed the specified limits, the testing laboratory will immediately notify the resident engineer.

Make sure that aggregate treatment is adequate by witnessing contractor quality control testing, and that the contractor enters the treatment data specified in the special provisions into a log. For each day of aggregate lime treatment, obtain the treatment data log electronically for the resident engineer’s project file.

4-3903C (1d) Liquid Antistrip Treatment

Make sure that data required in the liquid antistrip treatment section of the special provisions is entered into the production unit’s treatment data log and submitted in the required format.

For each day of antistrip treatment, obtain the treatment data log electronically for the resident engineer’s project files.

4-3903C (2) Production Start-Up Evaluation

A production start-up evaluation occurs within the first 750 tons produced on the first day of HMA production. The evaluation is also required when production has stopped for more than 30 days and if a new job mix formula is being used.

The plant inspector generally takes the following steps related to a production start-up evaluation:

- During the first 750 tons of production, witnesses the contractor sampling aggregate, asphalt binder, and recycled asphalt pavement on the first day of production in accordance with Section 39-2.01A(4)(h)(v), “Production Start-Up Evaluation,” of the Standard Specifications, and California Test 125, “Method of Test for Sampling Highway Materials and Products Used in the Roadway Pavement Structure Sections.” The inspector retains three split samples for testing and dispute resolution as described earlier.

- Labels each HMA sample with enough information to identify the exact location. Refer to Section 4-3903C (3), “Hot Mix Asphalt Production,” of this manual.

- Ships one sample of asphalt binder to METS for testing as detailed in Section 6-2, “Acceptance of Manufactured or Fabricated Materials and Products,” of this manual, noting that it is a production start-up acceptance test.

- Immediately tests one aggregate sample for aggregate gradation and sand equivalent. If recycled asphalt pavement is used, determine aggregate gradation in accordance with California Test 384 “Method of Test for Combining Gradations for Hot Mix Asphalt (HMA) Using Reclaimed Asphalt Pavement (RAP) and/or Reclaimed Asphalt Shingles (RAS).” California Test 384 is available at: https://dot.ca.gov/programs/engineering-services/california-test-methods

- When test results fall outside the specification limits, the inspector notifies the contractor, and requires and confirms that the contractor takes corrective action.

- If aggregate gradation or sand equivalent test results fall outside the specification limits, notify the resident engineer immediately.
• Tests one aggregate sample for aggregate acceptance quality characteristics.

For samples that will be shipped to the district material laboratory or field construction laboratory for testing, complete Form TL-0101, “Sample Identification Card,” following the instructions printed in the form booklet and the information in Section 6-103, “Field Sampled Material Identification for Testing,” of this manual. Record the type of mix, the HMA producer, the producer’s mix identification number, and the production tonnage that this sample represents.

Check the box on the sample TL-0101 for acceptance test, marked Priority, and include Production Start-Up Evaluation Test under Remarks. Under Remarks, identify the tests to be performed:

1. Los Angeles Rattler
2. Percent of crushed particles coarse aggregate
3. Percent of crushed particles fine aggregate
4. Fine aggregate angularity
5. Flat and elongated particles
6. Other aggregate properties specified in the project special provisions, if applicable

The specifications require 3 days for test result turnaround, so samples must be shipped immediately. If any test results fall outside the specified limits, the testing laboratory will immediately notify the resident engineer.

4-3903C (3) Hot Mix Asphalt Production

During production, the plant inspector generally takes the following steps related to HMA plant operations:

• Observes the overall plant operation to make sure the contractor controls dust and smoke. Requests that the contractor corrects any obvious violation and ceases operation if necessary to prevent damage to HMA mixture.

• Obtains aggregate samples and performs AASHTO T 255, “Total Evaporable Moisture Content of Aggregate by Drying,” or AASHTO T 329, “Moisture Content of Asphalt Mixtures by Oven Method.”

• Confirms that the contractor is performing sampling and testing for moisture content at the frequency shown under the quality control section of the Standard Specifications applicable to the type of HMA. Because moisture influences proportioning, it is good practice to test both aggregate and recycled asphalt pavement for moisture content.

• Compares the contractor’s quality control test results with Caltrans test results and notifies both the contractor and resident engineer if the test results are significantly different. On SPF projects, the Caltrans verification test results for pay factor quality characteristics are not shared with the contractor until the contractor submits all test results for the lot.
• Verifies that the contractor is adjusting the HMA plant controller based on the contractor’s aggregate moisture quality control testing.

• Obtains aggregate samples for field testing for aggregate grading and sand equivalent at the frequency shown in Table 6-1.13, “Materials Acceptance Sampling and Testing Requirements,” of this manual. Tests aggregate samples before lime treatment for testing sand equivalent. (Recycled asphalt pavement does not need to be sampled for sand equivalent.) Do not use aggregate samplers that do not safely produce a manageable size sample.

• Labels each aggregate sample with the contract number, date, type of mix, aggregate gradation (for example, 1/2 inch), aggregate source, HMA producer, and producer’s mix identification number. Indicates the number of tons produced when the sample was taken.

• Tests aggregate samples for aggregate gradation and sand equivalent at the frequency shown in Table 6-1.13 of this manual. If recycled asphalt pavement is used, determine aggregate gradation in accordance with California Test 384 “Method of Test for Combining Gradations for Hot Mix Asphalt (HMA) Using Reclaimed Asphalt Pavement (RAP) and/or Reclaimed Asphalt Shingles (RAS).” California Test 384 is available at:
  https://dot.ca.gov/programs/engineering-services/california-test-methods

• Notifies the contractor of aggregate gradation and sand equivalent test results, and confirms that any required plant adjustment has been made to correct for out-of-specification aggregate gradation.

• If aggregate gradation or sand equivalent test results fall outside the specification limits, notifies the resident engineer immediately. If the contractor makes significant or numerous adjustments in bin aggregate proportions, increase the frequency of aggregate gradation testing.

• Obtains aggregate samples for aggregate acceptance quality characteristics at the sampling frequencies shown in Table 6-1.13 of this manual and sample in accordance with California Test 125. If lime-treated, aggregate samples must be taken before lime treatment for testing aggregate properties. Recycled asphalt pavement does not need to be sampled.

• Labels each aggregate sample with the contract number, date, type of mix, aggregate gradation, aggregate source, HMA producer, and producer’s mix identification number. Indicates the number of tons produced when the sample was taken. Refers to the guidance in Section 4-3903D (5), “Sampling and Testing Hot Mix Asphalt,” of this manual. Tests aggregate at the frequency shown in Table 6-1.13 of this manual. For samples that will be shipped to the district material laboratory or field construction laboratory for testing, completes Form TL-0101, “Sample Identification Card.” Follows the instructions printed in the booklet that contains the form and the information in Section 6-103, “Field Sampled Material Identification for Testing,” of this manual. Records the type of mix, the HMA producer, and the producer’s mix identification number. Checks the
acceptance tests box on the TL-0101. Under “Remarks,” identifies the tests to be performed:

1. Los Angeles Rattler
2. Percent of crushed particles coarse aggregate
3. Percent of crushed particles fine aggregate
4. Fine aggregate angularity
5. Flat and elongated particles
6. Other aggregate properties specified in the project special provisions, if applicable

If any test results exceed the specified limits, the materials laboratory will immediately notify the resident engineer.

If any single quality characteristic has two consecutive acceptance or quality control tests not in compliance with the specifications, verify that before resuming production and placement of HMA on the project, the contractor:

1. Stops production
2. Notifies the resident engineer
3. Takes corrective action
4. Provides a split sample for the engineer’s testing
5. Demonstrates compliance with the specifications before resuming production and placement of HMA on the project

- Samples asphalt binder at the frequencies shown in Section 6-1, “Sample Types and Frequencies,” and in accordance with Section 6-2, “Acceptance of Manufactured or Fabricated Materials and Products,” of this manual, and fills out Form TL-0101 before shipping samples to METS for testing.

- Assures asphalt binder quality by following Section 4-92, “Asphalt Binders,” of this manual.

- For asphalt rubber binder components:
  1. Collects certificates of compliance for each truckload of crumb rubber modifier and asphalt modifier.
  2. Collects a “Buy America” certificate for each truckload of crumb rubber modifier. Refer to Section 3-604, “Buy America,” of this manual for more information.
  3. Samples asphalt modifier binder at the frequencies shown in Section 6-1, “Sample Types and Frequencies,” of this manual. Ships to METS as detailed in Section 6-2, “Acceptance of Manufactured or Fabricated Materials and Products,” of this manual.

- Verifies that the temperatures of the asphalt binder, aggregate, and HMA do not exceed the limits specified in Section 39-2.01B(8), “Hot Mix Asphalt Production,” of the Standard Specifications.
- Makes sure that the batch size and feed rates do not exceed the mixing capacity range used during plant dynamic testing.
- Verifies HMA mix moisture content from samples taken behind the paver in accordance with AASHTO T 329, “Moisture Content of Asphalt Mixtures by Oven Method.” However, the HMA can be sampled and tested at the plant to determine if sampling and testing at the mat are necessary by performing the informal test described below. If HMA samples taken at the plant meet the mix moisture acceptance requirements, samples taken behind the paver will also meet the specification requirement.

To perform an informal, quick moisture content check at the plant, use the following procedure:

1. Have the contractor take a shovelful of aggregate from the dryer’s discharge chute
2. Notice any steaming or dark spots on the aggregate
3. Pass a cool, shiny, clean mirror, spatula, or similar item in a slow, deliberate motion immediately above the aggregate
4. Observe the amount of condensed moisture on the item
5. Advise the contractor if moisture is seen

This informal method cannot be used for acceptance.

- Observes production to assure the specified HMA mixture conforms to project specifications and the MPQP.

4-3903C (3a) Batch Plants
Do not approve a shorter mixing time than was used during the plant dynamic testing conducted for plant acceptance, in accordance with Chapter 3, Section II-B, “Dynamic Testing,” of the MPQP manual.

Verify that the automatic batching equipment functions within the limits specified in Chapter 2, Section II-F, “Batch Mixing HMA Plants,” of the MPQP manual.

4-3903C (3b) Continuous Mixing Plants
For continuous mixing plants (dryer drum or dryer drum pugmill), verify that the following are operating:

1. Vibrating unit on the fine bins
2. Low-level and no-flow interlock systems for aggregate and recycled asphalt pavement feeder bins

3. No-flow interlock system for asphalt binder storage and feed system

4. Automatic plant controller

5. Dust control systems

6. Segregation devices at HMA storage

The mixing time depends on the length of the mixing area and the rate of drop in the dryer drum during mixing. The most efficient pugmill mixing occurs when the material level remains at the top of the paddles along the length of the mixer. For best results, feeding must be continuous and uniform. Do not approve a production rate faster or slower than the range of production used during the plant dynamic testing conducted for plant acceptance in accordance with Chapter 3, Section II-B, “Dynamic Testing,” of the MPQP manual.

4-3903C (4) Plant Weighing Systems

Observe the operation of all weighing systems. Whenever scales and meters seem inaccurate, contact the district weights and measures coordinator for further assistance. Be aware of scale and meter security seals and set points.

For batch plants:

- Make sure that the weigh box containing the total batch does not come in contact with anything that prevents a true indication of the batch weight.
- When intermediate storage, such as a silo, is used for HMA, periodically check the batching by comparing the total weight of the batches in a truckload with the platform scale weight for the same load.
- Check the asphalt binder scales frequently to verify that they return to within zero tolerance limits and that the scale lever systems or load cells move freely.

When plants are used for only one project, the accuracy of meter-driven devices that proportion asphalt binder can be checked. To do so, compare meter totalizer readings with asphalt binder tank stabbings and, in conjunction with an on-site vehicle scale, with the combined aggregate totalizer readings. Take into account any wasted mix or individual ingredients wasted after proportioning.

4-3903C (5) Hot Mix Asphalt Storage

Verify that HMA storage silos are in accordance with Chapter 2, Section II-J, “HMA Storage,” of the MPQP manual.

4-3903C (6) Hot Mix Asphalt Transporting

Before the trucks are loaded, verify the absence of an excessive amount of parting agent or other contaminating material. Such material is excessive when it forms pools. Diesel or other petroleum-based products are prohibited from use as parting agents.
After the trucks are loaded, be sure the HMA aggregates are coated with the asphalt binder and not segregated. Notify the resident engineer if loads need to be rejected based on nonuniformity of HMA mixture.

Make sure that rubberized HMA gap-graded and open-graded friction course loads are completely covered with tarpaulins when the atmospheric temperature is below 70 degrees Fahrenheit. Tarps are not required if the time from discharge to truck until transfer to the paver’s hopper or to the pavement surface is less than 30 minutes. If the trucks are tarped, record that information on Form CEM-3501, “Hot Mix Asphalt Production Report.”

4-3903D Paving Operations
During HMA placement, the paving inspector generally takes the following steps:

- Record daily HMA placement information on Form CEM-3502, “Hot Mix Asphalt Placement Report,” and additional information, including instructions to contractor’s personnel, on Form CEM-4601, “Assistant Resident Engineer’s Daily Report.”
- Refer to “Placing Hot-Mix Asphalt” in Construction of Quality Asphalt Pavements, published by the Asphalt Institute, as guidance for best practices during HMA placement.

4-3903D (1) Atmospheric and Pavement Temperature
- Verify that placement occurs within the specified temperature ranges by taking sufficient measurements of the atmosphere, pavement, and HMA. The temperature ranges vary based on the type of HMA being placed. For temperature range requirements, refer to Section 39-2.01C(1) “General,” and 39-2.02C, “Construction,” of the Standard Specifications.
- Record temperatures and the time taken on Form CEM-3502, “Hot Mix Asphalt Placement Report.” Notify the contractor to stop HMA placement when temperatures are below specified limits.

4-3903D (2) Tack Coat
- Make sure that tack coat is applied to surfaces to be paved and at a high enough rate to meet the minimum residual rate specified. Use guidance in Section 4-9403, “During the Course of Work,” of this manual to determine the minimum required spray rate. The contractor may request and the paving inspector authorize that the application of tack coat is waived between layers when both of the following conditions apply:
  1. The surface to be paved does not have a film of dust or clay
  2. The temperature of the surface to be paved is at least 140 degrees Fahrenheit
- If the contractor uses asphaltic emulsion that has not yet been tested by Caltrans, verify that each delivery of asphaltic emulsion includes a certificate of
compliance that covers items described in Section 94-1.01C, “Submittals,” of the Standard Specifications. Also, check that each delivery includes a safety data sheet.

- Make sure that if asphaltic emulsion has been diluted, the contractor notifies the engineer of the dilution rate and includes the dilution information required by Section 39-2.01C(3)(f), “Tack Coat,” of the Standard Specifications.
- For information on inspecting tack coat, refer to Section 4-3908A, “References,” of this manual for the Tack Coat Guidelines website.

4-3903D (3) Transporting and Spreading

- Verify that HMA delivery trucks have weighmaster certificates and collect the certificates electronically or from the arriving trucks. If inspection resources are limited, collect weighmaster certificates intermittently throughout the paving shift or daily. If HMA loads are rejected before placement, note on the back of the weighmaster certificate or on the electronic file and on Form CEM-4601, “Assistant Resident Engineer’s Daily Report,” why the HMA was rejected, such as cold mix, segregated mix, or contaminated mix.

- Be aware that queuing of trucks may contribute to excessive cooling of HMA mixture.

- Make sure the contractor uses a material transfer vehicle (MTV) when required. Section 39, “Asphalt Concrete,” of the Standard Specifications requires the use of an MTV for all types of HMA except Type A and minor HMA. The special provisions may require the use of MTVs for Type A.

- Make sure the contractor does not cross a structure with an MTV or other heavy paving equipment that exceeds the weight limits for a vehicle on highways as defined in California Vehicle Code, Division 15, without written authorization. Coordinate all requests for authorization with the project’s structure representative. If the project has not been assigned a structure representative, coordinate the review through the bridge construction engineer.

- If windrowing is used, prevent overcooling of the HMA by not allowing excessive windrowing. When “method” compaction is used, verify that the windrow temperature does not fall below 260 degrees, or below 250 degrees Fahrenheit when WMA “additive” technology is used. In all cases, check that the windrow length does not exceed 250 feet in front of the loading equipment.

1. Windrow temperatures can be monitored with an infrared heat gun. Type A HMA may be rejected for not meeting minimum first coverage of breakdown surface temperature shown in Section 39-2.02C, “Construction,” of the Standard Specifications. RHMA-G also may be rejected for not meeting minimum first coverage of breakdown surface temperature shown in Section 39-2.03C, “Construction,” of the Standard Specifications.

2. When using a heat gun on a windrow, be aware that the instrument measures only surface temperature and that the interior of the windrow is hotter. When
the HMA is run through the material transfer vehicle, paver, or both, the mat temperature may be above the minimum specified breakdown temperature.

3. If windrow temperatures are inadequate, or if visual inspection of the material in the windrow identifies segregation, poor mixing, or an over-rich mix, notify the contractor. If this material is incorporated into the paving, additional inspection and testing may be necessary to determine if the mix is acceptable.

- When HMA is placed against the edge of a longitudinal or transverse construction joint that is damaged or not placed in a neat line, make sure the contractor saw cuts or grinds the pavement straight and vertically along the joint and removes the extraneous material.

- Verify that longitudinal joints on the finished surface correspond to the edge of traffic lanes and in lower lifts are offset and alternated at least 0.5 foot from each side of the lane line.

- Assure that the paver spreads the HMA at the required thickness and that lift thickness for Type A complies with Section 39-2.02C “Construction,” of the Standard Specifications, and for HMA placed under method compaction specifications, the lift thickness does not exceed 0.25 foot.

- Verify pavement thickness by comparing the HMA spread rate with the theoretical rate and, if necessary, require the contractor to make adjustments.

Below is an example spread-rate calculation assuming 12 feet wide, 0.15-foot thickness, mix 150 pounds per cubic foot, and 16 tons shown on a weighmaster certificate.

1. Calculate the weight of HMA 0.15-foot thick required for 1 square foot: 150 x 0.15 = 22.5 pounds per square foot
2. Calculate the weight of HMA for 1 linear foot: 22.5 x 12 = 270 pounds per linear foot
3. Calculate the linear feet that can be covered by one truckload: (16 tons x 2,000 pounds per ton) ÷ 270 pounds per linear foot = 118.5 linear feet
4. Calculate the linear feet covered by 1 ton of HMA: 2,000 pounds per ton ÷ 270 pounds per linear foot = 7.41 feet

Check layer thickness and spread rate during placement, and check daily theoretical spread rate against the distance actually paved for the day. Note these on Form CEM-3502, “Hot Mix Asphalt Placement Report.”

Payment for HMA is based on the weight shown on the weighmaster certificate. Because of the high cost of HMA, it is important to monitor the spread rate so an excess of HMA is not placed and project funding is not exceeded.
4-3903D (4) Production Start-Up Evaluation Samples

Section 39-2.01A(4)(h)(v), “Production Start-Up Evaluation,” of the Standard Specifications requires samples of HMA within the first 750 tons of production on the first day of production.

- Observe the contractor sampling from the mat behind the paver or other location approved by the resident engineer. The contractor must sample in accordance with California Test 125, “Method of Test for Sampling Highway Materials and Products Used in the Roadway Pavement Structure Sections,” and give the resident engineer three of the four split samples.

- Test the HMA production start-up evaluation sample for quality characteristics shown in Section 4-3903D (5), “Sampling and Testing Hot Mix Asphalt,” of this manual.

- Test aggregate at the frequency shown in Table 6-1.13, “Materials Acceptance Sampling and Testing Requirements,” of this manual. For samples that will be shipped to the district material laboratory or field construction laboratory for testing, complete Form TL-0101, “Sample Identification Card.” Follow the instructions printed in the form booklet and the information in Section 6-103, “Field Sampled Material Identification for Testing,” of this manual. Record the type of mix, the HMA producer, and the producer’s mix identification number. Check the acceptance tests box on the TL-0101. Under Remarks, identify the tests to be performed.

  Label each HMA sample with enough information to identify the exact location. Refer to the description in Section 4-3903D (5) of this manual.

Check the box on TL-0101 for acceptance test marked Priority, and include Production Start-up Evaluation Test under Remarks. Also under Remarks, list all required acceptance tests. The resident engineer must report the test results to the contractor within 5 business days of sampling. For AASHTO T 324 (Modified), “Standard Method of Test for Hamburg Wheel-Track Testing of Compacted Asphalt Mixtures,” and AASHTO T 283, “Standard Method of Test for Resistance of Compacted Asphalt Mixtures to Moisture-Induced Damage,” test results, report test results within 15 days of sampling. To meet these timelines, ship samples immediately.

4-3903D (5) Sampling and Testing Hot Mix Asphalt

- Obtain split samples of HMA from the mat behind the paver or other location approved by the resident engineer, in accordance with California Test 125, “Method of Test for Sampling Highway Materials and Products Used in the Roadway Pavement Structure Sections.” Table 6-1.13, “Materials Acceptance Sampling and Testing Requirements,” of this manual provides the frequency for sampling HMA mix.

  Label each HMA sample with the aggregate grading (for example, 1/2 inch), asphalt binder target value, producer, and producer’s mix identification number. Indicate both the stationing where the sample was taken and the area...
represented (for example, STA 100+50, NB, Lane 1, first layer). Also include the Form TL-0101, “Sample Identification Card,” number if the sample is being shipped to the district material laboratory or field construction laboratory for testing. The label must have enough information to identify the exact location in the event the HMA is rejected and must be removed.

- Test aggregate at the frequency shown in Table 6-1.13 of this manual. For samples that will be shipped to the district material laboratory or field construction laboratory for testing, complete Form TL-0101. Follow the instructions printed in the form booklet and the information in Section 6-103, “Field Sampled Material Identification for Testing,” of this manual. Record the type of mix, the HMA producer, and the producer’s mix identification number. Check the acceptance tests box on the TL-0101, and identify the acceptance tests to be performed under Remarks. Include only the acceptance tests that you are requesting to meet the acceptance test frequency in Table 6-1.13 of this manual:
  - Asphalt binder content
  - Air voids content at N-design
  - Voids in mineral aggregate
  - Dust proportion (report only if an adjustment for asphalt binder content target value is less than 0.3 percent from optimum binder content)
  - Maximum theoretical density AASHTO T 209, Method A
  - Hamburg Wheel Track (AASHTO T 324 [Modified])
  - Moisture susceptibility (AASHTO T 283), both dry strength and wet strength

If any single quality characteristic, except smoothness, has two consecutive acceptance or quality control tests out of compliance with the specifications, verify that before resuming production and placement of HMA on the project, the contractor:

1. Stops production
2. Notifies the resident engineer
3. Takes corrective action
4. Provides a split sample for the engineer’s testing
5. Demonstrates compliance with the specifications

4-3903D (6) Compaction

The contractor must comply with the method process in Section 39-2.01C(2)(c), “Method Compaction Equipment,” and in Section 39-2.01C(15)(b), “Method Compaction,” of the Standard Specifications if:

- The total paved thickness is less than 0.15 foot
- The HMA is used in:
  - Asphalt concrete remove-and-replace areas (dig outs)
- Leveling courses
- Detours not to remain in the final roadway structural section
- Areas in which the resident engineer determines that conventional compaction and compaction measurement methods are impeded

4-3903D (6a) Method Process Compaction

For the method process HMA compaction:

- Use the MultiCool program as a guide for determining the length of time available for achieving compaction, based on layer thickness, HMA temperature, existing pavement temperature, and atmospheric temperature. Recognize that the MultiCool program forecasts the average temperature of the HMA lift as a function of time after placement, not the surface temperatures included in the method compaction specifications. The MultiCool program is available at:
  
  https://dot.ca.gov/programs/construction/hot-mix-asphalt-construction

- Make sure that:
  1. Specified equipment performs the compaction in the specified order.
  2. A required number of coverages is made for each compaction type (first coverage, breakdown, and finish).
  3. The HMA compaction is completed when temperatures are higher than the specified minimum temperature for each compaction type (first coverage, breakdown, and finish).
  4. When a vibratory roller is specified for compaction, the speed of the vibratory roller in miles per hour does not exceed the vibrations per minute divided by 1,000. When the HMA layer thickness is less than 0.08 foot, the vibratory roller must be in the off mode.
  5. When a pneumatic-tire roller is specified for compaction, the speed does not exceed 5 miles per hour.

- Inspect the finished HMA surface for marks, tearing, and irregular texture that may be caused by segregated mix. Notify the contractor of noncompliant areas.

4-3903D (6b) Compaction Determination by Cores

When the total paved thickness is at least 0.15 foot:

- The contractor will determine the number of rollers and sequence necessary to meet the compaction requirements of the specifications.

- For quality control testing, the contractor must use nuclear gauges calibrated to cores under California Test 375, “Determining the In-Place Density and Relative Compaction of Hot Mix Asphalt Pavement Using Nuclear Gages,” to determine the relative compaction.
• The contractor will obtain the cores for the resident engineer within 5 days of HMA placement. The resident engineer will use the cores to determine relative compaction.

1. Randomly select core locations for every 250 tons of hot mix asphalt placed according to Part 3, Section 3B, “Test Site Location,” of California Test 375, “Determining the In-Place Density and Relative Compaction of Hot Mix Asphalt Pavement Using Nuclear Gages.”

2. Witness the contractor taking the cores, mark each core, and place the cores in a protective container before taking possession of the cores.

3. Complete Form TL-0101, “Sample Identification Card,” following the instructions printed in the form’s booklet and the information in Section 6-103, “Field Sampled Material Identification for Testing,” of this manual. Identify the stationing from which samples were taken and the area they represent, for example, “lane #1, first layer.” Label the samples with enough information that the exact location HMA was placed can be identified if it is rejected and has to be removed. On Form TL-0101, check the box for acceptance test.

4. Transport the cores to the district materials laboratory or construction field laboratory where they will be tested for in-place density (California Test 375), except the density of each core will be determined using AASHTO T 275, Method A, “Bulk Specific Gravity of Compacted Bituminous Mixtures Using Paraffin-Coated Specimens,” and the theoretical maximum density of the mix will be determined using AASHTO T 209, Method A. “Standard Method of Test for Theoretical Maximum Specific Gravity (Gmm) and Density of Asphalt Mixtures.”

4-3903D (7) Smoothness

Except for areas that must be tested for smoothness using a 12-foot straightedge, make sure the contractor tests all finish surfaces of HMA and the finish surface the open-graded friction course (OGFC) is being placed on, with an inertial profiler.

Refer to Section 36-3.01D(3)(b) “Smoothness,” of the Standard Specifications for surfaces that are to be measured with a 12-foot straightedge.

If existing asphalt concrete has been cold planed, before overlaying the surface with HMA, make sure the cold planed surface meets the 12-foot straightedge tolerance required by Section 39-3.04C(2) “Grade Control and Surface Smoothness,” of the Standard Specifications.

If existing asphalt concrete surfacing has been replaced, before overlaying the surface with HMA, make sure the replaced asphalt concrete surface meets the 12-foot straightedge tolerance as required by Section 36-3.01D(4) “Department Acceptance,” of the Standard Specifications.

When there is an item for repaving grinding, and where existing asphalt concrete surfacing has not been cold planed or replaced:
1. Before overlaying the surface with HMA, make sure the contractor performs prepaving grinding to reduce or eliminate localized roughness to less than 180 inches per mile as required by Section 39-2.01C(3)(e) “Prepaving Grinding,” of the Standard Specifications.

2. If notified by the contractor that an existing asphalt concrete surface cannot be corrected by prepaving grinding, respond within 5 business days with agreement or disagreement. Formulate the response based on field review of the defined locations and the inertial profile data.

   If in agreement that the contractor-defined areas cannot be corrected by grinding, make sure the response defines the lane, direction, and the profiler stationing limits where the 12-foot straightedge will be used to evaluate smoothness on the final HMA surface. Upon completion of the final HMA surface, use these stations to define leave-out sections in the profile data file covering the final HMA surface.

   If determined that the contractor-defined areas can be corrected by prepaving grinding, assure that the response defines the reasoning. The reasoning should include a ProVAL grind plan that demonstrates grinding can be performed to meet the requirements in Section 39-2.01C(3)(e), “Prepaving Grinding,” of the Standard Specifications.

3. If the project has inadequate funds to cover prepaving grinding, contact the project manager to determine if additional funds are available to cover the additional work.

Where testing with a 12-foot straightedge is required, the paving inspector checks pavement smoothness for acceptance by daily use of a straightedge to determine whether the finished surface complies with the tolerances specified in Section 36-3.01D(4), “Department Acceptance,” of the Standard Specifications. These checks are in addition to checks the contractor is required to make and report in accordance with Section 36-3.01C(4) “Straightedge Measurements” of the Standard Specifications.

The paving inspector records straightedge measurements on Form CEM-4601, “Assistant Resident Engineer’s Daily Report,” and notifies the contractor of all out-of-specification areas.

Where smoothness is to be measured with an inertial profiler, the contractor must measure smoothness with an inertial profiler that meets the requirements of Section 36-3, “Pavement Smoothness,” of the Standard Specifications. Follow the guidelines in Section 4-36, “Surfacing and Pavements—General,” of this manual to assure that the inertial profiler, inertial profiler operator, submittals, and measurements meet the requirements of Section 36-3, “Pavement Smoothness,” of the Standard Specifications.

Review Section 39, “Asphalt Concrete,” of the Standard Specifications for the specified smoothness acceptance requirements. Analyze the contractor’s inertial profiles using ProVAL software.
• Check that prepaving grinding is performed only on existing asphalt concrete surfaces. Do not allow prepaving grinding work on existing asphalt concrete surfaces that are designated to be cold planed for mill and fill type paving, or in areas where existing asphalt concrete is designated to be replaced, or has been replaced, such as dig outs. Corrective grinding work on replaced asphalt concrete surfacing is considered part of the replace asphalt concrete surfacing work and is not prepaving grinding work. Make sure the contractor’s prepaving inertial profiles are used to determine where prepaving grinding work is required. Do not use profiles provided with the bid documents.

• Monitor the contractor’s planning for prepaving grinding. Document any concerns you have about methods planned for achieving smoothness on an existing surface. A handbook and training videos on using ProVAL to develop grind plans are available at:
  
  https://dot.ca.gov/programs/construction/training

• After making prepaving grinding corrections, make sure the contractor takes and submits the corresponding inertial profiles. Require the contractor to repeat the prepaving grinding and inertial profile submittal process, if necessary.

• Verify that the profile data file covering the surface of the completed prepaving grinding work defines lane sections where the final pavement surface will and will not have the smoothness specifications applied to it.

• Unless authorized by a change order, reject any HMA placed over an existing asphalt concrete surface that is required to, but does not meet the prepaving grinding smoothness requirements.

• Make sure prepaving profiles are taken before cold planing, and after replacing asphalt concrete surfacing.

• Once it has been determined that the contractor’s prepaving grinding profiles meet the requirements, request that Caltrans’ inertial profiler be run to verify that the profiles are within 10 percent.

Verify that the final HMA surface meets the smoothness requirements.

When OGFC is being placed atop HMA, make sure the HMA surface meets the smoothness requirements before placement of the OGFC.

Retain one copy of profile information in “.ppf” ProVAL format.

4-3903D (8) Miscellaneous Areas and Dikes

The contractor must place HMA at miscellaneous areas and place dikes where shown on the plans and in accordance with Section 39-2.01B(11), “Miscellaneous Areas and Dikes,” of the Standard Specifications.

4-3903D (9) Fog Seal Coat

The contractor applies fog seal coat to rumble strip ground areas and ground areas caused by smoothness correction grinding. If smoothness correction grinding is
excessive, contact the Division of Maintenance Office of Asphalt Pavements before allowing the contractor to fog seal within the traveled way.

The contract item for fog seal coat is used when fog seal must be applied to shoulders, miscellaneous areas, and dikes. Prohibit the contractor from applying fog seal coat to the traveled way.

Fog seal coat applied to ground-in rumble strips and smoothness correction areas is not paid separately. Refer to Section 4-37, “Bituminous Seals,” of this manual for additional information.

4-3903D (10) Open to Traffic

Do not allow traffic on new HMA until its mid-depth temperature is below 160 degrees Fahrenheit. The contractor may request in writing and the resident engineer authorize cooling of HMA Type A with water when rolling is complete.

The contractor must spread sand at a rate of 1 to 2 pounds per square yard before opening to public traffic on new rubberized HMA.

Temporary construction signs and temporary pavement delineation must be in place before opening to public traffic.

4-3903D (11) Temporary Transverse Joint Taper

Make sure the contractor constructs a temporary joint taper between the existing pavement and any newly placed paving or cold planing area when a transverse joint greater than 0.04 foot cannot be avoided before opening to traffic.

Verify that the taper transition rates meet the requirements of Section 7-1.03, “Public Convenience,” of the Standard Specifications.

Check that the temporary joint taper surface is uniform and there is no more than a 0.02-foot gap from the lower edge of a 12-foot straightedge and the taper surface when placed parallel and perpendicular to traffic.

4-3903D (12) Existing Asphalt Concrete

Make sure the contractor makes a 2-inch deep saw cut along limits where asphalt is designated to be removed.

Check that the contractor schedules cold planing and placement of HMA in accordance with the timeline requirements covered by Section 39-3.04, “Cold Planing Asphalt Concrete Pavement,” of the Standard Specifications.

Verify that cold planing equipment has automatic controls for the longitudinal grade and transverse slope of the cutter head. When cold planing, document contractor’s methods to control grades of the cold planer.

Inspect the cold planed surface to verify that the planing operations result in a neat and uniform surface. Make sure the contractor replaces broken, missing, or worn teeth if the surface pattern indicates the surface is not uniform.
Inspect the cold planed surface for signs of delamination. To minimize the potential for differential compaction, if necessary, provide direction to make minor adjustments or second passes to the cold planer to decrease potential for delamination. Document any locations that may cause smoothness issues if left unaddressed. Document any locations where you and the contractor disagree that delamination may be significant enough to cause differential compaction. Documentation should include high-resolution digital photographs or videos.

4-3904 Contract Administration

The resident engineer must review the notice of materials to be used, review and accept the job mix formula for HMA, review and accept the contractor’s quality control plan when applicable, and verify Caltrans inspection reports and acceptance testing results for contract compliance. The resident engineer makes decisions regarding noncompliant materials and placement.

The Federal Highway Administration requires Caltrans to have a quality assurance program. As part of that program, this chapter defines quality assurance and contract administration requirements for HMA. Caltrans requires that these same quality assurance standards be met for state-funded projects. If the requirements are not met, there is a risk that federal funds will be withheld or withdrawn. The resident engineer takes the following steps for HMA contract administration:

- Verifying that Form CEM-3101, “Notice of Materials To Be Used,” includes all component materials and materials sources used in HMA. Refer to Section 6-202, “Responsibilities for Acceptance of Manufactured or Fabricated Materials and Products,” of this manual for details.
- Making sure that the job mix formula for the project is verified and accepted before placement of HMA.
- Verifying that the contractor’s quality control plan is submitted and complies with the requirements of Section 39-2.01A(3)(c) “Quality Control Plan,” of the Standard Specifications. The quality control plan must describe the organization and procedures used by the contractor to control HMA quality, sampling, implementing and maintaining quality, when corrective actions are needed based on the contractor’s action limit, implementing corrective actions, and method used to backfill core locations.

The submitted quality control plan must also address the following elements affecting HMA quality: aggregate, asphalt binder, additives, and production paving.

4-3904A Acceptance Testing and Evaluation

The resident engineer makes sure that acceptance testing is performed at least at the minimum frequency shown in Table 6-1.13, “Materials Acceptance Sampling and Testing Requirements: Asphalt Concrete,” of this manual. Record test results on Form CEM-3701, “Test Result Summary,” so that minimum acceptance testing frequency is documented and easily verified.
The resident engineer verifies that acceptance samples are transported to testing laboratories within the timeframes specified in Example 6-1.2, “Sample Cylinder Label,” of this manual, except where specific sampling or test method requirements preclude doing so, for example, curing of specimens before transport. Test within 1 business day from sampling for projects within 50 miles of the testing laboratory or within 2 business days from sampling for projects more than 50 miles from the testing laboratory. Make sure the proper chain of custody is maintained throughout the process, including delivery to and receipt from a commercial shipping service. Use Form CEM-3701, “Test Result Summary,” to summarize acceptance test frequency and results on each material. Use this form to record dates for sampling, shipping to laboratory, receiving test results from laboratory, and notifying the contractor of test results. Monitor timeliness of material testing turnaround against Table 6-1.2, “Time Required for Materials Acceptance Tests,” of this manual, and make sure corrective actions are taken, and document deficiencies encountered. Notify contractor of all acceptance test results within 2 business days of receipt from laboratory. Advise the contractor that all test results are available for inspection and provide copies of these test results upon request. Maintain copies of the test results in Category 37, “Initial Tests and Acceptance Tests,” of the project files.

The resident engineer verifies that final inertial profile submittals meet the requirements for mean roughness index and areas of localized roughness. Use 4-3603B, “Pavement Smoothness,” of this manual as a guide in reviewing submittals. The resident engineer compares the contractor’s and Caltrans’ International Roughness Index values over each 0.1-mile section of lane. The resident engineer uses the contractor’s final inertial profiles for acceptance when they are within 10 percent of Caltrans’ values.

The resident engineer assures that production start-up evaluation testing is completed and recorded on Form CEM-3703, “Production Start-Up Evaluation,” and that the contractor is provided with a copy of the completed form.

4-3904A (1) Acceptance Test Results Outside Specified Limits on Non-Statistical Pay Factor Projects

If any acceptance test result, except smoothness, is outside the limits specified, notify the contractor in writing that the material represented by the tests is noncompliant, and include a statement that the noncompliant material is rejected and must be removed or remedied in accordance with Section 5-1.30, “Noncompliant and Unauthorized Work,” of the Standard Specifications. Attach a copy of the acceptance test result.

Ask the contractor if any corrective action has been taken based on quality control test data for the period when the acceptance sample was taken.

For every in-place density test failure, notify the contractor in writing that the material represented by the failed in-place density test is noncompliant, and include the following statements:
"The noncompliant material is rejected and must be removed or remedied in accordance with Section 5-1.30, 'Noncompliant and Unauthorized Work,' of the Standard Specifications.

"At the engineer’s option, noncompliant material may be accepted based on the engineer's evaluation of the effectiveness of your corrective actions. If the engineer decides to accept the noncompliant material, payment will be based on the table ‘Reduced Payment Factors for Percent of Maximum Theoretical Density,’ in Section 39-2.01A(4)(i)(ii), 'In-Place Density,' of the Standard Specifications."

For two consecutive density test failures, follow guidance in Section 4-3904A (2) "Two Consecutive Acceptance Test Results Outside of Specification Limits on Non-Statistical Pay Factor Projects," of this manual.

If acceptance test results are disputed within the period specified in Section 39-2.01A(4)(i)(iv), “Dispute Resolution,” of the Standard Specifications, try to resolve these issues at the project level before involving the independent third party.

If an acceptance test is outside the acceptance specification limits, immediately direct the field construction lab, district materials lab, or METS to test the most recent acceptance sample for compliance with the specifications. There may be additional samples that have not been tested. Always test the most recently pulled sample first. Designate this sample for priority testing.

If the most recent sample fails, follow guidance in Section 4-3904A (2) of this manual.

If the most recent sample passes, test the samples immediately before and after the initial failed sample. At a minimum, continue testing samples taken before and after the initial failed sample until a sample passes. If during this testing there are two consecutive failures, and there are passing results after these failures that indicate necessary corrective actions were already implemented, do not follow the guidance in Section 4-3904A (2) of this manual.

4-3904A (2) Two Consecutive Acceptance Test Results Outside Specification Limits on Non-Statistical Pay Factor Projects

If two consecutive acceptance test results do not comply with the specifications:

- Immediately inform the contractor to stop production.
- Inform the contractor in writing that the material represented by the two out-of-specification acceptance tests is noncompliant, and include a statement that the noncompliant material is rejected and must be removed or remedied in accordance with Section 5-1.30, “Noncompliant and Unauthorized Work,” of the Standard Specifications. Attach copies of both test results that indicate the material is outside specification limits.
- Submit any samples taken between the two failed tests to the appropriate lab for priority testing to define the amount of material not in compliance with the specifications.
1. Notify the appropriate lab that two consecutive acceptance tests are outside the acceptance specification limits.

2. Direct the testing labs to test all samples between the first and second out-of-specification acceptance tests and any remaining samples immediately before or after any failure. Use their test results to define the quantity of hot mix asphalt that will be rejected.

- Notify the contractor in writing of results of all additional acceptance tests conducted to determine the extent of the out-of-specification material. In the notice, include language that the material represented by out-of-specification material is noncompliant and rejected and must be removed or remedied to comply with Section 5-1.30, “Noncompliant and Unauthorized Work,” of the Standard Specifications.

- Require the contractor to do all of the following:
  1. Take corrective action to remedy the cause of out-of-specification material.
  2. Provide written documentation of corrective action taken.
  3. Demonstrate compliance by providing quality control testing of material produced but not delivered to the project.
  4. Provide samples of HMA for both the resident engineer and contractor to test. The contractor samples this material in the engineer’s presence and splits the samples into four parts.
  5. Test one part of the split sample to verify that the corrective action taken by the contractor was successful.

If both Caltrans’ and the contractor’s test results are within specifications, the contractor has demonstrated compliance with the specifications and may resume production.

Since the samples tested by the contractor and resident engineer are from a split sample, the test results should not be significantly different. If there is a significant difference, the resident engineer and the contractor should investigate the reason for the discrepancy. Contractors can choose to begin production during this investigation but proceed at their own risk.

- The contractor may dispute any out-of-specification acceptance test result within the specified number of days of receiving the test result by notifying the resident engineer in writing in accordance with Section 39-2.01A(4)(i)(iv), “Dispute Resolution,” of the Standard Specifications. Try to resolve testing or sampling issues at the project level before involving the independent third party.

4-3904A (3) Contractor Requests for Accepting Noncompliant Work

If the contractor agrees that the HMA placed is noncompliant, the contractor may propose to the resident engineer in writing that the noncompliant material will be remedied or that the noncompliant material will be left in place for reduced compensation. Consult with the district materials engineer and either the Division of
Maintenance Office of Asphalt Pavements, the district’s construction field coordinator, or both, about acceptance of the contractor’s proposal. Document material remediation or reduced pay by issuing a contractor-requested change order. Document all noncompliant materials test results including the action taken on Form CEM-6302, “Final Materials Certification.” Refer to Section 6-106, “Project Materials Certification,” of this manual for documentation requirements.

4-3904A (4) Acceptance of Lots using Statistical Pay Factor Specifications


Administering SPF projects requires analysis of contractor quality control test data, engineer’s verification test data, and when a dispute arises, independent third-party laboratory test data. The analysis is performed each day and upon completion of each lot using a Caltrans-furnished spreadsheet titled SPFPay. The spreadsheet is available at:

https://dot.ca.gov/programs/construction/hot-mix-asphalt-construction

The SPF specifications require that the quality control manager enter the quality control test data into the SPFPay spreadsheet after each sublot. The quality control manager submits this data daily to the resident engineer. The resident engineer imports the contractor’s quality control data into a copy of the spreadsheet. Any new or revised data is highlighted. If a highlighted test result indicates a previously submitted test result has been changed, the engineer does not accept the data until the contractor provides evidence of justifiable reason for changing the data, such as correcting a clerical error. If the highlighted data is only new test data, the engineer accepts the data.

After accepting the data, the engineer reviews the SPFPay spreadsheet for any stop-production notifications. These stop-production notifications indicate the material in the lot to that point is not acceptable until one or more sublots of material is rejected from the sublot, regardless of improvement to the percent within limits (PWL) or quality factors after the notification. If the resident engineer finds these stop notifications and that the quality control manager did not stop production or notify the engineer of the need to stop production, the resident engineer stops production, and does not allow production to proceed until the contractor identifies the sublot or sublots of material that will be rejected from the lot. The stop notification indicates that PWL for a pay factor quality characteristic fell below an acceptable threshold. The threshold requires the quality factor to be 0.90 or greater, which is also expressed as a PWL of 70 percent or greater. The number 8 sieve is less critical, and requires the quality factor to remain above 0.75, which is also expressed as PWL threshold of 45 percent.

Upon completion of a lot, all stop notifications on previously completed sublots must be cleared. Clearing the stop notifications requires rejection and removal of the sublot, and its corresponding test results from SPFPay. The engineer allows the
contractor to continue production of a lot only after the contractor identifies which sublots will be removed and rejected from the lot.

The engineer does not share pay factor verification test data with the contractor until the lot is completed and all of the contractor’s quality control test data has been submitted.

At completion of the lot, and within 7 days of receiving all of the quality control test data for the lot, the engineer runs a verification check of the contractor’s quality control data and provides the results of the verification check to the contractor. The engineer uses the “Priority” designation on the verification samples described in Section 6-102C, “Acceptance Samples and Tests,” of this manual when needed to complete the verification check within the 7-day time period. Once verified, the engineer notifies the contractor and makes the applicable adjustment on the next progress pay estimate.

A lot is a quantity of HMA. A new lot begins when one of the following occurs:

- 20 sublots are complete
- JMF changes
- Production stops for more than 30 days

Upon completion of each lot, the engineer verifies the contractor’s quality control data using the engineer’s verification test results. The engineer uses the SPFPay spreadsheet to perform this check.

Once the contractor’s quality control test data is verified, the engineer accepts the lot. The SPFPay spreadsheet calculates the quality factors for each of the five pay factor quality characteristics using the following equation and without rounding:

\[ \text{quality factor} = \frac{\text{PWL}}{2} + 0.55 \]

Each quality factor typically results in a value from 0.90 through 1.05. The lot is acceptable when all quality factors are 0.90 or higher, except above 0.75 or higher for the percentage passing the number 8 sieve, and there are no stop notifications shown on any subplot requiring one or more sublots of material to be rejected and removed from the lot.

Once the lot is accepted, the resident engineer pays for the HMA at item price and includes the incentive or disincentive payment adjustment for the lot on the next progress estimate. Refer to Section 4-3907E, “Compensation Adjustment for Hot Mix Asphalt Placed Using the Statistical Pay Factor Specifications,” of this manual for guidance on making the payment adjustment.

4-3904A (5) Monitoring Non-Pay Factor Quality Characteristics using Statistical Pay Factor Specifications

The contractor’s minimum sampling frequency is defined in the specifications. When the contractor’s testing indicates that a non-pay factor test is out of specification, the contractor is required to notify the engineer and document corrective actions taken. If the contractor’s quality control test for a single non-pay factor quality characteristic
falls out of specification two consecutive times, or any non-pay factor quality characteristic fails 3 times in a single day, the contractor must stop production, notify the engineer, and demonstrate compliance before continuing production.

The resident engineer may perform testing on non-pay factor quality characteristics at any time, but at a minimum frequency defined in Table 6-1.12, “Materials Acceptance Sampling and Testing Requirements,” of this manual.

When the resident engineer determines that a non-pay factor quality characteristic is to be tested, samples are pulled from two consecutive contractor defined sublots. These samples are independent of the contractor’s. Refer to section 4-3903A (2), “Department Acceptance,” of this manual for detailed guidance on sampling and testing of non-pay factor quality characteristics, and stopping production because of two consecutive non-pay factor test failures.

4-3904B  Testing for Significant Difference

The resident engineer should compare the contractor’s test results against Caltrans’ test results to determine if they are significantly different. Compare the test results in one of two ways:

1. A one-to-one comparison of the test results of a single split sample (job mix formula verification and production start-up).

2. The comparison of groups of test results, that is, the average of all acceptance tests compared to the average of all quality control tests.

The resident engineer should always examine the differences between contractor and Caltrans test results for job mix formula verification, production start-up, and dispute resolution based on a one-to-one comparison of the test results. For job mix formula verification and production start-up evaluation, the test result comparison will show whether the contractor and Caltrans can test properly sampled and split samples for aggregate and HMA and get reasonably close test results. If a significant difference exists, the resident engineer should notify the contractor. The resident engineer and contractor should examine what is causing the difference and try to find a way to bring their results closer.

The resident engineer should never consider a one-to-one comparison of two test results from different samples, such as Caltrans’ acceptance result of a sample taken in the morning compared to a contractor’s quality control test result of a sample taken in the afternoon. If examination of the contractor’s and Caltrans’ test results shows large differences, compare the test result groups to determine if the results are significantly different. Compare the average of all acceptance test results to the average of the contractor’s quality control test results, and use Table 4-39.1, “Precision Index,” of this manual, to determine if the difference between the test results is reasonable or significantly different. If the comparison between the test results indicates a significant difference, notify the contractor. The resident engineer and contractor together should examine and investigate the cause of test result differences.
Use the reasonable testing difference values in Table 4-39.1 to evaluate whether a significant testing difference exists.
### Table 4-39.1. Precision Index

<table>
<thead>
<tr>
<th>Quality Characteristic</th>
<th>Test Method</th>
<th>Reasonable Testing Differences</th>
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**NOTES:**

1. Examine the AASHTO T 209, Method A values for theoretical maximum density also. Determine whether resolution of AASHTO T 209, Method A is necessary and sufficient to resolve issues with percent theoretical maximum density or design air void content.

2. Comparing one core to the average of quality control test results within the same 250 tons.

3. Comparing the average of Caltrans' cores to the average of quality control test results for the same volume of HMA or the same area.

4. Comparing the average of three of Caltrans' cores in 3 lots of 250 tons each to the average of quality control test results for the same 3 lots of HMA.
4-3904C  Certificates of Compliance
The resident engineer obtains certificates of compliance for each delivery of asphalt binder (attach bill of lading), crumb rubber modifier, tack coat, and fog seal.

Keep track of total quantity of material delivered and check that inspectors have obtained an adequate number of certificates of compliance to cover the quantity of material received.

In addition, perform the following contract administration reviews for certificates of compliance:

- Refer to the Certification Program for Suppliers of Asphalt to determine what information must be shown on the certificate of compliance for asphalt binders.
- Obtain “Buy America” certification for each shipment of crumb rubber modifier.

Assure that asphalt binder contract administration requirements are met by following Section 4-92, “Asphalt Binders,” of this manual.

4-3905  Level of Inspection
Suggested levels of field inspection for typical concrete pavement activities are:

- Benchmark inspection of subgrade for compaction and elevation requirements
- Intermittent inspection of HMA production operations
- Continuous inspection of HMA delivery, placement
- Continuous inspection of HMA compaction operation using method compaction specifications
- Benchmark inspection of HMA compaction operation using the core density compaction specifications
- Continuous acceptance sampling and testing of HMA
- Intermittent monitoring of the contractor’s adherence to their quality control plan
- Benchmark evaluation of pavement surfacing for signs of segregation, raveling, or other distresses
- Benchmark inspection for smoothness

4-3906  Quality Control
Guidance for quality control activities included in this section is summarized as follows:

- Review contractor’s quality control plan within 5 business days of the submittal. For the standard process, verify the plan complies with the requirements of Section 39-2.01A(3)(c) “Quality Control Plan,” of the Standard Specifications. For the for Type-A HMA using the SPF process, verify the plan complies with the requirements of 39-2.09A(3)(b), “Quality Control Plan,” of the special provisions. For RHMA-G using the SPF process, verify the plan complies with the requirements of 39-2.10A(3)(b), “Quality Control Plan,” of the special provisions.
• Verify that the contractor submits a copy of the AASHTO re:source accreditation for the laboratory performing the mix design. A current list of accredited labs is available at:
  
  http://aashtoresource.org/aap/accreditation-directory

• For HMA placed using the SPF process, verify the contractor’s quality control testing laboratories performing AASHTO tests have a current AASHTO re:source accreditation.

• For HMA placed using the SPF process, verify contractor’s quality control testing laboratory and quality testing personnel are accredited and qualified under the Department’s Independent Assurance Program. The list of accredited and qualified laboratories and personnel are maintained in the Statewide Independent Assurance Database (SIAD). The SIAD is available at:
  
  https://sia.dot.ca.gov/index.php

Review the contractor’s quality control test results to verify that testing meets the specifications for Caltrans acceptance. For most quality control characteristics, the contractor samples and tests at a minimum frequency of once for every 750 tons of produced HMA.

• Verify that, when any quality characteristic is beyond the action limits shown in the quality control plan, the contractor is taking corrective action. The contractor must document the corrective action in accordance with Section 39-2.01A(4)(h), “Quality Control,” of the Standard Specifications.

• Verify that the contractor is complying with the minimum quality control testing frequencies specified in Section 39-2.01, “General,” and the frequencies specified under Section 39-2.01A(4)(h) “Quality Control,” both of the Standard Specifications, for the type of HMA being produced.

• For HMA placed under the standard process, make sure the contractor stops production when two consecutive quality control or acceptance tests are out of specification, notifies the resident engineer, takes corrective action, and demonstrates compliance with the specifications before resuming production and placement of HMA.

• For HMA placed under the SPF process, make sure the contractor stops production when two consecutive non-pay factor quality control or acceptance tests are out of specification, notifies the resident engineer, takes corrective action, and demonstrates compliance with the specifications before resuming production and placement of HMA.

• Verify that certifications for the inertial profiler and operator have not expired. The corresponding expiration dates are available at:
  
  https://dot.ca.gov/programs/engineering-services/inertial-profiler-certification-program

• Review the contractor’s monitoring of best paving practices that promote smoothness. Encourage the contractor to monitor and record locations where
paving practices commonly known to negatively affect smoothness occur, then to follow up and compare those locations to the localized roughness reports of the corresponding International Roughness Index values. Examples of common occurrences are: paver stops, excessive screed angle adjustments, excessive variation in head of material in front of screed (paving width adjustments, poor controls), variations in paving speed, poor or lack of automated grade controls using a ski or averaging system, or poor roller practices.

• Before paving, use MultiCool software to estimate how rapidly a freshly placed HMA mat will cool as a function of the mix properties and site conditions. The MultiCool software is available at:

  https://dot.ca.gov/programs/construction/hot-mix-asphalt-construction

A MultiCool application is also available for smartphones using either the Android or iOS operating systems.

• Before placing tack coat, make sure the contractor plans to spray tack coat at a rate required to achieve the minimum residual rate. Rates vary based on the application and the dilution rate. To determine the minimum rate, calculate your own rate as shown in the example at 4-9403, “During the Course of Work,” of this manual or use the “Minimum Tack Coat Spray Rates (PDF)” at:

  https://dot.ca.gov/programs/construction/hot-mix-asphalt-construction

4-3907 Payment

For details of payment, review the applicable, “Payment” subsection of Section 39 “Asphalt Concrete,” of the Standard Specifications.

For guidelines on how to weigh HMA, refer to Section 3-902E, “Weighing Equipment and Procedures,” of this manual.

For measuring asphalts, liquid asphalts, and asphaltic emulsions used as tack coat, refer to Sections 4-92, “Asphalt Binders”; and 4-94, “Asphaltic Emulsions,” of this manual.

4-3907A Payment Adjustment for Core Density

For HMA placed using the standard process, determine if a deduction is required for cores outside specification limits for the percent of maximum theoretical density. Use the table, “Reduced Payment Factors for Percent of Maximum Theoretical Density,” in Section 39-2.01A(4)(i)(ii), “In-Place Density,” of the Standard Specifications. The core density (compaction) deduction should be taken on the next monthly estimate as an administrative deduction.

4-3907B Compensation Adjustment for Price Index Fluctuations

For compensation adjustments for price index fluctuations for asphalt binder, use the guidance provided in Section 4-9205A “Compensation Adjustments for Price Index Fluctuations” of this manual.
4-3907C  Payment After Dispute Resolution for Independent Third Parties

If applicable, when the dispute resolution process determines the contractor’s test results are correct, Caltrans pays the independent third party testing costs and adjusts the contract time. The resident engineer adjusts payment and contract time in accordance with Section 8-1.07, “Delays,” of the Standard Specifications and processes a change order to allow for payment and adjustment.

4-3907D  Compensation and Contract Time for Delays

When failing to comply with the specified times to return test results to the contractor, the resident engineer must adjust payment and contract time under Section 8-1.07, “Delays,” of the Standard Specifications:

• Within 20 days of sampling for job mix formula verification
• Within 3 days of rubberized HMA production sampling for job mix formula verification
• Within 3 days of sampling for production start-up evaluation

Make compensation and contract time adjustments only when work completion is delayed.

4-3907E  Compensation Adjustment for Hot Mix Asphalt Placed Using the Statistical Pay Factor Specifications

The resident engineer determines acceptance of each lot of HMA placed using the SPF process using guidance in Section 4-3904A (4), “Acceptance of Lots Using Statistical Pay Factor Specifications” of this manual.

Once a lot is accepted, the resident engineer uses the SPFPay spreadsheet to determine the composite quality factor for the lot. The composite quality factor is the weighted average of the individual quality factors for each of the five pay factor quality characteristics, rounded to two decimal places. The individual quality factors are not rounded before determining the composite quality factor.

The resident engineer then uses the composite quality factor for the lot and the contractor’s bid item price to determine the unit price adjustment. That unit price adjustment is then applied to each ton of HMA placed in the accepted lot. The unit price adjustment per ton is determined as follows:

\[
\text{Unit Price Adjustment for Lot} = (\text{composite quality factor} - 1.00) \times \text{HMA Bid Price}
\]

Using the unit price adjustment equation, if the composite quality factor is 1.05, the contractor earns a 5 percent incentive, or if the composite quality factor is 0.95, the contractor earns 5 percent less, which is a disincentive.

The resident engineer includes the applicable adjustment on the next progress estimate after the lot has been accepted and the adjustment has not been disputed. When the adjustment is not included on the next progress estimate, and the amount is an incentive, the resident engineer includes it on the next progress estimate and
pays interest calculated in accordance with the requirements of Section 9-1.03, “Payment Scope,” of the *Standard Specifications*.

When the engineer’s test data does not verify the contractor’s test data, the engineer immediately notifies the contractor and uses the Caltrans verification test data in place of the contractor’s quality control test data as basis for acceptance and determination of a payment adjustment.

If the contractor disputes the non-verification, the engineer follows the dispute process defined in the specifications. For Type-A HMA, refer to section 39-2.09A(4)(c)(v), “Dispute Resolution” of the project’s special provisions. For RHMA-G, refer to section 39-2.10A(4)(c)(v), “Dispute Resolution” of the project’s special provisions.

If the contractor disputes the engineer’s non-verification of the lot, the specifications require that both parties first attempt to resolve the dispute without involvement of an independent third party. This may include witness testing and sharing of test data worksheets. If this first step does not resolve the dispute, the engineer provides the split samples from the engineer’s disputed verification test samples to the independent third party, who runs the tests on those samples. Those test results are used in the verification test of the contractor’s quality control samples reported for the lot.

If the independent test results verify the contractor’s test results, the lot is considered verified and the payment adjustment is determined using the contractor quality control test data. The engineer then pays for the independent testing costs.

If the independent test results do not verify the contractor’s test results, the lot is not verified, and the payment adjustment is determined using the independent test results. The contractor then pays the independent third party testing costs.

### 4-3908 References and Resources

The following provide construction personnel with additional sources of information:

#### 4-3908A References

- Authorized Materials Lists:
  

- California Test Methods, METS:
  
  [https://dot.ca.gov/programs/engineering-services/california-test-methods](https://dot.ca.gov/programs/engineering-services/california-test-methods)

- Certification Program for Suppliers of Asphalt, METS:
  

- CEM forms, Division of Construction:
  
  [https://dot.ca.gov/programs/construction/forms](https://dot.ca.gov/programs/construction/forms)

- *Independent Assurance Manual*, Procedures for Accreditation of Laboratories and Qualification of Testers, METS:
4-3908B  Resources

Use available experts within your district or region to resolve issues and obtain additional information about HMA production and placement. Contact the construction engineer and Division of Construction coordinator for issues about contract administration related to HMA specifications. Contact the district materials engineer for issues about materials and the district independent assurance coordinator for issues concerning testing.

When questions about Section 39, “Asphalt Concrete,” of the Standard Specifications or related special provisions cannot be addressed by district or region experts, or the construction engineer refers the resident engineer to the Division of Construction or Engineering Services for assistance, contact the following:

For materials or testing issues:

    Chief, Office of Central Laboratories  
    Materials Engineering and Testing Services  
    California Department of Transportation

For contract administration, measurement or payment issues:

    Chief, Office of Construction Standards
Chapter 5  Contract Administration

Section 1  Project Records and Reports

5-101  Forms Used for Contract Administration

5-101A  General

5-101B  Construction Forms

- Form CEM-0101  Resident Contractor’s Report of Assignment
- Form CEM-0501  Relief from Maintenance
- Form CEM-0602  Project Safety Program Statement
- Form CEM-0603  Major Construction Incident Notification
- Form CEM-0604  Project Safety Review or Meeting
- Form CEM-0606  Construction Safety Checklists
- Form CEM-1201  Subcontracting Request
- Form CEM-1202A  Contractor Action Request—Change of Name/Address
- Form CEM-1202B  Contractor Action Request—Assignment of Contract Monies, Assignee Change of Name/Address
- Form CEM-1203  Contractor Action Request—Assignment of Contract Performance
- Form CEM-1302  Project Positive Work Zone Protection Determination
- Form CEM-1303  Positive Work Zone Protection Supplement
- Form CEM-1901  Burial Location of Soil Containing Aerially Deposited Lead
- Form CEM-1902  Burial Location of Soil Containing Naturally Occurring Asbestos
- Form CEM-1903  Burial Location of Soil Containing Aerially Deposited Lead (Topographic Survey)
- Form CEM-1904  Agreement Between a Contractor Working on State Facilities and a Real Property Owner for Disposing Construction Related Material on Commercial Zoned Property Owner’s Property
- Form CEM-1905  Agreement Between a Contractor Working on State Facilities and a Real Property Owner for Disposing Construction Related Material on Residential Zoned Property Owner’s Property
- Form CEM-1906  Agreement Between a Contractor Working on State Facilities and a Real Property Owner for Disposing Construction-Related Material Suitable for Use on Residential Zoned Property
- Form CEM-2006  Legally Responsible Person Authorization of Approved Signatory
| Form CEM-2006T | Legally Responsible Person Authorization of Approved Signatory—Lake Tahoe Hydrologic Unit |
| Form CEM-2008 | SWPPP/WPCP Amendment Certification and Acceptance |
| Form CEM-2009 | SWPPP/WPCP Amendments Log |
| Form CEM-2023 | Stormwater Training Record |
| Form CEM-2024 | Stormwater Training Log—Optional |
| Form CEM-2030 | Stormwater Site Inspection Report |
| Form CEM-2031T | Daily Stormwater Site Inspection Report - Lake Tahoe Hydrologic Unit |
| Form CEM-2032 | Permanent Erosion Control Establishment (PECE) Report |
| Form CEM-2035 | Stormwater Corrective Actions Summary |
| Form CEM-2035T | Stormwater Corrective Actions Summary – Lake Tahoe Hydrologic Unit |
| Form CEM-2045 | Rain Event Action Plan |
| Form CEM-2045T | Rain Event Action Plan—Lake Tahoe Hydrologic Unit |
| Form CEM-2051 | Stormwater Sampling and Analysis Log—Optional |
| Form CEM-2052 | Stormwater Sample Field Test Report/Receiving Water Monitoring Report |
| Form CEM-2058 | Stormwater Meter Calibration Record—Specialty Meters |
| Form CEM-2061 | Notice of Discharge Report |
| Form CEM-2061T | Notice of Discharge Report—Lake Tahoe Hydrologic Unit Stormwater Sample Field Test Report/Receiving Water Monitoring Report |
| Form CEM-2062 | Numeric Action Level Exceedance Report |
| Form CEM-2062T | Numeric Action Level Exceedance Report—Lake Tahoe Hydrologic Unit |
| Form CEM-2063 | Numeric Effluent Limitation Violation Report—ATS Discharges |
| Form CEM-2063T | Numeric Effluent Limitation Violation Report—Lake Tahoe Hydrologic Unit |
| Form CEM-2070 | SWPPP/WPCP Annual Certification of Compliance |
| Form CEM-2075 | Project Stormwater Annual Report |
| Form CEM-2075T | Project Stormwater Annual Report—Lake Tahoe Hydrologic Unit |
| Form CEM-20CC | Attachment CC, Water Pollution Control Best Management Practices List |
Form CEM-20DAPP  Appendix D, Notification Log
Form CEM-20DCON  SWPPP/WPCP Attachment D, Contractor Personnel Training Record
Form CEM-20DSUB  SWPPP/WPCP Attachment D, Subcontractor Personnel Stormwater Training Record
Form CEM-20EE   SWPPP Attachment EE, Stormwater Sampling Locations
Form CEM-2101  COZEEP Daily Report
Form CEM-2102  COZEEP/MAZEEP Task Order
Form CEM-2103  COZEEP/MAZEEP Cancellation Form
Form CEM-2210  Traffic Control Daily Report
Form CEM-2301  Temporary Pedestrian Access Route Compliance Inspection Report
Form CEM-2302  Temporary Pedestrian Access Route Weekly Inspection Report
Form CEM-2303  Temporary Pedestrian Access Route Sidewalk Detour Inspection Report
Form CEM-2311  Temporary Pedestrian Access Route Contractor Compliance Report
Form CEM-2312  Temporary Pedestrian Access Route Contractor Weekly Report
Form CEM-2401  Substitution Report for Disadvantaged Business Enterprise (DBE) or Underutilized Disadvantaged Business Enterprise (UDBE)
Form CEM-2402(F)  Final Report—Utilization of Disadvantaged Business Enterprises (DBE), First-Tier Subcontractors
Form CEM-2402(S)  Final Report—Utilization of Disabled Veteran Business Enterprises (DVBE), State Funded Projects Only
Form CEM-2403(F)  Disadvantaged Business Enterprises (DBE) Certification Status Change
Form CEM-2404(F)  Monthly DBE /UDBE Trucking Verification
Form CEM-2405  Disabled Veteran Business Enterprise (DVBE) Substitution Request to the Department of General Services (DGS)
Form CEM-2406  Monthly Disadvantaged Business Enterprises (DBE) Payment
Form CEM-2407  Disadvantaged Business Enterprises Joint Check Agreement Request
Form CEM-2500  LCPtracker Vendor Access Request
Form CEM-2501  Fringe Benefit Statement
Form CEM-2502  Contractor or Subcontractor Payroll
Form CEM-2503  Statement of Compliance
| Form CEM-2504 | Employee Interview: Labor Compliance/EEO |
| Form CEM-2504 | (Spanish), Entrevista de Empleado: Cumplimiento Laboral/IOE |
| Form CEM-2506 | Labor Compliance—Wage Violation |
| Form CEM-2507 | Labor Violation: Case Summary |
| Form CEM-2508 | Contractor Payroll Source Document Audit Summary |
| Form CEM-2509 | Checklist—Source Document Audit |
| Form CEM-2601 | Construction Progress Chart |
| Form CEM-2701 | Weekly Statement of Working Days |
| Form CEM-2702 | Overrun in Contract Time |
| Form CEM-3101 | Notice of Materials to Be Used |
| Form CEM-3501 | Hot Mix Asphalt Production Report |
| Form CEM-3502 | Hot Mix Asphalt Placement Report |
| Form CEM-3511 | Contractor Job Mix Formula Proposal |
| Form CEM-3512 | Contractor Hot Mix Asphalt Design Data |
| Form CEM-3513 | Caltrans Hot Mix Asphalt Verification |
| Form CEM-3514 | Contractor Job Mix Formula Renewal |
| Form CEM-3701 | Test Result Summary |
| Form CEM-3702 | Relative Compaction Summary |
| Form CEM-3703 | Caltrans Production Start-Up Evaluation |
| Form CEM-3736 | Pavement Smoothness Inertial Profiler Submittal Record |
| Form CEM-3736AC | Asphalt Concrete Pavement Smoothness Corrections Information |
| Form CEM-3736C | Concrete Pavement Smoothness Corrections Information |
| Form CEM-3801 | Request for Assignment of Inspectors, Samplers, and Testers |
| Form CEM-3802 | Quality Control Inspector Affidavit of Proficiency |
| Form CEM-3803 | Daily Summary of Quality Control Testing |
| Form CEM-3804 | Hot Mix Asphalt Inspection and Testing Summary |
| Form CEM-3810 | Construction Grade Checking Report |
| Form CEM-4101 | Materials Release Summary |
| Form CEM-4102 | Material Inspected and Released on Job |
| Form CEM-4202 | Material Plant Safety Checklist |
| Form CEM-4401 | Solid Waste Disposal and Recycling Report |
| Form CEM-4403 | Recycled Materials Report |
| Form CEM-4410 | Crumb Rubber Usage Report |
| Form CEM-4501 | Resident Engineer’s Daily Report/Assistant Resident Engineer’s Daily Report |
| Form CEM-4601 | Assistant Resident Engineer’s Daily Report |
Form CEM-4701 Drainage System Summary
Form CEM-4801 Quantity Calculations
Form CEM-4900 Change Order
Form CEM-4901 Change Order Input
Form CEM-4902 Extra Work Bill (Short Form)
Form CEM-4902A Extra Work Bill—Title Page
Form CEM-4902B Extra Work Bill—Labor Charges
Form CEM-4902C Extra Work Bill—Equipment Charges
Form CEM-4902D Extra Work Bill—Material Charges
Form CEM-4903 Change Order Memorandum
Form CEM-4904 Caltrans Authorization for Using Internet Extra Work Bill System
Form CEM-4905 Contractor Authorization for Using Internet Extra Work Bill System
Form CEM-4906 Internet Extra Work Bill (iEWB) User Account Request Form
Form CEM-4907 Tentative Daily Extra Work Agreement
Form CEM-4910 Value Engineering Change Proposal Submittal
Form CEM-4911 Value Engineering Change Proposal Acceptance/Rejection
Form CEM-5101 Request for Payment for Materials on Hand
Form CEM-5105 Materials on Hand Summary
Form CEM-5500 Partnering Facilitator Registration
Form CEM-5501 Partnering Facilitator Evaluation—Kick-Off
Form CEM-5502 Partnering Facilitator Evaluation—Closeout
Form CEM-5773 Americans with Disabilities Act (ADA) Project Compliance Certification
Form CEM-5773ADE Curb Ramp (Case A, D, or E) Americans with Disabilities Act (ADA) Compliance Inspection Report
Form CEM-5773B Curb Ramp (Case B) Americans with Disabilities Act (ADA) Compliance Inspection Report
Form CEM-5773C Curb Ramp (Case C) Americans with Disabilities Act (ADA) Compliance Inspection Report
Form CEM-5773CH Curb Ramp (Case CH) Americans with Disabilities Act (ADA) Compliance Inspection Report
Form CEM-5773CM Curb Ramp (Case CM) Americans with Disabilities Act (ADA) Compliance Inspection Report
Form CEM-5773DW Sidewalk at Driveway Americans with Disabilities Act (ADA) Compliance Inspection Report
Form CEM-5773FG  Curb Ramp (Case F or G) Americans with Disabilities Act (ADA) Compliance Inspection Report
Form CEM-5773NSPL  Curb Ramp (Non-Standard Plan - Parallel) Americans with Disabilities Act (ADA) Compliance Inspection Report
Form CEM-5773NSPP  Curb Ramp (Non-Standard Plan - Perpendicular) Americans with Disabilities Act (ADA) Compliance Inspection Report
Form CEM-5773P  Parking Americans with Disabilities Act (ADA) Compliance Inspection Report
Form CEM-5773PW  Passageway Americans with Disabilities Act (ADA) Compliance Inspection Report
Form CEM-5773SW  Sidewalk Americans with Disabilities Act (ADA) Compliance Inspection Report
Form CEM-5803A  Electrical System Inspection Checklist
Form CEM-5803B  Detector Loop Inspection Checklist
Form CEM-5819A  Cable Verification Worksheet
Form CEM-5819B  Segment Verification Worksheet
Form CEM-5819C  Link Loss Budget Worksheet
Form CEM-6003  Progress Pay—Estimate Project Initiation or Update
Form CEM-6004  Contract Transactions Input
Form CEM-6101  Project Record—Estimate Request
Form CEM-6200  Candidate Application for Dispute Resolution Board (DRB) Member/Dispute Resolution Advisor (DRA)
Form CEM-6201  Notice of Potential Claim
Form CEM-6201A  Initial Notice of Potential Claim
Form CEM-6201B  Supplemental Notice of Potential Claim
Form CEM-6201C  Full and Final Documentation of Potential Claim
Form CEM-6201D  Initial Potential Claim Record
Form CEM-6201E  Supplemental Potential Claim Record
Form CEM-6201F  Full and Final Potential Claim Record
Form CEM-6202  Dispute Resolution Board Establishment Report
Form CEM-6203  Dispute Review Board (DRB) Update Report
Form CEM-6204  Dispute Resolution Board (DRB) —Dispute Meeting Report
Form CEM-6205  Dispute Review Board (DRB) Completion Report
Form CEM-6206  Dispute Resolution Advisor—Establishment Report
Form CEM-6207  Dispute Resolution Advisor (DRA)—Dispute Meeting Report
Form CEM-6208    Dispute Resolution Ladder Establishment
Form CEM-6209    Elevation of a Dispute
Form CEM-6210    Alternative Dispute Resolution—Progress Meeting Report
Form CEM-6220    Dispute Resolution Board (DRB) Member/Dispute Resolution Advisor (DRA) Resume
Form CEM-6301    Contract Acceptance
Form CEM-6302    Final Materials Certification
Form CEM-6303    Final Acceptance Checklist for Federal-Aid Projects of Division Interest (PODI)
Form CEM-9001    Construction Manual Proposed Change
Form OFG-1       Oversight Resident Engineer’s Preconstruction Checklist
Form OFG-2       Local Agency and Oversight Resident Engineer Preconstruction Conference Checklist
Form OFG-3       Local Agency Resident Engineer Contract Provisions Checklist
Form OFG-4       Oversight Resident Engineer’s Construction Contract Administration Verification Checklist
Form OFG-5       Federal-Aid Projects of Division Interest
Form OFG-6       Final Acceptance Checklist for Caltrans Oversight Projects
Form PM-S-0110   Safety Meeting Report

5-101C    Materials Engineering and Testing Services Forms
Form MR-0518    Job Cement Samples Record
Form TL-0015    Quality Assurance—Nonconformance Report
Form TL-0016    Quality Assurance—Nonconformance Resolution
Form TL-0028    Notice of Materials to Be Inspected at Job Site
Form TL-0029    Report of Inspection of Material
Form TL-0038    Inspection Request
Form TL-0101    Sample Identification Card
Form TL-0502    Field Sample of Portland Cement Concrete Sample Card
Form TL-0608    Notice of Materials to be Furnished
Form TL-0624    Inspection Release Tag
Form TL-0625    Materials Suitability Tag
Form TL-0649    Report of Materials on Hand
Form TL-6013    Material Suitability Documentation Report
Form TL-6014    Material Suitability Report
Form TL-6037    Fabrication Progress Report

5-101D    Other State Forms
Form DPD-3013    Request for Construction Staking
Form LA-17      Report of Chemical Spray Operations
### 5-101E Traffic Operations Forms
- Form TR-0019 Notice of Change in Clearance or Bridge Weight Rating
- Form TR-0020 Notice of Change in Vertical or Horizontal Clearance
- Form TR-0029 Notice of Change in Clearance or Bridge Weight Rating
- Form TR-0030 Work Zone Category 1 Temporary Traffic Control Device Certificate of Crashworthiness
- Form TR-0405 Certification of Compliance with Americans with Disabilities Act (ADA)

### 5-101F Federal Forms
- Form FHWA-1391 Federal-Aid Highway Construction Contractors Annual EEO Report
- Form DOL SF-308 Request for Wage Determination and Response to Request

### 5-102 Organization of Project Documents

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Chapter 5  Contract Administration

Section 1  Project Records and Reports

5-101  Forms Used for Contract Administration

5-101A  General

One of the duties of the resident engineer is to keep accurate and complete records of the work.

This section includes a list of forms used in administering a construction project and maintaining records. Use forms not related directly to contract administration, such as personnel documents and accounting forms, in accordance with instructions contained in other Caltrans manuals.

The Division of Construction issues new or revised Construction forms. All Division of Construction forms have a prefix of CEM (Construction Engineering Management) and a number that is related to the form’s uniform filing system category. If an existing form no longer meets its intended purpose, refer to Section 1-004, “Changes,” of this manual.

Complete Form CEM-9001, “Construction Manual Proposed Change,” including your supervisor’s approval, and send it to the Division of Construction Publications Unit. Explain the reason for the proposed change and attach a draft of the proposed revised form.

The Division of Construction will review the proposed change and make a decision regarding any future revision. Not all forms issued by the Materials Engineering and Testing Services (METS) are listed in this manual. If a test method includes a specific form, contact METS. Forms issued by Structure are listed on the Structure Construction forms Onramp page.

5-101B  Construction Forms

All Division of Construction forms are available online at:

https://dot.ca.gov/programs/construction/forms

Following is a list and descriptions of the Division of Construction forms:

*Form CEM-0101  Resident Engineer’s Report of Assignment*

When assigned to a new project, the resident engineer will use this form to provide contact information. Distribute copies of the report according to instructions on the form and any district instructions.

It is not necessary or desirable to hold the form until all information is available. Submit partial information with a note that a supplemental form will follow.
Form CEM-0501  Relief from Maintenance
The resident engineer uses this form to recommend that the contractor be relieved from maintenance and responsibility in accordance with Section 5-1.38, “Maintenance and Protection Relief,” of the Standard Specifications. For more information refer to Section 3-520, “Maintenance and Protection Relief,” of this manual.

Form CEM-0602  Project Safety Program Statement
The resident engineer uses this form to list the sections of the Code of Safe Practices that apply to the project. This form may also be used to designate an employee as the project safety coordinator.

Form CEM-0603  Major Construction Incident Notification
The resident engineer uses this form to report major construction incidents. Instructions for completion are included on the last page of the form.

Form CEM-0604  Project Safety Review or Meeting
The form documents the project safety meeting before work begins, the project safety review, and the post-project safety meeting with the contractor’s designated project safety representative as discussed in Section 2-109, “Project Safety Reviews,” of this manual.

Form CEM-0606  Construction Safety Checklists
Construction safety staff use this form at least weekly to conduct safety reviews throughout the duration of the project to monitor the contractor’s compliance with safety regulations and specifications. It is also used for discussion in the every-other-week project safety review with the contractor.

Form CEM-1201  Subcontracting Request
The contractor submits this form and the resident engineer uses the form to calculate the percentage of work to be performed by the contractor. Section 3-5, “Control of Work,” of this manual describes the procedures. The resident engineer must sign this form before the contractor can begin on the applicable subcontracted work. Before approval, verify that subcontractors are not on the debarred contractors list on the California Department of Industrial Relations website:

http://www.dir.ca.gov/dlse/debar.html

Form CEM-1202A  Contractor Action Request—Change of Name/Address
The contractor submits this form to the resident engineer to request a change in the contractor’s name or address under the contract in accordance with Section 5-1.12, “Assignment,” of the Standard Specifications.
Form CEM-1202B Contractor Action Request—Assignment of Contract Monies, Assignee Change of Name/Address
The contractor submits this form to the resident engineer to request an assignment of monies, or an assignee’s change of name or address under the contract in accordance with Section 5-1.12, “Assignment,” of the Standard Specifications.

Form CEM-1203 Contractor Action Request—Assignment of Contract Performance
The original contractor or the contractor’s surety submits this form to the resident engineer in accordance with Section 5-1.12, “Assignment,” of the Standard Specifications.

Form CEM-1302 Project Positive Work Zone Protection Determination
This form is completed by the project engineer to document that a project complies with the policy for providing positive work zone protection. Refer to Design Information Bulletin 91, "Guidelines on the Use of Positive Work zone Protection (PWP) & Mitigation Measures."

Form CEM-1303 Positive Work Zone Protection Supplement
This form is completed by the resident engineer to document when an addition, revision or exception is required on a project for compliance with the policy for providing positive work zone protection. Refer to Design Information Bulletin 91, "Guidelines on the Use of Positive Work zone Protection (PWP) & Mitigation Measures."

Form CEM-1901 Burial Location of Soil Containing Aerially Deposited Lead
The contractor submits this form to the resident engineer at ADL@dot.ca.gov within 5 business days of completing placement of the material. The resident engineer reviews the information and retains the form in the construction project records.

Form CEM-1902 Burial Location of Soil Containing Naturally Occurring Asbestos
The contractor submits this form to the resident engineer at NOA@dot.ca.gov within 5 business days of completing placement of the material. The resident engineer reviews the information and retains the form in the construction project records.

Form CEM-1903 Burial Location of Soil Containing Aerially Deposited Lead (Topographic Survey)
The contractor submits this form to the resident engineer and by email to ADL@dot.ca.gov within 5 business days after topographic survey of the top at each location. The resident engineer reviews the information, retains the form in the construction project records and forwards the form to the District ADL Coordinator.
Form CEM-1904  Agreement Between a Contractor Working on State Facilities and a Real Property Owner for Disposing Construction Related Material on Commercial Zoned Property Owner’s Property

The contractor uses this form when Type Com material is being disposed of on an owner’s commercial zoned property. The contractor must submit this form to the resident engineer when taking ownership of materials and, by doing so, the contractor states that the property owner has been notified that the material being deposited contains lead with concentrations between 80 milligrams per kilogram (mg/kg) and 320 mg/kg and has received a copy of the information handout containing lead concentration data. The contractor further agrees to furnish to the resident engineer with all required permits, licenses, agreements, certifications, and clearances before placing material on the property. For more information, refer to Section 7-107B (2) “Regulated Material,” of this manual.

Form CEM-1905  Agreement Between a Contractor Working on State Facilities and a Real Property Owner for Disposing Construction Related Material on Residential Zoned Property Owner’s Property

The contractor uses this form when unregulated material is being disposed of on an owner’s residential zoned property. The contractor must submit this form to the resident engineer when taking ownership of materials and, by doing so, the contractor states that the property owner has been notified that the material being deposited contains lead with concentrations less than 80 mg/kg. The contractor further agrees to furnish to the resident engineer with all required permits, licenses, agreements, certifications, and clearances before placing material on the property.

Form CEM-1906  Agreement Between a Contractor Working on State Facilities and a Real Property Owner for Disposing Construction-Related Material Suitable for Use on Residential Zoned Property

The contractor uses this form when unregulated material is being disposed of on an owner’s residential zoned property. The contractor must submit this form to the resident engineer when taking ownership of materials and, by doing so, the contractor states that the property owner has been notified that the material being deposited contains lead with concentrations less than 80 mg/kg. The contractor further agrees to furnish to the resident engineer with all required permits, licenses, agreements, certifications, and clearances before placing material on the property. For more information, refer to Section 7-107B (1) “Unregulated Material,” of this manual.

Form CEM-2006  Legally Responsible Person Authorization of Approved Signatory

The district director submits this form and the resident engineer reviews the information for completeness and accuracy. File the form in the construction project records. Instructions are included on the last page of the form.
Form CEM-2006T  Legally Responsible Person Authorization of Approved Signatory—Lake Tahoe Hydrologic Unit

The district director submits this form to the California Regional Water Quality Control Board, as required by the Caltrans National Pollutant Discharge Elimination System (NPDES) permit. Instructions are included on the last page of the form.

Form CEM-2008  SWPPP/WPCP Amendment Certification and Acceptance

The resident engineer reviews this form for completeness and accuracy as submitted by the contractor, and files it in the construction project records. Instructions are included on the last page of the form.

Form CEM-2009  SWPPP/WPCP Amendments Log

The resident engineer reviews this form for completeness and accuracy as submitted by the contractor, and files it in the project files. Instructions are included on the last page of the form.

Form CEM-2023  Stormwater Training Record

The resident engineer reviews this form as submitted by the contractor, and files it in the project files. Instructions are included on the last page of the form.

Form CEM-2024  Stormwater Training Log—Optional

The resident engineer files this form, as filled out by the contractor, in the project files. Instructions are included on the last page of the form.

Form CEM-2030  Stormwater Site Inspection Report

The resident engineer fills out and files this form in the project records. Instructions are included on the last page of the form.

Form CEM-2031T  Daily Stormwater Site Inspection Report - Lake Tahoe Hydrologic Unit

The water pollution control manager submits this form to the resident engineer as required by the Lake Tahoe Hydrologic Unit Construction General Permit. Instructions are included on the last page of the form.

Form CEM-2032  Permanent Erosion Control Establishment (PECE) Report

The water pollution control manager submits this form to the resident engineer when a contract has a bid item for Permanent Erosion Control Establishment. The resident engineer reviews work descriptions, schedules, and associated change orders for compliance and payment. The resident engineer retains the form in the construction project records under the Storm Water Pollution Prevention Plan files.

The resident engineer files this form as filled out by the contractor, in the project files. Instructions are included on the form.

Form CEM-2035  Stormwater Corrective Actions Summary

The resident engineer files this form as filled out by the contractor, in the project files. Instructions are included on the last page of the form.

Form CEM-2035T  Stormwater Corrective Actions Summary – Lake Tahoe Hydrologic Unit

The water pollution control manager submits this form to the resident engineer as required by the Lake Tahoe Hydrologic Unit Construction General Permit. Instructions are included on the last page of the form.

Form CEM-2045  Rain Event Action Plan

The resident engineer files this form, as filled out by the contractor, in the project files. Instructions are included within the pages of the form.

Form CEM-2045T  Rain Event Action Plan—Lake Tahoe Hydrologic Unit

The resident engineer files this form, as filled out by the contractor, in the project files. Instructions are included within the pages of the form.

Form CEM-2051  Stormwater Sampling and Analysis Log—Optional

The resident engineer files this form, as filled out by the contractor, in the project files. Instructions are included on the last page of the form.

Form CEM-2052  Stormwater Sample Field Test Report/Receiving Water Monitoring Report

The resident engineer files this form, as filled out by the contractor, in the project files. Instructions are included on the last page of the form.

Form CEM-2058  Stormwater Meter Calibration Record—Specialty Meters

The resident engineer files this form, as filled out by the contractor, in the project files. Instructions are included on the last page of the form.

Form CEM-2061  Notice of Discharge Report

The resident engineer submits this form to the California Regional Water Quality Control Board, as required by the Caltrans NPDES permit. Instructions are included on the last page of the form.
Form CEM-2061T  Notice of Discharge Report—Lake Tahoe Hydrologic Unit
Stormwater Sample Field Test Report/Receiving Water Monitoring Report

This form is to be completed when the contractor, Caltrans, State Water Resources Control Board, or Regional Water Quality Control Board staff determines that stormwater discharges, authorized nonstormwater discharges, or nonauthorized, nonstormwater discharges will violate an applicable water quality standard. This form is submitted to the resident engineer. Instructions are included on the last page of the form.

Form CEM-2062  Numeric Action Level Exceedance Report

The resident engineer submits this form to the California Regional Water Quality Control Board, as required by the Caltrans NPDES permit. Instructions are included on the last page of the form.

Form CEM-2062T  Numeric Action Level Exceedance Report—Lake Tahoe Hydrologic Unit

The resident engineer submits this form to the California Regional Water Quality Control Board, as required by the Caltrans NPDES permit. Instructions are included on the last page of the form.

Form CEM-2063  Numeric Effluent Limitation Violation Report—ATS Discharges

The resident engineer submits this form to the California Regional Water Quality Control Board, as required by the Caltrans NPDES permit. Instructions are included on the last page of the form.

Form CEM-2063T  Numeric Effluent Limitation Violation Report—Lake Tahoe Hydrologic Unit

The resident engineer submits this form to the California Regional Water Quality Control Board, as required by the Caltrans NPDES permit. Instructions are included on the last page of the form.

Form CEM-2070  SWPPP/WPCP Annual Certification of Compliance

The resident engineer submits this form to the California Regional Water Quality Control Board, as required by the Caltrans NPDES permit. Instructions are included on the last page of the form.

Form CEM-2075  Project Stormwater Annual Report

This form is completed by the contractor and submitted to the resident engineer to document stormwater monitoring and training information required to prepare a Stormwater Annual Report each year for all SWPPP projects for more than three consecutive months. Instructions are included on the last page of the form.
Form CEM-2075T        Project Stormwater Annual Report–Lake Tahoe Hydrologic Unit

This form is completed by the contractor and submitted to the resident engineer to document stormwater monitoring and training information required to prepare a Stormwater Annual Report each year for all enrolled projects in the Lake Tahoe Hydrologic Unit for the period of October 16 of the previous year through October 15 of the current year. Instructions are included on the last page of the form.

Form CEM-20CC        Attachment CC, Water Pollution Control Best Management Practices List

The contractor’s water pollution control manager completes the form at different phases of the construction project to document the type and quantity of best management practices planned to prevent water pollution. Information in this form helps the water pollution control manager mobilize labor and coordinate necessary supplies. In addition, information in this form allows the stormwater inspector to fully understand the construction stage and anticipated quantity of best management practices in the field during the site visit.

Form CEM-20DAPP        Appendix D, Notification Log

Subcontractors and material suppliers must be notified of their responsibilities on the construction job site related to stormwater runoff pollution prevention. This form documents the stormwater pollution prevention notifications given to each subcontractor and material supplier.

Form CEM-20DCON        SWPPP/WPCP Attachment D, Contractor Personnel Training Record

Contractor personnel responsible for implementation of stormwater pollution prevention practices are required to be adequately trained in this field. Attachment D documents the training record of the contractor’s personnel. This form is included in the stormwater pollution prevention plan (SWPPP) and is updated as necessary.

Form CEM-20DSUB        SWPPP/WPCP Attachment D, Subcontractor Personnel Stormwater Training Record

Subcontractor personnel responsible for implementation of stormwater pollution prevention practices are required to be adequately trained in this field. Attachment D documents the training record of the subcontractor’s personnel. This form is included in the SWPPP and is updated as necessary.

Form CEM-20EE        SWPPP Attachment EE, Stormwater Sampling Locations

This form lists all potential water quality sampling locations within a project site during the course of construction. This form is prepared by the qualified SWPPP developer at the start of the project and is included in the SWPPP. Depending on the stage of construction and areas of disturbed soil activities, appropriate sampling
locations from this list are selected for sampling of the stormwater runoff or discharge.

**Form CEM-2101 COZEEP Daily Report**
The California Highway Patrol and Caltrans jointly use this form to report highway patrol resources used for the Construction Zone Enhanced Enforcement Program (COZEEP). Chapter 2, “Safety and Traffic,” of this manual further describes the use of the form.

**Form CEM-2102 COZEEP/MAZEEN Task Order**
The resident engineer uses this form to request highway patrol support for the Construction Zone Enhanced Enforcement Program. Additional use of this form is described in Chapter 2, “Safety and Traffic,” of this manual.

**Form CEM-2103 COZEEP/MAZEEN Cancellation Form**
The resident engineer uses this form to cancel any previously requested highway patrol support. Use of this form is described in Chapter 2, “Safety and Traffic,” of this manual.

**Form CEM-2210 Traffic Control Daily Report**
This form is to be completed by the certified traffic control technician assigned to the closure, to provide documentation on temporary traffic control system closures as required by, Section 12-4.02C(11), “Traffic Control Technician,” of the Standard Specifications.

**Form CEM-2301 Temporary Pedestrian Access Route Compliance Inspection Report**
The resident engineer uses this form to document initial inspection and Americans with Disabilities Act (ADA) compliance of a temporary pedestrian access route. For details, refer to Section 4-12, “Temporary Traffic Control,” of this manual.

**Form CEM-2302 Temporary Pedestrian Access Route Weekly Inspection Report**
The resident engineer uses this form to document weekly inspection and ADA compliance of a temporary pedestrian access route. For details, refer to Section 4-12, “Temporary Traffic Control,” of this manual.

**Form CEM-2303 Temporary Pedestrian Access Route Sidewalk Detour Inspection Report**
The resident engineer uses this form to document inspection and ADA compliance of a temporary pedestrian access route provided using an existing pedestrian route. For details, refer to Section 4-12, “Temporary Traffic Control,” of this manual.
Form CEM-2311 Temporary Pedestrian Access Route Contractor Compliance Report

The contractor uses this form to initially document that a temporary pedestrian access route is ADA compliant. For details, refer to Section 4-12, “Temporary Traffic Control,” of this manual.

Form CEM-2312 Temporary Pedestrian Access Route Contractor Weekly Report

The contractor uses this form to document weekly that a temporary pedestrian access route is ADA compliant. For details, refer to Section 4-12, “Temporary Traffic Control,” of this manual.

Form CEM-2401 Substitution Report for Disadvantaged Business Enterprise (DBE) or Underutilized Disadvantaged Business Enterprise (UDBE)

The contractor fills out and provides this form to the resident engineer who uses the information to authorize DBE subcontractor substitutions. Sections 3-8, “Prosecution and Progress,” and 8-3, “Disadvantaged Business Enterprises and Disabled Veteran Business Enterprises,” of this manual contain additional information on substituting subcontractors.

Form CEM-2402(F) Final Report—Utilization of Disadvantaged Business Enterprises (DBE), First-Tier Subcontractors

The contractor completes this form. The resident engineer certifies the form. It describes work performed and materials provided by disadvantaged business enterprise firms. Refer to Section 8-3, “Disadvantaged Business Enterprises and Disabled Veteran Business Enterprises,” of this manual for details.

Form CEM-2402(S) Final Report—Utilization of Disabled Veteran Business Enterprises (DVBE), State Funded Projects Only

The contractor fills out and certifies this form which describes work performed and materials provided by disabled veteran business enterprise firms. The resident engineer verifies the form. Refer to Section 8-3, “Disadvantaged Business Enterprises and Disabled Veteran Business Enterprises,” of this manual for details.

Form CEM-2403(F) Disadvantaged Business Enterprises (DBE) Certification Status Change

The contractor fills out and certifies this form. The resident engineer uses the form to verify the actual dollar amount paid to DBE subcontractors on federally funded projects that have a change in certification status during the course of the contract. Refer to Section 8-3, “Disadvantaged Business Enterprises and Disabled Veteran Business Enterprises,” of this manual for details.
Form CEM-2404(F)  Monthly DBE /UDBE Trucking Verification
The contractor must submit this form before the 15th of each month. It lists the dollar amount paid to the DBE trucking companies for truck work performed by DBE certified truckers and for any fees or commissions for non-DBE truckers used each month on the project. Instructions for filling out this form are on the last page of the form.

Form CEM-2405  Disabled Veteran Business Enterprise (DVBE) Substitution Request to the Department of General Services (DGS)
The resident engineer completes this form, attaches all DVBE substitution request documentation from the contractor, and sends to the headquarters Division of Construction labor compliance program manager. Instructions for filling out this form are on the last page of the form.

Form CEM-2406  Monthly Disadvantaged Business Enterprises (DBE) Payment
The contractor completes this form for labor compliance purposes on federally funded projects only. Refer to Section 8-1, “Labor Compliance,” of this manual for more information.

Form CEM-2407  Disadvantaged Business Enterprises Joint Check Agreement Request
This signed agreement between the contractor and Disadvantaged Business Enterprise (DBE) subcontractor tracks and monitors the use of joint checks, which are two-party checks to both parties sent to DBEs for the purchase of materials for use on the job. The agreement is provided to the resident engineer for inclusion in the project files.

Form CEM-2500  LCPtracker Vendor Access Request
The contractor uses this form to request a user account in the LCPtracker system. The contractor submits the completed form to the district labor compliance officer.

Form CEM-2501  Fringe Benefit Statement
The contractor completes this form for labor compliance purposes. Refer to Section 8-1, “Labor Compliance,” of this manual for more information.

Form CEM-2502  Contractor or Subcontractor Payroll
When it is requested, furnish this form to the contractor. It is used to fulfill the payroll submittal requirements of the contract. Refer to Section 8-1, “Labor Compliance,” of this manual for more information.
Form CEM-2503  Statement of Compliance  
The contractor may use this form for the required statement of compliance with payroll submittals. Refer to Section 8-1, “Labor Compliance,” of this manual for more information.

Form CEM-2504  Employee Interview: Labor Compliance/EEO  
Use this form to record information from interviews of contractors' employees. Directions for the interviewer are on the back of the form. Refer to Section 8-1, “Labor Compliance,” of this manual for more information.

Form CEM-2504 (Spanish), Entrevista de Empleado: Cumplimiento Laboral/IOE  
Same as previous form, printed in Spanish.

Form CEM-2506  Labor Compliance—Wage Violation  
The district labor compliance officer uses this form to document labor compliance wage violations. Refer to Section 8-1, “Labor Compliance,” of this manual for more information.

Form CEM-2507  Labor Violation: Case Summary  
The district labor compliance officer uses this form in conjunction with Form CEM-2506 to summarize labor violation cases. Refer to Section 8-1, “Labor Compliance,” of this manual for more information.

Form CEM-2508  Contractor Payroll Source Document Audit Summary  
The district labor compliance officer uses this form to document the verification of the contractor's payroll source document audit. Refer to Section 8-1, “Labor Compliance,” of this manual for more information.

Form CEM-2509  Checklist—Source Document Audit  
The district labor compliance officer uses this form during the contractor's payroll source document audit. Refer to Section 8-1, “Labor Compliance,” of this manual for more information.

Form CEM-2601  Construction Progress Chart  
The resident engineer maintains this form for each project. Refer to Section 3-8, “Prosecution and Progress,” of this manual for details.

Form CEM-2701  Weekly Statement of Working Days  
The resident engineer uses this form to track contract time on construction contracts. The last page of the form and Section 3-8, “Prosecution and Progress,” of this manual contain instructions for filling out the Weekly Statement of Working Days.
**Form CEM-2702  Overrun in Contract Time**
The Division of Construction may use this form to grant time adjustments after contract time has elapsed. For more information, refer to Section 3-8, “Prosecution and Progress,” of this manual.

**Form CEM-3101  Notice of Materials to Be Used**
The contractor must use this form to list all materials to be used on the project. Refer to Section 6-2, “Acceptance of Manufactured or Fabricated Material and Products,” of this manual for details on the use of the form. Instructions to the contractor are on the last page of the form.

**Form CEM-3501  Hot Mix Asphalt Production Report**
The plant inspector uses this form to document daily hot mix asphalt production processes and report any plant, material, and production deficiency to the resident engineer.

**Form CEM-3502  Hot Mix Asphalt Placement Report**
The paving inspector uses this form to document daily hot mix asphalt placement processes and report any material and construction deficiencies to the resident engineer.

**Form CEM-3511  Contractor Job Mix Formula Proposal**
The contractor uses this form to submit to the resident engineer, before the work begins, the hot mix asphalt mix formula tested for intended use on the project. The form states job mix formula target values for aggregate sieves and the percent of asphalt binder, as well as source information for all materials.

**Form CEM-3512  Contractor Hot Mix Asphalt Design Data**
The contractor uses this form to document the testing data developed by the mix design laboratory. Refer to Section 4-39, “Asphalt Concrete,” of this manual for more information.

**Form CEM-3513  Caltrans Hot Mix Asphalt Verification**
Caltrans verifies that the proposed job mix formula complies with the specifications on this form. The resident engineer signs and returns the form to the contractor. Refer to Section 4-39, “Asphalt Concrete,” of this manual for more information.

**Form CEM-3514  Contractor Job Mix Formula Renewal**
The contractor submits test results for renewal of hot mix asphalt job mix formula on this form to the resident engineer. When the test results indicate that the sampled and tested hot mix asphalt complies with the specifications, the resident engineer requests the district materials laboratory perform hot mix asphalt verification testing. Refer to Section 4-39, “Asphalt Concrete,” of this manual for more information.
Form CEM-3701 Test Result Summary
The resident engineer must use this form to summarize acceptance tests frequency and results on each material. The form is also used to record dates for sampling, date shipped to laboratory, test result transmission to the resident engineer, and contractor notification of test result. Refer to Category 37, "Initial Tests and Acceptance Tests," in Section 5-102, "Organization of Project Documents," of this manual for details.

Form CEM-3702 Relative Compaction Summary
The resident engineer may use this form to summarize compaction test results in the same manner that Form CEM-3701 is used for other tests.

Form CEM-3703 Caltrans Production Start-Up Evaluation
The resident engineer uses this form to record the testing results at the beginning of production. Refer to Section 4-39, "Asphalt Concrete," of this manual for more information.

Form CEM-3736 Pavement Smoothness Inertial Profiler Submittal Record
The quality control manager submits this form to the resident engineer and the Caltrans secure file sharing system along with specified profiling information within 2 business days of profiling. The resident engineer reviews the information and retains the form in the construction project records.

Form CEM-3736AC Asphalt Concrete Pavement Smoothness Corrections Information
The contractor submits this form to the resident engineer and the Caltrans secure file sharing system along with their final profiling information within 5 business days of profiling. The resident engineer reviews the information and retains the form in the construction project records.

Form CEM-3736C Concrete Pavement Smoothness Corrections Information
The contractor submits this form to the resident engineer and the Caltrans secure file sharing system along with their final profiling information within 5 business days of profiling. The resident engineer reviews the information and retains the form in the construction project records.

Form CEM-3801 Request for Assignment of Inspectors, Samplers, and Testers
The contractor uses this form to submit the names of quality control staff for hot mix asphalt projects using the quality control, quality assurance (QCQA) process.
Form CEM-3802  Quality Control Inspector Affidavit of Proficiency
The contractor uses this form to document the hot mix asphalt experience and training of proposed hot mix asphalt quality control inspectors for projects using the QCQA process.

Form CEM-3803  Daily Summary of Quality Control Testing
The contractor uses this form to provide a summary of quality control test results for each day that hot mix asphalt is placed on a QCQA process project.

Form CEM-3804  Hot Mix Asphalt Inspection and Testing Summary
The contractor uses this form to provide a checklist that shows the inspections and testing for each day that hot mix asphalt is placed on a QCQA process project. The contractor’s quality control manager must document on this form deviations from the specifications or regular practices and certify that the information, tests, or calculations, comply with the contract specifications.

Form CEM-3810  Construction Grade Checking Report
The contractor uses this form to conduct quality control for different types of grades during construction; the resident engineer conducts grade verification and acceptance for grades.

Form CEM-4101  Materials Release Summary
The resident engineer uses this form to summarize the materials released by METS and materials inspected at the job site.

Form CEM-4102  Material Inspected and Released on Job
The resident engineer uses this form to list certain materials that may arrive on the job site without a Form TL-0029, “Report of Inspection of Material.” Refer to Section 6-3, “Field Tests,” of this manual for details.

Form CEM-4202  Material Plant Safety Checklist
The material plant inspector uses this form when checking a material plant for safety.

Form CEM-4401  Solid Waste Disposal and Recycling Report
The contractor completes and certifies the information reported on this form. The resident engineer reviews then submits the authorized form to the district recycling coordinator with a copy to the statewide recycling coordinator in headquarters Division of Design. The use of this form is described in Section 7-109, “Solid Waste Disposal and Recycling Reporting,” of this manual.
Form CEM-4403 Recycled Materials Report
The form is completed by the contractor to document the recycled materials that were incorporated into the contract. This form documents the recycling of materials to comply with SB-1 Section 2030 (c).

Form CEM-4410 Crumb Rubber Usage Report
The contractor submits this form monthly to the resident engineer and email address CRM@dot.ca.gov. The resident engineer reviews the information and verifies paid quantities and contractor submittal of form to email address. Instructions to the contractor and resident engineer are on the last pages of the form. Refer to Section 7-108, “Crumb Rubber Usage Reporting,” of this manual for more information.

Form CEM-4501 Resident Engineer’s Daily Report/Assistant Resident Engineer’s Daily Report
The resident engineer and assistant resident engineers use this form to record project activities daily. For more information, refer to Section 5-0, “Conduct of the Work,” of this manual.

Form CEM-4601 Assistant Resident Engineer’s Daily Report
Assistant resident engineers use this form to record daily individual contract item activity. It is also used to record extra work activity and to verify contractor’s personnel listed on payrolls. For more information refer to Section 5-0, “Conduct of the Work,” of this manual.

Form CEM-4701 Drainage System Summary
The resident engineer and assistant resident engineers use this form to record progress and summarize activity on drainage contract items. Refer to Category 47, “Drainage Systems,” in Section 5-102, “Organization of Project Documents,” of this manual for details.

Form CEM-4801 Quantity Calculations
The resident engineer and assistant resident engineers use this form for the basic source document for most contract item quantity calculations.

Form CEM-4900 Change Order
The resident engineer uses this form for change orders. Refer to Section 5-3, “Change Orders,” of this manual for information about change orders.

Form CEM-4901 Change Order Input
The resident engineer and assistant resident engineers use this form to input change orders for the project record and estimate data. Refer to Section 5-103D, “Change Orders,” of this manual for details.
Form CEM-4902 Extra Work Bill (Short Form)
The contractor uses this form for billing extra work. Details for use are on the last page of the form and are included in Section 5-103E, “Change Order Billing,” of this manual. The resident engineer may authorize contractor-designed forms. With prior approval from the Division of Construction, the contractor may submit change order bill data on a computer report identical to this form for all Caltrans projects.

Form CEM-4902A Extra Work Bill—Title Page
The contractor uses this form for billing extra work. It is the first page of the four-part change order bill. It identifies the project, change order number, method of payment, and performer of work. This form also provides for manual calculation of the bill. Details for use are on the last page of the form and are included in Section 5-103E, “Change Order Billing,” of this manual. The resident engineer may authorize contractor-designed forms. With prior approval from the Division of Construction, the contractor may submit change order bill data on a computer report identical to this form for all Caltrans projects.

Form CEM-4902B Extra Work Bill—Labor Charges
Contractors use this form for billing extra work. It is used to enter labor charges and other expense subject to labor markup. Details for use are on the last page of the form and are included in Section 5-103E, “Change Order Billing,” of this manual. The resident engineer may authorize contractor-designed forms. With prior approval from the Division of Construction, the contractor may submit change order bill data on a computer report identical to this form for all Caltrans projects. This form is used with Form CEM-4902A, “Extra Work Bill—Title Page.”

Form CEM-4902C Extra Work Bill—Equipment Charges
The contractor uses this form to enter equipment charges to the change order bill. Instructions for use are on the second page of the form and are included in Section 5-103E, “Change Order Billing,” of this manual. The resident engineer may authorize contractor-designed forms. With prior approval from the Division of Construction, the contractor may submit change order bill data on a computer report identical to this form for all Caltrans projects. This form is used with Form CEM-4902A, “Extra Work Bill—Title Page.”

Form CEM-4902D Extra Work Bill—Material Charges
The contractor uses this form for billing extra work. It is used to enter material charges to the change order bill. Details for use are on the last page of the form and are included in Section 5-103E, “Change Order Billing,” of this manual. The resident engineer may authorize contractor-designed forms. With prior approval from the Division of Construction, the contractor may submit change order bill data on a computer report identical to this form for all Caltrans projects. This form is used with Form CEM-4902A.
Form CEM-4903  Change Order Memorandum
The resident engineer uses this form in conjunction with Form CEM-4900, “Change Order,” to report the necessary engineering and administrative data relative to the change. Refer to Section 5-3, “Change Orders,” of this manual for details.

Form CEM-4904  Caltrans Authorization for Using Internet Extra Work Bill System
The resident engineer completes this form, outlining contract markups and change order bill roles, to authorize Caltrans staff access to the Caltrans Internet Extra Work Bill (iEBW) system. The resident engineer submits the form, along with completed Form CEM-4905 from the contractor, to the appropriate iEBW district administrator.

Form CEM-4905  Contractor Authorization for Using Internet Extra Work Bill System
The contractor furnishes the resident engineer with daily reports of any extra work as required in Section 5-1.27D, “Cost Accounting Records,” of the Standard Specifications. The prime contractor completes this form for authority to use the internet to submit change order bills. The contractor submits this form, usually at the preconstruction meeting, to the resident engineer or to the managing partner if the contract is a joint venture. Required change order bill training and the iEBW website provide additional information at:

http://www.dot.ca.gov/hq/construc/iewb/

Form CEM-4906  Internet Extra Work Bill (iEBW) User Account Request Form
The contractor uses this form after completing the Internet Extra Work Billing (iEBW) system training to request a user account in the iEBW system. The contractor submits the completed form to the resident engineer for approval. The resident engineer submits the form to the appropriate iEBW district administrator for processing.

Form CEM-4907  Tentative Daily Extra Work Agreement
The resident engineer and assistant resident engineers use this form to record daily labor, equipment, and materials used on work paid at force account that has been authorized through an approved change order. Signatures by both Caltrans and contractor representatives signify tentative agreement on the extra work to avoid potential disagreements with later billing and payment.

Form CEM-4910  Value Engineering Change Proposal Submittal
The contractor uses this form to submit a value engineering change proposal submittal for the Department’s consideration. For details on the use of this form, refer to Section 3-405, “Value Engineering,” of this manual.
Form CEM-4911  Value Engineering Change Proposal
       Acceptance/Rejection
The resident engineer uses this form to document the outcome of each value
engineering change proposal submittal. For details on the use of this form, refer to
Section 3-405, “Value Engineering,” of this manual.

Form CEM-5101  Request for Payment for Materials on Hand
The contractor uses this form to request payment for materials on hand. Instructions
for the form and administrative procedures are covered in Section 3-9, “Payment,” of
this manual.

Form CEM-5105  Materials on Hand Summary
The resident engineer uses this form to track, authorize, and document payments for
materials on hand. Instructions for the form and administrative procedures are
covered in Section 3-9, “Payment,” of this manual.

Form CEM-5500  Partnering Facilitator Registration
The facilitator applicant to the Caltrans Partnering Program must submit this
registration form to the resident engineer and email address
Partnering.Program@dot.ca.gov before performing any work. The form must be
submitted for each Caltrans project on which the facilitator participates.

Form CEM-5501  Partnering Facilitator Evaluation—Kick-Off
The resident engineer uses this form to gather project team evaluations of the
partnering facilitator’s performance following the kick-off partnering workshop when
partnering is implemented on a Caltrans construction project.

Form CEM-5502  Partnering Facilitator Evaluation—Closeout
The resident engineer uses this form to gather project team evaluations of the
partnering facilitator’s performance following the close-out partnering workshop.

Form CEM-5773  Americans with Disabilities Act (ADA) Project
       Compliance Certification
The resident engineer uses this form to certify ADA construction compliance of the
project’s pedestrian facilities. For details on the use of this form, refer to Section 4-73,
“Concrete Curbs and Sidewalks,” of this manual.

Form CEM-5773ADE  Curb Ramp (Case A, D, or E) Americans with Disabilities
       Act (ADA) Compliance Inspection Report
The resident engineer uses this form to document inspection and ADA compliance
of Case A, D or E curb ramps. For details on the use of this form, refer to Section 4-73,
“Concrete Curbs and Sidewalks,” of this manual.
Form CEM-5773B Curb Ramp (Case B) Americans with Disabilities Act (ADA) Compliance Inspection Report

The resident engineer uses this form to document inspection and ADA compliance of Case B curb ramps. For details on the use of this form, refer to Section 4-73, “Concrete Curbs and Sidewalks,” of this manual.

Form CEM-5773C Curb Ramp (Case C) Americans with Disabilities Act (ADA) Compliance Inspection Report

The resident engineer uses this form to document inspection and ADA compliance of Case C curb ramps. For details on the use of this form, refer to Section 4-73, “Concrete Curbs and Sidewalks,” of this manual.

Form CEM-5773CH Curb Ramp (Case CH) Americans with Disabilities Act (ADA) Compliance Inspection Report

The resident engineer uses this form to document inspection and ADA compliance of Case CH curb ramps. For details on the use of this form, refer to Section 4-73, “Concrete Curbs and Sidewalks,” of this manual.

Form CEM-5773CM Curb Ramp (Case CM) Americans with Disabilities Act (ADA) Compliance Inspection Report

The resident engineer uses this form to document inspection and ADA compliance of Case CM curb ramps. For details on the use of this form, refer to Section 4-73, “Concrete Curbs and Sidewalks,” of this manual.

Form CEM-5773DW Sidewalk at Driveway Americans with Disabilities Act (ADA) Compliance Inspection Report

The resident engineer uses this form to document inspection and ADA compliance of sidewalks at driveways. For details on the use of this form, refer to Section 4-73, “Concrete Curbs and Sidewalks,” of this manual.

Form CEM-5773FG Curb Ramp (Case F or G) Americans with Disabilities Act (ADA) Compliance Inspection Report

The resident engineer uses this form to document inspection and ADA compliance of Case F or G curb ramps. For details on the use of this form, refer to Section 4-73, “Concrete Curbs and Sidewalks,” of this manual.

Form CEM-5773NSPL Curb Ramp (Non-Standard Plan - Parallel) Americans with Disabilities Act (ADA) Compliance Inspection Report

The resident engineer uses this form to document inspection and ADA compliance of non-standard plan, parallel curb ramps. For details on the use of this form, refer to Section 4-73, “Concrete Curbs and Sidewalks,” of this manual.
**Form CEM-5773NSPP**  
**Curb Ramp (Non-Standard Plan - Perpendicular) Americans with Disabilities Act (ADA) Compliance Inspection Report**

The resident engineer uses this form to document inspection and ADA compliance of non-standard plan, perpendicular curb ramps. For details on the use of this form, refer to Section 4-73, “Concrete Curbs and Sidewalks,” of this manual.

**Form CEM-5773P**  
**Parking Americans with Disabilities Act (ADA) Compliance Inspection Report**

The resident engineer uses this form to document inspection and ADA compliance of accessible parking facilities. For details on the use of this form, refer to Section 4-73, “Concrete Curbs and Sidewalks,” of this manual.

**Form CEM-5773PW**  
**Passageway Americans with Disabilities Act (ADA) Compliance Inspection Report**

The resident engineer uses this form to document inspection and ADA compliance of passageways. For details on the use of this form, refer to Section 4-73, “Concrete Curbs and Sidewalks,” of this manual.

**Form CEM-5773SW**  
**Sidewalk Americans with Disabilities Act (ADA) Compliance Inspection Report**

The resident engineer uses this form to document inspection and ADA compliance of sidewalks. For details on the use of this form, refer to Section 4-73, “Concrete Curbs and Sidewalks,” of this manual.

**Form CEM-5803A**  
**Electrical System Inspection Checklist**

The resident engineer uses this form to document that all components in an electrical system have been inspected and comply with the contract requirements. One form needs to be completed for each electrical system.

**Form CEM-5803B**  
**Detector Loop Inspection Checklist**

The resident engineer uses this form to document that all detector loops in an electrical system have been tested and comply with the contract requirements. One form needs to be completed for each electrical system.

**Form CEM-5819A**  
**Cable Verification Worksheet**

The contractor uses this form to document that each fiber-optic cable delivered to the job site has been tested, before installation, and complies with the contract requirements. One form needs to be completed per cable.

**Form CEM-5819B**  
**Segment Verification Worksheet**

The contractor uses this form to document that each fiber-optic segment installed has been tested, before splicing, and complies with the contract requirements. One form needs to be completed per segment.
Form CEM-5819C Link Loss Budget Worksheet
The contractor uses this form to document that each fiber-optic link has been tested, before equipment is connected, and complies with the contract requirements. One form needs to be completed per link.

Form CEM-6003 Progress Pay—Estimate Project Initiation or Update
The resident engineer uses this form to add new information or to change information in the Contract Administration System (CAS). For details refer to Section 5-103B, “Project Initiation and Update,” of this manual.

Form CEM-6004 Contract Transactions Input
The resident engineer uses this form to input estimate data into CAS for the project record and estimate. Refer to Section 5-103C, “Contract Transactions,” of this manual for details.

Form CEM-6101 Project Record—Estimate Request
The resident engineer uses this form to request that an estimate be run. Refer to Section 5-103F (1), “Procedure,” of this manual for details.

Form CEM-6200 Candidate Application for Dispute Resolution Board (DRB) Member/Dispute Resolution Advisor (DRA)
Application to become a member of a dispute resolution board or become a dispute resolution advisor for Caltrans projects, listing qualifications and expertise.

Form CEM-6201 Notice of Potential Claim
The contractor uses this form to submit notices of potential claims to the resident engineer. For details on the use of this form, refer to Section 5-4, “Disputes,” of this manual.

Form CEM-6201A Initial Notice of Potential Claim
The contractor uses this form to submit an early notice of a potential claim issue. For details on the use of this form, refer to Section 5-4, “Disputes,” of this manual.

Form CEM-6201B Supplemental Notice of Potential Claim
The contractor uses this form to submit a detailed description along with the necessary attachments of the nature, circumstances, and estimated costs of a potential claim as a follow up to Form CEM-6201A, “Initial Notice of Potential Claim.”

Form CEM-6201C Full and Final Documentation of Potential Claim
The contractor uses this form to submit a complete documentation of a potential claim after completion of the work for which Forms CEM-6201A and CEM-6201B have been submitted. For details on the use of this form, refer to Section 5-4, “Disputes,” of this manual.
**Form CEM-6201D  Initial Potential Claim Record**
The contractor uses this form to detail the nature and circumstances of the potential claim. For details on the use of this form, refer to Section 5-4, “Disputes,” of this manual.

**Form CEM-6201E  Supplemental Potential Claim Record**
The contractor uses this form to detail the potential claim and cost associated with the claim. For further details on the use of this form, refer to Section 5-4, “Disputes,” of this manual.

**Form CEM-6201F  Full and Final Potential Claim Record**
The resident engineer uses this form to document the circumstances and costs associated with the potential claim. For details on the use of this form, refer to Section 5-4, “Disputes,” of this manual.

**Form CEM-6202  Dispute Resolution Board Establishment Report**
The Dispute Resolution Board (DRB) chair shall complete this form upon establishing the DRB and email it to the resident engineer and the alternative dispute resolution (ADR) engineer at ADR.Engineer@dot.ca.gov. For details on the use of this form, refer to Sections 3-522, “Alternative Dispute Resolution Processes” and 5-4, “Disputes,” of this manual.

**Form CEM-6203  Dispute Review Board (DRB) Update Report**
The resident engineer completes and submits this form to the Division of Construction yearly beginning on the anniversary of the contract first working day. For details on the use of this form, refer to Section 5-4, “Disputes,” of this manual.

**Form CEM-6204  Dispute Resolution Board (DRB) —Dispute Meeting Report**
The Dispute Resolution Board (DRB) chair shall complete Sections 1 through 5 of this form within 35 days of the dispute meeting and email it to the resident engineer and the alternative dispute resolution (ADR) engineer at ADR.Engineer@dot.ca.gov. The resident engineer shall complete Section 6 of this form and email to ADR.Engineer@dot.ca.gov. Section 7 is for DRB chair and resident engineer’s comments. For details on the use of this form, refer to Sections 3-522, “Alternative Dispute Resolution Processes” and 5-4, “Disputes,” of this manual.

**Form CEM-6205  Dispute Review Board (DRB) Completion Report**
The resident engineer completes and submits this form to the Division of Construction 30 days after receipt of the contractor’s exceptions to the proposed final estimate. For details on the use of this form, refer to Section 5-4, “Disputes,” of this manual.
Form CEM-6206  
**Dispute Resolution Advisor—Establishment Report**

The Dispute Resolution Advisor (DRA) shall complete this form upon establishing the DRA and email it to the resident engineer and the alternative dispute resolution (ADR) engineer at ADR.Engineer@dot.ca.gov. For details on the use of this form, refer to Sections 3-522, “Alternative Dispute Resolution Processes” and 5-4, “Disputes,” of this manual.

Form CEM-6207  
**Dispute Resolution Advisor (DRA)—Dispute Meeting Report**

The Dispute Resolution Advisor (DRA) shall complete Sections 1 through 5 of this form within 15 days of the dispute meeting and email it to the resident engineer and the alternative dispute resolution (ADR) engineer at ADR.Engineer@dot.ca.gov. The resident engineer shall complete Section 6 of this form and email to ADR.Engineer@dot.ca.gov. Section 7 is for DRA and resident engineer's comments. For details on the use of this form, refer to Sections 3-522, “Alternative Dispute Resolution Processes” and 5-4, “Disputes,” of this manual.

Form CEM-6208  
**Dispute Resolution Ladder Establishment**

As an option, the resident engineer completes and submits this form to the Division of Construction to document the levels of authority consulted. For details on the use of this form, refer to Section 5-4, “Disputes,” of this manual.

Form CEM-6209  
**Elevation of a Dispute**

As an option, the resident engineer completes and submits this form to the Division of Construction to assist in defining the dispute before elevating it to the next level. For details on the use of this form, refer to Section 5-4, “Disputes,” of this manual.

Form CEM-6210  
**Alternative Dispute Resolution—Progress Meeting Report**

The dispute resolution board chair or the dispute resolution advisor complete Sections 1 through 8 of this form within 10 days of a meeting and email it to the resident engineer, contractor, and alternative dispute resolution (ADR) engineer at ADR.Engineer@dot.ca.gov. The resident engineer and contractor shall complete Section 9 of this form and email to the alternative dispute resolution (ADR) engineer at ADR.Engineer@dot.ca.gov.

Form CEM-6220  
**Dispute Resolution Board (DRB) Member/Dispute Resolution Advisor (DRA) Resume**

DRB members/DRAs must submit this form whenever changes occur to current employment, ongoing consulting services, or when approved as a DRB member or as a DRA by the parties (Caltrans and the contractor). Submit the completed electronic form (PDF File) to ADR.Engineer@dot.ca.gov. Approved DRB members and DRAs list their credentials, which are filed with Caltrans for use in disputes that would benefit from their work experience and expertise.
Form CEM-6301  Contract Acceptance
The resident engineer uses this form to document acceptance and the various quantities delivered by the contract. Instructions are on the back of the form. For details on the use of this form, refer to Section 3-523B, “Contract Acceptance,” of this manual.

The district does not need to fax a copy of Form CEM-6301, “Contract Acceptance,” to the Division of Construction. If there is a federal number on the form, the district estimate desk makes a copy of the form and, at the end of each month, collects and sends these copies to the Caltrans Office of Federal Resources, MS-24.

Form CEM-6302  Final Materials Certification
The resident engineer uses this form to document that tests on acceptance samples indicate the materials incorporated in the construction work, and the construction operations controlled by sampling and testing, were in conformity with the authorized plans and specifications.

Form CEM-6303  Final Acceptance Checklist for Federal-Aid Projects of Division Interest (PODI)
The resident engineer uses this form to document project status for the Federal Highway Administration (FHWA) and to help with the final vouchering process once the final estimate is produced.

Form CEM-9001  Construction Manual Proposed Change
Caltrans personnel or external stakeholders may use this form to submit a recommendation for a change to the Construction Manual. Completed forms with supervisor approval and attachments, if applicable, should be sent to the Division of Construction, Publications Unit email: Construction.Publications@dot.ca.gov.

Form OFG-1 Oversight Resident Engineer’s Preconstruction Checklist
The resident engineer uses this form to document contacts within the local agency where the work is being performed. For further details on use of this form, refer to Section 3.1.7, “Oversight Resident Engineer Files,” of the Oversight Resident Engineer Guidelines.

Form OFG-2 Local Agency and Oversight Resident Engineer Preconstruction Conference Checklist
The resident engineer uses this form to document general project conditions at the preconstruction meeting with the contractor. For details on use of this form, refer to Section 3.1.7, “Oversight Resident Engineer Files,” of the Oversight Resident Engineer Guidelines.
**Form OFG-3 Local Agency Resident Engineer Contract Provisions Checklist**
The resident engineer uses this form to document state and federal requirements with the contractor. For details on use of this form, refer to Section 3.1.7, “Oversight Resident Engineer Files,” of the *Oversight Resident Engineer Guidelines*.

**Form OFG-4 Oversight Resident Engineer's Construction Contract Administration Verification Checklist**
The resident engineer uses this form to document the contract administration activities required on the project. For details on use of this form, refer to Section 3.1.7, “Oversight Resident Engineer Files,” of the *Oversight Resident Engineer Guidelines*.

**Form OFG-5 Federal-Aid Projects of Division Interest**
The resident engineer uses this form to document federal-aid requirements for the project. For details on use of this form, refer to Section 3.1.7, “Oversight Resident Engineer Files,” of the *Oversight Resident Engineer Guidelines*.

**Form OFG-6 Final Acceptance Checklist for Caltrans Oversight Projects**
The resident engineer uses this form to document that all required procedures have been performed on the project. For details on use of this form, refer to Section 3.1.7, “Oversight Resident Engineer Files,” of the *Oversight Resident Engineer Guidelines*.

**Form PM-S-0110 Safety Meeting Report**
The construction engineer or resident engineer must use this form to document a tailgate safety meeting with all employees to discuss the project and potential safety issues that may arise from contractor operations.

5-101C **Materials Engineering and Testing Services Forms**
Structural Materials, under Materials Engineering and Testing Services (METS), is responsible for TL forms. Find some forms under Engineering Services’ Testing and Technology Services link at:

[http://cefs2.dot.ca.gov/jsp/forms.jsp](http://cefs2.dot.ca.gov/jsp/forms.jsp)

**Form MR-0518 Job Cement Samples Record**
The resident engineer uses this form to submit cement samples for testing. Instructions for the use of this form are found in Section 6-2, “Acceptance of Manufactured or Fabricated Material and Products,” of this manual.

**Form TL-0015 Quality Assurance—Nonconformance Report**
METS uses this form when METS personnel discover that structural material or quality control procedures do not meet specific contract requirements. METS sends a copy to the resident engineer.
Form TL-0016  Quality Assurance—Nonconformance Resolution
METS uses this form to document the resolution to an outstanding Form TL-0015. METS sends a copy to the resident engineer.

Form TL-0028  Notice of Materials to Be Inspected at Job Site
METS uses this form to assign inspection duties. METS sends a copy to the resident engineer.

Form TL-0029  Report of Inspection of Material
METS uses this form to confirm that material has been inspected, and the inspector has attached inspection release tags or other means of identification. METS sends a copy to the resident engineer, who compares it with inspection tags or markings on delivered materials.

Form TL-0038  Inspection Request
METS uses this form to document requests by the vendor or fabricator for bid items that require inspection.

Form TL-0101  Sample Identification Card
The resident engineer uses this form to submit samples to METS or district materials laboratories for testing materials other than field samples of concrete (compressive strength) and cement samples.

Form TL-0502  Field Sample of Portland Cement Concrete Sample Card
The resident engineer uses this form to submit compressive strength samples of concrete. Refer to Section 6-3, “Field Tests,” of this manual for details on marking of samples.

Form TL-0608  Notice of Materials to be Furnished
METS uses this form to inform all parties that METS will inspect and release material before it’s sent to the job site. TL-0038, “Inspection Request,” is included with the TL-0608 that is sent to the vendor and fabricator.

Form TL-0624  Inspection Release Tag
When a METS inspector has inspected material, the inspector will attach this form with lot numbers, inspector’s initials, and date of inspection. When it is not feasible to attach tags, the METS inspector will mark lot numbers on the material.

Form TL-0625  Materials Suitability Tag
METS uses this form to verify that a quality assurance inspector has inspected the material and released it to the job site. A blue tag attached to the material includes the contract number, state lot number, blue tag number, inspector’s initials, and date of inspection. When it is not feasible to attach tags, the METS inspector will mark lot numbers on the material.
Form TL-0649  Report of Materials on Hand
METS uses this form to verify that material has been inspected and is in acceptable condition. Refer to Section 3-9, “Payment,” of this manual for details.

Form TL-6013 Toll  Material Suitability Documentation Report
METS structural material representative, in consultation with the resident engineer and design staff as needed, completes this form. The form documents the decision to release material that is tagged with TL-0625 and is listed in TL-6014.

Form TL-6014  Material Suitability Report
This form is completed by the METS quality assurance inspector and is used to list the material to be released with TL-0625. The report includes material description, blue tag number, and description of conformance.

Form TL-6037  Fabrication Progress Report
METS uses this form to notify resident engineers of progress being made on fabrication of various items. Refer to Section 3-9, “Payment,” of this manual for details.

Some METS forms can be found at the Caltrans Electronic Forms System’s website:
http://cefs.dot.ca.gov/jsp/forms.jsp

5-101D  Other State Forms
Following are state forms used in contract administration that are not issued by the Division of Construction or METS. They are available on the Caltrans Electronic Forms System’s website:
http://cefs.dot.ca.gov/jsp/forms.jsp

Form DPD-3013  Request for Construction Staking
The contractor uses this form to request construction staking. The resident engineer and the survey party chief add information to the request. It serves as a record of construction staking and any charges to the contractor for restaking. For information on construction surveys and use of the form, refer to Chapter 12, “Construction Surveys,” of the Caltrans Surveys Manual.

Form LA-17  Report of Chemical Spray Operations
The contractor uses this form to submit the required weekly pesticide application report. Refer to Section 4-2002C (2), “Pesticides,” of this manual for details.

5-101E  Traffic Operations Forms
The following forms from the Division of Traffic Operations are at:
http://cefs2.dot.ca.gov/jsp/forms.jsp
Form TR-0019   Notice of Change in Clearance or Bridge Weight Rating
The resident engineer uses this form to report permanent changes to vertical or horizontal clearance for vehicular traffic or permanent changes in bridge permit ratings on divided roadways. Refer to Section 3-703B, “Permanent Clearance and Bridge Permit Rating Changes,” of this manual for details.

Form TR-0020   Notice of Change in Vertical or Horizontal Clearance
The resident engineer uses this form to report permanent changes to vertical or horizontal clearance for vehicular traffic. Refer to Section 3-703B, “Permanent Clearance and Bridge Permit Rating Changes,” of this manual for details.

Form TR-0029   Notice of Change in Clearance or Bridge Weight Rating
The resident engineer uses this form to report permanent changes to vertical or horizontal clearance for vehicular traffic or permanent changes in bridge permit ratings on undivided roadways. Refer to Section 3-703B, “Permanent Clearance and Bridge Permit Rating Changes,” of this manual for details.

Form TR-0030   Work Zone Category 1 Temporary Traffic Control Device Certificate of Crashworthiness
The resident engineer provides this standard form to the contractor for them to self-certify the Category 1 temporary traffic control devices used on the contract. Refer to Section 4-1202B, “Temporary Traffic Control Devices” of this manual for details.

Form TR-0405   Certification of Compliance with Americans with Disabilities Act (ADA)
The resident engineer uses this form to certify compliance with ADA standards prior to and after construction. Refer to Design Information Bulletin 82-06 at the website:
https://dot.ca.gov/programs/design/design-information-bulletins-dibs

5-101F  Federal Forms
Following is a list of some federal forms that are used in contract administration. Obtain the forms from the U.S. Department of Transportation, Federal Highway Administration’s website:
https://www.fhwa.dot.gov/eforms/

Form FHWA-1391   Federal-Aid Highway Construction Contractors Annual EEO Report
The contractor must submit this form on all federal-aid contracts over $10,000. All subcontractors on federal-aid projects whose subcontracts exceed $10,000 must also submit the form. Contractors and subcontractors report project employment data for the last full week of July on the form.
Form DOL SF-308 Request for Wage Determination and Response to Request

Request wage rate determinations for federal-aid contracts by using this U.S. Department of Labor form. Obtain the form from the U.S. Department of Labor’s website:

https://www.dol.gov/whd/programs/dbra/sf308.htm

5-102 Organization of Project Documents

5-102A General
This section describes the uniform filing system for organizing project records and reports. The system uses numbered categories for filing project documents. Use the uniform filing system on all projects.

There are 63 categories in the filing system. There are several unassigned categories. Use them for project documents that do not fit in assigned categories. If necessary, divide a category into subcategories.

Assign the appropriate category numbers to documents filed at a separate location, such as a field office. The filing system will then be correct when records are brought together after project completion. Project records may be scanned and stored electronically. Maintain hard copy files as a backup before project completion.

Construction projects awarded on or after July 1, 2021, are required to store all project records electronically on the Caltrans Falcon electronic document management system (FalconDMS). By adopting available technology and electronically storing project records on the FalconDMS, accessibility to these documents will be improved. Section 5-102C, “Description of Categories,” of this manual lists the 63 filing categories required for the proper cataloging of contract documents. Users uploading documents into the FalconDMS will assign electronic indexing called “metadata” to the documents and will automatically file the project records in the corresponding categories as listed in Section 5-102C. This electronic indexing can be used for searching and retrieval of documents stored in the categories. Training is required for all staff before using FalconDMS. Request FalconDMS training or assistance downloading FalconDMS software in an email to FalconDMS.Construction@dot.ca.gov.

Training material and contact information for FalconDMS can be found on the Division of Constructions Office of Performance and Innovation Onramp page.

Construction projects awarded before July 1, 2021, may use FalconDMS, if practical, or continue to maintain project records in hardcopy form.

5-102B Indexing
For hardcopy paper filing of projects, use a category index, similar to the table in Section 5-102D of this manual, for each project. Post the index in a prominent location.
When the location of a category is separate from the main file, indicate its location on the index under the appropriate heading.

When FalconDMS is used, as discussed in Section 5-102A, “General,” of this manual, the category index is built into the electronic filing system. Proper upload of documents to FalconDMS will allow files to be easily searched across the various indexing fields, or “metadata,” defined in the system.

Projects awarded before July 1, 2021, may be switched from a hardcopy filing system to filing the project documents on FalconDMS midway through the project. If that choice is made, the legacy hardcopy project documents should be maintained in their existing form with a note in each category that starting on the date the project switched to filing project documents on FalconDMS and any project documents after that date would be located on the FalconDMS system. It is not required for legacy projects with an award date before July 1, 2021, to store project documents on FalconDMS, but it is encouraged to improve efficiency.

5-102C Description of Categories

The following discussion describes the documents that should be included in each category and, for some categories, a recommended order of the documents in the categories:

Category 1 Project Personnel

Include all personnel-related records in this category. Suggested subcategories are listed below. On smaller projects, some of the listed subcategories may be combined when the amount of detail shown is not warranted.

- Form CEM-0101, “Resident Engineer’s Report of Assignment”
- Attendance report
- Overtime records
- Overtime requests and authorizations
- Absence requests
- Personnel transfer records
- Personnel roster
- Travel expense claims and records
- Individual personnel file, such as emergency telephone numbers, experience or training records

Category 2 Project Office Equipment and Supplies

In this category, file documents relating to equipment and supplies. Include records of equipment and supplies that have been received or returned. The subcategories listed below outline the scope of this category.

- Equipment inventory
• Shipping records; related shipping and receiving records should be stapled together
• Receiving records
• Transfer requests
• Local requests
• Automotive records
• Cash expenditure vouchers
• Purchase orders
• Bills of lading

*Category 3 Equipment and Personnel Cost Reports*

In this category, file construction engineering cost reports. Suggested subcategories are:

• PRSM (task management) reports
• Equipment cost reports

*Category 4 Service Contracts*

In this category, file documents related to the project office utilities and services. File requests for service with all correspondence relating to project office service contracts in an appropriate subcategory. File the receiving records for bills for utilities and services in a "date received" sequence.

It is recommended that a separate subcategory be used for each company or each service agreement. File purchase orders for supplies in Category 2, “Project Office Equipment and Supplies.”

The subcategories that may be included in this category are:

• Rent
• Electricity
• Gas
• Telephone
• Drinking water
• Overnight mail and shipping service
• Additional service agreements, as required

Category 4 includes only transactions connected with the resident engineer’s office. Do not confuse this category with Category 16, “Utility Agreements,” Category 17, “Utility Work Performed,” or a subcategory of Category 52, “Charges to Total Contract Allotment.” These are part of the project’s construction operations.
Category 5 General Correspondence

In this category, file letters that do not relate to any other category or subcategory in use. File correspondence concerning a subject that directly relates to some other category in that category. For example, file correspondence developed in connection with a change order in the change order category file.

File correspondence in any subcategory in chronological order.

When the volume of correspondence builds up, segregate and divide it into more detailed subject subcategories. When appropriate, transfer correspondence from Category 5 to a more specific category. For example, a property owner may object to certain conditions on the project. After considerable correspondence, the resident engineer writes a change order to solve the problem. At this point, the resident engineer should transfer all of the correspondence related to the change order to the change order category file.

A letter might cover subjects in multiple categories. When the letter relates directly to two subjects, file a copy in each category or cross-reference to the location of the original. Cross-referencing need be only a note describing the letter filed in a different category.

The following are examples of subcategories in Category 5. The number of subcategories will depend on the volume of correspondence. Show all subcategories in the index.

- Request for information (RFI) and responses
- Request for clarification (RFC) and responses
- To district office
- From district office
- To Project Development
- From Project Development
- To Maintenance
- From Maintenance
- To Traffic Operations
- From Traffic Operations
- To contractor; for example, letters, transmittals, faxes, memos, email
- From contractor; for example, letters, transmittals, faxes, memos, email
- Property owners
- Utility companies
- Form CEM-0501, “Relief From Maintenance”
- Any additional subcategories that may be required depending on the volume of the correspondence
Category 6 Safety
File project documents relating directly to safety in this category. Suggested subcategories are:
• Employee safety
• Caltrans employee accident and injury reports
• Form CEM-0602, “Project Safety Program Statement”
• Contract documents relating to safety
• Correspondence with the Division of Occupational Safety and Health (Cal/OSHA)
• Form CEM-0606, “Construction Safety Checklist”
• A copy of the contractor’s Injury and Illness Prevention Program
• A copy of the contractor’s Code of Safe Practices in use for the project

Category 7 Public Relations
File documents covering the subject of public relations in this category.

Category 8 Construction Surveys
Use this category for filing all survey documents that do not directly or solely relate to another category.

File Form DPD-3013, “Request for Construction Staking,” in this category. Create subcategories for requests on which staking has been completed and those on which staking has not been completed. Cross-file staking requests that include restaking charges in Category 54, “Deductions from Payment to Contractor.”

Category 9 Welding

Category 10 Extra Category Number
Use this extra category number for project documents that do not fit in currently established categories. When used, enter the name of the category on the index sheet.

Category 11 Information Furnished at Start of Project
In this category, file documents related to planning, design, contract funding, advertising, and opening bids. Do not file documents in this category that apply solely or directly to other established categories. Create subcategories as necessary because of the volume of documents:
• Project Report
• Preliminary Report
• Project Expenditure Authorization, including Supplemental Allotments
• Detail Estimate of Project Cost
• Notice of Award of Contract
• Bid Summary Sheets
• Federal Detail Estimate
• Executed Contract, Special Provisions, and Plans
• Notice of Approval of the Contract
• Environmental Permits
• Encroachment Permits and Cooperative Agreements
• Bidder Inquiry Information

Category 12 Contractor
Use this category to file the documents that the contractor is required to submit. Do not use it for general correspondence or documents appropriate to a different category. The following subcategories suggest the scope of the category:
• Contractor’s organization, including the designation of the contractor’s authorized representative as required by Section 5-1.16, “Representative,” of the Standard Specifications
• Contractor’s equipment list
• Contractor’s borrow agreements
• List of subcontractors and other project documents concerning subcontracting
• Shop plans, if not filed under a more appropriate category
• Falsework plans
• Insurance documents, as required in Section 7-1.05, “Indemnification,” and Section 7-1.06, “Insurance,” of the Standard Specifications

Category 13 Signs and Striping
In this category, file all documents related to signing, delineation, and handling public traffic during construction. Suggested subcategories are:
• Layout of Construction Signs
• Detour Design, Striping, and Signing
• Traffic Striping Diagrams

Category 14 Photo Records
File routine photos and their identification in this category. File photos relating to claims in Category 62, “Disputes.” It is a good practice to take photos on a monthly basis to document the work during construction. Maintain video recordings and
digital photo files in an organized manner. Note the location of these items in this category file.

Suggested subcategories are:

- Before Construction
- During Construction
- After Construction

**Category 15 Accidents**

In this category, file documents related to accidents. Subcategories may include:

- Caltrans Employee Accident and Injury Reports
- Caltrans Vehicle Accident Reports
- California Highway Patrol Accident Reports
- Local Police Accident Reports
- Records and Investigations of Public Traffic Accidents
- Records and Investigations of Contractor Incidents

**Category 16 Utility Agreements**

In this category, file documents that relate to work to be done to utility facilities in connection with the project.

Create subcategories for utility companies. Set up second-level subcategories when required by the number of documents. The following are examples of subcategories within this category:

- 16.1.1 PG&E Co.—Agreements
- 16.1.2 PG&E Co.—Relocations
- 16.1.3 PG&E Co.—Encroachment Permit
- 16.2 AT&T Corp.
- 16.3 Union Pacific Railroad.

**Category 17 Utility Work Performed**

In this category, file daily reports and other records of utility facility work. Create the same primary subcategories as those used in Category 16.

Create second level subcategories when required by the number of documents and the amount of work. For example, if the work would develop daily reports and receiving records of only one utility relocation, these documents could be kept in one subcategory in chronological order. When the same utility company has more than one relocation, a more detailed breakdown is advisable.
Category 18 Agreements
In this category, file non-utility agreements with third parties or other state or county agencies. The number and levels of subcategories will depend upon the agreements and the nature and extent of the work involved. A list of suggested subcategories includes:

- Right-of-Way Agreements—Without Obligations
- Right-of-Way Agreements—With Obligations
- Forest Service Agreements
- Borrow Agreements between Caltrans and owner
- Disposal Agreements between Caltrans and owner
- Service Agreements, which are utility service agreements such as for highway lighting
- Disposal Permits
- Records of Royalty Payments
- Encroachment Permits

File an encroachment permit relating to a utility facility agreement under Category 16, “Utility Agreements.” File an encroachment permit relating to a right-of-way agreement in this category.

Where there are several right-of-way agreements requiring some degree of control, such as right-of-way agreements with obligations, maintain a summary to show the status of these agreements. An example of the status summary headings:

- The agreement number
- The location of work to be performed
- A brief description of work to be done and by whom
- When the work is completed
- The change order number if the required work is being done by change order

Category 19 Hazardous Waste and Hazardous Materials
File any information regarding the discovery and removal of hazardous waste in this category.

To comply with the record retention requirements of the ADL Agreement, the resident engineer must retain aerially deposited lead (ADL)-related records as follows:

- File all ADL-related correspondence, reports, data, and records in Category 19, “Hazardous Waste and Hazardous Materials” of the project records.
- File all ADL-related documents included with the resident engineer pending file in Category 19.
Category 20 Water Pollution Control Plan or Stormwater Pollution Prevention Plan
File all correspondence regarding water pollution control plans (WPCP) or stormwater pollution prevention plans (SWPPP) in this category. A list of suggested subcategories:

• Authorized WPCP or SWPPP
• Amendments to WPCP or SWPPP
• Notification of Construction
• Correspondence
• Inspections by Contractor
• Inspections by Caltrans
• Notices of Noncompliance
• Annual Certification of Compliance
• Notice of Completion of Construction

Category 21 Construction or Maintenance Zone Enhanced Enforcement Program
File documents relating directly to the Construction Zone Enhanced Enforcement Program (COZEEP) in this category. Suggested subcategories are shown below:

• Form CEM-2103, “COZEEP/MAZEED Cancellation Form”
• Form CEM-2102, “COZEEP/MAZEED Task Order”
• Form CEM-2101, “COZEEP Daily Report”

Category 22 Traffic Management Information
Use this category to file information related to traffic management. Possible subcategories include:

• Contractor lane closure requests
• Lane closure requests submitted to the transportation management center
• Authorized lane closures
• Contractor contingency plans
• Traffic count data

Category 23 Temporary Pedestrian Access Routes
Use this category number for the following:

• Form CEM-2301, “Temporary Pedestrian Access Route Compliance Inspection Report”
• Form CEM-2302, “Temporary Pedestrian Access Route Weekly Inspection Report”
• Form CEM-2303, “Temporary Pedestrian Access Route Sidewalk Detour Inspection Report”
• Form CEM-2311, “Temporary Pedestrian Access Route Contractor Compliance Report”
• Form CEM-2312, “Temporary Pedestrian Access Route Contractor Weekly Report”

Category 24  Disadvantaged Business Enterprises and Disabled Veteran Business Enterprises

Use this category for the following:
• Disadvantaged business enterprises (DBE) and disabled veteran business enterprises (DVBE) correspondence
• The contractor’s DBE/DVBE utilization plan
• DBE and DVBE substitution requests and approvals
• DBE and DVBE monthly reports
• Form CEM-2402(F), “Final Report—Utilization of Disadvantaged Business Enterprises (DBE), First-Tier Subcontractors”
• Form CEM-2403(F), “Disadvantaged Business Enterprises (DBE) Certification Status Change”
• Form CEM-2404(F), “Monthly DBE/UDBE Trucking Verification”
• Form CEM-2407, “Disadvantaged Business Enterprise (DBE) Joint Check Agreement Request”
• Other DBE and DVBE related documents

Category 25  Labor Compliance and Equal Employment Opportunity

In this category, file required labor compliance and equal employment opportunity information. Refer to Sections 8-1, “Labor Compliance,” and 8-2, “Equal Employment Opportunity,” of this manual for details.

Category 26  Progress Schedule

In this category, file the progress schedule, critical path method submittals, and other related information.

Category 27  Weekly Statement of Working Days

In this category, file Form CEM-2701, “Weekly Statement of Working Days.” Also file correspondence relating to contract time in a subcategory of this category.
**Category 28 Weekly Newsletter**
In this category, file periodic newsletters and reports that are prepared during the project. Include weekly reports of a general nature pertaining to the progress of the contract.

**Category 29 Materials Information and Preliminary Tests**
In this category, file materials information and preliminary test reports. Suggested subcategories include:
- Materials information
- Report of foundation investigation
- Report of preliminary tests on aggregate base
- Report of preliminary tests on aggregate subbase

**Category 30 Basement Soil Test Results**
In this category, file basement soil test results taken during the design phase to determine structural section adequacy.

**Category 31 Notice of Materials to Be Used**
In this category, file Form CEM-3101, “Notice of Materials to Be Used.” Create a system for checking that notices have been received.
Make Form CEM-3101s that contain information for structure items available for use by the structure representative. Consider filing the Form CEM-3101 listing structure items in a separate subcategory of this category.

**Category 32 Notice of Materials to Be Inspected at the Job Site**
In this category, file Form TL-0028, “Notice of Materials to Be Inspected at Job Site.”

**Category 33 Notice of Materials to Be Furnished**
In this category, file Form TL-0608, “Notice of Materials to Be Furnished.”

**Category 34 Treated Base**
In this category, file documents for cement-treated base, cement-treated permeable base, and asphalt-treated permeable base. Do not include documents that are to be filed in other categories, such as Categories 37, “Initial Tests and Acceptance Tests,” or 48, “Bid Item Quantity Documents.”

Use subcategories similar to the examples listed. Create a numbering system that identifies the category, item, and subcategory. For example, 34.26.3 indicates: Category 34 “Treated Bases”; 26 is the contract item number of the material and identifies the subcategory; 3 is the second level subcategory identifying the particular document. For example:
- 34.26.1 Mix design data, cement-treated base
• 34.26.2 Plant records, cement-treated base
• 34.26.3 Spread records, cement-treated base
• 34.27.1 Mix design data, cement-treated permeable base
• 34.27.2 Plant records, cement-treated permeable base
• 34.27.3 Spread records, cement-treated permeable base
• 34.28.1 Mix design data, asphalt-treated permeable base
• 34.28.2 Plant records, asphalt-treated permeable base
• 34.28.3 Spread records, asphalt-treated permeable base
• 34.4 Certificates of compliance for materials used in treated bases

Category 35 Hot Mix Asphalt
In this category, file documents related to hot mix asphalt, except those to be filed in categories such as 37 or 48. Following are suggested subcategories:
• Form CEM-3501, “Hot Mix Asphalt Production Report”
• Form CEM-3502, “Hot Mix Asphalt Placement Report”
• Form CEM-3511, “Contractor Job Mix Formula Proposal”
• Form CEM-3512, “Contractor Hot Mix Asphalt Design Data”
• Form CEM-3513, “Caltrans Hot Mix Asphalt Verification”
• Certificates of compliance for materials used in hot mix asphalt

Category 36 Concrete other than structure items
In this category, file documents related to concrete. Do not include documents that are to be filed in categories such as 37, 43, and 48. For structure items, the project documents are to be filed in Category 43, “Concrete and Reinforcing Steel.” Refer to the Bridge Construction Records and Procedures manual for details. Following are suggested subcategories:
• 36.1 Portland cement concrete pavement
• 36.1.1 Mix Designs
• 36.1.2 Plant Records
• 36.1.3 Certificates of compliance for materials used in concrete pavement
• 36.2 Portland cement concrete, Class A structure and minor concrete
• 36.2.1 Mix Designs
• 36.2.2 Plant Records
• 36.2.3 Certificates of compliance for materials used in Class A structure concrete and minor concrete
Category 37 Initial Tests and Acceptance Tests

In this category, file initial tests and acceptance tests. File documents in each subcategory chronologically unless there is a specific reason for doing otherwise.

Use subcategories similar to the forms listed. Create a numbering system that identifies the category, item, and subcategory. For example, 37.21.3 indicates: Category 37, “Initial Tests and Acceptance Tests”; 21 is the contract item number of the material and identifies the subcategory; and 3 is the second level subcategory identifying the particular test result.

- Form CEM-3701, “Test Result Summary”
- Form CEM-3702, “Relative Compaction Summary”
- Form CEM-3703, “Caltrans Production Start-Up Evaluation”
- Form CEM-3736, “Pavement Smoothness Inertial Profiler Submittal Record”
- Form CEM-3736AC, Asphalt Concrete Pavement Smoothness Corrections Information”
- Form CEM- 3736C, “Concrete Pavement Smoothness Corrections Information”
- Embankment
  37.10.1 Relative Compaction
- Structure Backfill
  37.14.1 Sand Equivalent
  37.14.2 Relative Compaction
- Aggregate Subbase
  37.21.1 Relative Compaction
  37.21.2 Moisture
  37.21.3 Sieve Analysis
  37.21.4 Sand Equivalent
  37.21.5 Record of Thickness
    (summarized in the order that measurements are made)
- Aggregate Base
  37.22.1 Relative Compaction
  37.22.2 Moisture
  37.22.3 Sieve Analysis
  37.22.4 Sand Equivalent
  37.22.5 Record of Thickness
    (summarized in the order that measurements are made)
- Hot Mix Asphalt
37.31.1 Aggregate Gradation
37.31.2 Asphalt Binder Content
37.31.3 Maximum Theoretical Density (percent)
37.31.4 Sand Equivalent (minimum)
37.31.5 Stabilometer Value (minimum)
37.31.6 Air Voids Content
37.31.7 Crushed Particles
37.31.8 Moisture Content
37.31.9 Los Angeles Rattler
37.31.10 Fine Aggregate Angularity
37.31.11 Flat and Elongated Particle
37.31.12 Voids in Mineral Aggregate
37.31.13 Voids with Asphalt
37.31.14 Dust Proportion
37.31.15 Smoothness
37.31.16 Asphalt Binder
37.31.17 Asphalt Rubber Binder
37.31.18 Asphalt Modifier
37.31.19 Crumb Rubber Modifier
37.31.20 Certificates of Compliance for Materials Used in Hot Mix Asphalt

- Portland Cement Concrete Pavement
  37.42.1 Sand Equivalent
  37.42.2 Cleanness Value
  37.42.3 Sieve Analysis
  37.42.4 Modulus of Rupture
  37.42.5 Penetration Values
  37.42.6 Cement Content
  37.42.8 Coefficient of Friction
  37.42.9 Other related items

Bills of lading and copies of sample identification tags may be filed in this category temporarily and discarded when their respective test reports are filed.

File test results for items assigned to Structure Construction personnel in this category in accordance with instructions contained in the Bridge Construction Records and Procedures manual.
Category 38 Quality Control
In this category, include all documents relating to quality control. Create a subcategory system to include the following:

- Forms CEM-3801, “Request for Assignment of Inspectors, Samplers, and Testers” and Form CEM-3802, “Quality Control Inspector Affidavit of Proficiency”
- Form CEM-3803, “Daily Summary of Quality Control Testing”
- Form CEM-3804, “Hot Mix Asphalt Inspection and Testing Summary”
- Copies of related correspondence

Category 39 Materials Testing Qualification of Employees
In this category, file copies of certifications of the employees performing acceptance tests.

Category 40 Field Laboratory Assistant Reports to Resident Engineer
In this category, file chronologically any reports made by the project’s materials tester. For more than one type of report, such as a report and a summary form, provide subcategories.

Category 41 Report of Inspection of Material
In this category, file the following forms:

- Form TL-0015, “Quality Assurance—Nonconformance Report”
- Form TL-0016, “Quality Assurance—Nonconformance Resolution”
- Form TL-0029, “Report of Inspection of Material”
- Form TL-0624, “Inspection Release Tag”
- Form TL-0625, “Material Suitability Tag”
- Form TL-6013 Toll, “Material Suitability Documentation Report”
- Form TL-6014, “Material Suitability Report”
- Form CEM-4101, “Materials Release Summary”
- Form CEM-4102, “Material Inspected and Released on Job”

Create subcategories within Category 41 for each contract item requiring inspection at the source by a METS inspector. Place a summary sheet (use Form CEM-4101, “Materials Release Summary”) in each subcategory containing the date of inspection, quantity inspected, cumulative quantity, and lot numbers. The summary sheet documents that materials used in the work have been inspected.

Staple Form TL-0624, “Inspection Release Tag,” removed from materials received on the project, to Form TL-0029, “Report of Inspection of Material,” on a letter-size sheet of paper and file it in the appropriate subcategory. The sheet should include the name of the engineer who removed it and the date removed. When lot numbers
are marked on the items, note the observed lot number on the related Form TL-0029.

Form TL-0625, “Material Suitability Tag,” should be attached to the TL-6014, “Material Suitability Report,” received from METS and filed.

When the Form TL-0029 includes material for more than one item, include a reference on the summary sheet showing the file location of the TL-0029.

File test reports (usually on Form CEM-4102, “Material Inspected and Released on Job”) that cover material sampled on the job in place of source inspection in the appropriate subcategory of this category, not in Category 37, “Initial Tests and Acceptance Tests.”

File reports of inspection or certificates of compliance for materials assigned to the structure representative in this category in accordance with instructions contained in Bridge Construction Records and Procedures manual.

**Category 42 Material Plants**

In this category, file Form CEM-4202, “Material Plant Safety Checklist,” and all other project documents pertaining to material plant inspections.

**Category 43 Concrete and Reinforcing Steel**

In this category, file documents relative to concrete and reinforcing steel in accordance with instructions in the Bridge Construction Records and Procedures manual.

**Category 44 Recycle Materials and Diversion of Solid Waste**

In this category, file a completed copy of Form CEM-4401, “Solid Waste Disposal and Recycling Report.” The contractor completes Form CEM-4401 and the resident engineer reviews the form within the reporting time constraints. The use of this form is described in Section 7-109, “Solid Waste Disposal and Recycling Reporting,” of this manual.

**Category 45 Resident Engineer’s Daily Reports**

In this category, file Form CEM-4501, “Resident Engineer’s Daily Report/Assistant Resident Engineer’s Report,” and the structure representative’s daily report.

**Category 46 Assistant Resident Engineer’s Daily Reports**

In this category, file Form CEM-4601, “Assistant Resident Engineer’s Daily Report.”

Subcategories may be used. They may vary depending on the complexity of the project and the desires of the district. The resident engineer and the structure representative must agree on the subcategories before the start of work. The following procedures establish the subcategories.

1. Reports Covering Contract Items
Create a subcategory for each major operation so that all items affecting the major operations are grouped. An example of a system for a relatively large project follows.

Modify the category breakdown to conform to the size and nature of the project. Make the breakdown narrow enough so that reports covering any particular contract item may be obtained with ease. Review the breakdown to verify that it includes all contract items.

Make as many daily reports as necessary to cover all contract item work in the appropriate subcategories.

As indicated in Example 5-1.1, set up a separate subcategory for each structure.
Example 5-1.1 Subcategories for project files

<table>
<thead>
<tr>
<th>Category and Subcategory</th>
<th>Subject</th>
<th>Contract Items in the Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>46.1</td>
<td>Chronological</td>
<td>All</td>
</tr>
<tr>
<td>46.2</td>
<td>Clearing and Grubbing</td>
<td>5</td>
</tr>
<tr>
<td>46.3</td>
<td>Roadway Excavation, Ditch Excavation Aggregate Subbase</td>
<td>8,13,11,15,22</td>
</tr>
<tr>
<td>46.4</td>
<td>Salvage Fence, Fence Gates</td>
<td>2,78,79,80</td>
</tr>
<tr>
<td>46.5</td>
<td>Guard Railing, Markers, Barricades</td>
<td>1,4,82,83,87</td>
</tr>
<tr>
<td>46.6</td>
<td>AB, CTB</td>
<td>23,24</td>
</tr>
<tr>
<td>46.7</td>
<td>Hot Mix Asphalt Slurry Seals, Dikes</td>
<td>28,29,30,31,32</td>
</tr>
<tr>
<td>46.8</td>
<td>Concrete Paving</td>
<td>35,36,37</td>
</tr>
<tr>
<td>46.9</td>
<td>Curbs and Sidewalks Slope Paving, Curb Drains, Spec. Gutter Drains</td>
<td>73,74,76,77</td>
</tr>
<tr>
<td>46.10</td>
<td>Minor Str., Precast MH and DI, Reinf. Steel, Misc. Iron and Steel</td>
<td>42,69,70,46,75</td>
</tr>
<tr>
<td>46.11</td>
<td>RCP, CMP, SSP ARCH, Drainage Gates, Under/Down Drain, Str Exc., Str. Backfill</td>
<td>9,11,58</td>
</tr>
<tr>
<td>46.12</td>
<td>Preparing Slopes, Straw</td>
<td>16,17,18,19,20</td>
</tr>
<tr>
<td>46.13</td>
<td>Permanent Signing</td>
<td>52,53,54,55</td>
</tr>
<tr>
<td>46.14</td>
<td>Hwy Lighting and Sign Illumination</td>
<td>88</td>
</tr>
<tr>
<td>46.15</td>
<td>Finishing Roadway</td>
<td>21</td>
</tr>
<tr>
<td>46.16</td>
<td>Structure 1</td>
<td>89,90,91</td>
</tr>
<tr>
<td>46.17</td>
<td>Structure 2</td>
<td>89,90,91</td>
</tr>
</tbody>
</table>

2. Reports Covering Extra Work

Pending receipt of the contractor's billing, file chronologically the original and one copy of Form CEM-4601, “Assistant Resident Engineer’s Daily Report,” covering extra work in a subcategory of this category. After receiving the change order bill report and approving payment, record the change order bill number on both copies of the daily report covering the extra work. Keep one copy of the daily report in this chronological file and use it to detect future billings for the same work. File the second copy with the daily extra work report in Category 49, “Change Orders.”

Change order bills for material should show the date the material was supplied or placed and referenced to the invoice so that the particular material may be readily identified. Keep a summary of invoices paid and use it as a check against duplicate payment.

The specific system used for filing resident engineer’s and assistant resident engineer’s daily reports is optional (except for extra work). However, Category 45
and 46 must be used and the file index must clearly show the specific system being used.

**Category 47 Drainage Systems**

To maintain a record of contract items for drainage systems, use Form CEM-4701, “Drainage System Summary.”

Use a Form CEM-4701 for each drainage system shown on the drainage quantity plan sheet. The preliminary work required to set up each system summary includes entering the contract number, the system number, planned station and description of the system, and the preliminary or planned quantities, which are entered from the drainage quantity plan sheet.

The assistant resident engineer describes progress on each drainage system in the daily report and enters estimates of work completed on the “Progress Record” portion of the drainage system summary.

Enter the quantity of work completed during an estimate period or near the end of the estimate period for each item in the “Estimate of Work Completed” portion of the drainage system summary. The quantities of work completed may then be entered on Form CEM-6004, “Contract Transactions Input,” and paid on the next estimate. Use the extra column next to the item quantity column to identify the Form CEM-6004 page and line number where the quantity was entered. After all items for a particular drainage system have been calculated and checked, the final quantities are entered in the row labeled, “Actual Q.”

To keep track of and reduce the number of drainage system summaries that have to be checked at the end of each estimate period, divide the category into subcategories, such as:

- **47.1 Before Work Starts**
  
  Place the preliminary drainage summaries in this subcategory in numerical order. Each drainage system summary will remain in this subcategory until work starts on that system.

- **47.2 Staked and Being Worked On**
  
  When a drainage system is staked, transfer the drainage summary sheet from index 47.1, “Before Work Starts,” to index 47.2, “Staked and Being Worked On.” Transfer the individual quantity calculation sheets with the drainage summary.

- **47.3 Drainage System Complete, Final Quantities Not Complete**
  
  After all work is completed on a particular drainage system, transfer the summary sheet with its calculation sheets to this subcategory. Removing the summary from the preceding index (47.2, Staked and Being Worked On), precludes having to go through completed structure summaries at the end of each estimate period when making entries of work completed. Determination of pay quantities should be made as soon as possible after work on the system is complete.
• 47.4 Final Quantities Completed

After all quantity calculations for a drainage system are completed and the adjusted quantities entered into the project record, transfer the summary sheet and its calculation sheets to this subcategory.

Since all drainage quantity calculation sheets will remain filed in Category 47, some item-numbered folders in Category 48 may have no documents.

Category 48 Bid Item Quantity Documents

In this category, file source documents supporting contract item quantities. List the subcategories in Category 48 by contract item number order. Identify individual calculation sheets for the contract items in the following manner. A quantity sheet with the number 48.14.2 indicates that it is sheet number 2 covering contract item number 14 and filed in Category 48, "Bid Item Quantity Documents." Some drainage item quantity documents may be filed in Category 47.

Category 49 Change Orders

In this category, file change orders and supporting documents in numerical order. Subcategories of this category are change order numbers in numerical order.

Contained within each subcategory are:

• The Form CEM-4900, “Change Order,” Form CEM-4903, “Change Order Memorandum,” and any accompanying correspondence.
• Form CEM-4901, “Change Order Input.”
• Daily change order bills and reports matched with assistant resident engineer’s daily reports.

Two additional subcategories may be:

• The Labor Surcharge and Equipment Rental Rates (Cost of Equipment Ownership) books applicable to the contract.
• Equipment rental rates and memos covering rates not shown in the Labor Surcharge and Equipment Rental Rates book.

Category 50 Adjustment in Compensation Calculations

In this category, file project documents and calculations to support adjustments in compensation.

After a change order is written, the supporting project documents may be transferred to the change order file or remain in this category. Provide cross references between categories 49 and 50 when the supporting documents and calculations remain in Category 50.

List the subcategories under this category by contract item numbers.
Category 51 Materials on Hand
In this category, file Form CEM-5101, “Request For Payment for Materials on Hand,” the related evidence of purchase, and any other project documents supporting material on hand payments.

Category 52 Charges to Total Contract Allotment
In this category, file the documents related to and supporting charges to the contract allotment for materials and services supplied by Caltrans.
Divide the category into the subcategories indicated below:
  • Department-Furnished Material and Expenses
    In this subcategory, file the contractor’s letters requesting delivery of Department-furnished materials. Also, save shipping and receiving records on Department-furnished material and file the related records together.
  • Service Contracts
    In this subcategory, file supporting documents and records of project-related services. These are not the service contracts connected with the project office.

Category 53 Credit to Contract
In this category, include a subcategory to keep a record of any salvaged or surplus material. Also set up a subcategory for copies of daily extra work reports that cover work to maintain and repair damage to state property, except damage the contractor caused. Refer to Section 3-519, “Maintenance and Protection,” of this manual.

Credit received for salvaged or surplus material or repair of damage is not applied to the contract allotment and the project is not given credit for any additional money to spend.

Category 54 Deductions From Payment to Contractor
In this category, file documents related to deductions from payments to contractors. Possible subcategories include the following:
  • Royalties on material
  • Materials bought for the contractor by Caltrans
  • Laboratory testing done for the contractor (refer to Section 6, “Control of Materials,” of the Standard Specifications)
  • Re-staking, engineering and inspection costs charged to the contractor
  • Cost of damaged or missing state-owned signs
  • Railroad flagging charges
  • Noncompliance with the equal employment opportunity provisions of the contract
  • Liquidated damages (refer to Section 3-906G, “Deductions,” of this manual)
  • Any other deductions (refer to Section 3-9, “Payment,” of this manual)
**Category 55 Partnering**  
This category is for filing all documents related to partnering meetings, workshops, and evaluations. Subcategories may include:

- Form CEM-5501, “Partnering Facilitator Evaluation—Kick-Off”
- Form CEM-5502, “Partnering Facilitator Evaluation—Closeout”

**Category 56 Extra Category Number**  
Use this extra category number for project documents that do not fit in currently established categories. When used, enter the name and number of the category on the index sheet.

**Category 57 Permanent Pedestrian Facilities**  
This category is for filing compliance inspection reports, preconstruction and post-construction surveys, and Americans with Disabilities Act (ADA) project compliance certification documents. Subcategories may include:

- Form CEM-5773ADE, “Curb Ramp (Case A, D, or E) Americans with Disabilities Act (ADA) Compliance Inspection Report”
- Form CEM-5773B, “Curb Ramp (Case B) Americans with Disabilities Act (ADA) Compliance Inspection Report”
- Form CEM-5773C, “Curb Ramp (Case C) Americans with Disabilities Act (ADA) Compliance Inspection Report”
- Form CEM-5773CH, “Curb Ramp (Case CH) Americans with Disabilities Act (ADA) Compliance Inspection Report”
- Form CEM-5773CM, “Curb Ramp (Case CM) Americans with Disabilities Act (ADA) Compliance Inspection Report”
- Form CEM-5773DW, “Sidewalk at Driveway Americans with Disabilities Act (ADA) Compliance Inspection Report”
- Form CEM-5773FG, “Curb Ramp (Case F or G) Americans with Disabilities Act (ADA) Compliance Inspection Report”
- Form CEM-5773P, “Parking Americans with Disabilities Act (ADA) Compliance Inspection Report”
- Form CEM-5773PW, “Passageway Americans with Disabilities Act (ADA) Compliance Inspection Report”
- Form CEM-5773SW, “Sidewalk Americans with Disabilities Act (ADA) Compliance Inspection Report”
• Pre- and postconstruction surveys
• Form CEM-5773, “Americans with Disabilities Act (ADA) Project Compliance Certification”

**Category 58 Extra Category Number**
Use this extra category number for project documents that do not fit in currently established categories. When used, enter the name and number of the category on the index sheet.

**Category 59 Bridge Estimate Data**
In this category, file the bridge estimate data as covered in the *Bridge Construction Records and Procedures* manual.

**Category 60 Contract Administration System Inputs and Reports**
This category contains documents resulting from CAS. Possible subcategories are:
• Form CEM-6003, “Progress Pay—Estimate Project Initiation or Update”
• Form CEM-6004, “Contract Transactions Input”
The following CAS reports are cumulative. Only the most current results need to be retained.
• Status of Contract Items
• Project Record Item Sheets
• Status of Change Orders
• Change Order Master Listing

**Category 61 Estimate and Project Status**
In this category, file monthly Project Record-Estimate Request documents. The suggested subcategories of this category are:
• Project Contingency Fund Status
• Estimate
The following documents may be filed by estimate number in numeric order:
• Form CEM-6101, “Project Record—Estimate Request”
• Estimate Verification Form
• Progress Payment Voucher
• Estimate Processing Results
• Project Record-Estimate and Project Status
Category 62 Disputes

In this category, file notes, photographs, information, and other project documents that may be necessary to establish facts with respect to a dispute. Include any documents that may be related to a dispute in this category or briefly describe and cross-reference them.

Number notices of potential claims in chronological order. Use these numbers for subcategories.

The scope of this category may vary considerably, depending upon the nature and circumstances of the dispute. The following types of documents indicate the type of information that should be included:

- Form CEM-6201, “Notice of Potential Claim”
- Acknowledgment of the contractor’s dispute
- Disputes Review Board Agreement
- Contractor’s claim for a time extension (cross-reference to Category 27)
- Acknowledgment of the contractor’s claim for time extension
- Other correspondence relating to disputes
- Photographs pertaining to disputes

Category 63 Project Completion Documents

In this category, file documents related to the completion of the project. The following are suggested subcategories:

- Form CEM-6301, “Contract Acceptance”
- Form CEM-6302, “Final Materials Certification”
- Punchlist

5-102D Category Numbers and Headings

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5-103  The Contract Administration System

5-103A  General

This section describes the Contract Administration System (CAS), sometimes referred to as “the progress pay system.” The primary purpose of this computer system is to help administer Caltrans construction projects. Functional units within the Division of Construction update and maintain records on individual contracts in CAS from the award and approval of the contract through to the completion and final payment.

CAS is one of three subsystems of the Project Information System and Analysis (PISA). The three PISA subsystems that make up the primary computer system that Caltrans uses for tracking contract capital costs are: planning and design, bidding and award, and project construction. Each module of PISA passes data to the next module as a project progresses from conception to completion. Refer to Figure 5-1.1, “Contract Administration System, Systems Interface,” for a general overview of how CAS relates to the other components of the Caltrans computer system used for tracking and paying contract capital costs.

CAS is also composed of separate modules, each of which accomplishes a distinct function. The following are the most common of CAS’ many modules:

- Project initiation and update
- Contract transactions
- Change order
- Daily extra work report
- Project record estimate
- Reports
- Online update and inquiry

Resident engineers use these modules to do the following:

- Account for quantities from source documents
- Account for change orders and payments for extra work
- Determine the status of the projects’ financing
- Authorize payments to contractors
Figure 5-1.1. Contract Administration System, Systems Interface

- **BID OPENING SYSTEM (BID)**
  The BID passes contract item information and the winning bidder’s name and address when the project is initiated into CAS.

- **PROJECT MANAGEMENT CONTROL SYSTEM (PMCS)**
  The PMCS passes contract location, federal-aid number, project type, and project descriptions to the CAS. Project cost information is passed to the PMCS system from the Contract Summary Record.

- **CONTRACT ADMINISTRATION SYSTEM (CAS)**

- **CONSTRUCTION UNIT COST SYSTEM (CUC)**
  The CUC gathers item prices from BID, Basic Engineering Estimating System (BEES), and change order entries.

- **BRIDGE DATA MANAGEMENT (BDM)**
  Report of any structure work done on highway contracts.

- **AMS Advantage**
  Issues payment transaction information to State Controller.

- **STATE CONTROLLER**
  AMS Advantage passes an electronic file to the State Controller containing contractor payment information. State Controller creates pay vouchers and distributes the warrants and payment vouchers to the contractors.

- **ORACLE DATABASE: EXTRA WORK BILLING SYSTEM (iEWB)**
  Process contractors’ extra work bills.

- **CONSTRUCTION CONTRACT INFORMATION SYSTEM (CCIS)**
  Tracks Milestones such as District Expenditure Done (DED) and others.
5-103B Project Initiation and Update

5-103B (1) Major and Minor A Contracts

When Caltrans has determined the lowest responsible bidder, the Office Engineer will transfer project data from the bid opening system to CAS. Usually, this data transfer will occur before awarding the contract and before determining the total allotment. When this information about the award and total allotment becomes available, the Division of Construction will update the computer file by adding to or changing existing information. Items of work are tracked as either federally participating or nonparticipating.

Immediately after the new contract information in the computer file has been transferred from the bid opening system, the data is available to the district for processing. The district must update the file with district information such as the resident engineer’s name and address, the bridge representative’s name, and the project’s password. To perform the update, the district uses Form CEM-6003, “Progress Pay—Estimate Project Initiation or Update,” which is explained in more detail in Section 5-103B (3), “Completing Form CEM-6003, ‘Progress Pay—Estimate Project Initiation or Update.’” of this manual.

After receipt of the contract award summary, progress pay may be initiated. The Division of Construction progress pay desk verifies the contractor voucher name and address and enters project fund information into CAS from the contract award summary. The district estimate desk verifies the bid open date. Using the CAS data-entry screen, the district estimate desk enters the award, approval, completion, and acceptance dates; the number of working days; the plant establishment period; and time-related overhead information into CAS from the contract award summary, approval memo, and the Form CEM-6301, “Contract Acceptance.”

The result of the district’s file update will be a dummy Form CEM-6101, “Project Record—Estimate Request,” and a contract contents report, which lists contract items. The form and report should be checked thoroughly and any discrepancies brought immediately to the attention of the Division of Construction progress pay coordinator.

During a contract’s life, the contractor may request a local address change or a legal name change. The district must maintain the accuracy of local address information in CAS using Form CEM-6003, “Progress Pay—Estimate Project Initiation or Update.” The State Controller mails progress payment checks. Only the headquarters Division of Construction progress pay coordinator is authorized to make changes to the address from Form CEM-1202B, “Contractor Action Request—Assignment of Contract Monies, Assignee Change of Name/Address” verified by the resident engineer with the Division of Construction field coordinator’s concurrence.

5-103B (2) Emergency Contracts in Excess of Minor B Limits

Payment for all emergency contracts estimated at greater than the Minor B contract limit in construction cost are to be paid through CAS. The Minor B limit is evaluated
and re-established every 2 years and DPAC announces the new policy by issuing a DPAC Information Bulletin and posting it to its Onramp page.

The district performs the initial setup of emergency contracts in CAS using the Emergency Force Account (EFA) Contract Initiation Instructions in CAS (Contract Administration System). The headquarters estimate desk performs the final setup steps. Entering the emergency contract in CAS is typically performed after the “Confirmation of Verbal Agreement” has been issued, but before the contract is authorized. This allows the contractor and the engineer to begin processing change order billings using the iEWB system. Progress estimates are not to be requested until confirming the contract has been authorized and the AMS Advantage contract document has reached the final stage.

To establish a contract in CAS, a minimum of one contract item must be used. This is typically covered by establishing the one item for the amount of the contract payment bond. In order to process change order billings, CAS requires at least one change order be issued. The change order is administrative only, and issued for the total of the construction authorization, less the value of the bid item(s), less $15,000; for example: change order amount=total allotment-item(s)-$15,000. Establishing the change order for this amount provides protections to prevent change order billings from exceeding the available funds.

5-103B (3) Completing Form CEM-6003, “Progress Pay—Estimate Project Initiation or Update”

The purpose of Form CEM-6003 is to add new information, or to change information, in the computer file. The computer program will accept changes only for contracts in your own district.

Except for the “Project Key,” complete only the data fields that you wish to update. The computer program will ignore blank fields and will place the data from the completed fields in the file whether or not such information is already on file. Fields left blank on the input form do not change what is in the file.

Ensure the data you enter on the form conforms to these rules, listed by data field as follows:

5-103B (3a) Project Key
Enter the letter “U” under “FB,” and in the remaining spaces, enter the district and contract number.

5-103B (3b) Card Type C05 (each field is independent and can be updated separately)
For the following data fields under card type C05, list the following:

• Resident engineer’s phone number.
• Responsible unit: Though the current financial system (E-FIS) now uses a 4-digit source unit value, enter the prior financial system (TRAMS) 3-digit source unit.
value. The responsible unit may range from 501 to 545. Warning: Until this number is in the computer file, progress pay estimates cannot be processed.

- Date work started: Enter the date the contractor began work on the job site. If the contractor has not begun, leave this field blank and submit an update when work begins.

- Estimated date for completion: Enter your best estimate, not the calculated completion date. When progress estimate requests are submitted, this date is updated.

- Password: Use of this feature is optional. Enter any combination of six characters. The characters may be alphabetic, numeric, or include any of the following special characters: *, /, =, (,), +, -, @, #, %, &. Once established, this password is required when you file, among other things, contract item payments, using Form CEM-6004, “Contract Transactions Input.” The password will restrict access to the computer files.

- Suspension or reactivation: If a contract is suspended, enter the date of suspension and “S” in the “SR” column. When the suspended contract is reactivated, enter the date of reactivation and “R” in the “SR” column. You only have 30 calendar days from the suspension or reactivation date to enter this information into the computer.

- First Chargeable Working Day: Enter the date that contract time begins, usually 15 calendar days after the approval date. This is the date used to calculate the number of working days that determine satisfactory progress and the percent of time elapsed.

5-103B (3c) Card Type C06 to C08

Resident engineer’s mailing address: On the first line, enter the resident engineer’s last name first, followed by a comma. Then enter a space and the first name, followed by a space and middle initial (SMITH, John C.). On the second and third lines, enter the mailing address of the construction field office. Warning: The computer program treats all three lines as a single “data field.” If you need to change this field, you must reenter all three lines.

5-103B (3d) Card Type C09 to C14

Only the headquarters Division of Construction progress pay coordinator can change the address in CAS.

To change the contractor’s local address, enter the contractor’s name on line C09, and as necessary, continue the name on lines C10 through C12. Leave unused lines blank.

Enter the contractor’s local address on lines C13 and C14. Also enter the contractor’s local phone number on line C14.

Warning: You must enter the entire name and address each time you wish to update any or all of these lines. You cannot update a single line.
5-103B (3e) Card Type C15

For the following data fields under card type C15, do the following:

- Structure representative’s name: If the contract requires structure work, enter the structure representative’s name even if it is the same name as the resident engineer’s. Enter only the last name and first initial (SMITH, J.).
- Structure responsible unit: Though the current financial system (E-FIS) now uses a 4-digit source unit value, enter the prior financial system (TRAMS) 3-digit source unit value. The unit may range from 550 to 599.
- Original authorized amount for structure work: At the contract’s start, the resident engineer and the structure representative must determine the initial value of the required structure work. This value should include any portion of the contract item for mobilization that will be claimed as structure work. Warning: If this amount is not on file, Structure Construction cannot obtain any reports for this contract.
- Structure mobilization percentage: Enter, to the nearest whole percent, the portion of the contract item for mobilization that will be claimed as structure work.
- Structure completion: Enter a “C” to indicate the completion of structure work.

5-103B (4) Processing

CAS analyzes the changes made to the computer file and does the following:

- CAS notes whether the district is updating the “Responsible Unit” field for the first time. If so, CAS prints a dummy Project Record—Estimate form and a Contract Contents Report.
- If this update is not the first update, CAS prints only the first page of the Contract Contents Report. CAS prints the dummy Project Record—Estimate form only if the contractor’s name and address field has been changed.
- CAS also prints a listing of update requests, which is a summary report of all fields that have been updated in this run.

5-103C Contract Transactions

The majority of all data submitted to CAS will be contract transactions from the resident engineer on Form CEM-6004, “Contract Transactions Input.” Contract transactions are divided into the following three categories:

- Contract item transactions: These consist of five types of transactions that refer to contract items.
- Miscellaneous transactions: These consist of four types of transactions to handle general project needs.
- Change order transactions: These consist of three types of transactions that refer to change orders.
The Contract Transaction Processing Module processes 12 transaction types. Together with the services that the change order and Daily Extra Work Report Processing Modules perform, these modules are sufficient to generate contract records that provide control of progress payments and track the financial status of the contract.

5-103C (1) Transaction Types
The following describes, by category, the 12 possible transaction types:

5-103C (1a) Contract Item Transactions
CAS provides five ways to refer to a contract item in Form CEM-6004, “Contract Transactions Input.” An additional way is by including the item as part of a change order. This will cause the authorized quantity to be adjusted automatically. Thus, you do not have to account for status changes because of change orders. You can reference contract items through the following contract item transactions:

• Contract item payment: Make item payments by posting line entries to Form CEM-6004 in any order. Indicate bridge items by entering "B" in the proper column. If you use the report titled Bridge Quantities by Structure, you will also need to enter the structure number in accordance with instructions in Section 6, “Estimates,” of the Bridge Construction Records and Procedures manual, Vol. 1. Refer to Example 5-1.2, “Contract Transaction Input,” Line 01, of this manual.

• Contract item quantity balance: You may adjust the authorized quantity, if necessary, by submitting quantity balances as line entries on Form CEM-6004, “Contract Transactions Input.” You might need to make this type of transaction for various reasons. For example, a need might exist because of an incorrect engineer’s estimate for a contract item that would have a major effect on the contingency balance. This transaction type adjusts the authorized final cost for your project, as shown in the later discussion of progress pay estimates. Refer to Example 5-1.2, Line 02 of this manual.

• Contract item anticipated change: This transaction gives the engineer a method to allocate project funds to a specific contract item based on knowledge of anticipated additional or decreased work. Such transactions affect the estimated final quantity for the item and the estimated final cost for the project. The effect of these transactions is cumulative. If additional work is authorized by change order, a reversing entry is necessary. Refer to Example 5-1.2, Line 03 of this manual.

• Contract item final balance: When work is completed on a contract item, you should enter this fact into the system. This entry will mark the item in the computer file as “Complete.” On all subsequent progress pay estimates, the authorized quantity and the estimated final quantity will default to the amount paid to date, thus automatically balancing out the item. Additional item payments may be made, and the system will continue to balance the contract items. Refer to Example 5-1.2, Lines 04 and 05 of this manual.
• Contract item final balance ("Reopen"): This transaction allows you to reverse the status of the contract item from "Complete" to "Active." For example, you would use "Reopen" to change an incorrect entry that showed the item was complete. Refer to Example 5-1.2, Line 06 of this manual.

5-103C (1b) Miscellaneous Transactions
The four transaction types listed below comprise "miscellaneous transactions," the second category of contract transactions:

• Anticipated change: Use this transaction to record anticipated additional or decreased work when it is not possible or desirable to tie the anticipated change to a specific contract item or change order. These transactions are not cumulative and will affect the project’s estimated final cost only on the next progress pay estimate to be generated. Refer to Example 5-1.2, Line 07 of this manual.

These transactions are placed in the computer file, and their sum will appear on the next progress pay estimate that generates payment. If the next estimate is a supplemental progress pay estimate, only enter material on hand payment requests if the material on hand payment request was mistakenly omitted from the previously run progress pay estimate.

• For more information about materials on hand, refer to Section 3-9, “Payment,” and Example 5-1.2, Line 08 of this manual.

• Department-furnished materials allotment transfer: Use this transaction to increase or decrease the value of the Department-furnished materials allotment for your contract. The construction allotment will automatically adjust. To increase the Department-furnished materials allotment, enter a positive number. (This type of entry will decrease the contingency balance.) Refer to Example 5-1.2, Line 09 of this manual.

• Total allotment changes: Use this transaction to enter into the system any supplemental allotment that increases (or decreases) your contract’s total allotment. The total allotment in the computer file will adjust automatically as will the construction allotment. The construction allotment is defined as the total allotment less the Department-furnished materials allotment. Refer to Example 5-1.2, Line 10 of this manual.

5-103C (1c) Change Order Transactions
The three transaction types listed below comprise “change order transactions,” the final category of contract transactions:

• Change order anticipated change: This transaction has the same effect as does the contract item anticipated change except that a change order is being changed. Refer to Example 5-1.2, Line 11 of this manual.

• Change order final balance: This transaction has the same effect as a contract item balance. When work on a change order is finished, mark it “Complete” by entering this transaction. As with contract items, additional change order bills
may be paid, and the system will continue to balance the change order. Refer to Example 5-1.2, Line 12 of this manual.

- Change order final balance ("Reopen"): This transaction allows you to reverse the status of the change order from “Complete” to “Active.” Refer to Example 5-1.2, Line 13 of this manual.

5-103C (2) Completing Form CEM-6004, “Contract Transactions Input”

The resident engineer will use Form CEM-6004 more often than any other form in CAS. This section contains a completed sample of the form. Refer to Example 5-1.2, “Contract Transaction Input.”

Because of the high volume of transactions, make your entries on Form CEM-6004 as soon as the information becomes available. Partially filled pages are acceptable.

The sample form in this section shows some transactions. Note that leading zeros are not required in the numeric fields and that the plus sign is not required in the plus or minus columns. The following instructions are for the fields common to all transactions:

- Enter the district, contract number, password (if used), and page number. When assigning a page number, be careful because duplicate numbers will cause all transactions on the page to be rejected. You must complete these fields.

- Enter the posting date.

- Enter the source document description. If the transaction type refers to a project source document, for example, a calculation sheet or a scale sheet, enter into the form’s description column an adequate description of the source document. The source document must cross reference to Form CEM-6004. Post the page number, line number, and posting date from Form CEM-6004 to the source document. Refer to Example 5-1.3, “Quantity Calculation,” for a typical source document.

- Note: The last six characters of the source document description can be the structure number if this item concerns structure work. Refer to Example 5-1.2, Line 01 of this manual.

- Mark the structure field with the character “B” if this transaction concerns “structure work.” Otherwise, leave the space blank. If you use report “Bridge Quantities by Structure,” you will also need to enter the structure number in accordance with the instructions in Section 6, “Estimates,” of the Bridge Construction Records and Procedures manual, Vol. 1.

The form’s remaining fields are divided into two sections, “Contract Item Entries,” and “All Other Entries.” If you make any entry in one or more fields of one of the sections, all fields in the other section must be left blank. A single line entry cannot serve double duty.
5-103C (2a) Contract Item Entries

Each type of contract item transaction has its own format on Form CEM-6004. The following are the rules for making contract item entries:

• Quantity balance transactions:
  - Lump sum items cannot be quantity balanced. If you attempt to quantity balance them, the transaction will be rejected.
  - If the quantity balance is greater than the bid quantity, a warning message is issued.
  - If the value of the quantity balance exceeds $100,000, a warning message is issued.
  - The new authorized quantity is calculated. If it is negative, the transaction will be rejected.
  - If the new authorized quantity is less than the total payment for the next estimate, a warning message is issued. Take appropriate action on this warning, such as estimating the final quantity and entering the increase, covering the increase by change order, or requesting the computer to final balance the item. Such action is necessary to keep the project’s status of funds current.

• For item final balance and item final balance (“Reopen”), the item status is set to “Complete,” or “Active,” respectively. The system does not check to see if the item is a lump sum item or a final pay item.

• Item anticipated quantity change:
  - If the anticipated quantity change is greater than the bid quantity, a warning message is issued.
  - If the value of the anticipated quantity change exceeds $100,000, a warning message is issued.
  - A new estimated final quantity is calculated. If this estimated final quantity is negative, a warning message is issued.
  - If the new estimated final quantity is less than the total payment for the next estimate, a warning message is issued.

• Item payment:
  - Any transactions for the item “Mobilization” are rejected.
  - Any transactions for a void item will be rejected.
  - If the payment quantity is greater than the bid quantity, a warning message is issued.
  - If the value of the payment quantity exceeds $100,000, a warning message is issued.
The new total payment for the next estimate is calculated. If the total is negative, the transaction is rejected. (Negative transactions under "This Estimate" will be accepted.)

If the contract item is a lump sum item and the total payment for the next estimate would exceed 100 percent, the transaction is rejected.

If the contract item is not a lump sum item, the new total payment for the next estimate is compared to 125 percent of the bid quantity and the authorized quantity. Warning messages are issued if the total payment is more than one or both of these.

If the system issues any warning or rejection messages while it processes transactions for a contract item, the complete status of the item will be printed on the Contract Transactions Input Edit report before the system begins processing the next contract item. Use this printout to determine the reason the system issued the message.

- Percentages for lump sum quantity payments must be expressed as decimals. Only three decimal places are available. If 5 percent is to be paid, it must be entered as 0.050; (5.00 is 500 percent).

5-103C (2b) Miscellaneous Transactions

The following are the rules for making miscellaneous transactions:

- Anticipated changes:
  - If the amount anticipated exceeds $100,000, a warning message is issued.
  - If the amount anticipated exceeds 10 percent of the construction allotment, a warning message is issued.

- Material on hand payments:
  - If the amount exceeds $100,000, a warning message is issued.
  - If the amount is negative, a warning message is issued. (The system assumes that this is a correcting entry to a previous transaction accepted by the system and not yet processed for payment.)
  - A total is calculated for payment for the next estimate. This is the sum of all transactions since the last estimate. If the total is negative, a warning message is issued.

- Department-furnished materials allotment transfer:
  - If the amount of the transfer exceeds $100,000, a warning message is issued.
  - A new total is calculated for the Department-furnished materials allotment. If it is negative, the transaction is rejected.

- Total allotment changes:
  - If the amount exceeds $100,000, a warning message is issued.
If the amount exceeds 10 percent of the total allotment, a warning message is issued.

- If the amount of the change is negative, a warning message is issued.
- A new total allotment is calculated. If the amount is negative, the transaction is rejected.
- If the new total allotment is less than the total paid to date on the last estimate, a warning message is issued.

5-103C (2c) Change Order Transactions
The following are the rules for change order transactions:
- For the change order anticipated change, the new estimated final cost is computed for the change order and reported. The system does not do any checking.
- Change order final balance and final balance (“Reopen”):
  - The change order status is set to “Complete,” or “Active,” respectively. The system does not do any checking.
  - For a change order final balance (“Reopen”), the word “Reopen” must be left-justified.

5-103C (2d) General
The Contract Transactions Processing Module will sort your transactions into order, will edit each transaction for reasonableness and conformance to this manual, and will either accept or reject each transaction. From this processing, the system will issue a report titled “Contract Transactions Input Edit.” This report will list the disposition of each line entry that you submitted. A comprehensive set of warning messages exists. Do not ignore warning messages on the report.

- Do not use the same page and line numbers again.

You will find a summary on the last page of the Contract Transactions Input Edit report. The summary lists each Form CEM-6004, “Contract Transactions Input,” page that was processed and the numbers of transactions on that page that were accepted, for which warnings were issued, or that were rejected. Any missing line numbers on the page (breaks in the sequence of line numbers) will be printed. Use this list to make sure that all the transactions were entered into the system.

Examine the remainder of the report. You must respond to rejected entries and possibly to warnings.

5-103C (2e) Audit Trail
In any accounting procedure, it is necessary to link transactions to the specific source documents that generate the transactions. This linking is called an audit trail. Change orders and daily extra work reports carry unique identifying numbers that CAS uses in its processing. Here, a good audit trail is automatic. However, contract
transactions are different since there is no automatic reference to a unique source document.

CAS provides methods of cross-reference. You are responsible for an adequate audit trail. Note that Form CEM-6004 is an intermediate document in this respect.
### Example 5-1.2 Contract Transactions Input

**Table:**

<table>
<thead>
<tr>
<th>No.</th>
<th>Date</th>
<th>Line No.</th>
<th>Source Document Description</th>
<th>Contract No.</th>
<th>Description</th>
<th>Quantity (Units)</th>
<th>Time</th>
<th>URW</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>05/19</td>
<td>02</td>
<td>48.14-17</td>
<td>1331-14</td>
<td>BILL BOX ON ELM ST</td>
<td>1,273,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>02</td>
<td>05/19</td>
<td>03</td>
<td>ANT. ELIM. AC ON FL</td>
<td></td>
<td></td>
<td>15,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>03</td>
<td>05/19</td>
<td>04</td>
<td>BAL. COMPL. ITEM 6</td>
<td></td>
<td></td>
<td>152,400</td>
<td></td>
<td></td>
</tr>
<tr>
<td>04</td>
<td>05/19</td>
<td>06</td>
<td>REV. GRADE FR2 LINE</td>
<td></td>
<td></td>
<td>0.029</td>
<td></td>
<td></td>
</tr>
<tr>
<td>05</td>
<td>05/19</td>
<td>07</td>
<td>DELET. DRAINAGE</td>
<td></td>
<td></td>
<td>0.018</td>
<td></td>
<td></td>
</tr>
<tr>
<td>06</td>
<td>05/19</td>
<td>08</td>
<td>BAL. COMPL. CCO 18</td>
<td></td>
<td></td>
<td>0.005</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Note:** Refer to Section 5-103C(1) for a description of transaction types.
Example 5-1.3. Quantity Calculation

**STATE OF CALIFORNIA • DEPARTMENT OF TRANSPORTATION**

**QUANTITY CALCULATIONS**

CEM-4801 (REV 11/1/92) CT# 7541-3520-0

<table>
<thead>
<tr>
<th>JOB STAMP</th>
</tr>
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<tbody>
<tr>
<td>07-1381U4</td>
</tr>
<tr>
<td>07-LA-210-47.5/57.3</td>
</tr>
<tr>
<td>Fed. No.: None</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ITEM</th>
<th>DESCRIPTION</th>
<th>FILE NO.</th>
</tr>
</thead>
<tbody>
<tr>
<td>8 Temp. Railing (Type K)</td>
<td>48-8-2</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>LOCATION</th>
<th>SEGREGATION</th>
<th>DATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ramp 3</td>
<td>NO</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CALC. BY</th>
<th>DATE</th>
<th>CHK. BY</th>
<th>DATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>I.M. Engineer</td>
<td></td>
<td>U.R. Wright</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Field Measurement:</th>
<th>Estimated Quantity: 400</th>
</tr>
</thead>
<tbody>
<tr>
<td>Field Counted: ✓</td>
<td>Unit of Measure: linear feet</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Final Pay Item:</th>
<th>Unit Price: $25.00</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>75% = 300</td>
</tr>
<tr>
<td></td>
<td>125% = 500</td>
</tr>
</tbody>
</table>

Remarks or Other Calculations:

Pay This Estimate: 200 ✓
Previous Paid: 100 ✓
Total to Date: 300 ✓

Posted By: Office Engineer
Date: 08/08/2008
Posted To: CEM-6004, page 4, line 5
5-103C (3) Computer Processing

The contract item totals listed below are kept for contract work and for structure work so that the totals can be reported separately when appropriate. Records of the financial status of the contract items are maintained as follows:

- **Bid quantity**: This quantity cannot be changed.
- **Authorized quantity**: This item is the total of the bid quantity and the algebraic sum of the quantity changes as a result of change orders that have been filed.
- **Authorized quantity**: This item is the total of the authorized quantity and the algebraic sum of the quantity balances that the engineer entered.
- **Anticipated final quantity**: This item is the total of the authorized quantity and the algebraic sum of the anticipated quantity changes that the engineer entered.
- **Item status flag**: This flag is a file mark that indicates whether a contract item is “Active,” “Deleted,” or “Completed.”

5-103D Change Orders

CAS maintains separate records for each authorized change order on a project. As each change order is authorized, it must be entered into CAS through the use of Form CEM-4901, “Change Order Input.”

The method of entering each change order into the system may vary from district to district, but can be done as follows:

- The resident engineer writes a change order and completes Form CEM-4901, “Change Order Input.” For approval procedures, refer to Section 5-3, “Change Orders,” of this manual. The approval date must be entered on Form CEM-4901, and the Form CEM-4901 data is then entered into CAS.
- The result of entering the form data for each change order will consist of a change order report and a disposition report.
- The resident engineer should review the change order report and correct any errors. CAS automatically makes the following changes to the contract records:
  - The authorized final cost, the estimated final cost, the authorized contingency balance, and the estimated final contingency balance are adjusted to new values.
  - The totals for changes in extra work, adjustment of compensation, and contract items are adjusted to new values.
  - Each affected contract item will have the authorized quantity adjusted to reflect the change.
- Immediately after Form CEM-4901 has been processed, CAS will accept change order bills and anticipated changes that refer to the change order.
• When CAS processes a supplemental change order, the daily extra work reports that are in the holding file because of insufficient funds in the original change order will be made available for payment.

5-103D (1) Completing Form CEM-4901, “Change Order Input”

Use Form CEM-4901 to perform the following functions:
• File a new change order in the computer file.
• Update (change existing information) a change order in the computer file.
• Replace a filed change order with a different change order.
• Delete a change order from the computer file.

Completing the form depends on which of the functions is desired.

5-103D (1a) File

Enter the contract and change order numbers at the top of the form. The original change order is supplement “zero”; enter the zero on the form. Ignore the function and override boxes at the top of the form.

The remainder of the form is divided into five sections labeled “Card Type 1,” “Card Type 2,” “Card Type 3,” “Card Type 4,” and “Card Type 5.” Complete only those sections that are applicable.

Card Type 1: This section is required. Complete each entry in the section. If the entry for the field “Net Money Change This CCO” is zero, enter $0.00. The field “Time Extension Days” should include the number of working days added (or deleted), zero (0), or be coded “DEF” (instead of a number) if the change order was written with a deferred time adjustment clause. Enter a category code on every change order. Left-justify this code.

Card Type 2: If extra work or adjustment of compensation is not part of your change order, leave these fields blank. Otherwise, define the payment method by making three entries for each change:

1. Make the first entry by checking either the “EW” or “AC” box to indicate extra work or adjustment of compensation.

2. Make the second entry by choosing one of the “FA,” “LS,” or “UP” boxes to indicate whether payments will be made by force account, lump sum, or unit price.

3. Make the third entry by entering the dollar amount of the change (increase or decrease).

If multiple items of work in the change order are using the same pay method, they must be totaled. Also, you can enter each pay method only once per change order. If there is more than one type of extra work or adjustment of compensation on the change order, continue making successive line entries.
Card Type 3: If you have no changes for contract item prices, do not complete this section of the form. Otherwise, furnish the item number and increase or decrease the quantity for each changed item.

Card Type 4: If all or part of the work to be done under the change order is structure work, enter the net dollar amount involved. This amount will contribute to the change order changes line of the structure totals shown on the next estimate.

If this section of the form does not apply or the amount is zero, leave the section blank.

Card Type 5: This section is required.

For federal participation, enter the FHWA funding participation determination on every change order. If participation is in part, indicate the breakdown for participation-in-part funding.

For federal segregation, if more than one funding source exists, show the percentage allotted to each federal funding source.

5-103D (1b) Update
Use this function in the following way to replace any incorrect information in Card Type 1 or Card Type 4:

• Enter the contract and change order numbers.
• Place the letter "U" in the function box at the top right of the form.
• Enter the correct information in the appropriate fields. All information in Card Type 1 is always required.
• Leave all other fields on the form blank.
• The module for processing change orders will identify the fields that you have completed and will change this information in the computer file.

5-103D (1c) Replace
If a change order has been stored with incorrect information that cannot be corrected by the update function, use the replace function in the following way:

• Complete the entire form exactly as you would for the file function, using correct information.
• Place "R" in the function box at the top right of the form.

The module for processing change orders will replace the data stored in the computer file with the new change order.

If payments have already been recorded against a payment method that you are trying to eliminate, it is not possible to immediately replace an old change order with a new one. The same holds true if the payment to date exceeds the authorized amount. In these cases, the system requires that you do the following:

• Enter corrections for the change order bills that reverse payments to date to zero for the particular method of payment to be eliminated. For payments exceeding
the authorized amount, enter corrections for the change order bills to reduce payments below the authorized amount.

- Submit the replace request.
- After the change order has been replaced, reenter the change order bills that were reversed. When possible, use the update function instead of the replace function.

5-103D (1d) Delete
You can eliminate a change order from the computer file as follows:

- Enter the contract and change order numbers.
- Place the letter “D” in the function box at the top right of the form.

As with the replace function, a change order cannot be deleted until all payments have been reduced to zero through correcting entries on the daily extra work reports.

5-103D (2) Edits
The following lists some of the edits that a change order must pass through before the system will accept it:

- The change order number and the change order supplement number must be filled in or the change order will be rejected.
- The change order description cannot be blank, or the change order will be rejected.
- The net change amount cannot exceed the construction allotment. If the net change amount does exceed the construction allotment, the system will issue a warning message but will still accept the change order.
- The approval date must be after the bid opening date and be before or the same as “today’s” date; otherwise, the change order will be rejected.
- If the time extension days exceed 10 percent of the working days in the contract, the system issues a warning message but will accept the change order.
- If any payment method appears more than once on the input cards, the order will be rejected.
- If you enter any contract item change for a void item, the system will reject the change order.
- Lump sum items may appear on change orders only as a deletion of that item. Any increase or decrease in a lump sum item will be rejected.
- You can enter a contract item on a change order as an increase and as a decrease. If the item appears a third time, the system will reject the change order.
- If the contract item “mobilization” appears on a change order, the change order will be rejected.
• If the quantity change entry for a contract item exceeds the bid quantity, a warning message will be issued.

• The net dollar amount for the structure work on the change order must be greater than the sum of the negative changes and less than the sum of the positive changes, or the change order will be rejected.

• The net dollar change for the change order must equal the sum of the dollar amount in Card Type 2 and the extended dollar amounts for the quantities in Card Type 3, or the change order will be rejected.

• If the change order is already on file, the system will reject a duplicate entry. Additionally, if this change order’s number exceeds by five the largest change order number on file, or if the supplement’s number is more than two above the latest supplement on file for this change order, the system will reject the change order. However, if you checked the override field on the input field, the system will accept such responses.

• If the contract is completed, a warning is issued.

If you request the replace or delete function, more extensive processing is done. The system checks to see if it can maintain the payment to date under a payment method.

If the system cannot maintain the payment to date in this way, it rejects the request to replace or delete. A rejection notice is generated along with an explanation of what must be done to resolve the situation.

Following is an example:

• A change order is entered for extra work at force account and accepted by the system.

• Subsequently, change order bill payments are recorded against the change order.

• A request is entered to delete the change order from the computer file. In this case, the system will reject the request to delete because the payment method would be eliminated. There are no other supplements to this change order. The system requires that entries to correct change order bills be to reverse payments to date to zero. In such a case, the system would accept a delete request. In the more complicated cases where supplements to a change order exist, the system makes similar demands.

At this point, the processing of the change order is complete. However, when a supplemental change order is processed, the daily extra work reports in the holding file, because of insufficient funds in the original change order, will be made available for payment. The system produces a report, called a “DEWR Release From the Holding File.” This report shows the action the system took.
5-103E Change Order Billing

Change order billing is input, revised, corrected, and submitted for payment using the internet extra work billing system (iEWB) at:

https://dot.ca.gov/programs/construction/iewb

Computer-based training for learning how to use the iEWB system is available at:

https://dot.ca.gov/programs/construction/iewb

The iEWB system allows authorized users to correct extra work bills that have been previously processed and paid. Change order bills or corrected approved extra work bills that need to be paid but have insufficient funds will not be rejected because of insufficient funds (subject to the limitations in Section 3-906C, “Extra Work,” of this manual). Instead, the system will place these change order bills in a pending status to await the resident engineer’s further action. If there are insufficient funds to pay the extra work bill, usually, the resident engineer must write a supplemental change order to provide additional funds; the supplemental change order will make the appropriate change order bills available for payment. Once additional funds are added by the supplemental change order in CAS, the iEWB system will automatically process and pay the extra work bills that have been previously approved and are in the pending funds status.

All standard contracts are required to use the iEWB system to process payments for change orders.

For contracts that are not in CAS and therefore are not using the iEWB system, the form CEM-4902, “Extra Work Bill (Short Form),” can be used. This form is only used on contracts that are not in CAS.

Use Form CEM-4902 to enter basic information related to extra work performed under a change order. The following describes procedures for obtaining the information from the contractor, entering the information into the computer, and producing the daily extra work reports.

5-103E (1) Preparing Form CEM-4902, “Extra Work Bill (Short Form)”


The contractor initiates forms containing force account payment and submits them to the resident engineer. The resident engineer initiates forms containing payment at agreed prices. The backs of the forms contain the basic instructions for completing the forms. The following information supplements the instructions on the forms:

5-103E (1a) Basic Information (Title Page)

Enter the following for the basic information:
• The change order number: Right-hand justify this three-digit number; for instance, change order 1 is 001, change order 10 is 010.

• Report number: The contractor should leave the report number blank. Duplicate numbers will be rejected unless they are corrections to previous bills.

• Date performed: A separate change order bill must exist for each day on which force account work is performed except for work done by a specialist. Enter the date the work was performed in these spaces. For change order bills covering invoices only, enter the date on which the material was used. If this entry is not practical, enter the current date. You must enter a date in this field. You may enter the acronym “VAR” in the date performed field if the pay method is lump-sum unit-price or if equipment and labor are not present on the bill.

• Date of report: Enter the date on which the report is prepared.

• Payment method: Make sure the method selected matches one of the methods authorized by the change order.

• Bridge: Place the letter “T” in this box if toll bridge work is involved and you want to apply a 10 percent markup to equipment and material and a 25 percent markup to labor.

• Flagging: You must include on the change order bill the total hours spent on flagging.

• Labor surcharge: The contractor should enter this surcharge as a whole number; for instance, “15 percent” is entered as “15.” The contractor should obtain the applicable percentage from the effective Labor Surcharge and Equipment Rental Rates (Cost of Equipment Ownership) book. This surcharge is for regular hours. The system will apply the overtime surcharge based on the regular hour surcharge.

• Work performed by: This field should contain the name of the organization (the contractor, subcontractor or other) that performed the work. If the change order bill is for an invoice only, enter the name of the organization to which the invoice was addressed. Submit a separate daily change order bill for each organization’s work.

5-103E (1b) Equipment
Do the following for equipment:

• Equipment identification number: Enter this number (required.) It can be any number that the contractor assigned to the equipment for specific identification.

• Equipment description: Enter the description, which consists of four items: the “Class,” “Make,” “Code,” and “Attach” (attachments). The equipment description must come from the applicable Labor Surcharge and Equipment Rental Rates (Cost of Equipment Ownership) book. Make a copy of this publication available to the contractor. A listing of miscellaneous equipment, for equipment that is not shown in the Labor Surcharge and Equipment Rental Rates (Cost of Equipment Ownership) book, is available from the Division of Construction’s website.
• For equipment that is neither in *Labor Surcharge and Equipment Rental Rates (Cost of Equipment Ownership)* book nor available from the website’s miscellaneous listing, the contractor must request a rate from the resident engineer. The resident engineer will obtain an authorized rate from the Division of Construction’s rental rate engineer.

• Equipment for which a change order has established the rental rate will not have an equipment description and must be included as a unit price payment on the material charges portion of Form CEM-4902 (Short Form), lines 24–25, or Form CEM-4902D, “Extra Work Bill–Material Charges,” lines 24-33, of the daily extra work report.

• The following explains the procedures for “Class,” “Make,” “Code,” and “Attach,” within equipment description:
  o Class: This portion of the equipment description will be found in the *Labor Surcharge and Equipment Rental Rates (Cost of Equipment Ownership)* book under the heading for a particular class. For instance, after “Hydraulic Cranes and Excavators, Crawler Mounted,” you will find the class “HCECL.”
  o Make: For the equipment listed by “Class,” you will find the “Make” portion of the equipment description in the left-hand column. For instance, after “Bantam,” you will find the make “[BANT].”
  o Code: For the equipment listed by “Class” and “Make,” you will find the “Code” portion of the equipment description in the “Code” column. For instance, after “Model C-266,” you will find the code “0680.”
  o Attachments: You will find this portion of the equipment description in the front of the *Labor Surcharge and Equipment Rental Rates (Cost of Equipment Ownership)* book. The rate for the equipment under “Class,” “Make,” and “Code” above includes all attachments and accessories. Therefore, leave this column blank.

Enter all equipment descriptions beginning at the left of each field. Include all letters, numbers, dashes, or other symbols as they are shown in the *Labor Surcharge and Equipment Rental Rates (Cost of Equipment Ownership)* book.

• Regular hours for which payment is to be made: Enter the regular hours for which payment is to be made. Regular hours may not exceed 8 unless you are entering a daily rate item. If the date the work was performed is various, you may enter up to 99 in the regular hours field. Various is used for equipment at day rates.

• Overtime hours: Enter the overtime hours worked. Overtime hours may not exceed 16.

5-103E (1c) Other Expenses Subject to Labor Markup

This portion of the form is for travel expenses that cannot be entered as “Subsistence” under “Labor.”
If the units and rate are already entered, the computer will calculate the amount. Otherwise, enter the amount, and this figure will be used.

Note: If you use the “Unit” and “Rate” fields, leave the “Amount” field blank. If you enter an amount in the “Amount” field, don’t make an entry in the “Unit” and “Rate” fields.

5-103E (1d) Material or Work Done by Specialists, Lump Sum, or Unit Price Payments

The following explains the procedures for completing the Form CEM-4902, “Extra Work Bill (Short Form),” material section:

• Material: Note that the material entry will not be processed unless there is a value in both the “Units” and the “Unit Cost or Net Pay” fields. Do the following for material:
  o Invoice date: Preferably, enter the date of the invoice to help in checking for duplicate billing. However, if entering the invoice date is not practical, enter the date the material was used.
  o Invoice description: Enter a brief description of material.
  o Units: Normally, enter the unit one (1.00) for materials used.
  o Unit cost or net pay: In this column, enter the amount for which payment is due. Normally, this amount is the cost of the material plus tax, if applicable, less any discount offered.

• Work Done by Specialists: Enter this item in the same manner as described under “Material” above.

• Lump Sum: Follow these procedures for this entry:
  1. Vendor name and invoice number: You do not need to make any entries in the vendor column or the invoice number column.
  2. Date: Enter the date the work was performed. When entering this date is not practical, enter the current date.
  3. Invoice description: Enter “per Change Order No.________.”
  4. Units: Enter the units to be paid as a percentage of the lump sum amount, expressed in decimals. For instance, express 75 percent as 0.75. This figure must never exceed a total of 1.000.
  5. Unit cost or net pay: Enter the lump sum amount from the change order.

• Unit price payments: Enter this item in the same manner as described under “Lump Sum” above.

• Units: enter the number of units to be paid.

• Unit cost or net pay: enter the unit cost from the change order.
5-103E (1e) Signature of Prime Contractor’s Representative
For all force account payments, the contractor or contractor’s authorized representative must sign the change order bill. For agreed price payments, the signature is not required.

5-103E (2) Processing Form CEM-4902
The resident engineer receives Form CEM-4902, “Extra Work Bill (Short Form),” from the contractor, reviews the form, and if it is satisfactory, signs the change order bill and authorizes it for entry into CAS. When reviewing the submitted change order bill, the resident engineer must be guided by the policy contained in Section 3-9, “Payment,” of this manual. The following explains how the system will process Form CEM-4902:

• Request that CAS print a copy of the change order bill after it has been entered into the system before it will be paid.

• Computer programs will perform the following processes:
  o Edit all information for acceptability. For example, numeric data must be in numeric form, or the program will issue a warning.
  o Select information from the equipment database; for example, rates, descriptions, and attachments.
  o Validate the contract number, change order number, report number, type of work (payment method), dates, corrections, labor surcharge, and equipment description.
  o Audit right-of-way delay and the hours equipment and labor are used for work.
  o Compute extensions, markups, and summaries.
  o Verify that the authorized amount (for instance, 100 percent or $15,000) is not exceeded.
  o File a validated change order bill for payment at the estimate time.
  o Produce a daily extra work report. This report will contain all the information as entered on the change order bill plus equipment descriptions, extensions, markups, total payment, and contract information.
  o Produce an edit report. This report will contain processing results. These results are tabulated by change order within a contract. If the system rejects an entry, the rejection messages will be included on the daily extra work report. If the system accepts the change order bill, all warning messages will be contained on the edit report.

• After the reports have been printed and the district construction office has received them, the district will forward copies to the resident engineer. Daily extra work reports are printed in two parts, one for the contractor and one for the resident engineer.
5-103E (3) Corrections to Change Order Bills
You can make corrections to a change order bill after it has been entered into the system, but there is a limit of four corrections per change order bill. Refer to the Reverse/Correct section of the Internet Extra Work Billing System (iEWB) User Guide at:

5-103F Generating Estimates
CAS produces five types of estimates on demand:
• Monthly progress estimate
• Progress estimate after acceptance
• Supplemental progress estimate
• Semifinal estimate
• Final estimate

The resident engineer will regularly request the monthly progress and the progress after acceptance estimates while the remaining three types of estimates usually will be requested in cooperation with, or by, the district construction office.

Supplemental progress estimates may only be run between the completion of the monthly progress estimate run and the 15th of the following month.

Producing an estimate is completely automatic, based on data previously stored in the computer.

In addition, CAS will produce two other types of estimates that do not generate payments. These estimates are simply statements of the current status of the computer files. The following are the two types:
• Status purpose only estimate
• Proposed final estimate

5-103F (1) Procedure
Before requesting the first monthly progress estimate, enter the date work started and the responsible unit on Form CEM-6003, “Progress Pay—Estimate Project Initiation or Update.” The Division of Construction progress pay coordinator enters the approval date. If the approval date is not in the computer file, the system will reject the estimate request.

The procedure for processing an estimate includes the following steps:
• Preparing Form CEM-6101, “Project Record—Estimate Request,” and verifying the estimate. Transmit these to the district office.
• Computer processing of your estimate and printing the reports.
• Verifying the estimate results at the district Construction office.
• Returning the estimate reports to the resident engineer.

The schedule for completing the pay process and making payment to the contractor is rigid. This rigid schedule means all people involved must adhere to their individual schedules. District Construction offices will advise resident engineers of the schedules.

5-103F (1a) Preparing Form CEM-6101, “Project Record—Estimate Request”

To request an estimate, complete this form accurately in accordance with the following:

5-103F (1b) Estimate Parameters

For the estimate parameters, follow these instructions:

• Enter the contract number.

• Enter the estimate number. This number must be one greater than the last estimate that was successfully processed and paid.

• Enter the work period ending date in the estimate for the form’s “Work Performed Through” field. For a progress estimate or a supplemental progress estimate, enter the 20th day of the month. For all other types of estimates, use the date of completion.

• If this is a monthly progress estimate, place an “X” in the matching box on the form; otherwise, leave the box blank.

• If this is a progress estimate after acceptance, place an “X” in the matching box on the form; otherwise, leave the box blank.

• Enter the estimated date of completion. This date should be the resident engineer’s best estimate, not necessarily the computed date. If this estimate is not a progress estimate, enter the date of completion.

• Enter the values as of the “date work performed through” for chargeable working days, weather nonworking days, and authorized time extension days (change order) in the three matching fields of the form. As of February 16, 2012, “Other day” time extensions are no longer allowed, therefore do not increase this value to more than existed before this date. In most cases, this value should always be zero. The system will check the chargeable working days and weather nonworking days against the working days calendar and inform you of possible entry errors. However, it cannot check the two types of time extension days. These values affect the system’s computation of percent time elapsed.

• If you have a landscape contract that is in the plant establishment period, check one of the two boxes to indicate whether progress is satisfactory or unsatisfactory. These boxes are not for highway contracts that contain “Type 2” plant establishment periods. If you are unsure of this status, contact the district Construction office after reading the special provisions.

• The system determines whether contract progress is satisfactory or unsatisfactory. Occasionally, a situation arises in which, even though progress is
mathematically unsatisfactory, the resident engineer wishes to override the system and record satisfactory progress. To accomplish this override, place an “X” in the field, “Override Unsatisfactory Progress.” Also refer to the following item about projects with dual time limits.

- For some contracts, the standard manual formula does not apply for computing percent time elapsed. For such contracts, interpret the special provisions, and determine this percentage. Enter the percent in the box on the form; this will override the system’s calculation.

- If you have checked “Override Unsatisfactory Progress” or entered a number in percent time elapsed, enter a short explanation in the 25 spaces immediately below these fields on the form. Typical entries might be “change order days pending” or “Nonstandard time format.”

- If the estimate is a supplemental progress estimate, proposed final estimate, semifinal estimate, or final estimate, check the appropriate box. Note that on a supplemental progress estimate the date for “Estimate for Work Performed Through” and all of the working day information should be the same as the date for the last estimate.

- If this estimate is a rerun (a recalculation) of a previous successful estimate, check the recalculation box. Note that, if the most recent estimate processed was a status purpose only estimate, you are not rerunning an estimate this month; instead, you are trying to run the estimate that did not generate payment. Normally, the district office will enter requests to rerun an estimate.

5-103F (1c) Deductions

If you wish to take one or more deductions or to return one or more deductions from a previous estimate, enter them on Form CEM-6101, “Project Record—Estimate Request.” If you wish to rerun an estimate or to pay an estimate after a status only estimate, you still must enter the deductions again because any deduction stored in the computer file and carrying this estimate number will be erased automatically.

You can enter five types of deductions on this form. Each deduction entered requires an alpha code to be placed in the form’s type field and an entry in the description field. Use a minus sign to take a deduction and a plus sign to return a previous deduction. The following lists the rules by type of description:

- Administrative deductions: Enter “ADM” in the type field. Both plus and minus deductions are allowed.

- Equal employment opportunity deductions: Enter “EEO” in the type field. Both plus and minus deductions are allowed, but plus deductions should be adjustments or reversals of deductions taken on previous estimates. If you wish to take an EEO deduction on this estimate, leave the amount field blank. The system will compute the deduction amount for you. Only one “blank” EEO deduction, normally entered by the labor compliance officer, can appear on the form. Note: The system will not accept EEO deductions if the contract item
payment for this estimate is zero. It may be necessary to enter the minimum amount of $1,000.

- Labor compliance violation deductions: The labor compliance officer usually makes these entries on the form. The officer will enter “LCV” in the type field. The rules for LCV deductions are identical to those for EEO deductions. Note: “LCV” deductions will not be taken if the contract item payment for this estimate is zero. It may be necessary to enter the minimum amount of $1,000.

- Liquidated damages deductions: Enter “LIQ” in the type field. Both plus and minus deductions are allowed. Plus deductions reverse earlier deductions. Only use this type of deduction when liquidated damages are being assessed. If during the course of the work, the contractor’s progress is unsatisfactory and has progressed to a point where a reasonably accurate estimate of possible liquidated damages can be made, make a deduction instead of any retention for unsatisfactory progress using an ADM in the type field with the text “Antic.Liq.Damages.” Reverse the ADM when the actual liquidated damages are being assessed by using LIQ in the type field. Refer to Sections 3-807, “Liquidated Damages,” and 3-906G, “Deductions,” of this manual for more detailed guidance.

- Other outstanding documents deductions: Enter “OOD” in the type field. If you wish to take this deduction, leave the amount field blank. The system will compute the amount for you. Take this deduction only once per contract. The system will maintain the correct deduction on subsequent estimates by generating “OOD” in the type field with a description, “MAINTAIN OOD DEDUCT.” You can reverse the deduction at any time by entering a plus amount that exactly reverses the OOD deductions to date from the previous estimate. Negative OOD deduction amounts are never allowed on the input form.

After carefully preparing Form CEM-6101, “Project Record—Estimate Request,” promptly send it to the district office. The specific deadline for submittal may vary by district.

5-103F (2) Computer Processing

Once you have made your entries on Form CEM-6101, “Project Record—Estimate Request,” and transferred them to the computer, the system edits the estimates and then produces reports showing the results of the system’s processing.

5-103F (2a) Estimate Edits

Once Form CEM-6101, “Project Record—Estimate Request,” has been entered into CAS, the system will do the following:

- Edit Form CEM-6101 for consistency with previous estimates and with the working days calendar stored in the computer.
- Identify and summarize all daily extra work reports entered in the system and eligible for payment since the last estimate.
• Identify and summarize all contract transactions entered in the system since the last estimate.
• Identify and balance the change orders that require balancing.
• Identify and balance the contract items that require balancing.
• Make calculations for the item “Mobilization” (if necessary), for the various deductions and retentions, for percent time elapsed, for percent complete, and for various status totals, such as authorized final cost. The system also determines whether the contractor’s progress is satisfactory.
• Edit any deduction submitted for processing on Form CEM-6101, “Project Record—Estimate Request.” Special attention is given to three of the deductions as follows:
  o If the resident engineer has submitted an EEO deduction, CAS computes the amount as 10 percent of the contract item payment on this estimate, or a minimum of $1,000 or a maximum of $10,000, and places the deduction on file.
  o If the resident engineer has submitted an LCV deduction, the system performs the same calculation as for EEO deductions described above.
  o If the resident engineer has submitted an OOD deduction, the system will compute the deduction under the following conditions:
    − The contract has been completed, or retention is being reduced because the percent complete exceeds 95 percent. If one of these conditions is not met, the deduction will be rejected.
    − The total of all OOD deductions from prior estimates must be zero, or the deduction will be rejected. An OOD deduction should be taken only once for a contract.
    − If the first two conditions are met, the amount of the deduction is calculated as 5 percent of the total work completed to date less mobilization, or $10,000, whichever is less.

Further deduction processing as follows:
  o If the total to date for an OOD deduction is negative, the system will check whether the value has changed since the last estimate for total work completed to date less mobilization. If the value has changed, the system will generate a new OOD deduction with a description, “MAINTAIN OOD DEDUCT,” and an amount equal to the difference between the amount demanded by the formula and the amount of the total to date for this type of deduction. Thus, an OOD deduction, once submitted, will be maintained at the formula’s value unless it is exactly reversed by a positive deduction entry on Form CEM-6101, “Project Record—Estimate Request.”
  o For each type of deduction, you cannot give back more than has been taken. If you make this error, the estimate will fail. Messages are produced stating which deduction is in error.
At this point in the processing, the final values are computed for total work completed and total payment to the contractor. If there are “Limitation of Payment” dates and amounts in the special provisions for this contract, the Division of Construction progress pay coordinator will have entered them in the computer. The system will check the period ending date of this estimate and will generate or return any split-year-financing deductions that are necessary under the contract’s terms.

- If retention is being released on this estimate and the total to date for liquidated damages is zero, the system will issue a warning message.
- The system automatically computes overbid item deductions as required. These deductions are taken and returned at the appropriate times.

- Make calculations for the progress payment voucher, including retentions and payments to escrow accounts.
- Determining the success of the estimate’s processing.
- If processing is successful, CAS prints your estimate.
- If this estimate is for a zero or negative progress payment, the system prints a status purpose only estimate.
  - If the total authorized final cost is greater than the construction allotment, CAS will issue a severe warning.
  - If the total payment to date to the contractor on this estimate is greater than the construction allotment, the estimate will fail.

5-103F (2b) Estimate Output

Once CAS has processed the estimates, it produces the following reports:

- Schedule of extra work
- Schedule of deductions
- Project record estimate
- Project status
- Work done by Structures
- Progress payment voucher

Only two copies of the estimate will be sent to the field, one for the resident engineer and one for the contractor. The contractor also must receive copies of the reports listed.

In addition to the estimate documents previously listed, CAS also produces a report called “Estimate Processing Results.” This report is the tool by which the resident engineer can check the “estimate package.” This report has the following sections:

- Edit messages: The system can produce many possible messages. If the estimate is rejected, the exact reason will be found here. To assist in preventing
overpayments, among other problems, warning messages have been set based on carefully chosen tolerances. Read these messages carefully.

- Transaction selection: The system will print a list of the exact pages and lines of contract transactions that were used to produce the estimate. This list enables you to verify that all the contract transactions you submitted were used to produce the estimate.
- Change order processing: This lists any balancing of change orders by the system. Occasionally, the list also contains warning messages.
- Contract item processing: This part of the report does the same things as described for change order processing, but for contract items instead of change orders.
- Contract transactions list: This list identifies all contract transactions used to generate your estimate. If you question any line item on the project record-estimate, examine the detailed records to see how the system derived its totals.
- Structure totals: This item summarizes all structure work the system found while processing the estimate.

5-103F (3) Potential Problems

For the unwary, several points in the estimate process can cause errors. These problems result from misunderstanding what constitutes an estimate and how the estimate number should be increased from estimate to estimate.

On the title page of the project record estimate and in the estimate processing results, the system will print the type of estimate generated. If the estimate is one of the five types listed in Section 5-103F, “Generating Estimates,” of this manual a valid estimate was generated.

The progress pay system requires that the estimate number be increased only by valid estimates. Thus, if you request estimate number 3 to be processed, but the system generates a status-purpose-only estimate, a valid estimate was not generated. Request estimate number 3 again for the next estimate.

Another potential problem involves two types of contract transactions: materials on hand and anticipated changes. These transactions apply to a specific estimate period. If the estimate generated by the system is a status-purpose-only estimate, these transactions have not been “used.” They will appear on the next valid estimate generated. If their appearance on the next estimate is not satisfactory, you must use reversing entries before requesting the next estimate from the system.

If the estimate has failed for any reason, the system will print, with one exception, as many of the estimate reports as possible to help you analyze the problem. The one exception, the progress payment voucher, is only printed for successful estimates that are eligible for payment according to the system’s standards.

Processing the estimate is done by a series of computer programs that perform the following functions:
• Edit data input on Form CEM-6101, “Project Record—Estimate Request.”
• Select from the computer file the change order bills that will be used to generate this estimate.
• Select from the computer file the contract transactions that will be used to generate this estimate.
• Process the change orders.
• Process contract items.
• Process deductions.
• Conduct miscellaneous computations.
• Generate reports.

5-103G Approval of Estimates
The authorization of an estimate depends on the type of estimate being run. The following is the general outline and method for approving contract estimates.

5-103G (1) Resident Engineer
After an estimate has been run, the resident engineer must authorize it before the process of payment is continued. To expedite payment, the resident engineer can authorize through a memo, form letter, or telephone call with subsequent written confirmation to the district office.

5-103G (2) District Director
At the time the estimate was produced, so was a payment voucher. If the estimate is a final estimate, an individual who has been formally delegated by the district director to do so must sign the form.

5-103G (3) Flagging an Estimate for Payment
Flagging an estimate in the computer system for payment indicates that a payment voucher has been verified and authorized.

For payments on after-acceptance estimates, semifinal estimates, and final estimates, the Division of Construction progress pay coordinator must flag the estimates in the computer system for payment after the district’s flagging.

5-103H Reports Available Through the Contract Administration System
CAS online reporting through CA-Output Management Web Viewer is available at:

https://gc.go-online.ca.gov/CADVWeb.asp

CA-View user guide and tips may be found on the Information Technology Onramp page called “Information About CAS.”
5-103H (1) District (XX) Estimate Status
This report, which is also available statewide, provides information on the pay status of each contract in the district. For each contract, the report includes the following:

• Contract number
• Date of last estimate processed (if there was one)
• Number of the estimate
• Number of days elapsed since the estimate was processed
• Type of estimate
• Pay status and date paid (if paid)
• Date on which the payment voucher was authorized
• Resident engineer's name and phone number
• Responsible unit
• Password

5-103H (2) Project Management
The project management report is for use by the district office and Division of Construction managers. This report consists of the following two separate reports that are produced whenever “Project Management” is requested.

5-103H (2a) Project File Status Report
This report lists all contracts in the district (or statewide) that are on the computer’s active list. For each contract, the report provides the following information:

• Contract number
• Status
• Date bids were opened
• Date of award
• Date of approval
• Date of acceptance
• Bid amount
• Name of contractor

After bid opening, projects are added to the list automatically. After the final estimate and approvals from the districts and the disbursing office, the Division of Construction removes the projects from the list.

5-103H (2b) Exceptional Contracts Report
This report lists all contracts for which the following applies:

• More than 60 days have elapsed since the bid opening.
• More than 10 days have elapsed since the completion date and the contract needs an acceptance date.
• More than 45 days have elapsed since completion, but the proposed final estimates have not been run.
• More than 180 days have elapsed since completion, but the final estimates have not been run.

5-103H (3) District (XX) Project Status
This report is for use by construction managers. It lists all active contracts, and for each contract, provides the following information:
• Contract number
• Contractor’s name and county-route-postmile
• Date of the last estimate
• Percentage complete
• Percentage of time elapsed
• Construction allotment
• Total amount paid to date
• Estimated final cost
• Estimated final contingency balance

5-103H (4) Progress Payment-Work Done by Structure Construction (Copies)

5-103H (5) Project Record-Estimate (Copies)
A request for estimate copies will produce all of the documents that were produced automatically during the previous estimate’s run; you should not need to order copies through this program. For the estimate, the report contains the following information:
• Schedule of extra work
• Schedule of deductions
• Project record-estimate
• Project status
• Progress payment voucher

5-103H (6) Status of Contract Items
The district office requests this report monthly for all ongoing contracts. The report must be filed in Category 60, “Contract Administration System Inputs and Reports.”
For this report, the system prints one line of information for each contract item and summarizes the net effect of all contract transactions that have been entered against the item. This report allows the resident engineer to review each item and determine whether quantity balances and anticipated changes, among other things, are necessary.

If any particular number on the report seems questionable, the project record item sheets provide supporting detail. For example, if the authorized quantity differs from the bid quantity, the project record item sheets describe, under the item number, any changes due to change orders.

When applicable, take particular care to flag an item “COMPLETE” (using the item final balance transaction on Form CEM-6101) so that an accurate project status will be produced. Remember, flagging an item “COMPLETE” does not mean that contract item transactions will no longer be accepted; it means only that you have commanded the system to keep the item in balance at all times.

5-103H (7) Project Record Item Sheet

The district office requests this report monthly for all ongoing contracts. The report must be filed in Category 60, “Contract Administration System Inputs and Reports.”

With the following exceptions, the project record item sheets list every contract transaction entered into the system since the beginning of the contract:

- Item and change order final balance transactions will appear only on the report following the next estimate. Thereafter, they are dropped from the report.
- Miscellaneous anticipated change transactions also appear only on the report following the next estimate.

The report lists the contract transactions, first by the estimate number on which they were paid, and then by the page and line number of the input form. The total to date will be printed.

This is a cumulative report. Do not retain previous issues of this report in the project files. However, one issue of the report, usually the one requested immediately after all final quantities have been paid, must be retained in the project’s files.

5-103H (8) Status of Change Orders

Normally, the district office requests this report monthly for all ongoing contracts. The report must be filed in Category 60, “Contract Administration System Inputs and Reports.”

This report is similar to the status of contract items, which allows the engineer to review each change order.

Use the report to determine when supplemental change orders will be necessary to complete the work. The report also facilitates a review of those change orders where a credit is due Caltrans.

When applicable, flag change orders “COMPLETE” using the change order final balance transaction, so that an accurate project status can be produced. Similar to
flagging a contract item, flagging a change order “COMPLETE” means only that you have commanded the system to keep the change order in balance at all times.

5-103H (9) **Change Order Master Listing**

Normally, the district office requests this report monthly for all ongoing contracts. The report must be filed in Category 60.

This report summarizes all change orders stored in the computer file. It also contains the change order time extension and change order category code. The report lists each individual supplement with all the information the system contains. Do not retain previous issues in the project’s files. However, one issue, usually the one requested immediately after final payment has been made on all change orders, must be retained in the project’s files.

5-103H (10) **Bridge Quantities by Structure**

This report is for use by Structure Construction personnel. It is available on all projects for which Form CEM-6003, “Progress Pay—Estimate Project Initiation or Update,” has been filed. The filing of this form indicates a structure work amount and structure numbers have been entered for the contract transaction in accordance with the instructions in Section 6, “Estimates,” of the *Bridge Construction Records and Procedures* manual, Vol. 1.

5-103H (11) **District (XX) Status of Anticipated Changes**

This report is for use by the district and Division of Construction managers.

5-103H (12) **Project Record-Estimate (Dummy)**

A request for this item will produce the same form that was produced automatically when Form CEM-6003, “Progress Pay—Estimate Project Initiation or Update,” was filed.

This form is identical to a project record-estimate, except that it does not contain an estimate number or dates and no entries appear under “This Estimate” or “Total Estimate.” It is a blank estimate form, valuable only if it became necessary to make an estimate manually.

5-103H (13) **Contract Contents Report**

This report contains information that is currently in the file as a result of automatic entries or entries from Form CEM-6003 “Progress Pay—Estimate Project Initiation or Update.”

Most of the information in this report is included already in other reports and forms that are produced automatically. Therefore, you do not need to request it routinely.

5-103H (14) **Contract Contents Report-Contract Item Records**

This report provides the following information:

- Contract item number
• Contract item index number
• Item description
• Unit of measure
• Bid price
• Bid quantity
• Bid amount
• Amount overbid
• Void items
• Plant establishment items

Most of the information in this report is included already in other reports and forms that are produced automatically. Therefore, you do not need it for routine contract administration.

5-103H (15) Contract Contents Report-Contract Progress
For each contract item, this report includes a detailed analysis of the current and previous quantities and payment status. It also summarizes all other payments or deductions as well as data on contract time. The information in this report is included already in other reports that are produced automatically. Therefore, you do not need it for routine contract administration.

5-103H (16) DEWRs in Holding File
This daily extra work report lists change order bills that are in the holding file for all contracts in the district. If there are reports in the holding file, process supplemental change orders to provide additional funds. The bill must be re-approved in the iEWB system in order to be released for payment on the next estimate.

5-103H (17) Daily Extra Work Report
Copies of daily extra work reports are produced under the procedure outlined in Section 5-103E, “Change Order Billing,” of this manual. You can obtain copies by using the second page of the report request form or receive reports directly from the iEWB system. Refer to the iEWB User Guide for details.

5-103H (18) Rental Rates and Codes for Miscellaneous Equipment
This report provides a listing of equipment codes and related descriptive information for equipment that is not included in the Labor Surcharge and Equipment Rental Rates (Cost of Equipment Ownership) book.

5-103H (19) Reports for Structure Construction
In addition to the reports discussed above, CAS provides reports for Structure Construction. For details, refer to Section 6, “Estimates,” of the Bridge Construction Records and Procedures manual, Vol. 1.
5-103I Field Audits by Accounting Office

In accordance with instructions from the Division of Administrative Services, personnel from the Accounting Office will periodically review record-keeping procedures for construction projects. The accounting reviewer will prepare a report of the findings, a copy of which will be sent to the deputy district director of Construction and the resident engineer.

District Construction must then report back to the Accounting Office, stating what actions it took in response to the report’s recommendations. If the district’s actions result in a dispute, the deputy district director of Construction will resolve the dispute.

5-104 Final Construction Project Records

5-104A General

Construction project records consist of all material in the construction files, whether in the field office, the district construction office, or filed on the Falcon electronic document management system (FalconDMS). This section contains guidelines for the disposition of construction project records after Caltrans makes the final payment to the contractor. This section also provides guidelines for allowing public access to construction project records and for producing a set of as-built plans for each completed construction project. In addition to construction project records, the district keeps a project history file.

For construction project records not stored on FalconDMS, when the construction project is completed, the resident engineer initiates assembly of the project history file by transmitting designated records to the district Construction Unit for compilation. The project history file is stored in a secure, central file location within the district. For information about the project history file, refer to Chapter 7, “Uniform Filing System,” of the Project Development Procedures Manual. The construction records retention schedule, Form STD 73, “Records Retention Schedule,” lists records that are retained by the districts and Construction headquarters. For specific records stored in the project history file, refer to Section 5-104C, “Disposition of Construction Project Records,” of this manual.

For construction project records that are solely stored on FalconDMS, the project records will be retained in FalconDMS on the district server. When project files are stored on FalconDMS, there is no need to assemble a hardcopy project history file for retention in the district construction office. Records will be retained on FalconDMS in accordance with the requirements listed in section 5-104C, and the retention schedule will be managed within FalconDMS.

When resident engineers on construction projects with an award date before July 1, 2021, choose to switch from storing project records in hardcopy format to storing projects records on FalconDMS midway through the project, the resident engineer must initiate assembly of the project history file in electronic format by having the designated hardcopy records scanned and saved electronically and combined with the designated electronic records stored on FalconDMS. The remainder of the
Project records can be retained in both hardcopy and electronic format in accordance with the requirements listed in section 5-104C.

5-104B Public Access to Project Records
The California Public Records Act permits anyone to obtain any written information relating to the conduct of the public’s business that is prepared, owned, used, or retained by any state agency, regardless of the physical form or characteristic of the writing. Although the act includes exemptions for certain categories of records, most construction project records fall within the description of documents that must be produced upon proper demand. Except for preliminary drafts or notes that are not retained in the ordinary course of business, permanent project records that are reasonably identified are subject to inspection and copy.

Records exempt from disclosure include the following:

- Estimated project cost before bidding.
- Contract claim analysis.
- Personal information, such as home addresses, telephone numbers, medical records, and similar files, the disclosure of which would constitute an unwarranted invasion of personal privacy.
- Accident reports. If accident reports produced by another agency are requested, such as accident reports by the California Highway Patrol, refer the requester to the other agency.

If copies of payroll records are requested, refer to Section 7-1.02K(3), “Certified Payroll Records (California Labor Code, §1776),” of the Standard Specifications for the procedures to follow.

Resident engineers should refer all requests for copies of any records to the district Construction office and follow procedures established in the district for copying and charging for record copies.

Allow contractors and subcontractors to review records used to determine contract payment in the construction field office.

5-104C Disposition of Construction Project Records
District Construction personnel who are responsible for the disposition of construction project records must coordinate their activities with the district records officer.

District Construction offices must follow the statewide procedure for handling project records. This procedure is in accordance with the statewide records retention schedule and achieves the following objectives:

- Relieve the resident engineer of the responsibility for storing the records before or at the time final payment is made.
- Avoid unnecessary long-term storage of duplicate copies.
• Before the records are destroyed, transfer material that has historical value to the project history file.

• Retain construction project records in accordance with Table 5-1.1, “Construction Records Retention Schedule,” of this manual and as follows:

1. For projects that involve federal participation, retain the records for a minimum of 3 years after submission of the final federal voucher.

2. For projects that do not involve federal participation, retain the records for a minimum of 3 years after the date on which the final estimate is scheduled for payment.

3. For projects on which some legal question exists, such as a pending claim, a labor compliance case, or litigation, retain the records for 3 years after settlement. The district Construction office must send a memorandum to the district records officer to hold these records until further notice.

After records from the resident engineer’s office are sent to the district Construction office, eliminate duplicate records.

The construction project records retention schedule lists the length of time certain files must be retained, as well as files that must be kept permanently in the project history files in accordance with federal requirements.
| Project Record Category                          | Project Funding Type | Retention                                                      |
|------------------------------------------------|----------------------|                                                               |
| 1. Project Personnel                            | State only           | Until final estimate                                           |
| 2. Project Office Equipment and Supplies         | State only           | Until final estimate                                           |
| 3. Equipment and Personnel Cost Reports          | State only           | Until final estimate                                           |
| 4. Service Contracts                            | State only           | Until final estimate                                           |
| 5. General Correspondence                       | State or Federal     | 3 years beyond final estimate or final federal voucher         |
| 6. Safety                                       | State or Federal     | 3 years beyond final estimate or final federal voucher         |
| 7. Public Relations                             | State only           | Final estimate                                                 |
| 8. Construction Surveys                         | State or Federal     | 3 years beyond final estimate or final federal voucher         |
| 9. Welding                                      | State or Federal     | 3 years beyond final estimate or final federal voucher         |
| 10. (Extra category number)                     | To be announced       | To be announced                                                |
| 11. Information Furnished at Start of Project (except documents listed in 11a-f) | State or Federal | 3 years beyond final estimate or final federal voucher |
| 11a. Detail Estimate of Project Cost            | Federal and State    | Permanent project file                                         |
| 11b. Notice of Award of Contract                | Federal and State    | Permanent project file                                         |
| 11c. Contract Special Provisions and Addendums   | Federal and State    | Permanent project file                                         |
| 11d. Notice of Approval of the Contract         | Federal and State    | Permanent project file                                         |
| 11e. Executed Contract                          | Federal and State    | Permanent project file                                         |
| 11f. Bid Book                                   | Federal and State    | Permanent project file                                         |
| 12. Contractor (except 12a documents)           | State or Federal     | 3 years beyond final estimate or final federal voucher         |
| 12a. Contractor’s Borrow Agreements             | Federal and State    | Permanent project file                                         |
Table 5-1.1. Construction Records Retention Schedule (2 of 6)

<table>
<thead>
<tr>
<th>Project Record Category</th>
<th>Project Funding Type</th>
<th>Retention</th>
</tr>
</thead>
<tbody>
<tr>
<td>13. Signs and Striping</td>
<td>State or Federal</td>
<td>3 years beyond final estimate or final federal voucher</td>
</tr>
<tr>
<td>14. Photo Records</td>
<td>Federal and State</td>
<td>Permanent project File</td>
</tr>
<tr>
<td>15. Accidents</td>
<td>State or Federal</td>
<td>3 years beyond final estimate or final federal voucher</td>
</tr>
<tr>
<td>16. Utility Agreements</td>
<td>State or Federal</td>
<td>Permanent project file</td>
</tr>
<tr>
<td>17. Utility Work Performed</td>
<td>State or Federal</td>
<td>3 years beyond final estimate or final federal voucher</td>
</tr>
<tr>
<td>18. Agreements (except documents listed in 18a-e)</td>
<td>State or Federal</td>
<td>3 years beyond final estimate or final federal voucher</td>
</tr>
<tr>
<td>18a. Right of Way Agreements (with or without obligation)</td>
<td>Federal and State</td>
<td>Permanent project file</td>
</tr>
<tr>
<td>18b. Forest Service Agreements</td>
<td>Federal and State</td>
<td>Permanent project file</td>
</tr>
<tr>
<td>18c. Borrow Agreements (between state and owner)</td>
<td>Federal and State</td>
<td>Permanent project file</td>
</tr>
<tr>
<td>18d. Disposal Agreements (between state and owner)</td>
<td>Federal and State</td>
<td>Permanent project file</td>
</tr>
<tr>
<td>18e. Service Agreements (charged to contract allotment)</td>
<td>Federal and State</td>
<td>Permanent project file</td>
</tr>
<tr>
<td>20. Water Pollution Control Plan or Stormwater Pollution Prevention Plan</td>
<td>State or Federal</td>
<td>3 years beyond final estimate or final federal voucher</td>
</tr>
<tr>
<td>21. Construction or Maintenance Zone Enhanced Enforcement Program</td>
<td>State or Federal</td>
<td>3 years beyond final estimate or final federal voucher</td>
</tr>
<tr>
<td>22. Traffic Management Information</td>
<td>State or Federal</td>
<td>3 years beyond final estimate or final federal voucher</td>
</tr>
<tr>
<td>23. Temporary Pedestrian Access Routes</td>
<td>State only</td>
<td>Until final estimate</td>
</tr>
<tr>
<td>Project Record Category</td>
<td>Project Funding Type</td>
<td>Retention</td>
</tr>
<tr>
<td>----------------------------------------------------------------------------------------</td>
<td>----------------------</td>
<td>---------------------------------------------------------------------------</td>
</tr>
<tr>
<td>24. Disadvantaged Business Enterprises and Disabled Veteran Business Enterprises</td>
<td>State or Federal</td>
<td>3 years beyond final estimate or final federal voucher</td>
</tr>
<tr>
<td>25. Labor Compliance and Equal Employment Opportunity</td>
<td>State or Federal</td>
<td>3 years beyond final estimate or final federal voucher</td>
</tr>
<tr>
<td>26. Progress Schedule</td>
<td>State or Federal</td>
<td>3 years beyond final estimate or final federal voucher</td>
</tr>
<tr>
<td>27. Weekly Statement of Working Days</td>
<td>State or Federal</td>
<td>3 years beyond final estimate or final federal voucher</td>
</tr>
<tr>
<td>28. Weekly Newsletter</td>
<td>State only</td>
<td>Until final estimate</td>
</tr>
<tr>
<td>29. Materials information and Preliminary Tests</td>
<td>State or Federal</td>
<td>3 years beyond final estimate or final federal voucher</td>
</tr>
<tr>
<td>30. Basement Soil Test Results</td>
<td>State or Federal</td>
<td>3 years beyond final estimate or final federal voucher</td>
</tr>
<tr>
<td>31. Notice of Materials to be Used</td>
<td>State or Federal</td>
<td>3 years beyond final estimate or final federal voucher</td>
</tr>
<tr>
<td>32. Notice of Materials to be Inspected for the Job Site</td>
<td>State or Federal</td>
<td>3 years beyond final estimate or final federal voucher</td>
</tr>
<tr>
<td>33. Notice of Materials to be Furnished</td>
<td>State or Federal</td>
<td>3 years beyond final estimate or final federal voucher</td>
</tr>
<tr>
<td>34. Treated Base</td>
<td>State or Federal</td>
<td>3 years beyond final estimate or final federal voucher</td>
</tr>
<tr>
<td>35. Hot Mix Asphalt</td>
<td>State or Federal</td>
<td>3 years beyond final estimate or final federal voucher</td>
</tr>
<tr>
<td>36. Concrete (other than structure items)</td>
<td>State or Federal</td>
<td>3 years beyond final estimate or final federal voucher</td>
</tr>
</tbody>
</table>
Table 5-1.1. Construction Records Retention Schedule (4 of 6)

<table>
<thead>
<tr>
<th>Project Record Category</th>
<th>Project Funding Type</th>
<th>Retention</th>
</tr>
</thead>
<tbody>
<tr>
<td>37. Initial Tests and Acceptance Tests</td>
<td>State or Federal</td>
<td>3 years beyond final estimate or final federal voucher</td>
</tr>
<tr>
<td>38. Quality Control</td>
<td>State or Federal</td>
<td>3 years beyond final estimate or final federal voucher</td>
</tr>
<tr>
<td>39. Materials Testing Qualifications of Employees</td>
<td>State or Federal</td>
<td>3 years beyond final estimate or final federal voucher</td>
</tr>
<tr>
<td>40. Field Laboratory Assistant Reports to Resident Engineer</td>
<td>State or Federal</td>
<td>3 years beyond final estimate or final federal voucher</td>
</tr>
<tr>
<td>41. Report of Inspection Material</td>
<td>State or Federal</td>
<td>3 years beyond final estimate or final federal voucher</td>
</tr>
<tr>
<td>42. Material Plants</td>
<td>State or Federal</td>
<td>3 years beyond final estimate or final federal voucher</td>
</tr>
<tr>
<td>43. Concrete and Reinforcing Steel</td>
<td>State or Federal</td>
<td>3 years beyond final estimate or final federal voucher</td>
</tr>
<tr>
<td>44. Recycle Materials and Diversion of Solid Waste</td>
<td>State or Federal</td>
<td>3 years beyond final estimate or final federal voucher</td>
</tr>
<tr>
<td>45. Resident Engineer's Daily Reports</td>
<td>State or Federal</td>
<td>3 years beyond final estimate or final federal voucher</td>
</tr>
<tr>
<td>46. Assistant Resident Engineer’s Daily Reports</td>
<td>State or Federal</td>
<td>3 years beyond final estimate or final federal voucher</td>
</tr>
<tr>
<td>47. Drainage Systems</td>
<td>State or Federal</td>
<td>3 years beyond final estimate or final federal voucher</td>
</tr>
<tr>
<td>48. Bid Item Quantity Documents</td>
<td>State or Federal</td>
<td>3 years beyond final estimate or final federal voucher</td>
</tr>
<tr>
<td>49. Change orders (except documents listed in 49a-b)</td>
<td>State or Federal</td>
<td>3 years beyond final estimate or final federal voucher</td>
</tr>
<tr>
<td>Project Record Category</td>
<td>Project Funding Type</td>
<td>Retention</td>
</tr>
<tr>
<td>-------------------------</td>
<td>----------------------</td>
<td>-----------</td>
</tr>
<tr>
<td>49a. Change Orders (no drafts)</td>
<td>Federal and State</td>
<td>Permanent project files</td>
</tr>
<tr>
<td>49b. Memorandums (no drafts)</td>
<td>Federal and State</td>
<td>Permanent project files</td>
</tr>
<tr>
<td>50. Adjustment in Compensation Calculations</td>
<td>State or Federal</td>
<td>3 years beyond final estimate or final federal voucher</td>
</tr>
<tr>
<td>51. Materials on Hand</td>
<td>State or Federal</td>
<td>3 years beyond final estimate or final federal voucher</td>
</tr>
<tr>
<td>52. Charges to Total Contract Allotment</td>
<td>State or Federal</td>
<td>3 years beyond final estimate or final federal voucher</td>
</tr>
<tr>
<td>53. Credit to Contract</td>
<td>State or Federal</td>
<td>3 years beyond final estimate or final federal voucher</td>
</tr>
<tr>
<td>54. Deductions from Payment to Contractor</td>
<td>State or Federal</td>
<td>3 years beyond final estimate or final federal voucher</td>
</tr>
<tr>
<td>55. Partnering</td>
<td>State or Federal</td>
<td>3 years beyond final estimate or final federal voucher</td>
</tr>
<tr>
<td>56. (Extra category number)</td>
<td>To be announced</td>
<td>To be announced</td>
</tr>
<tr>
<td>57. Permanent Pedestrian Facilities</td>
<td>State or Federal</td>
<td>3 years beyond final estimate or final federal voucher</td>
</tr>
<tr>
<td>58. (Extra category number)</td>
<td>To be announced</td>
<td>To be announced</td>
</tr>
<tr>
<td>59. Bridge Estimate Data</td>
<td>State or Federal</td>
<td>3 years beyond final estimate or final federal voucher</td>
</tr>
<tr>
<td>60. Contract Administration System Inputs and Reports</td>
<td>State or Federal</td>
<td>3 years beyond final estimate or final federal voucher</td>
</tr>
<tr>
<td>61. Estimate and Project Status (except documents listed in 61a-b)</td>
<td>State or Federal</td>
<td>3 years beyond final estimate or final federal voucher</td>
</tr>
<tr>
<td>61a. Final Estimate</td>
<td>Federal and State</td>
<td>Permanent project records</td>
</tr>
<tr>
<td>61b. Invoice and Receiving Records (if applicable)</td>
<td>Federal and State</td>
<td>Permanent project records</td>
</tr>
</tbody>
</table>
Table 5-1.1. Construction Records Retention Schedule (6 of 6)

<table>
<thead>
<tr>
<th>Project Record Category</th>
<th>Project Funding Type</th>
<th>Retention</th>
</tr>
</thead>
<tbody>
<tr>
<td>62. Disputes</td>
<td>State or Federal</td>
<td>3 years beyond final estimate or final federal voucher</td>
</tr>
<tr>
<td>63. Project Completion Documents (except documents listed in 63a-c)</td>
<td>State or Federal</td>
<td>3 years beyond final estimate or final federal voucher</td>
</tr>
<tr>
<td>63a. Contract Acceptance</td>
<td>Federal and State</td>
<td>Permanent project records</td>
</tr>
<tr>
<td>63b. Final Materials Certification</td>
<td>Federal and State</td>
<td>Permanent project records</td>
</tr>
<tr>
<td>63c. Final Acceptance Checklist for Federal Aid High Profile Projects</td>
<td>Federal and State</td>
<td>Permanent project records</td>
</tr>
</tbody>
</table>

Prepare a transmittal list specifying the contents of each box when records are sent from the district construction office to the State Records Center or to another district. In a separate file in the district construction office, retain a copy of the transmittal list. Files stored electronically must also be sent.

The Bridge Construction Records and Procedures manual should be referenced for structure-related records that are transmitted to Structure Construction at the completion of the project for permanent storage.

5-104D As-Built Plans

Districts are responsible for all as-built road plans, and Structure Design is responsible for all as-built structure plans. To handle as-built plans, use the following procedure:

The district Design Unit will give the resident engineer full-size prints of all road plans. Prints of structure plans will be supplied to the structure representative. The plans may also be transmitted in electronic form when field forces have the capability of computer-aided drafting and design (CADD). As-built information is recorded on the full-size drawings or recorded on a set of contract plans using CADD.

Each sheet of as-built plans must be clearly identified as such. All sheets upon which changes are made must contain the name of the resident engineer or structure representative.

5-104D (1) District Procedure on As-Built Plans

The district will maintain a set of original project plan sheets. Field changes will be made on full-size prints or in a field CADD system and afterward transferred to the original CADD files in the district office. The set of plans, with changes delineated by the district Design Unit, becomes the as-built plans.
To attain uniformity in final project plans, include the following data on the as-built plans:

- Change order number
- Revisions in alignment and right-of-way
- Grade revisions in excess of 0.1 foot
- Changes in length, size, flow line elevations, and station of culverts. When alternate types of culverts are permitted, show which alternate was used
- Drainage changes
- Location of sewers, conduits, and other features
- Location of monuments, bench marks, freeway fences, and gates
- Revision of typical cross sections
- Changes in pavement lanes, tapers, ramps, frontage roads, road connections, driveways, sidewalks, islands, and median openings
- Curb and gutter changes
- Electrical conduits, pull boxes, vaults, cabinets, enclosures, and service points
- Revision in location of utility crossings and irrigation crossovers

Do not show the following on as-built plans:

- Construction quantities
- Property fences
- Miscellaneous small features, such as markers and delineators, which are readily changed by maintenance forces

The resident engineer must complete the as-built plans as soon as possible after work is completed to ensure compliance with the archiving of as-built plans, but no later than 90 days after contract acceptance.

After the district Design Unit has completed the transfer of as-built information on the final as-built drawings, the unit will return the plans to the resident engineer for review and signature of final approval. For the processing and disposition of as-built plans after the construction review, refer to Chapter 15, “Final Project Development Procedures,” of the Project Development Procedures Manual.

5-104D (2) Procedure on As-Built Plans for Bridges and Structures

Structure Construction must handle structure as-built plans in the following manner:

- From the resident engineer, obtain full-size prints of all sheets with “Structure” signature blocks. If these prints are not available from the resident engineer, the structure representative must contact Structure Design.
- The structure representative will make the as-built corrections to these prints and forward them to Sacramento Structure Construction. These corrected prints must
be forwarded to the Sacramento office as soon as possible after completion of the structures, but no later than 30 days after the completion of the project.

- For prints of projects consisting solely of roadside rest or maintenance facilities, Sacramento Structure Construction must forward the prints directly to Structure Design, Documents Unit. All other projects must be forwarded to Structure Maintenance and Investigations, which determines which sheets should be microfilmed for the structure files.

- Prints not identified for filing by Structure Maintenance and Investigations will be forwarded to the appropriate district office for the preparation of as-built plan sheets. Structure Design will make the as-built corrections on the original plan sheets. If the original plan sheet is not currently stored in Structure Design, it may be obtained from the district.

On state projects that do not have a representative from Structure Construction, the resident engineer must make the as-built changes on the prints bearing “Structure” signature blocks. As soon as possible after completion of the structures, forward the prints to Structure Construction in Sacramento. The procedure outlined above must then be followed.

On projects funded by others, where the local entity or private entity is the sponsor, follow the procedure for as-built plans for bridges and structures described in Special Funded Projects' Information and Procedures Guide and the Encroachment Permits Manual.

For additional guidelines and details for completing structure as-built plans, refer to the Bridge Construction Records and Procedures manual.

**5-104D (3) Projects Not on State Highways**

- On all district-administered projects not on state highways, the information to be included on as-builts will remain the same as for contracts on state highways. The district will be fully responsible for completing as-built project plans and forwarding them to the local agencies. If desired, the district can make a copy of the plans for their own records before returning them to the local agencies.

- The engineer responsible for structure work will place as-built corrections on structure plans of all state and federally funded projects for local roads and streets. On Caltrans administered contracts, follow normal Caltrans procedures for processing these plans. On locally administered contracts, the engineer responsible for structure work will provide Special Funded Projects, Structures Local Assistance, a set of original tracings or duplicates of reproducible quality with as-built corrections. After microfilming, return these tracings or duplicates to the local agency.
Chapter 6  
Sampling and Testing

Section 1  
Sample Types and Frequencies

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  Concrete *(Standard Specifications* Section 90) (1 of 9) Concrete, Except Minor Concrete and Rapid Strength Concrete |
|---|
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  Concrete *(Standard Specifications* Section 90) (2 of 9) Concrete, Except Minor Concrete and Rapid Strength Concrete |
| Table 6-1.17. Materials Acceptance Sampling and Testing Requirements: 
  Concrete *(Standard Specifications* Section 90) (3 of 9) Concrete, Except Minor Concrete and Rapid Strength Concrete |
| Table 6-1.17. Materials Acceptance Sampling and Testing Requirements: 
  Concrete *(Standard Specifications* Section 90) (4 of 9) Concrete, Except Minor Concrete and Rapid Strength Concrete |
| Table 6-1.17. Materials Acceptance Sampling and Testing Requirements: 
  Concrete *(Standard Specifications* Section 90) (5 of 9) Concrete, Except Minor Concrete and Rapid Strength Concrete |
| Table 6-1.17. Materials Acceptance Sampling and Testing Requirements: 
  Concrete *(Standard Specifications* Section 90) (6 of 9) Concrete, Except Minor Concrete and Rapid Strength Concrete |
| Table 6-1.17. Materials Acceptance Sampling and Testing Requirements: 
  Concrete *(Standard Specifications* Section 90) (7 of 9) Concrete, Except Minor Concrete and Rapid Strength Concrete |
| Table 6-1.17. Materials Acceptance Sampling and Testing Requirements: 
  Concrete *(Standard Specifications* Section 90) (8 of 9) Concrete, Except Minor Concrete and Rapid Strength Concrete |
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Chapter 6  

Sampling and Testing

Section 1  Sample Types and Frequencies

6-101  General
Sampling and testing materials and products must be in accordance with contract specifications. Sampling and testing are of equal importance for assuring materials and products meet acceptance specifications.

Caltrans representatives must be familiar with materials handling and processing methods to assure representative samples are obtained. Caltrans representatives should be sufficiently knowledgeable about test methods to ensure compatibility between sample and test procedure.

Samples for acceptance must be taken in accordance with California Test 125, “Methods of Test for Sampling Highway Materials and Products Used in the Roadway Pavement Structure Sections,” or sampling requirements in specifications. For California Tests, Caltrans representatives must be qualified testers in accordance with the Independent Assurance Manual.

It is the resident engineer’s responsibility to assure the safety of the Caltrans representative. In accordance with Material Plant Quality Program or California Test 109, “Method for Testing of Material Production Plants,” the district weights and measures coordinator inspects material plants for safety in areas that the Caltrans representative will enter.

In certain situations, to assure the Caltrans representative’s safety, the contractor will take acceptance samples for Caltrans. The Caltrans representative must witness the contractor taking acceptance samples. The Caltrans representative must determine when the sample is taken and observe that the sample is taken in accordance with California Test 125, or sampling requirements in specifications. The Caltrans representative must take possession of the sample from the contractor and transport it to a Caltrans office or the testing laboratory. The Caltrans representative must properly fill out form TL-0101 “Sample Identification Card.”

The resident engineer is responsible for the chain of custody for material acceptance samples. Material acceptance samples and dispute resolution samples must be in Caltrans’ possession from the sampling point. Adequate sample storage facilities must be arranged for at construction field offices or other Caltrans facilities. The chain of custody for material samples is an important part of the Caltrans quality assurance program.

6-101A  References
• Independent Assurance Program, Division of Engineering Services, Materials Engineering and Testing Services (METS), Caltrans:

  https://dot.ca.gov/programs/engineering-services/independent-assurance-program
• California Test Methods, METS, Caltrans, available at:
  https://dot.ca.gov/programs/engineering-services/california-test-methods

• American Association of State Highway and Transportation Officials (AASHTO), American Society for Testing and Materials International (ASTM), and other test methods are available at the IHS Markit website, which can be accessed from a link on the METS website:
  http://des.onramp.dot.ca.gov/materials-engineering-and-testing-services-mets

• Material Plant Quality Program, Division of Construction, Caltrans, available at:
  https://dot.ca.gov/programs/construction/material-plant-quality-program

6-102 Types of Sampling and Testing
The following are the types of sampling and testing used by Caltrans.

6-102A Preliminary Samples and Tests
Preliminary samples and tests are made before award of a contract. Construction personnel rarely perform preliminary sampling and testing. The district materials engineer is responsible for preliminary sampling and testing. Such tests are used for design purposes, and to provide data for the materials information package for prospective bidders.

6-102B Initial Samples and Tests
Initial samples and tests are performed on materials proposed for use in the project. These initial tests determine whether proposed materials sources, local materials, or products meet the specifications.

Construction personnel may sample potential sources. For soils and aggregate tests, send samples to the district materials laboratory. Caltrans laboratories performing acceptance testing must be qualified under the AASHTO re:source and Caltrans' Independent Assurance Program. Caltrans' field laboratories also meet the re:source requirements when Caltrans' district or regional materials laboratory meets the requirement.

Sampling and testing potential local materials is not mandatory unless specified. Charge the contractor for the cost of sampling and testing potential local materials sources in accordance with Section 6, “Control of Materials,” of the Standard Specifications.

The typical time required for testing initial source samples of potential local materials sources is shown in Table 6-1.1.

Table 6-1.1. Time Required for Source Testing

<table>
<thead>
<tr>
<th>Material</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aggregates for hot mix asphalt</td>
<td>2 weeks</td>
</tr>
<tr>
<td>Aggregates for cement treatment</td>
<td>4 weeks</td>
</tr>
<tr>
<td>Material</td>
<td>Time</td>
</tr>
<tr>
<td>--------------------------------------</td>
<td>--------</td>
</tr>
<tr>
<td>Aggregates for concrete mixture</td>
<td>4 weeks</td>
</tr>
<tr>
<td>Aggregates for concrete pavement</td>
<td>60 days</td>
</tr>
<tr>
<td>Screenings for bituminous seals</td>
<td>2 weeks</td>
</tr>
<tr>
<td>Soils (R-value)</td>
<td>3 weeks</td>
</tr>
<tr>
<td>Untreated base materials</td>
<td>3 weeks</td>
</tr>
</tbody>
</table>

### 6-102B (1) Unprocessed Soils and Aggregates

The discussion on unprocessed soils and aggregates is primarily applicable to preliminary and initial sampling, although the same precautions apply when sampling for specification compliance.

#### 6-102B (1a) Stone from Ledges and Quarries

Inspect the ledge or quarry face to determine any variations in strata, or in portions of the ledge. Observe and record differences in color and structure. Obtain separate samples of unweathered stone from all strata that appear to vary in color and structure.

#### 6-102B (1b) Material Sites of Sand, Gravel, or Soil

Select samples representing the different materials available in the deposit. If the deposit is worked as an open face or pit, take the samples by channeling the face so that they will represent material that visual inspection indicates may be used. It is necessary, especially in small deposits, to excavate test holes some distance in back of, and parallel to, the face to determine the extent of the supply. The number and depth of these test holes depend on the quantity of material to be used from the deposit. Obtain samples from open test pits by channeling a face of the test pit in the same manner as sampling a face of a materials site. Do not include material in the sample that will be stripped from the pit as overburden. Obtain separate samples from the face of the bank and from the test holes. If visual inspection indicates that there is considerable variation in the material, obtain separate samples at different depths.

Use test holes to sample deposits that have no open faces. When sampling material sites, select depth and spacing of test holes considering the probable method of operating the pit. In general, dozers will combine the material laterally. A shovel will remove the material vertically. Test results in a “spotty” pit may be misleading to the extent that operations may be too expensive to make the required grading.

If possible, use a dozer or shovel to open up the pit before sampling rather than depending on test holes.

### 6-102B (2) Processed Aggregates

Sample processed aggregates from locations such as stockpiles, transportation units, conveyors, or windrows in accordance with California Test 125, “Methods of Test for Sampling Highway Materials and Products Used in the Roadway Pavement Structure Sections.”
6-102C Acceptance Samples and Tests

Acceptance tests are generally performed on materials that will be incorporated into the work. Some acceptance tests are performed on materials already incorporated into the work. Acceptance sampling and testing should begin as soon as the material is delivered or in place.

Sample materials at the locations specified in the Standard Specifications, the special provisions, or as required by California Test 125. If the sampling location is not specified, sample at the location indicated in the materials acceptance sampling and testing requirements tables in Section 6-107, “Materials Acceptance Sampling and Testing” of this manual. Regardless of location, sample randomly and within the frequency specified to obtain representative samples of the material used in the work.

On Form TL-0101, “Sample Identification Card,” use the “Priority” designation for the first few acceptance samples of each construction material. Use “Priority” for verification tests for acceptance. Use the “Priority” designation for all samples if the material being supplied is of questionable quality or if the construction means and methods or source of materials changes. For “Priority” tests, indicate if there is a preference for telephoned, faxed, or emailed test results on Form TL-0101, “Sample Identification Card,” along with the telephone number of the person who is to receive them.

For “Priority” and “Normal” processing times for acceptance tests of materials, refer to Table 6-1.2, “Time Required for Materials Acceptance Tests,” of this manual.

The minimum time required for acceptance tests of products is shown in Table 6-1.2, of this manual.

Make sure acceptance samples are shipped or transported to testing laboratories within the following timeframes:

1. Within 1 business day from sampling for projects within 50 miles of the testing laboratory
2. Within 2 business days from sampling for projects more than 50 miles from the testing laboratory

The specified timeframes are not applicable if specific sampling or test method requirements preclude doing so, for example, curing of specimens before transport.

Assure that proper chain of custody is maintained throughout the process, including delivery to and receipt from commercial shipping services.

Use Form CEM-3701, “Test Result Summary,” to summarize acceptance test frequency and test results on each material. Use this form to record sampling and testing related dates and monitor timeliness of acceptance testing. Compare timeliness of material testing turnaround against Table 6-1.2, and verify that corrective actions are taken and documented if repeated deficiencies are detected.

Notify contractor of all acceptance test results within 2 business days of receipt from laboratory. Advise the contractor that all test results are available for their inspection, and provide copies of these test results upon their request. Maintain copies of the test results within the project files for ready accessibility.
## Table 6-1.2. Time Required for Materials Acceptance Tests (1 of 4)

<table>
<thead>
<tr>
<th>Material and Test</th>
<th>Sample to Lab (Note 1) (business days)</th>
<th>Lab Time Priority (Note 2) (business days)</th>
<th>Lab Time Normal (Note 2) (business days)</th>
<th>Reporting to Contractor (Note 3) (business days)</th>
<th>Total (business days)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SOILS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gradation (CT 202)</td>
<td>1 to 2</td>
<td>1</td>
<td>3</td>
<td>2</td>
<td>4 to 7</td>
</tr>
<tr>
<td>Sand Equivalent (CT 217)</td>
<td>1 to 2</td>
<td>1</td>
<td>3</td>
<td>2</td>
<td>4 to 7</td>
</tr>
<tr>
<td>Relative Compaction (CT 231/216)</td>
<td>1 to 2</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>4 to 6</td>
</tr>
<tr>
<td>Plasticity Index (Geosynthetic Reinforced Embankment)</td>
<td>1 to 2</td>
<td>3</td>
<td>7</td>
<td>2</td>
<td>6 to 11</td>
</tr>
<tr>
<td>pH (Geosynthetic Reinforced Embankment)</td>
<td>1 to 2</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>5 to 7</td>
</tr>
<tr>
<td>Percentage Crushed Particles (Shoulder Backing – CT 205)</td>
<td>1 to 2</td>
<td>2</td>
<td>5</td>
<td>2</td>
<td>5 to 7</td>
</tr>
<tr>
<td>Durability Index (Shoulder Backing – CT 229)</td>
<td>1 to 2</td>
<td>2</td>
<td>5</td>
<td>2</td>
<td>5 to 9</td>
</tr>
<tr>
<td>R-value (Imported Borrow – CT 301)</td>
<td>1 to 2</td>
<td>4</td>
<td>6</td>
<td>2</td>
<td>7 to 10</td>
</tr>
<tr>
<td><strong>SUBBASES AND BASES</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Relative Compaction (CT 231/216)</td>
<td>1 to 2</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>4 to 6</td>
</tr>
<tr>
<td>Gradation (CT 202)</td>
<td>1 to 2</td>
<td>1</td>
<td>3</td>
<td>2</td>
<td>4 to 7</td>
</tr>
<tr>
<td>Sand Equivalent (CT 217)</td>
<td>1 to 2</td>
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<td>3</td>
<td>2</td>
<td>4 to 7</td>
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<td>R-value (CT 301)</td>
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<td>6</td>
<td>2</td>
<td>7 to 10</td>
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<tr>
<td>Durability Index (CT 229)</td>
<td>1 to 2</td>
<td>2</td>
<td>5</td>
<td>2</td>
<td>5 to 9</td>
</tr>
<tr>
<td>Compressive Strength (Cement-treated base [CTB] aggregate – CT 312)</td>
<td>-</td>
<td>Age based</td>
<td>Age based</td>
<td>2</td>
<td>Age +2</td>
</tr>
<tr>
<td>Compressive Strength (Lean Concrete Base [LCB]–ASTM C39)</td>
<td>-</td>
<td>Age based</td>
<td>Age based</td>
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<td>Age +2</td>
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Table 6-1.2. Time Required for Materials Acceptance Tests (2 of 4)

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Table 6-1.2. Time Required for Materials Acceptance Tests (3 of 4)

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

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Notes:
1. Time to testing laboratory begins from time of sampling and includes any required field curing time and time required for transport to the testing laboratory.
2. Time in laboratory begins from time laboratory receives the sample and includes any required laboratory curing time before testing and time required to prioritize samples. This time also includes the lab manager’s review of test results and the time to notify the resident engineer.
3. Reporting time begins when the test is provided to the resident engineer and ends when the contractor is notified of the test results.

* Days to schedule lab for testing
Table 6-1.3. Time Required for Products Acceptance Tests

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<th>Product</th>
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<td>Fencing, all types</td>
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<tr>
<td>Guide posts</td>
<td>3</td>
</tr>
<tr>
<td>Geosynthetic fabrics</td>
<td>3</td>
</tr>
<tr>
<td>Geosynthetic fabrics (UV testing)</td>
<td>45</td>
</tr>
<tr>
<td>Metal guardrail</td>
<td>7</td>
</tr>
<tr>
<td>Pavement markers</td>
<td>4</td>
</tr>
<tr>
<td>Prestressing steel</td>
<td>10</td>
</tr>
<tr>
<td>Reinforcing steel and wire</td>
<td>2</td>
</tr>
<tr>
<td>Rubber (accompanied by manufacturer test report)</td>
<td>3</td>
</tr>
<tr>
<td>Rubber (without test report)</td>
<td>14</td>
</tr>
<tr>
<td>Structural steel</td>
<td>10</td>
</tr>
<tr>
<td>Type B joint seal</td>
<td>7</td>
</tr>
</tbody>
</table>

6-102D  Dispute Resolution Samples

Code of Federal Regulations, Title 23, Section 637.207 (23 CFR 637.207), “Quality Assurance Program,” paragraph (a)(1)(iii), states, “If the results from the quality control sampling and testing are used in the acceptance program, the STD (state transportation department) shall establish a dispute resolution system. The dispute resolution system shall address the resolution of discrepancies occurring between the verification sampling and testing and the quality control sampling and testing.” When specified, the engineer must split acceptance test samples and store the split samples in case of a disputed test result. Caltrans requires split samples to be stored in a facility under state control in case they are needed for dispute resolution.

6-102E  Investigation Samples and Tests

Specific materials or quality problems such as pavement failures, difficulty in achieving percent of maximum theoretical density, or inconsistent test results may require special samples and tests. When materials problems are encountered, contact the district materials engineer. The district materials engineer may request help from METS and the Division of Construction. METS will request all acceptance test results and contractor quality control test results along with material-specific additional samples and tests in order to conduct a forensic investigation.

6-102F  Research Samples and Tests

Pilot projects usually have special requirements for sampling and testing of materials. Projects developed around research needs usually require larger samples and more frequent testing than what is required by Caltrans’ acceptance testing minimum
frequencies. The unit that requested the research project will provide oversight for all of the special sampling and testing requirements.

6-103 Field Sampled Material Identification for Testing

Samples must be properly identified so the testing laboratory can function efficiently and report results to the project in a timely manner. In addition, accuracy in identifying where the material was placed in the project can be very useful if the material must be rejected by the engineer and then removed by the contractor.

For requesting faster processing of samples, use the “priority” designation as discussed in Section 6-102C, “Acceptance Samples and Tests,” of this manual.

For field material samples, except for concrete cylinder compressive strength, use Form TL-0101, “Sample Identification Card.” For concrete cylinder compressive strength, use Form TL-0502, “Field Sample of Portland Cement Concrete Sample Card.”

In general, prepare Form TL-0101 as follows:

• Fill in every blank space with complete information, including the quantity and lot of material sampled.
• The “Location of Source” must clearly indicate the place (that is, behind paver, stockpile, cold feed belt) where the sample was taken.
• Indicate “Normal” for laboratory processing of sample or “Priority” if test result is needed quickly.
• If the sample was taken at the request of the contractor from local deposits as a potential source in accordance with Section 6-1.03, “Local Materials,” of the Standard Specifications, note this under “Remarks.” Request that the district materials laboratory provides the cost of testing so that Caltrans can be reimbursed by the contractor.
• To protect the sample identification card against moisture or stains, place it in a plastic bag or shipping label protector and tape it to the sample container.
• Distribute copies as shown on the form on the same day the sample is shipped.
• Prepare Form TL-0101 in accordance with the following details based on the type of material:
  o Aggregate sources must be in compliance with or not subject to the State Mining and Reclamation Act (SMARA). Verify that sources of aggregates are indicated and include the SMARA listing number. For additional information, refer to Section 7-103H (2), “Surface Mining and Reclamation Act,” of this manual.
  o For hot mix asphalt (HMA) sample be sure to:
    1. Identify the HMA plant producing the material.
    2. Identify the job mix formula (JMF) producer identification number.
    3. Include the type of mix and aggregate grading specified.
    4. Under “Remarks,” include the grade and source of the asphalt binder.
5. Under “Remarks,” include the percentage of asphalt binder designated in the JMF.
   o For asphalt binder sample be sure to:
     1. Identify the HMA plant using the material.
     2. Identify the source of asphalt binder.
     A list of approved asphalt suppliers is available at:
     https://mets.dot.ca.gov/aml/AsphaltBindersList.php
     For nonapproved suppliers, identify the refinery and shipment number for each truckload.
   o For tack coat or asphalt emulsion samples, be sure to:
     1. Identify the source of the asphalt binder or asphaltic emulsion.
     2. Under “Remarks” include the dilution rate (50/50 or 60/40) for asphaltic emulsions or enter “Not Diluted.”
   o If the specification has requirements based on the use of the material, include the intended use under “Remarks.” This is especially important for electrical conductors, as the applicable specifications depend on where and how the conductor is used.

• Prepare Form TL-0502, “Field Sample of Portland Cement Concrete Sample Card,” for each set of two cylinders, set of three cylinders, or set of five cylinders shipped as follows:
  o Fill in every blank space with complete information.
  o Indicate sources of aggregates and include the SMARA listing number. Aggregate sources must be in compliance with or not subject to SMARA. For additional information, refer to Section 7-103H (2), “Surface Mining and Reclamation Act,” of this manual. Indicate in the space for water the total weight of water used per cubic yard of cementitious material in the mix based on actual weight (not design weight).
  o Under “Remarks,” indicate the specified concrete strength.
  o Under “Remarks,” indicate if the unit weight of the hardened concrete cylinders is required. The testing laboratory will not furnish unit weight data unless it is specifically requested.
  o To protect the sample card against moisture or stains, place it in a plastic bag or shipping label protector, and tape it to the sample container.
  o Distribute copies as shown on the form on the same day the sample is shipped.

A uniform system for marking cylinders is used. This system consists of the contract number and the sample number. The sample number consists of a series of digits separated by dashes (-) to indicate: method of storage for curing; age at which cylinders are to be tested; the cylinder number of the set of two, set of three, or set of five, that is to be tested; and project coding. Use a flow pen or permanent marker to mark the cylinders.
Following are examples of the cylinder marking system.

Example 6-1.1. Sample Cylinder Label (Set of either five 6- by 12-inch or five 4- by 8-inch cylinders)

Contract No. 03-100844
Sample No. 1-28-1/5_ _ _ _
Date Cast ______________
Structure ID: 59-5629L

For sample shown in Example 6-1.1, (Set of either five 6- by 12-inch or five 4- by 8-inch cylinders):

• The first digit indicates method 1 storage for curing.
• The second two digits indicate that the cylinder is to be tested at 28 days.
• The 1/5 set indicates that it is the No. 1 cylinder of 5 cylinders. The No. 2 cylinder would be marked 2/5, and so on, for the remaining cylinders of the group.
• The last four spaces are reserved for any project coding consisting of numbers, letters, or a combination.

Note if only one sample card was made for five cylinders, the third symbol on the card would be 1,2,3,4,5/5.

Example 6-1.2. Sample Cylinder Label (Set of two 6- by 12-inch cylinders)

Contract No. 03-100844
Sample No. 2-14-2/2_ _ _ _
Date Cast ______________
Structure ID: 59-5629L

For sample shown in Example 6-1.2 (Set of two 6- by 12-inch cylinders):

• The first digit indicates method 2 storage for curing.
• The second two digits indicate that the cylinder is to be tested at 14 days.
• The 2/2 set indicates that it is the No. 2 cylinder of a group of 2 cylinders.
• The last four spaces are reserved for any project coding consisting of numbers, letters or a combination.

Note if one sample card is made for the two cylinders, the third symbol on the card would be 1,2/2.

Example 6-1.3. Sample Cylinder Label (Set of three 4- by 8-inch cylinders)

Contract No. 03-100844
Sample No. 2-07-3/3_ _ _ _
Date Cast ______________
Structure ID: 59-5629L
For sample shown in Example 6-1.3 (Set of three 4- by 8-inch cylinders)

- The first digit indicates method 2 storage for curing.
- The second two digits indicate that the cylinder is to be tested at 7 days.
- The 3/3 set indicates that it is the No. 3 cylinder of a group of 3 cylinders.
- The last four spaces are reserved for any project coding consisting of numbers, letters or a combination.

Note if one sample card is made for the three cylinders, the third symbol on the card would be 1,2,3/3.

### 6-104 Shipping of Field Samples

Based on turnaround time needed to receive a test result, ship samples from the job site to the laboratory using the most economical mode of transportation available consistent with the time element involved. Do not accumulate samples at the project site to save transportation costs.

Concrete cylinders are shipped to the laboratory in accordance with California Test 540, “Method of Test for Making and Curing Concrete Test Specimens in the Field.” Cylinders are shipped without removing the mold and are packed in cardboard containers available at the district warehouse.

If the district laboratory is equipped to test concrete cylinders, they should be shipped there. Otherwise cylinders may be delivered either to the Southern Regional Lab at 13970 Victoria Street, Fontana, CA 92336, or METS at 5900 Folsom Boulevard, Sacramento, CA 95819, whichever is more convenient. Ship concrete cylinders within the time limits specified in California Test 540 or the test result cannot be used as an acceptance test.

Shipping costs to district materials laboratories, the Southern Regional Lab, or METS, are to be prepaid.

### 6-105 Acceptance Records

Keep records of all samples and tests in the project files as permanent job records. Monitor acceptance testing frequency, results, and timelines by using Form CEM-3701, “Test Result Summary.” Corrective action or retesting of failing tests must be noted in the “Remarks” column of the form.

Documentation of the reason materials represented by failing tests were incorporated into the project must be included in the project files. For more information on procedures to follow in the case of failing tests, refer to Section 3-6, “Control of Materials,” of this manual.

It is not necessary to secure separate samples for each project when two or more projects receive materials from the same source. File a copy of the test report with each project.

### 6-106 Project Materials Certification

When construction work on the project is complete, prepare Form CEM-6302, “Final Materials Certification.” Use the form to certify that, other than for the exceptions listed
on the form, the results of tests performed on acceptance samples show that the materials used in the work controlled by sampling and testing conform to the approved plans and specifications.

If exceptions exist, check the exceptions box and note all nonconforming materials on the form. The following are examples of nonconforming materials that must be noted as exceptions:

- Materials accepted by applying a specified pay factor or deficiency adjustment, such as for hot mix asphalt, concrete pavement, or rapid-strength concrete.
- Materials out of “operating range” but within “contract compliance” for which a specified payment deduction was made.
- Materials not in compliance with the as-bid contract plans or specifications for which a change order was approved to accept the material.
- Materials that require certificates of compliance but one or more have not been submitted.

Sign the form and put the original in the project files. Send a copy to district Construction and, if the project is subject to Federal Highway Administration (FHWA) construction oversight activities, send a copy to the FHWA California division administrator. The name and address of the FHWA California division administrator is available at:

https://www.fhwa.dot.gov/cadiv/directory.cfm

6-107 Materials Acceptance Sampling and Testing

Sampling and testing materials and products must be in accordance with contract specifications. Sampling and testing are of equal importance for assuring materials and products meet acceptance specifications.

The tables that make up Table 6-1.4, “Materials Acceptance Sampling and Testing Requirements,” contain Caltrans’ minimum sampling and testing requirements for materials acceptance. The frequency of sampling and testing indicated in the tables is to be used under normal conditions. Materials that are marginal in meeting the specifications should be sampled and tested on a more frequent basis. Request “Priority” testing for samples taken on potentially marginal materials.

When shown in the tables that testing frequencies may be adjusted, document any adjustment in a “Memo to File.” Place the “Memo to File” in the appropriate part of Category 37, “Initial Tests and Acceptance Tests,” of the project files.

Adherence to the sample size requirements shown in the tables will prevent unnecessary delays and expense of obtaining supplementary samples to complete tests.

Refer to Section 6-105 “Acceptance Records,” of this manual for documenting acceptance tests results. For more information on procedures to follow in the case of failing tests, refer to Section 3-6, “Control of Materials,” of this manual.
Table 6-1.4. Materials Acceptance Sampling and Testing Requirements: Earthwork (*Standard Specifications* Section 19) (1 of 3)

<table>
<thead>
<tr>
<th>Test</th>
<th>Test Method</th>
<th>Sample Size &amp; Container Size</th>
<th>Sampling Location (Note 1)</th>
<th>Acceptance Test Frequency</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>STRUCTURE BACKFILL (Section 19-3.02C)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sieve Analysis</td>
<td>California Test 202</td>
<td>50 lb</td>
<td>Materials site or stockpile</td>
<td>1 every 3,000 tons or 2,000 cu yd</td>
<td>If uniform material is within specification limits, test frequency may be decreased to 1 per day</td>
</tr>
<tr>
<td>Sand Equivalent</td>
<td>California Test 217</td>
<td>50 lb</td>
<td>Materials site or stockpile</td>
<td>1 every 3,000 tons or 2,000 cu yd</td>
<td>If uniform material is within specification limits, test frequency may be decreased to 1 per day</td>
</tr>
<tr>
<td>Relative Compaction</td>
<td>California Test 231</td>
<td>Sample for California Test 216</td>
<td>Project site in accordance with California Test 231</td>
<td>1 every 2,000 sq yd and test compaction at every 8 in. of thickness</td>
<td>Relative compaction test is required at each location structure backfill is placed</td>
</tr>
<tr>
<td>Maximum Wet Density</td>
<td>California Test 216</td>
<td>35 lb</td>
<td>Relative compaction test site locations</td>
<td>1 every relative compaction test</td>
<td>Wet common-composite test maximum value may be used in accordance with California Test 231</td>
</tr>
<tr>
<td><strong>PERVIOUS BACKFILL MATERIAL (Section 19-3.02D)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sieve Analysis</td>
<td>California Test 202</td>
<td>50 lb</td>
<td>Stockpile</td>
<td>1 every 3,000 tons or 2,000 cu yd</td>
<td>If uniform material within specification limits, test frequency may be decreased to 1 per day</td>
</tr>
<tr>
<td><strong>COMPACATION (Section 19-5)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>R-Value</td>
<td>California Test 301</td>
<td>50 lb</td>
<td>Project site</td>
<td>Test to verify R-value if differing site conditions are encountered</td>
<td>If R-value testing in the materials report is incomplete because of preproject conditions, then test to verify design R-value</td>
</tr>
<tr>
<td>Relative Compaction</td>
<td>California Test 231</td>
<td>Sample for California Test 216</td>
<td>California Test 216</td>
<td>1 every 2,000 sq yd</td>
<td></td>
</tr>
<tr>
<td>Maximum Wet Density</td>
<td>California Test 216</td>
<td>35 lb</td>
<td>Relative compaction test site locations</td>
<td>1 every relative compaction test</td>
<td></td>
</tr>
</tbody>
</table>
### Table 6-1.4. Materials Acceptance Sampling and Testing Requirements: Earthwork (*Standard Specifications* Section 19) (2 of 3)

<table>
<thead>
<tr>
<th>Test</th>
<th>Test Method</th>
<th>Sample Size &amp; Container Size</th>
<th>Sampling Location (See Note 1)</th>
<th>Acceptance Test Frequency</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>EMBANKMENT CONSTRUCTION (Section 19-6)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Relative Compaction</td>
<td>California Test 231</td>
<td>Sample for California Test 216</td>
<td>Project site in accordance with California Test 231</td>
<td>1 every 2,000 sq yd and test compaction at every 8 in. of thickness</td>
<td></td>
</tr>
<tr>
<td>Maximum Wet Density</td>
<td>California Test 216</td>
<td>35 lb</td>
<td>Relative compaction test site locations</td>
<td>1 every relative compaction test</td>
<td>Wet common-composite test maximum value may be used in accordance with California Test 231</td>
</tr>
<tr>
<td><strong>GEOSYNTHETIC REINFORCED EMBANKMENT (Section 19-6.02B)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Plasticity Index</td>
<td>California Test 204</td>
<td>50 lb</td>
<td>Materials site or stockpile</td>
<td>1 per source before use</td>
<td></td>
</tr>
<tr>
<td>pH</td>
<td>California Test 643</td>
<td>50 lb</td>
<td>Materials site or stockpile</td>
<td>1 per source before use</td>
<td></td>
</tr>
<tr>
<td><strong>Sieve Analysis</strong></td>
<td>California Test 202</td>
<td>50 lb</td>
<td>Stockpile</td>
<td>Before use, 1 every 3,000 tons or 2,000 cu yd</td>
<td>If material is uniform and well within specification limits, the test frequency may be decreased to 1 per day</td>
</tr>
<tr>
<td><strong>BORROW MATERIAL (Section 19-7)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>R-Value</td>
<td>California Test 301</td>
<td>50 lb</td>
<td>Import borrow source</td>
<td>1 per source</td>
<td>Test for R-value only when an R-value is specified for import borrow in the special provisions; if material at import borrow source is not uniform, increase testing frequency</td>
</tr>
</tbody>
</table>
Table 6-1.4. Materials Acceptance Sampling and Testing Requirements: Earthwork (*Standard Specifications* Section 19) (3 of 3)

<table>
<thead>
<tr>
<th>Test</th>
<th>Test Method</th>
<th>Sample Size &amp; Container Size</th>
<th>Sampling Location (Note 1)</th>
<th>Acceptance Test Frequency</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>SHOULDER BACKING (Section 19-9)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Crushed Particles</td>
<td>California Test 205</td>
<td>50 lb</td>
<td>Materials site or stockpile</td>
<td>1 per project before use</td>
<td></td>
</tr>
<tr>
<td>Durability</td>
<td>California Test 229</td>
<td>50 lb</td>
<td>Materials site or stockpile</td>
<td>1 per project before use</td>
<td></td>
</tr>
<tr>
<td>Unit Weight</td>
<td>California Test 212 Rodding Method</td>
<td>50 lb</td>
<td>Materials site or stockpile</td>
<td>1 per project before use</td>
<td></td>
</tr>
<tr>
<td>Sieve Analysis</td>
<td>California Test 202</td>
<td>50 lb</td>
<td>Materials site or stockpile</td>
<td>1 every 3,000 tons or 2,000 cu yd</td>
<td>If uniform material is within specification limits, test frequency may be decreased to 1 per day</td>
</tr>
<tr>
<td>Sand Equivalent</td>
<td>California Test 217</td>
<td>50 lb</td>
<td>Materials site or stockpile</td>
<td>1 every 3,000 tons or 2,000 cu yd</td>
<td>If uniform material is within specification limits, test frequency may be decreased to 1 per day</td>
</tr>
</tbody>
</table>

Note:
1. Refer to California Test 125 for sampling procedures.
Table 6-1.5. Materials Acceptance Sampling and Testing Requirements: Stabilized Soils (*Standard Specifications* Section 24) (1 of 3)

<table>
<thead>
<tr>
<th>Test</th>
<th>Test Method</th>
<th>Sample Size &amp; Container Size</th>
<th>Sampling Location (Note 1)</th>
<th>Acceptance Test Frequency</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>LIME (Section 24-2.02)</td>
<td>Various properties</td>
<td>See <em>Standard Specifications</em> Section 24-2.02</td>
<td>Initial sample provided by contractor; subsequent sampling from mid-point of delivery</td>
<td>Each 100 tons of lime, 2 per day maximum</td>
<td>Must be on an Authorized Material List and certificate of compliance must accompany each shipment; recommend 1 acceptance test per 5 samples of lime</td>
</tr>
<tr>
<td>LIME TREATMENT</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DETERMINATION OF LIME APPLICATION RATE (Section 24-2.01D)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unconfined Compressive Strength</td>
<td>California Test 373</td>
<td>100 lb</td>
<td>Native soils; test each type of material to be treated</td>
<td>Before soil stabilization work and if source of lime changes</td>
<td>To determine appropriate lime content</td>
</tr>
<tr>
<td>Optimum Moisture Content</td>
<td>California Test 373</td>
<td>100 lb</td>
<td>Native soils; test each type of material to be treated</td>
<td>Before soil stabilization work</td>
<td></td>
</tr>
<tr>
<td>VERIFICATION OF LIME APPLICATION RATE AND STABILIZED SOIL MIXTURE (Section 24-2.01D)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lime Application (Dry Form)</td>
<td>Calibrated tray method or equal</td>
<td>Building paper or pan of known area</td>
<td>Surface receiving lime</td>
<td>Each 40,000 sq ft, 2 per day minimum</td>
<td>To determine if application rate is within ± 5% of ordered application rate</td>
</tr>
<tr>
<td>Lime Application (Slurry Form)</td>
<td>Volumetric measurement that is then reduced to lime weight</td>
<td>Determined over known area</td>
<td>Slurry holding tank</td>
<td>Each 40,000 sq ft, 2 per day minimum</td>
<td>To determine if application rate is within ± 5% of ordered application rate</td>
</tr>
<tr>
<td>Uniformity of Mixed Stabilized Soil</td>
<td>Phenolphthalein alcohol indicator solution spray</td>
<td>N/A</td>
<td>Representative areas</td>
<td>Each day at five separate locations</td>
<td>Taken after completion of initial mixing</td>
</tr>
</tbody>
</table>
Table 6-1.5. Materials Acceptance Sampling and Testing Requirements: Stabilized Soils (Standard Specifications Section 24) (2 of 3)

<table>
<thead>
<tr>
<th>Test</th>
<th>Test Method</th>
<th>Sample Size &amp; Container Size</th>
<th>Sampling Location (Note 1)</th>
<th>Acceptance Test Frequency</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>VERIFICATION OF LIME APPLICATION RATE AND STABILIZED SOIL MIXTURE (Section 24-2.01D)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Moisture Content of Mixed Stabilized Soil</td>
<td>California Test 226</td>
<td>0.25 lb each sample</td>
<td>Representative areas at mid depth</td>
<td>Each day at five separate locations to verify contractor’s quality control tests</td>
<td>Taken during mellowing period</td>
</tr>
<tr>
<td>Gradation of Mixed Stabilized Soil</td>
<td>California Test 202</td>
<td>25 lb</td>
<td>Representative areas</td>
<td>1 every 4,000 sq yd, 1 per day minimum</td>
<td>Taken before compaction</td>
</tr>
<tr>
<td><strong>MIXED STABILIZED SOIL (Sections 24-2.01 and 24-2.03)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Relative Compaction</td>
<td>California Test 231</td>
<td>Sample for California Test 216</td>
<td>Project site in accordance with California Test 231</td>
<td>1 every 2,000 sq yd and test compaction at every 6 in. of thickness</td>
<td></td>
</tr>
<tr>
<td>Maximum Wet Density</td>
<td>California Test 216</td>
<td>35 lb</td>
<td>Relative compaction test site locations</td>
<td>1 every relative compaction test</td>
<td>Wet common-composite test maximum value may be used in accordance with California Test 231</td>
</tr>
<tr>
<td>Dimensions</td>
<td>Measurement</td>
<td>N/A</td>
<td>Random locations in place after compaction</td>
<td>As necessary for verification of stabilized soil thickness and surface grades</td>
<td></td>
</tr>
</tbody>
</table>
Table 6-1.5. Materials Acceptance Sampling and Testing Requirements: Stabilized Soils (*Standard Specifications* Section 24) (3 of 3)

<table>
<thead>
<tr>
<th>Test</th>
<th>Test Method</th>
<th>Sample Size &amp; Container Size</th>
<th>Sampling Location (Note 1)</th>
<th>Acceptance Test Frequency</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>CURING SEAL-ASPHALTIC EMULSION (Section 24-1.02C)</td>
<td>Various properties based on asphaltic emulsion type used</td>
<td>Based on asphaltic emulsion type used; see <em>Standard Specifications</em> Section 94</td>
<td>1 liter (or 1 qt) wide-mouth plastic bottle with screw on lids that are sealed with tape</td>
<td>Sampling line leading to the spray bar</td>
<td>1 each shipment</td>
</tr>
</tbody>
</table>

Note:

1. Refer to California Test 125 for sampling procedures.
Table 6-1.6. Materials Acceptance Sampling and Testing Requirements: Aggregate Subbases (Standard Specifications Section 25)

<table>
<thead>
<tr>
<th>Test</th>
<th>Test Method</th>
<th>Sample Size &amp; Container Size</th>
<th>Sampling Location (Note 1)</th>
<th>Acceptance Test Frequency</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>AGGREGATE SUBBASE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gradation (Sieve Analysis)</td>
<td>California Test 202</td>
<td>50 lb</td>
<td>Windrow or roadway</td>
<td>Every 3,000 tons or 2,000 cu yd (See Note 2)</td>
<td>If uniform material is within specification limits, frequency may be decreased to 1 test per day</td>
</tr>
<tr>
<td>Sand Equivalent</td>
<td>California Test 217</td>
<td>50 lb</td>
<td>Windrow or roadway</td>
<td>Every 3,000 tons or 2,000 cu yd (See Note 2)</td>
<td>If uniform material within specification limits, frequency may be decreased to 1 test per day</td>
</tr>
<tr>
<td>R-Value</td>
<td>California Test 301</td>
<td>50 lb</td>
<td>Windrow or roadway</td>
<td>Every 3,000 tons or 2,000 cu yd</td>
<td>R-value testing may be reduced to 1 acceptance test per project when test records demonstrate that comparable material from the same source meets minimum R-value requirements</td>
</tr>
<tr>
<td>Relative Compaction</td>
<td>California Test 231</td>
<td>Sample for California Test 216</td>
<td>Roadway in accordance with California Test 231</td>
<td>Every 2,000 sq yd</td>
<td></td>
</tr>
<tr>
<td>Maximum Wet Density</td>
<td>California Test 216</td>
<td>35 lb</td>
<td>Relative compaction test site locations</td>
<td>Every 2,000 sq yd</td>
<td>Wet common-composite test maximum value may be used in accordance with California Test 231</td>
</tr>
<tr>
<td>Dimensions</td>
<td>N/A</td>
<td>N/A</td>
<td>Random locations</td>
<td>As necessary for acceptance</td>
<td>Verify thickness of aggregate subbase</td>
</tr>
</tbody>
</table>

Notes:
1. Refer to California Test 125 for sampling procedures.
2. If material is outside the specification limits, sample and test representative material every 500 cu yd so that deductions may be taken for noncompliant material.
## Table 6-1.7. Materials Acceptance Sampling and Testing Requirements: Aggregate Bases (*Standard Specifications* Section 26)

<table>
<thead>
<tr>
<th>Test</th>
<th>Test Method</th>
<th>Sample Size &amp; Container Size</th>
<th>Sampling Location (Note 1)</th>
<th>Acceptance Test Frequency</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>AGGREGATE BASES</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gradation (Sieve Analysis)</td>
<td>California Test 202</td>
<td>50 lb</td>
<td>Windrow or roadway</td>
<td>Every 3,000 tons or 2,000 cu yd (See Note 2)</td>
<td>If uniform material is within specification limits, frequency may be decreased to 1 test per day</td>
</tr>
<tr>
<td>Sand Equivalent</td>
<td>California Test 217</td>
<td>50 lb</td>
<td>Windrow or roadway</td>
<td>Every 3,000 tons or 2,000 cu yd (See Note 2)</td>
<td>If uniform material is within specification limits, frequency may be decreased to 1 test per day</td>
</tr>
<tr>
<td>Resistance Value (R-Value)</td>
<td>California Test 301</td>
<td>50 lb</td>
<td>Windrow or roadway</td>
<td>Every 3,000 tons or 2,000 cu yd</td>
<td>R-value testing may reduced to 1 acceptance test per project when test records demonstrate that comparable material from the same source meets minimum R-value requirements</td>
</tr>
<tr>
<td>Durability Index</td>
<td>California Test 229</td>
<td>50 lb</td>
<td>Windrow or roadway</td>
<td>1 per project</td>
<td>Durability test not required for Class 3 aggregate base</td>
</tr>
<tr>
<td>Moisture</td>
<td>California Test 226</td>
<td>25 lb</td>
<td>Materials site or stockpile</td>
<td>2 daily when aggregate base is paid for by weight</td>
<td></td>
</tr>
<tr>
<td>Relative Compaction</td>
<td>California Test 231</td>
<td>Sample for California Test 216</td>
<td>Roadway in accordance with California Test 231</td>
<td>Every 2,000 sq yd</td>
<td></td>
</tr>
<tr>
<td>Maximum Wet Density</td>
<td>California Test 216</td>
<td>35 lb</td>
<td>Relative compaction test site locations</td>
<td>Every 2,000 sq yd</td>
<td>Wet common-composite test maximum value may be used in accordance with California Test 231</td>
</tr>
<tr>
<td>Dimensions</td>
<td>N/A</td>
<td>N/A</td>
<td>Random locations</td>
<td>As necessary for acceptance</td>
<td>Verify thickness of aggregate base</td>
</tr>
</tbody>
</table>

Notes:
1. Refer to California Test 125 for sampling procedures.
2. If material is outside the specification limits, sample and test representative material every 500 cu yd so that deductions may be taken for noncompliant material.
### Table 6-1.8. Materials Acceptance Sampling and Testing Requirements: Cement Treated Bases (Standard Specifications Section 27) (1 of 3)

<table>
<thead>
<tr>
<th>Test</th>
<th>Test Method</th>
<th>Sample Size &amp; Container Size</th>
<th>Sampling Location (Note 1)</th>
<th>Acceptance Test Frequency</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>CEMENT TREATED BASE Class A or Class B</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AGGREGATE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gradation (Sieve Analysis)</td>
<td>California Test 202, California Test 105</td>
<td>40 lb</td>
<td>Plant, truck, windrow, or roadway</td>
<td>1 every 3,000 tons or 2,000 cu yd, minimum 1 per day of production</td>
<td></td>
</tr>
<tr>
<td>Sand Equivalent</td>
<td>California Test 217</td>
<td>40 lb</td>
<td>Plant, truck, windrow, or roadway</td>
<td>1 every 3,000 tons or 2,000 cu yd, minimum 1 per day of production</td>
<td></td>
</tr>
<tr>
<td>AGGREGATE Class B</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>R-Value (with and without cement)</td>
<td>California Test 301</td>
<td>100 lb for aggregate qualification</td>
<td>Windrow or roadway</td>
<td>Before production</td>
<td></td>
</tr>
<tr>
<td>CEMENT Type II Portland Cement</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Various properties must comply with Standard Specifications Section 90-1.02B(2)</td>
<td>See Standard Specifications Section 90-1.02B(2)</td>
<td>8 lb</td>
<td>Cement treated base plant or cement spreader</td>
<td>1 each 100 tons of cement, 2 per day maximum</td>
<td>Recommend 1 acceptance test per project for cement from approved suppliers and certificate of compliance with each shipment</td>
</tr>
<tr>
<td>WATER</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chlorides</td>
<td>California Test 422</td>
<td>Clean 2-qt plastic jug with lined, sealed lid</td>
<td>1 per source; at point of use</td>
<td>Water supplies for domestic use do not need to be tested</td>
<td></td>
</tr>
</tbody>
</table>
Table 6-1.8. Materials Acceptance Sampling and Testing Requirements: Cement Treated Bases (*Standard Specifications* Section 27) (2 of 3)

<table>
<thead>
<tr>
<th>Test</th>
<th>Test Method</th>
<th>Sample Size &amp; Container Size</th>
<th>Sampling Location (Note 1)</th>
<th>Acceptance Test Frequency</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>WATER (Cont.)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sulfates</td>
<td>California Test 417</td>
<td>Clean 2-qt plastic jug with lined, sealed lid</td>
<td>1 per source; at point of use</td>
<td></td>
<td>Water supplies for domestic use do not need to be tested</td>
</tr>
<tr>
<td>COMPLETED MIX Class A</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Compressive Strength</td>
<td>California Test 312</td>
<td>See California Test 312, Part II</td>
<td>Windrow or roadway before compaction</td>
<td>1 per day</td>
<td>If first 3 days of production test records demonstrate materials are in compliance, recommend test every 5 days of production</td>
</tr>
<tr>
<td>COMPLETED MIX Class B</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>R-Value</td>
<td>California Test 301</td>
<td>50 lb</td>
<td>Windrow or roadway before compaction</td>
<td>1 every 3,000 tons or 2,000 cu yd</td>
<td>Recommend R-value testing be reduced to 1 every 10,000 cu yd when test records demonstrate that material from the same source, and having comparable grading and sand equivalent values, meets the minimum R-value requirements</td>
</tr>
</tbody>
</table>
Table 6-1.8. Materials Acceptance Sampling and Testing Requirements: Cement Treated Bases (*Standard Specifications* Section 27) (3 of 3)

<table>
<thead>
<tr>
<th>Test</th>
<th>Test Method</th>
<th>Sample Size &amp; Container Size</th>
<th>Sampling Location (Note 1)</th>
<th>Acceptance Test Frequency</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMPLETED MIX Class A and Class B</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cement Content</td>
<td>California Test 338</td>
<td>See California Test 338, Part 1</td>
<td>Windrow or roadway before compaction</td>
<td>1 every 1,500 tons or 1,000 cu yd, minimum 1 per day of production</td>
<td></td>
</tr>
<tr>
<td>Optimum Moisture</td>
<td>California Test 312</td>
<td>See California Test 312</td>
<td>Windrow or roadway</td>
<td>Before production</td>
<td></td>
</tr>
<tr>
<td>Moisture Content</td>
<td>California Test 226</td>
<td>10 lb in sealed container</td>
<td>Roadway before compaction</td>
<td>2 daily</td>
<td></td>
</tr>
<tr>
<td>Relative Compaction</td>
<td>California Test 312 or 231</td>
<td>Sample for California Test 216</td>
<td>Roadway in accordance with California Test 231</td>
<td>1 every 2,000 sq yd</td>
<td></td>
</tr>
<tr>
<td>Maximum Wet Density</td>
<td>California Test 216, California Test 312</td>
<td>35 lb</td>
<td>Relative compaction test site locations</td>
<td>1 every 2,000 sq yd</td>
<td>Wet common-composite test maximum value may be used in accordance with California Test 231</td>
</tr>
<tr>
<td>Dimensions</td>
<td>N/A</td>
<td>N/A</td>
<td>Random locations</td>
<td>As necessary for acceptance</td>
<td>Verify thickness of cement treated base</td>
</tr>
</tbody>
</table>

Note:
1. Refer to California Test 125 for sampling procedures.
### Table 6-1.9. Materials Acceptance Sampling and Testing Requirements: Concrete Bases (*Standard Specifications* Section 28)

#### Lean Concrete Base

<table>
<thead>
<tr>
<th>Test</th>
<th>Test Method</th>
<th>Sample Size &amp; Container Size</th>
<th>Sampling Location (Note 1)</th>
<th>Acceptance Test Frequency</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>LEAN CONCRETE BASES</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Compressive strength (7-days)</td>
<td>ASTM C39</td>
<td>6 cylinders 6x12 in. - 3 tests</td>
<td>Concrete truck discharge chute</td>
<td>1,000 cu yd or 1 day's production if less than 1,000 cu yd</td>
<td></td>
</tr>
<tr>
<td>Compressive strength (3-days)</td>
<td>ASTM C39</td>
<td>6 cylinders 6x12 in. - 3 tests</td>
<td>Concrete truck discharge chute</td>
<td>1,000 cu yd or 1 day's production if less than 1,000 cu yd</td>
<td>Optional test to qualify for a transverse contraction joint waiver</td>
</tr>
<tr>
<td><strong>RAPID STRENGTH CONCRETE BASE</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Modulus of rupture (7-days)</td>
<td>California Test 524</td>
<td>3 beams - 6x6x20 inches</td>
<td>Concrete truck discharge chute</td>
<td>1 per 500 cu yd or 1 day's production if less than 500 cu yd</td>
<td></td>
</tr>
<tr>
<td><strong>LEAN CONCRETE BASE RAPID SETTING</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Compressive strength (7-days)</td>
<td>California Test 521</td>
<td>6 cylinders 6x12 in. - 3 tests</td>
<td>Concrete truck discharge chute</td>
<td>1 per 500 cu yd or 1 day's production if less than 500 cu yd</td>
<td></td>
</tr>
<tr>
<td><strong>CONCRETE BASE</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Modulus of rupture (7-days)</td>
<td>California Test 523</td>
<td>2 beams of 6x6x32 in. for centerpoint loading or 6x6x20 in. for third-point loading</td>
<td>Concrete truck discharge chute</td>
<td>1,000 cu yd or 1 day's production if less than 1,000 cu yd</td>
<td></td>
</tr>
<tr>
<td>Dimensions</td>
<td>N/A</td>
<td>N/A</td>
<td>Random locations</td>
<td>As necessary for acceptance</td>
<td>Verify thickness of base</td>
</tr>
</tbody>
</table>
Note:
1. Refer to California Test 125 for sampling procedures.
Table 6-1.10. Materials Acceptance Sampling and Testing Requirements:
Treated Permeable Bases (*Standard Specifications* Section 29)
Asphalt Treated Permeable Base (ATPB) (1 of 4)

<table>
<thead>
<tr>
<th>Test</th>
<th>Test Method</th>
<th>Sample Size &amp; Container Size</th>
<th>Sampling Location (Note 1)</th>
<th>Acceptance Test Frequency</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>AGGREGATE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Percentage Crushed Particles</td>
<td>California Test 205</td>
<td>Combined two 40-lb canvas bags (See Note 2) or Batch 160 lb (proportioned per bin percentages)</td>
<td>Plant</td>
<td></td>
<td>Before production and minimum 1 random for every 50,000 tons or less of paving</td>
</tr>
<tr>
<td>Los Angeles Rattler (at 500 revolutions)</td>
<td>California Test 211</td>
<td>Combined two 40-lb canvas bags (See Note 2) or Batch 160 lb (proportioned per bin percentages)</td>
<td>Plant</td>
<td></td>
<td>Before production and minimum 1 random for every 50,000 tons or less of paving</td>
</tr>
<tr>
<td>Film Stripping</td>
<td>California Test 302</td>
<td>Combined two 40-lb canvas bags (See Note 2) or Batch 160 lb (proportioned per bin percentages)</td>
<td>Plant</td>
<td></td>
<td>Before production and minimum 1 random for every 50,000 tons or less of paving</td>
</tr>
<tr>
<td>Gradation (Sieve Analysis)</td>
<td>California Test 202</td>
<td>Combined two 20-lb canvas bags (See Note 3) or Batch 40 lb (proportioned per bin percentages)</td>
<td>Plant</td>
<td>1 for every 4 hours of production</td>
<td></td>
</tr>
</tbody>
</table>
Table 6-1.10. Materials Acceptance Sampling and Testing Requirements:
Treated Permeable Bases (*Standard Specifications* Section 29)
Asphalt Treated Permeable Base (ATPB) (2 of 4)

<table>
<thead>
<tr>
<th>Test</th>
<th>Test Method</th>
<th>Sample Size &amp; Container Size</th>
<th>Sampling Location (Note 1)</th>
<th>Acceptance Test Frequency</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>AGGREGATE (Cont.)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cleanness Value</td>
<td></td>
<td>Combined two 20-lb canvas bags (See Note 3) or Batch 40 lb (proportioned per bin percentages)</td>
<td>Plant</td>
<td>1 for every 4 hours of production</td>
<td>Recommend 1 acceptance test per day if 3 consecutive results exceed 62</td>
</tr>
<tr>
<td><strong>ASPHALT</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Certificate of compliance required for each shipment; if asphalt binder source is not on approved list, sample and test asphalt before use</td>
</tr>
<tr>
<td>Various properties based on asphalt type used; see <em>Standard Specifications</em> Section 92</td>
<td></td>
<td>Based on asphalt type used; see <em>Standard Specifications</em> Section 92</td>
<td>1-qt double-seal friction-top metal cylindrical shaped can</td>
<td>Asphalt feed line connecting plant storage tanks</td>
<td>1 per day</td>
</tr>
<tr>
<td><strong>COMPLETED MIX</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asphalt Content</td>
<td></td>
<td>California Test 382</td>
<td>40 lb in metal containers</td>
<td>Plant, truck, windrow, or roadbed</td>
<td>1 for every 4 hours of production</td>
</tr>
<tr>
<td><strong>AGGREGATE</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Los Angeles Rattler (loss at 500 revolutions)</td>
<td></td>
<td>California Test 211</td>
<td>50 lb</td>
<td>Plant</td>
<td>Before production and minimum 1 random for every 25,000 cu yd</td>
</tr>
<tr>
<td>Soundness</td>
<td></td>
<td>California Test 214</td>
<td>50 lb</td>
<td>Plant</td>
<td></td>
</tr>
<tr>
<td>Sieve Analysis (Gradation)</td>
<td></td>
<td>California Test 202</td>
<td>40 lb</td>
<td>Plant</td>
<td>1 for every 4 hours of production; (See Note 4)</td>
</tr>
</tbody>
</table>
Table 6-1.10. Materials Acceptance Sampling and Testing Requirements: Treated Permeable Bases *(Standard Specifications Section 29)*
Asphalt Treated Permeable Base (ATPB) (3 of 4)

<table>
<thead>
<tr>
<th>Test</th>
<th>Test Method</th>
<th>Sample Size &amp; Container Size</th>
<th>Sampling Location (See Note 1)</th>
<th>Acceptance Test Frequency</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>AGGREGATE (Cont.)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cleanness Value</td>
<td>California Test 227</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>CEMENT</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cement, various properties;</td>
<td>Must comply with <em>Standard Specifications</em> Section 90-1.02B(2)</td>
<td>8 lb</td>
<td>Concrete plant</td>
<td>1 for each 100 tons, 2 per day max</td>
<td>Recommend 1 acceptance test per project for cement from approved suppliers with certificate of compliance</td>
</tr>
<tr>
<td>must comply with <em>Standard Specifications</em> Section 90-1.02B(2)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>WATER</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chlorides</td>
<td>California Test 422</td>
<td>Clean 2-qt plastic jug with lined, sealed lid At point of use; see Remarks</td>
<td>1 per source</td>
<td></td>
<td>Water supplies for domestic use do not need to be tested</td>
</tr>
<tr>
<td>Sulfates</td>
<td>California Test 417</td>
<td>Clean 2-qt plastic jug with lined, sealed lid At point of use; see Remarks</td>
<td>1 per source</td>
<td></td>
<td>Water supplies for domestic use do not need to be tested</td>
</tr>
<tr>
<td>Setting Time</td>
<td>ASTM C 191 or ASTM C 266</td>
<td>Contact METS for required quantity of water sample At point of use</td>
<td>1 per source</td>
<td></td>
<td>Water supplies for domestic use do not need to be tested</td>
</tr>
<tr>
<td>Mortar Compressive Strength</td>
<td>ASTM C109</td>
<td>Contact METS for required quantity of water sample At point of use</td>
<td>1 per source</td>
<td></td>
<td>Water supplies for domestic use do not need to be tested</td>
</tr>
<tr>
<td>Coloring Agents</td>
<td>Must comply with <em>Standard Specifications</em> Section 90-1.02D</td>
<td>Contact METS for required quantity of water sample At point of use</td>
<td>1 per source</td>
<td></td>
<td>Water supplies for domestic use do not need to be tested</td>
</tr>
</tbody>
</table>
Table 6-1.10. Materials Acceptance Sampling and Testing Requirements:
Treated Permeable Bases (*Standard Specifications* Section 29)
Asphalt Treated Permeable Base (ATPB) (4 of 4)

<table>
<thead>
<tr>
<th>Test</th>
<th>Test Method</th>
<th>Sample Size &amp; Container Size</th>
<th>Sampling Location (Note 1)</th>
<th>Acceptance Test Frequency</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>WATER</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Water supplies for domestic use do not need to be tested</td>
</tr>
<tr>
<td>Alkalis</td>
<td>Must comply with <em>Standard Specifications</em> Section 90-1.02D</td>
<td>Contact METS for required quantity of water sample</td>
<td>At point of use</td>
<td>1 per source</td>
<td>Water supplies for domestic use do not need to be tested</td>
</tr>
<tr>
<td>Specific Gravity</td>
<td>Must comply with <em>Standard Specifications</em> Section 90-1.02D</td>
<td>Contact METS for required quantity of water sample</td>
<td>At point of use</td>
<td>1 per source</td>
<td>Water supplies for domestic use do not need to be tested</td>
</tr>
</tbody>
</table>

Notes:

1. Refer to California Test 125 for sampling procedures.
2. Store one 40-lb canvas bag for dispute resolution.
3. Store one 20-lb. canvas bag for dispute resolution.
4. If test records determine that aggregate gradation or cleanness value is close to specification limit or outside the specification limits, sample and test concrete every 300 cu yd so that deductions may be taken for noncompliant material.
### Table 6-1.11. Materials Acceptance Sampling and Testing Requirements: Recycled Pavement *(Standard Specifications Section 30)*

<table>
<thead>
<tr>
<th>Test</th>
<th>Thickness</th>
<th>Field Measurement</th>
<th>Random location</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thickness-Field Measurement</td>
<td>Thickness</td>
<td>Field Measurement</td>
<td>Random location</td>
<td>3 per lot</td>
</tr>
<tr>
<td>Relative Compaction (% min)</td>
<td>California Test 231</td>
<td>Sample for California Test 216</td>
<td>In accordance with California Test 231</td>
<td>1 every 2,000 sq yd and test compaction at every 6 in. of thickness</td>
</tr>
<tr>
<td>Relative Compaction (% min)</td>
<td>California Test 231</td>
<td>Sample for California Test 216</td>
<td>In accordance with California Test 231</td>
<td>1 every 2,000 sq yd and test compaction at every 6 in. of thickness</td>
</tr>
<tr>
<td>Thickness</td>
<td>Thickness</td>
<td>3 random locations per lot</td>
<td>See Section 4-4004 of this manual</td>
<td>No Data</td>
</tr>
<tr>
<td>Thickness</td>
<td>Thickness</td>
<td>3 random locations per lot</td>
<td>See Section 4-4004 of this manual</td>
<td>No Data</td>
</tr>
<tr>
<td>Thickness</td>
<td>Thickness</td>
<td>3 random locations per lot</td>
<td>See Section 4-4004 of this manual</td>
<td>No Data</td>
</tr>
<tr>
<td>Cement application rate</td>
<td>Calibrated tray or equal</td>
<td>Building paper or pan of known area</td>
<td>Surface receiving cement</td>
<td>Each 40,000 sq ft, 2 per day minimum</td>
</tr>
<tr>
<td>Relative Compaction (% min)</td>
<td>California Test 231</td>
<td>Sample for California Test 216</td>
<td>In accordance with California Test 231</td>
<td>1 every 2,000 sq yd and test compaction at every 6 in. of thickness</td>
</tr>
</tbody>
</table>
Notes:
1. Refer to California Test 125 for sampling procedures.
Table 6-1.12. Materials Acceptance Sampling and Testing Requirements: Bituminous Seals (Standard Specifications Section 37) (1 of 9)

<table>
<thead>
<tr>
<th>Test</th>
<th>Test Method</th>
<th>Sample Size &amp; Container Size</th>
<th>Sampling Location (Note 1)</th>
<th>Acceptance Test Frequency</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASPHALTIC EMULSION AND ASPHALTIC EMULSION FOR FLUSH COAT</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Various properties in accordance with Section 37 of Standard Specifications</td>
<td>See Section 37-2.02A(4)(b)(ii) of Standard Specifications</td>
<td>1 liter (or 1 qt) wide-mouth plastic bottle with screw on lids that are sealed with tape</td>
<td>Transport tanker</td>
<td>Each shipment</td>
<td>Certificate of compliance required with each shipment</td>
</tr>
<tr>
<td>Asphaltic emulsion spread rate</td>
<td>CT 339</td>
<td>Per test method</td>
<td>Full width of boot truck</td>
<td>Once per project</td>
<td></td>
</tr>
<tr>
<td>POLYMER MODIFIED ASPHALTIC EMULSION</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Viscosity</td>
<td>AASHTO T 59</td>
<td>1 liter (or 1 qt) wide-mouth plastic bottle with screw on lids that are sealed with tape</td>
<td>Transport tanker</td>
<td>Each shipment</td>
<td>Certificate of compliance required with each shipment</td>
</tr>
<tr>
<td>Sieve Test</td>
<td>AASHTO T 59</td>
<td>1 liter (or 1 qt) wide-mouth plastic bottle with screw on lids that are sealed with tape</td>
<td>Transport tanker</td>
<td>Each shipment</td>
<td>Certificate of compliance required with each shipment</td>
</tr>
<tr>
<td>Demulsibility</td>
<td>AASHTO T 59</td>
<td>1 liter (or 1 qt) wide-mouth plastic bottle with screw on lids that are sealed with tape</td>
<td>Transport tanker</td>
<td>Each shipment</td>
<td>Certificate of compliance required with each shipment</td>
</tr>
</tbody>
</table>
### Table 6-1.12. Materials Acceptance Sampling and Testing Requirements: Bituminous Seals (*Standard Specifications* Section 37) (2 of 9)

<table>
<thead>
<tr>
<th>Test</th>
<th>Test Method</th>
<th>Sample Size &amp; Container Size</th>
<th>Sampling Location (Note 1)</th>
<th>Acceptance Test Frequency</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Torsional Recovery</td>
<td>California Test 332</td>
<td>1 liter (or 1 qt) wide-mouth plastic bottle with screw on lids that are sealed with tape</td>
<td>Transport tanker</td>
<td>Each shipment</td>
<td>Certificate of compliance required with each shipment</td>
</tr>
<tr>
<td>Penetration</td>
<td>AASHTO T 49</td>
<td>1 liter (or 1 qt) wide-mouth plastic bottle with screw on lids that are sealed with tape</td>
<td>Transport tanker</td>
<td>Each shipment</td>
<td>Certificate of compliance required with each shipment</td>
</tr>
<tr>
<td>Ring and Ball</td>
<td>AASHTO T 53</td>
<td>1 liter (or 1 qt) wide-mouth plastic bottle with screw on lids that are sealed with tape</td>
<td>Transport tanker</td>
<td>Each shipment</td>
<td>Certificate of compliance required with each shipment</td>
</tr>
<tr>
<td>Test</td>
<td>Test Method</td>
<td>Sample Size &amp; Container Size</td>
<td>Sampling Location (Note 1)</td>
<td>Acceptance Test Frequency</td>
<td>Remarks</td>
</tr>
<tr>
<td>----------------------------------</td>
<td>-------------------</td>
<td>------------------------------</td>
<td>----------------------------</td>
<td>---------------------------</td>
<td>---------</td>
</tr>
<tr>
<td><strong>ASPHALT MODIFIER FOR ASPHALT RUBBER BINDER</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Viscosity</td>
<td>ASTM D445</td>
<td>1-qt wide-mouth can with friction top lid or 1-qt rectangular can with screw-on lid</td>
<td>Sample port on tanker truck</td>
<td>1 random per project</td>
<td></td>
</tr>
<tr>
<td>Flash Point</td>
<td>ASTM D92</td>
<td>1-qt wide-mouth can with friction top lid or 1-qt rectangular can with screw-on lid</td>
<td>Sample port on tanker truck</td>
<td>1 random per project</td>
<td></td>
</tr>
<tr>
<td>Molecular Analysis</td>
<td>ASTM D2007</td>
<td>1-qt wide-mouth can with friction top lid or 1-qt rectangular can with screw-on lid</td>
<td>Sample port on tanker truck</td>
<td>1 random per project</td>
<td></td>
</tr>
<tr>
<td><strong>CRUMB RUBBER MODIFIER FOR ASPHALT RUBBER BINDER</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wire in CRM (max %)</td>
<td>CT 385</td>
<td>CRM scrap tire: Two 2.5 lb in gallon zip-lock bags</td>
<td>CRM bulk bag</td>
<td>Minimum 1 random per project</td>
<td></td>
</tr>
</tbody>
</table>
Table 6-1.12. Materials Acceptance Sampling and Testing Requirements: Bituminous Seals *(Standard Specifications Section 37)* (4 of 9)

<table>
<thead>
<tr>
<th>Test</th>
<th>Test Method</th>
<th>Sample Size &amp; Container Size</th>
<th>Sampling Location (Note 1)</th>
<th>Acceptance Test Frequency</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fabric in CRM (max %)</td>
<td>CT 385</td>
<td>CRM scrap tire: Two 2.5 lb in gallon zip-lock bags</td>
<td>CRM bulk bag</td>
<td>Minimum 1 random per project</td>
<td></td>
</tr>
<tr>
<td>CRM particle length</td>
<td></td>
<td>CRM high natural: Two 2.5 lb in gallon zip-lock bags</td>
<td>CRM bulk bag</td>
<td>Minimum 1 random per project</td>
<td></td>
</tr>
<tr>
<td>CRM specific gravity</td>
<td>CT 208</td>
<td>CRM scrap tire: Two 2.5 lb in gallon zip-lock bags</td>
<td>CRM bulk bag</td>
<td>Minimum 1 random per project</td>
<td></td>
</tr>
<tr>
<td>Natural rubber content in high nature CRM (%)</td>
<td>ASTM D297</td>
<td>CRM high natural: Two 2.5 lb in gallon zip-lock bags</td>
<td>CRM bulk bag</td>
<td>Minimum 1 random per project</td>
<td></td>
</tr>
</tbody>
</table>

**ASPHALT RUBBER BINDER**

<table>
<thead>
<tr>
<th>Test</th>
<th>Test Method</th>
<th>Sample Size &amp; Container Size</th>
<th>Sampling Location (Note 1)</th>
<th>Acceptance Test Frequency</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cone Penetration</td>
<td></td>
<td>1-qt double-seal friction-top metal cylindrical shaped can</td>
<td>Asphalt feed line connecting to the HMA plant</td>
<td>Production start-up evaluation and 1 random per 5 samples</td>
<td>Certificate of compliance required with each shipment</td>
</tr>
</tbody>
</table>
Table 6-1.12. Materials Acceptance Sampling and Testing Requirements: Bituminous Seals (*Standard Specifications* Section 37) (5 of 9)

<table>
<thead>
<tr>
<th>Test</th>
<th>Test Method</th>
<th>Sample Size &amp; Container Size</th>
<th>Sampling Location (Note 1)</th>
<th>Acceptance Test Frequency</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASPHALT RUBBER BINDER (Cont.)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Resilience</td>
<td></td>
<td>1 qt double-seal friction-top metal cylindrical shaped can</td>
<td>Asphalt feed line connecting to the HMA plant</td>
<td>Production start-up evaluation and 1 random per 5 samples</td>
<td>Certificate of compliance required with each shipment</td>
</tr>
<tr>
<td>Softening point</td>
<td></td>
<td>1 qt double-seal friction-top metal cylindrical shaped can</td>
<td>Asphalt feed line connecting to the HMA plant</td>
<td>Production start-up evaluation and 1 random per 5 samples</td>
<td>Certificate of compliance required with each shipment</td>
</tr>
<tr>
<td>Asphalt Rubber Binder Viscosity</td>
<td>ASTM D7741</td>
<td>1 gal metal cylindrical shaped can with double-seal friction top</td>
<td>Asphalt storage tank</td>
<td>The greater of 1 every 5 lots or once a day</td>
<td>For safety, engineer may witness contractor perform test</td>
</tr>
<tr>
<td>Base Asphalt Binder Properties</td>
<td>See <em>Standard Specifications</em> Section 92</td>
<td>Five 1 qt double-seal friction-top metal cylindrical shaped can</td>
<td>Asphalt storage tank</td>
<td>The greater of 1 every 5 lots or once a day</td>
<td>Certificate of compliance required for each shipment; if asphalt binder source is not on approved list, test before use</td>
</tr>
</tbody>
</table>

**SCREENINGS/AGGREGATE FOR CHIP SEALS**

<table>
<thead>
<tr>
<th>Test</th>
<th>Method</th>
<th>Sample Size</th>
<th>Location</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>LA Rattler</td>
<td>California Test 211</td>
<td>50 lb in canvas bags or 5-gal buckets</td>
<td>Stockpile</td>
<td>Once per project</td>
</tr>
<tr>
<td>% Crushed Particles</td>
<td>AASHTO T 335</td>
<td>50 lb in canvas bags or 5-gal buckets</td>
<td>Stockpile</td>
<td>Once per project</td>
</tr>
</tbody>
</table>
Table 6-1.12. Materials Acceptance Sampling and Testing Requirements: Bituminous Seals (Standard Specifications Section 37) (6 of 9)

<table>
<thead>
<tr>
<th>Test</th>
<th>Method</th>
<th>Sample Size &amp; Container Size</th>
<th>Sampling Location</th>
<th>Acceptance Test Frequency</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Film Stripping</td>
<td>California Test 302</td>
<td>50 lb in canvas bags or 5-gal buckets</td>
<td>Stockpile</td>
<td>Once per project</td>
<td></td>
</tr>
<tr>
<td>Sieve Analysis</td>
<td>California Test 202</td>
<td>30 lb</td>
<td>Stockpile</td>
<td>Twice daily</td>
<td></td>
</tr>
<tr>
<td>Cleanness Value</td>
<td>California Test 227</td>
<td>30 lb</td>
<td>Stockpile</td>
<td>Once daily</td>
<td></td>
</tr>
<tr>
<td>Sieve Analysis</td>
<td>California Test 202</td>
<td>25 lb</td>
<td>Stockpile</td>
<td>Once per project</td>
<td></td>
</tr>
</tbody>
</table>

Crack Treatment Material

<table>
<thead>
<tr>
<th>Test</th>
<th>Method</th>
<th>Sample Size &amp; Container Size</th>
<th>Sampling Location</th>
<th>Acceptance Test Frequency</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Softening point</td>
<td>ASTM D36</td>
<td>2 each 3-lb minimum samples in silicone release boxes</td>
<td>From crack treatment material dispensing wand</td>
<td>Once per project</td>
<td>Indicate the specified type of crack treatment material on the TL-0101</td>
</tr>
<tr>
<td>Cone penetration</td>
<td>ASTM D5329</td>
<td>2 each 3-lb minimum samples in silicone release boxes</td>
<td>From crack treatment material dispensing wand</td>
<td>Once per project</td>
<td>Indicate the specified type of crack treatment material on the TL-0101</td>
</tr>
<tr>
<td>Resilience</td>
<td>ASTM D5329</td>
<td>2 each 3-lb minimum samples in silicone release boxes</td>
<td>From crack treatment material dispensing wand</td>
<td>Once per project</td>
<td>Indicate the specified type of crack treatment material on the TL-0101</td>
</tr>
<tr>
<td>Test</td>
<td>Test Method</td>
<td>Sample Size &amp; Container Size</td>
<td>Sampling Location (Note 1)</td>
<td>Acceptance Test Frequency</td>
<td>Remarks</td>
</tr>
<tr>
<td>------</td>
<td>-------------</td>
<td>------------------------------</td>
<td>---------------------------</td>
<td>---------------------------</td>
<td>---------</td>
</tr>
<tr>
<td>CRACK TREATMENTS (Cont.) Crack Treatment Material</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tensile adhesion</td>
<td>ASTM D5329</td>
<td>2 each 3-lb minimum samples in silicone release boxes</td>
<td>From crack treatment material dispensing wand</td>
<td>Once per project</td>
<td>Indicate the specified type of material on the TL-0101</td>
</tr>
<tr>
<td>Asphalt compatibility</td>
<td>ASTM D5329</td>
<td>2 each 3-lb minimum samples in silicone release boxes</td>
<td>From crack treatment material dispensing wand</td>
<td>Once per project</td>
<td>Indicate the specified type of material on the TL-0101</td>
</tr>
<tr>
<td>Flexibility</td>
<td>ASTM D3111</td>
<td>2 each 3-lb minimum samples in silicone release boxes</td>
<td>From crack treatment material dispensing wand</td>
<td>Once per project</td>
<td>Indicate the specified type of material on the TL-0101</td>
</tr>
<tr>
<td>Specific gravity</td>
<td>ASTM D70</td>
<td>2 each 3-lb minimum samples in silicone release boxes</td>
<td>From crack treatment material dispensing wand</td>
<td>Once per project</td>
<td>Indicate the specified type of material on the TL-0101</td>
</tr>
<tr>
<td>Sieve test</td>
<td>See note in Section 37-6.01D(3) “Department Acceptance” of the <em>Standard Specifications</em></td>
<td>2 each 3-lb minimum samples in silicone release boxes</td>
<td>From crack treatment material dispensing wand</td>
<td>Once per project</td>
<td>Indicate the specified type of material on the TL-0101</td>
</tr>
</tbody>
</table>
Table 6-1.12. Materials Acceptance Sampling and Testing Requirements: Bituminous Seals (*Standard Specifications* Section 37) (8 of 9)

<table>
<thead>
<tr>
<th>Test</th>
<th>Test Method</th>
<th>Sample Size &amp; Container Size</th>
<th>Sampling Location (Note 1)</th>
<th>Acceptance Test Frequency</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SAND FOR CRACK TREATMENT</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sieve Analysis</td>
<td>California Test 202</td>
<td>25 lb</td>
<td>Stockpile</td>
<td>Once per project</td>
<td></td>
</tr>
<tr>
<td><strong>SLURRY SEAL AGGREGATE</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Los Angeles Rattler (loss at 500 revolutions)</td>
<td>California Test 211</td>
<td>50 lb</td>
<td>Stockpile</td>
<td>Once per project</td>
<td></td>
</tr>
<tr>
<td>Percentage of Crushed Particles</td>
<td>California Test 205</td>
<td>50 lb</td>
<td>Stockpile</td>
<td>Once per project</td>
<td></td>
</tr>
<tr>
<td>Film Stripping</td>
<td>California Test 302</td>
<td>50 lb</td>
<td>Stockpile</td>
<td>Once per project</td>
<td></td>
</tr>
<tr>
<td>Durability Index</td>
<td>California Test 229</td>
<td>50 lb</td>
<td>Stockpile</td>
<td>Once per project</td>
<td></td>
</tr>
<tr>
<td>Sieve Analysis</td>
<td>California Test 202, California Test 105</td>
<td>30 lb</td>
<td>Stockpile</td>
<td>Once daily</td>
<td></td>
</tr>
<tr>
<td>Sand Equivalent</td>
<td>California Test 217</td>
<td>30 lb</td>
<td>Stockpile</td>
<td>Once daily</td>
<td></td>
</tr>
<tr>
<td><strong>MICRO-SURFACING AGGREGATES</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Los Angeles Rattler (loss at 500 revolutions)</td>
<td>California Test 211</td>
<td>50 lb</td>
<td>Stockpile</td>
<td>Once per project</td>
<td></td>
</tr>
<tr>
<td>Percentage of Crushed Particles</td>
<td>California Test 205</td>
<td>50 lb</td>
<td>Stockpile</td>
<td>Once per project</td>
<td></td>
</tr>
<tr>
<td>Durability Index</td>
<td>California Test 302</td>
<td>50 lb</td>
<td>Stockpile</td>
<td>Once per project</td>
<td></td>
</tr>
</tbody>
</table>
Table 6-1.12. Materials Acceptance Sampling and Testing Requirements: Bituminous Seals (*Standard Specifications* Section 37) (9 of 9)

<table>
<thead>
<tr>
<th>Test</th>
<th>Test Method</th>
<th>Sample Size &amp; Container Size</th>
<th>Sampling Location (Note 1)</th>
<th>Acceptance Test Frequency</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>MICRO-SURFACING AGGREGATES (Cont.)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sieve Analysis</td>
<td>California Test 202</td>
<td>30 lb</td>
<td>Stockpile</td>
<td>Once daily</td>
<td></td>
</tr>
<tr>
<td>Sand Equivalent</td>
<td>California Test 217</td>
<td>30 lb</td>
<td>Stockpile</td>
<td>Once daily</td>
<td></td>
</tr>
</tbody>
</table>

Note:
1. Refer to California Test 125 for sampling procedures.
Table 6-1.13. Materials Acceptance Sampling and Testing Requirements: Asphalt Concrete *(Standard Specifications Section 39)* (1 of 14)

<table>
<thead>
<tr>
<th>Test</th>
<th>Test Method</th>
<th>Sample Size &amp; Container Type</th>
<th>Sampling Location (Note 1)</th>
<th>Sampling Frequency</th>
<th>Acceptance Test Frequency</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>AGGREGATE: All Types of HMA</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gradation (Sieve Analysis) <em>(See Note 2)</em></td>
<td>AASHTO T 27, California Test 105, California Test 384</td>
<td>Combined six 20-lb canvas bags <em>(see Note 3)</em> or Batch 30 lb <em>(proportioned per bin percentages)</em></td>
<td>HMA plant</td>
<td>For standard process, 1 for each 750 tons, 1 per day minimum For statistical pay factor (SPF) process, per stratified random sampling plan <em>(see Notes 10 and 11)</em></td>
<td>Production start-up evaluation. For standard process, minimum 1 per day of paving For SPF process, test per stratified random sampling plan <em>(see Note 14)</em></td>
<td></td>
</tr>
<tr>
<td>Sand Equivalent</td>
<td>AASHTO T 176</td>
<td>Combined six 20-lb canvas bags <em>(See Note 3)</em> or Batch 30 lb <em>(proportioned per bin percentages)</em></td>
<td>HMA plant or before lime treatment</td>
<td>For standard process, 1 for each 750 tons, 1 per day minimum For SPF process, same frequency as gradations</td>
<td>Production start-up evaluation. For standard process, minimum 1 per day of paving For SPF process, test with gradation samples</td>
<td>Not required for OGFC <em>(open graded friction course)</em></td>
</tr>
</tbody>
</table>
Table 6-1.13. Materials Acceptance Sampling and Testing Requirements: Asphalt Concrete *(Standard Specifications Section 39)* (2 of 14)

<table>
<thead>
<tr>
<th>Test</th>
<th>Test Method</th>
<th>Sample Size &amp; Container Type</th>
<th>Sampling Location (Note 1)</th>
<th>Sampling Frequency</th>
<th>Acceptance Test Frequency</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>AGGREGATE: All Types of HMA</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Percent Crushed Particles (Coarse)</td>
<td>AASHTO T 335</td>
<td>Combined six 20-lb canvas bags (See Note 3) or Batch 30 lb (proportioned per bin percentages)</td>
<td>HMA plant or before lime treatment</td>
<td>1 for each 750 tons, 1 per day minimum</td>
<td>For the SPF process, see Note 17</td>
<td>Production start-up evaluation, and minimum 1 random for every 25,000 tons or less of paving For the SPF process, see Note 17</td>
</tr>
<tr>
<td>Percent Crushed Particles (Fine)</td>
<td>AASHTO T 335</td>
<td>Combined six 20-lb canvas bags (See Note 3) or Batch 30 lb (proportioned per bin percentages)</td>
<td>HMA plant or before lime treatment</td>
<td>1 for each 750 tons, 1 per day minimum</td>
<td>For the SPF process, see Note 17</td>
<td>Production start-up evaluation, and minimum 1 random for every 25,000 tons or less of paving For the SPF process, see Note 17</td>
</tr>
<tr>
<td>LA Rattler (500 Revolutions)</td>
<td>AASHTO T 96</td>
<td>Combined six 20-lb canvas bags (See Note 3) or Batch 30 lb (proportioned per bin percentages)</td>
<td>HMA plant or before lime treatment</td>
<td>1 for each 750 tons, 1 per day minimum</td>
<td>For the SPF process, see Note 17</td>
<td>Production start-up evaluation, and minimum 1 random for every 50,000 tons or less of paving For the SPF process, see Note 17</td>
</tr>
</tbody>
</table>
Table 6-1.13. Materials Acceptance Sampling and Testing Requirements:
Asphalt Concrete (*Standard Specifications* Section 39) (3 of 14)

<table>
<thead>
<tr>
<th>Test</th>
<th>Test Method</th>
<th>Sample Size &amp; Container Type</th>
<th>Sampling Location (Note 1)</th>
<th>Sampling Frequency</th>
<th>Acceptance Test Frequency</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>AGGREGATE: All Types of HMA (Cont.)</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>LA Rattler (100 Revolutions)</td>
<td>AASHTO T 96</td>
<td>Combined six 20-lb canvas bags (See Note 3) or Batch 30 lb (proportioned per bin percentages)</td>
<td>HMA plant or before lime treatment</td>
<td>1 for each 750 tons, 1 per day minimum For the SPF process, see Note 17</td>
<td>Production start-up evaluation, and minimum 1 random for every 50,000 tons or less of paving For the SPF process, see Note 17</td>
<td></td>
</tr>
<tr>
<td>Fine Aggregate Angularity</td>
<td>AASHTO T 304, Method A</td>
<td>Combined six 20-lb canvas bags (See Note 3) or Batch 30 lb (proportioned per bin percentages)</td>
<td>HMA plant or before lime treatment</td>
<td>1 for each 750 tons, 1 per day minimum For the SPF process, see Note 17</td>
<td>Production start-up evaluation, and minimum 1 random for every 50,000 tons or less of paving For the SPF process, see Note 17</td>
<td>Not required for OGFC or Minor HMA</td>
</tr>
<tr>
<td>Flat and Elongated Particles</td>
<td>ASTM D4791</td>
<td>Combined six 20-lb canvas bags (See Note 3) or Batch 30 lb (proportioned per bin percentages)</td>
<td>HMA plant or before lime treatment</td>
<td>1 for each 750 tons, 1 per day minimum For the SPF process, see Note 17</td>
<td>Production start-up evaluation, and minimum 1 random for every 50,000 tons or less of paving For the SPF process, see Note 17</td>
<td>Not required for Minor HMA</td>
</tr>
<tr>
<td>Test</td>
<td>Test Method</td>
<td>Sample Size &amp; Container Type</td>
<td>Sampling Location (Note 1)</td>
<td>Sampling Frequency</td>
<td>Acceptance Test Frequency</td>
<td>Remarks</td>
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</tr>
<tr>
<td><strong>ASPHALT BINDER</strong></td>
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</tr>
<tr>
<td>Various properties based on asphalt type used (see Standard Specifications Section 92)</td>
<td>See Standard Specifications Section 92</td>
<td>1-qt double-seal friction-top metal cylindrical shaped can</td>
<td>Asphalt feed line connecting the plant storage tanks</td>
<td>1 per day of HMA production</td>
<td>1 random for every 5 samples</td>
<td>Certificate of compliance required for each shipment; if asphalt binder source is not on approved list, sample and test asphalt before use</td>
</tr>
<tr>
<td><strong>ASPHALT RUBBER BINDER</strong></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Asphalt Rubber Binder Properties</td>
<td>See Standard Specifications Section 39-2.03A(4)(e)(ii)</td>
<td>1-qt double-seal friction-top metal cylindrical shaped can</td>
<td>Asphalt rubber feed line from the HMA plant</td>
<td>1 every lot</td>
<td>Production start-up evaluation and 1 random per 5 samples</td>
<td>Certificate of compliance required for each lot</td>
</tr>
<tr>
<td>Asphalt Rubber Binder Viscosity</td>
<td>ASTM D7741</td>
<td>1 gal double-seal friction-top metal cylindrical shaped can</td>
<td>Asphalt rubber feed line connecting to the HMA plant</td>
<td>1 every lot</td>
<td>1 every lot</td>
<td>For safety, engineer may witness contractor perform test</td>
</tr>
</tbody>
</table>
Table 6-1.13. Materials Acceptance Sampling and Testing Requirements: Asphalt Concrete (*Standard Specifications* Section 39) (5 of 14)

<table>
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<tr>
<th>Test</th>
<th>Test Method</th>
<th>Sample Size &amp; Container Type</th>
<th>Sampling Location (Note 1)</th>
<th>Sampling Frequency</th>
<th>Acceptance Test Frequency</th>
<th>Remarks</th>
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<tbody>
<tr>
<td><strong>ASPHALT RUBBER BINDER (Cont.)</strong></td>
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</tr>
<tr>
<td>Base Asphalt Binder Properties</td>
<td>See <em>Standard Specifications</em> Section 92</td>
<td>1-qt double-seal friction-top metal cylindrical shaped can</td>
<td>Asphalt storage tank</td>
<td>Each shipment</td>
<td>Production start-up evaluation and 1 random per 5 samples</td>
<td>Certificate of compliance required for each shipment; if asphalt binder source is not on approved list, sample and test asphalt before use</td>
</tr>
<tr>
<td>Asphalt Modifier Properties</td>
<td>ASTM D445 ASTM D92 ASTM D2007</td>
<td>1-qt double-seal friction-top metal cylindrical shaped can or 1-qt rectangular can with screw-on lid</td>
<td>Sample port on tanker truck</td>
<td>Each shipment</td>
<td>1 random per project</td>
<td></td>
</tr>
<tr>
<td>Crumb Rubber Modifier (CRM) Properties</td>
<td>California Test 208, California Test 385, ASTM D297</td>
<td>CRM scrap tire: Two 2.5 lb in gallon zip-lock bags; CRM high natural: Two 2.5 lb in gallon zip-lock bags</td>
<td>CRM bulk bag</td>
<td>Each shipment</td>
<td>1 random per project</td>
<td></td>
</tr>
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</table>
### Table 6-1.13. Materials Acceptance Sampling and Testing Requirements: Asphalt Concrete (*Standard Specifications* Section 39) (6 of 14)

<table>
<thead>
<tr>
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<th>Sampling Frequency</th>
<th>Acceptance Test Frequency</th>
<th>Remarks</th>
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</thead>
<tbody>
<tr>
<td>HOT MIX ASPHALT: Type A</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Moisture Content</td>
<td>AASHTO T 329</td>
<td>10 lb, sealed metal container</td>
<td>Loose mix from behind the paver (See Note 4)</td>
<td>Production start-up evaluation, and minimum 1 per project</td>
<td>Production start-up evaluation, and minimum 1 per project during paving</td>
<td>Test within 1 hour of sampling</td>
</tr>
<tr>
<td>Asphalt Binder Content</td>
<td>AASHTO T 308, Method A</td>
<td>60 lb (See Notes 5 and 18) (8x8x4=6 boxes, 8½x8½x4 ½=4 boxes) (See Notes 5 and 18)</td>
<td>Loose mix from behind the paver (See Note 4)</td>
<td>For standard process, 1 for each 750 tons, 1 per day minimum. For SPF process, per stratified random sampling plan (See Notes 10 and 11)</td>
<td>Production start-up evaluation; For standard process, minimum 1 per day of paving For SPF process, per stratified random sampling plan (See Note 14)</td>
<td></td>
</tr>
<tr>
<td>Maximum Theoretical Density</td>
<td>AASHTO T 209</td>
<td>60 lb (See Notes 5 and 18) (8x8x4=6 boxes, 8½x8½x4 ½=4 boxes) (See Notes 5 and 18)</td>
<td>Loose mix from behind the paver (See Note 4)</td>
<td>For standard process, 1 for each 750 tons, 1 per day minimum For SPF process, two samples per shift with verification density cores (See Notes 10 and 13)</td>
<td>Production start-up evaluation. For standard process, 1 random test per day of paving For SPF process, per stratified random sampling plan</td>
<td></td>
</tr>
<tr>
<td>Test</td>
<td>Test Method</td>
<td>Sample Size &amp; Container Type</td>
<td>Sampling Location (See Note 1)</td>
<td>Sampling Frequency</td>
<td>Acceptance Test Frequency</td>
<td>Remarks</td>
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</tr>
<tr>
<td>HOT MIX ASPHALT: Type A (Cont.)</td>
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</tr>
<tr>
<td>Air Void Content</td>
<td>AASHTO T 269</td>
<td>100 lb (See Note 5) (8x8x4=10 boxes, 8½x8½x4 ½=8 boxes)</td>
<td>Loose mix from behind the paver (See Note 4)</td>
<td>Production start-up evaluation, 1 every 25,000 tons of paving. For HMA placed using SPF, see Notes 10 and 11</td>
<td>Production start-up evaluation, and minimum 1 random for every 25,000 tons of paving, except for HMA placed using SPF, see Note 14</td>
<td></td>
</tr>
<tr>
<td>Voids in Mineral Aggregate</td>
<td>SP-2 Asphalt Mixture Volumetrics</td>
<td>100 lb (See Note 5) (8x8x4=10 boxes, 8½x8½x4 ½=8 boxes)</td>
<td>Loose mix from behind the paver (See Note 4)</td>
<td>Production start-up evaluation, 1 every 25,000 tons of paving</td>
<td>Production start-up evaluation, and minimum 1 random for every 25,000 tons of paving</td>
<td></td>
</tr>
<tr>
<td>Dust Proportion</td>
<td>SP-2 Asphalt Mixture Volumetrics</td>
<td>100 lb (See Note 5) (8x8x4=10 boxes, 8½x8½x4 ½=8 boxes)</td>
<td>Loose mix from behind the paver (See Note 4)</td>
<td>Production start-up evaluation, 1 every 25,000 tons of paving</td>
<td>Production start-up evaluation, and minimum 1 random for every 25,000 tons of paving</td>
<td></td>
</tr>
</tbody>
</table>
Table 6-1.13. Materials Acceptance Sampling and Testing Requirements: Asphalt Concrete (Standard Specifications Section 39) (8 of 14)

<table>
<thead>
<tr>
<th>Test</th>
<th>Test Method</th>
<th>Sample Size &amp; Container Type</th>
<th>Sampling Location (Note 1)</th>
<th>Sampling Frequency</th>
<th>Acceptance Test Frequency</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>HOT MIX ASPHALT: Type A (Cont.)</td>
<td>Hamburg Wheel Track</td>
<td>California Test 389</td>
<td>70 lb (See Notes 5 and 18) (8x8x4=7 boxes, 8½x8½x4 ½=6 boxes)</td>
<td>Loose mix at plant, truck, or windrow</td>
<td>Production start-up evaluation, 1 every 10,000 tons of paving</td>
<td>Not required for Minor HMA</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Production start-up evaluation, and minimum 1 random for every 10,000 tons or less of paving</td>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td>For SPF process, see Note 16</td>
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<td></td>
<td></td>
<td></td>
<td>For SPF process, see Note 16</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Moisture Susceptibility</td>
<td>AASHTO T 283</td>
<td>140 lb (See Notes 5, 6 and 18) (8x8x4=15 boxes, 8½x8½x4 ¼=12 boxes)</td>
<td>Loose mix at plant, truck, or windrow</td>
<td>Production start-up evaluation, 1 every 50,000 tons of paving</td>
<td>Test for dry strength and wet strength; not required for Minor HMA</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Production start-up evaluation, and minimum 1 random test for every 50,000 tons of paving</td>
<td></td>
</tr>
<tr>
<td>HOT MIX ASPHALT: With RAP/RAS</td>
<td>Binder Recovery</td>
<td>AASHTO T 164, ASTM D1856</td>
<td>10 lb (8x8x4=1 box, 8½x8½x4 ½=1 box) (See Note 18)</td>
<td>Loose mix from behind the paver (See Note 4)</td>
<td>Production start-up evaluation, 1 every 25,000 tons of paving</td>
<td>1 random for every 25,000 tons or less of paving</td>
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</table>
Table 6-1.13. Materials Acceptance Sampling and Testing Requirements: Asphalt Concrete (*Standard Specifications* Section 39) (9 of 14)

<table>
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<th>Test</th>
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<th>Sampling Frequency</th>
<th>Acceptance Test Frequency</th>
<th>Remarks</th>
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<tbody>
<tr>
<td><strong>RUBBERIZED HOT MIX ASPHALT: Gap Graded</strong></td>
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</tr>
<tr>
<td>Moisture Content</td>
<td>AASHTO T 329</td>
<td>10 lb, sealed metal container</td>
<td>Loose mix from behind the paver (See Note 4)</td>
<td>Production start-up evaluation, and minimum 1 per project</td>
<td>Production start-up evaluation, and minimum 1 per project during paving</td>
<td>Test within 1 hour of sampling</td>
</tr>
<tr>
<td>Asphalt Binder Content</td>
<td>AASHTO T 308, Method A</td>
<td>60 lb (See Notes 5 and 18) (8x8x4=6 boxes, 8½x8½x4 ½=4 boxes)</td>
<td>Loose mix from behind the paver (See Note 4)</td>
<td>1 for each 750 tons, 1 per day minimum. For HMA placed using SPF, see Notes 10 and 11</td>
<td>Production start-up evaluation; 1 random test per day of paving. For HMA placed using SPF, see Note 10</td>
<td></td>
</tr>
<tr>
<td>Maximum Theoretical Density</td>
<td>AASHTO T 209</td>
<td>60 lb (See Notes 5 and 18) (8x8x4=6 boxes, 8½x8½x4 ½=4 boxes)</td>
<td>Loose mix from behind the paver (See Note 4)</td>
<td>1 for each 750 tons, 1 per day minimum. For HMA placed using SPF, see Notes 11 and 13</td>
<td>Production start-up evaluation; minimum 1 per day of paving, except for HMA placed using SPF, see Notes 10 and 13</td>
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Table 6-1.13. Materials Acceptance Sampling and Testing Requirements: Asphalt Concrete (Standard Specifications Section 39) (10 of 14)

<table>
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<th>Test</th>
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<th>Sampling Location (Note 1)</th>
<th>Sampling Frequency</th>
<th>Acceptance Test Frequency</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>RUBBERIZED HOT MIX ASPHALT: Gap Graded</strong></td>
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</tr>
<tr>
<td>Air Void Content</td>
<td>AASHTO T 269</td>
<td>100 lb (See Notes 5 and 18) (8x8x4=10 boxes, 8½x8½x4 ½=8 boxes)</td>
<td>Loose mix from behind the paver (See Note 4)</td>
<td>Production start-up evaluation, 1 every 25,000 tons of paving. For HMA placed using SPF, see notes 10 and 11. Production start-up evaluation, and minimum 1 random test for every 25,000 tons of paving. For SPF process, test per stratified random sampling plan. See note 14.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Voids in Mineral Aggregate</td>
<td>SP-2 Asphalt Mixture Volumetrics</td>
<td>100 lb (See Notes 5 and 18) (8x8x4=10 boxes, 8½x8½x4 ½=8 boxes)</td>
<td>Loose mix from behind the paver (See Note 4)</td>
<td>Production start-up evaluation, 1 every 25,000 tons of paving.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dust Proportion</td>
<td>SP-2 Asphalt Mixture Volumetrics</td>
<td>100 lb (See Notes 5 and 18) (boxes, 8x8x4=10 boxes, 8½x8½x4 ½=8 boxes)</td>
<td>Loose mix from behind the paver (See Note 4)</td>
<td>Production start-up evaluation, 1 every 25,000 tons of paving.</td>
<td>Production start-up evaluation, and minimum 1 random test for every 25,000 tons of paving.</td>
<td></td>
</tr>
</tbody>
</table>

*Note 1: Instructions for sampling and testing.*
Table 6-1.13. Materials Acceptance Sampling and Testing Requirements: Asphalt Concrete *(Standard Specifications* Section 39) (11 of 14)

<table>
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<tr>
<th>Test</th>
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<th>Acceptance Test Frequency</th>
<th>Remarks</th>
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<tbody>
<tr>
<td><strong>RUBBERIZED HOT MIX ASPHALT: Gap Graded (Cont.)</strong></td>
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<td></td>
</tr>
<tr>
<td>Hamburg Wheel Track</td>
<td>California Test 389</td>
<td>75 lb (See Notes 5 and 18) (8x8x4=7 boxes, 8½x8½x4½=6 boxes)</td>
<td>Loose mix at plant, truck, or windrow</td>
<td>Production start-up evaluation 1 every 10,000 tons of paving</td>
<td>Production start-up evaluation, and minimum 1 random test for every 10,000 tons or less of paving For SPF process, see Note 16</td>
<td>Test for dry strength and wet strength</td>
</tr>
<tr>
<td>Moisture Susceptibility</td>
<td>AASHTO T 283</td>
<td>75 lb (See Notes 5, 6 and 18) (8x8x4=15 boxes, 8½x8½x4½=12 boxes)</td>
<td>Loose mix at plant, truck, or windrow</td>
<td>Production start-up evaluation, 1 every 50,000 tons of paving</td>
<td>Production start-up evaluation, and minimum 1 random test for every 50,000 tons of paving</td>
<td></td>
</tr>
<tr>
<td><strong>OPEN GRADED FRICTION COURSE (OGFC)</strong></td>
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</tr>
<tr>
<td>Asphalt Binder Content</td>
<td>AASHTO T 308, Method A</td>
<td>20 lb (See Note 5) 4, 1-gal metal containers with friction lids</td>
<td>Loose mix from behind the paver (See Note 4)</td>
<td>1 for each 750 tons, 1 per day minimum</td>
<td>Production start-up evaluation; minimum 1 per day of paving</td>
<td></td>
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</table>
### Table 6-1.13. Materials Acceptance Sampling and Testing Requirements: Asphalt Concrete *(Standard Specifications Section 39)* (12 of 14)

<table>
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<tr>
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<th>Acceptance Test Frequency</th>
<th>Remarks</th>
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<tbody>
<tr>
<td><strong>OPEN GRADED FRICTION COURSE (OGFC) (Cont.)</strong></td>
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</tr>
<tr>
<td>Moisture Content</td>
<td>AASHTO T 329</td>
<td>10 lb, sealed metal container</td>
<td>Loose mix from behind the paver (See Note 4)</td>
<td>Production start-up evaluation, and minimum 1 per project</td>
<td>Production start-up evaluation, and minimum 1 per project during paving</td>
<td>Test within 1 hour of sampling</td>
</tr>
<tr>
<td><strong>BONDED WEARING COURSE: Gap Graded (BWC-G) (See Note 7)</strong></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Asphalt Binder Content</td>
<td>AASHTO T 308, Method A</td>
<td>20 lb (See Note 5) 4, 1-gal metal containers with friction lids</td>
<td>Loose mix at plant</td>
<td>1 for each 750 tons, 1 per day minimum</td>
<td>Production start-up evaluation. Minimum 1 per day of paving</td>
<td></td>
</tr>
<tr>
<td>Moisture Content</td>
<td>AASHTO T 329</td>
<td>10 lb sealed metal container</td>
<td>Loose mix at plant</td>
<td>Production start-up evaluation, and minimum 1 per project</td>
<td>Production start-up evaluation, and minimum 1 per project during paving</td>
<td>Samples should be tested within 1 hour of sampling</td>
</tr>
<tr>
<td><strong>PAVEMENT DENSITY</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Density of cores</td>
<td>California Test 375</td>
<td>4- or 6-in cores</td>
<td>Final layer, cored to the specified total paved thickness</td>
<td>For the standard process, 1 for each 250 tons</td>
<td>For the standard process, 1 for each 250 tons</td>
<td>Density applies to HMA thickness of 0.15 ft or greater</td>
</tr>
<tr>
<td>(See Note 8)</td>
<td></td>
<td></td>
<td></td>
<td>For the SPF process, see Note 12</td>
<td>For SPF process, test per stratified random sampling plan. See Note 14</td>
<td></td>
</tr>
<tr>
<td>Test</td>
<td>Test Method</td>
<td>Sample Size &amp; Container Type</td>
<td>Sampling Location (See Note 1)</td>
<td>Sampling Frequency</td>
<td>Acceptance Test Frequency</td>
<td>Remarks</td>
</tr>
<tr>
<td>------</td>
<td>-------------</td>
<td>------------------------------</td>
<td>--------------------------------</td>
<td>-------------------</td>
<td>--------------------------</td>
<td>---------</td>
</tr>
<tr>
<td>PAVEMENT SMOOTHNESS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Straightedge</td>
<td>N/A</td>
<td>N/A</td>
<td>Pavement surface (See Note 9)</td>
<td>Entire final surface</td>
<td>Entire final surface</td>
<td>Areas exempt from Inertial Profiler</td>
</tr>
<tr>
<td>Inertial Profiler for Mean Roughness Index and Areas of Localized Roughness</td>
<td>California Test 387 AASHTO R 56 &amp; AASHTO R 57</td>
<td>Each 0.1 mile</td>
<td>Pavement surface</td>
<td>Entire final surface</td>
<td>Entire final surface</td>
<td>Entire final surface excluding areas requiring straightedge; use contractor-furnished profiles for IRI values within 10% of Caltrans' IRI values</td>
</tr>
<tr>
<td>TACK COAT</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asphalt Binder</td>
<td>Based on asphalt type used (see Standard Specifications Section 92)</td>
<td>1-qt double-seal friction-top metal cylindrical shaped can</td>
<td>Spray bar on asphalt distributor truck</td>
<td>Each truckload</td>
<td>1 random per project</td>
<td></td>
</tr>
</tbody>
</table>

Table 6-1.13. Materials Acceptance Sampling and Testing Requirements: Asphalt Concrete (Standard Specifications Section 39) (13 of 14)
### Table 6-1.13. Materials Acceptance Sampling and Testing Requirements: Asphalt Concrete (Standard Specifications Section 39) (14 of 14)

<table>
<thead>
<tr>
<th>Test</th>
<th>Test Method</th>
<th>Sample Size &amp; Container Type</th>
<th>Sampling Location (See Note 1)</th>
<th>Sampling Frequency</th>
<th>Acceptance Test Frequency</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TACK COAT (Cont.)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Verify tack coat spray rate is sufficient to meet the minimum specified residual rate.</td>
</tr>
<tr>
<td>Spread Rate</td>
<td>California Test 339</td>
<td>N/A</td>
<td>Pavement</td>
<td>N/A</td>
<td></td>
<td>As necessary for verification of tack coat spread rate</td>
</tr>
<tr>
<td>Asphalctic Emulsion</td>
<td>Based on emulsion type used (see Standard Specifications Section 94)</td>
<td>1 liter (or 1 qt) wide-mouth plastic bottle with screw on lids that are sealed with tape</td>
<td>Spray bar on emulsion distributor truck</td>
<td>Each truckload</td>
<td>1 random per project</td>
<td></td>
</tr>
</tbody>
</table>

**Notes:**

1. Refer to California Test 125 for sampling procedures.
2. When using RAP, RAS, or RAP/RAS, adjust gradation by the correction factor determined under California Test 384.
4. Sampling HMA behind the paver is the preferred location. You may also take samples from the windrow, production plant, or truck.
5. Sample sizes are based on split samples—one sample for acceptance testing, and one for dispute resolution. Store one-half of the boxes or cans for dispute resolution.
6. Contractor ships directly to district material laboratory.

7. For bonded wearing course using RHMA-G, RHMA-O, or HMA-O, sampling and testing must comply with requirements for RHMA-G, RHMA-O, or HMA-O.

8. Determine percent of maximum theoretical density under California Test 375, except use AASHTO T 275 to determine in-place density of each core and AASHTO T 209, Method A to determine maximum theoretical density instead of calculating maximum density.

9. May use Inertial Profiler data and ProVAL Rolling Straightedge module to assist in determining where to check with 12-foot straightedge.

10. For the statistical pay factor (SPF) process, and for each lot, prepare a stratified random sampling plan for the following pay factor quality characteristic: aggregate gradations, binder content, air voids, and percent of maximum theoretical density. Sample at milestones identified in the stratified random sampling plan. Do not share the verification sampling time or location with the contractor until immediately before sampling. Do not share the stratified random sampling plan with the contractor until completion of the lot. For guidance on developing the engineer’s stratified random sampling plans, refer to section 4-3902K, “Stratified Random Sampling Plan” of this manual.

11. Obtain enough material to split each sample into four parts. Perform verification testing on one part, provide one part to the contractor, hold one part for dispute resolution testing, and reserve the fourth part for additional verification testing in the event the lot runs short and you do not have at least the 3 tests needed for verification.

12. To determine in-place density, obtain verification density cores from the contractor’s sublot identified in the engineer’s stratified random sampling plan. Break the identified sublot into three equal parts, and randomly determine the coring location of each part. At each location, core three samples aligned longitudinally within 1 to 2 feet of the center core. Retain the center core for verification testing, and randomly determine which of the two remaining cores will be provided to the contractor and which will be retained by the engineer.

13. To determine the paving shift’s maximum theoretical density value used for verification of percent in-place density, obtain two samples of HMA from each paving shift the verification density cores are obtained from. Determine the shift’s maximum theoretical density value used for the verification by averaging the test results of the two samples. The two samples must be obtained randomly from the first and last half of the paving shift, or from a split of a single sample pulled within the sublot the density cores are obtained from.

14. Do not share the test results of pay factor quality characteristics with the contractor until completion of the lot.

15. For HMA placed using SPF, during production, sample non-pay factor items at the frequency determined by the engineer. Notify the contractor of your intent to sample, and obtain enough material to split into four parts. Test one part, provide one part to the contractor, and retain one part for independent third party testing. When sampling for non-pay factors, except sand equivalent testing, pull two samples from two consecutive sublots. If the first sample fails, immediately test the second sample. Refer to Section 4-3904A(5), “Monitoring Non-Pay Factor Quality Characteristics using Statistical Pay Factor Specifications” of this manual for guidance related to non-pay factor testing.

16. For HMA placed using SPF, when sampling for Hamburg Wheel Track, pull one additional sample for testing from the contractor’s next sublot. Test this second sample if the first sample fails.
17. For HMA placed using SPF, sample at same frequency as aggregate gradations, except pull two samples and test the second sample if the first sample fails.

18. Box quantities indicated represent recommended amounts for each individual test. Use CT 125 Appendix B Table 1 for more comprehensive quantities or suites of tests.
Table 6-1.14. Materials Acceptance Sampling and Testing Requirements: Concrete Pavement *(Standard Specifications* Section 40) (1 of 2)
See Table 6-1.17 for concrete materials

<table>
<thead>
<tr>
<th>Test</th>
<th>Test Method</th>
<th>Sample Size &amp; Container Size</th>
<th>Sampling Location (Note 1)</th>
<th>Acceptance Test Frequency</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CONCRETE</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Modulus of Rupture (Open to Traffic)</td>
<td>California Test 523 (Field Curing)</td>
<td>3 beams of 6x6x20 in. for third-point loading</td>
<td>Concrete truck discharge chute</td>
<td>1 set for the last pavement section placed before opening to traffic</td>
<td>Not used for acceptance, only to verify that pavement can be opened to traffic</td>
</tr>
<tr>
<td>Modulus of Rupture (28-days)</td>
<td>California Test 523</td>
<td>3 beams of 6x6x20 in. for third-point loading</td>
<td>Concrete truck discharge chute</td>
<td>1 set per age for each 1,000 cu yd, 1 per day minimum (See Note 2)</td>
<td>Recommend frequency of every 2,000 cu yd if after 10 sets all tests are in compliance</td>
</tr>
<tr>
<td>Air Content</td>
<td>California Test 504</td>
<td>See test method</td>
<td>Concrete truck discharge chute</td>
<td>1 every day of production</td>
<td>Only test when air entrainment is specified</td>
</tr>
<tr>
<td><strong>PAVEMENT</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thickness</td>
<td>California Test 531</td>
<td>4-in. diameter core, full thickness of pavement</td>
<td>See Section 4-4004, &quot;Level of Inspection,&quot; of this manual</td>
<td>1 every 1,200 sq yd</td>
<td></td>
</tr>
<tr>
<td>Dowel Bar Alignment and Concrete Consolidation</td>
<td>Measurement and Inspection</td>
<td>4-in. diameter core size</td>
<td>Transverse pavement joints</td>
<td>1 test every 700 sq yd</td>
<td>Each test consists of 2 cores, one on each end of dowel bar</td>
</tr>
<tr>
<td>Tie Bar Alignment and Concrete Consolidation</td>
<td>Measurement and Inspection</td>
<td>4-in. diameter core size</td>
<td>Longitudinal pavement joints</td>
<td>1 test every 4,000 sq yd</td>
<td>Each test consists of 2 cores, one on each end of tie bar</td>
</tr>
<tr>
<td>Coefficient of Friction</td>
<td>California Test 342</td>
<td>N/A</td>
<td>Pavement surface</td>
<td>1 test for each day of paving</td>
<td>Each test consists of 5 measurements</td>
</tr>
<tr>
<td>Smoothness - Straightedge</td>
<td>Measurement with 12-ft straightedge</td>
<td>N/A</td>
<td>Pavement surface</td>
<td>Entire final surface requiring straightedge</td>
<td></td>
</tr>
</tbody>
</table>
Table 6-1.14. Materials Acceptance Sampling and Testing Requirements: Concrete Pavement (*Standard Specifications* Section 40) (2 of 2)
See Table 6-1.17 for concrete materials

<table>
<thead>
<tr>
<th>Test</th>
<th>Test Method</th>
<th>Sample Size &amp; Container Size</th>
<th>Sampling Location (Note 1)</th>
<th>Acceptance Test Frequency</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>PAVEMENT (Cont.)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smoothness - Inertial Profiler for Mean Roughness Index and Areas of Localized Roughness</td>
<td>AASHTO R 56, AASHTO R 57, and California Test 387</td>
<td>0.1 mile</td>
<td>Pavement surface</td>
<td>Entire final surface</td>
<td>Entire final surface excluding specified areas</td>
</tr>
</tbody>
</table>

Notes:

1. Refer to California Test 125 for sampling procedures.
2. If concrete modulus of rupture is close to specification limit or outside the specification limits, sample and test concrete every 1,000 cu yd so that deductions may be taken for noncompliant material.
Table 6-1.15. Materials Acceptance Sampling and Testing Requirements: Existing Concrete Pavement (*Standard Specifications* Section 41)

<table>
<thead>
<tr>
<th>Test</th>
<th>Test Method</th>
<th>Sample Size &amp; Container Size</th>
<th>Sampling Location (Note 1)</th>
<th>Acceptance Test Frequency</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>INDIVIDUAL SLAB REPLACEMENT WITH RAPID STRENGTH CONCRETE (Section 41-9)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coefficient of Friction</td>
<td>California Test 342</td>
<td>N/A</td>
<td>Pavement surface</td>
<td>1 every 1,200 sq yd</td>
<td>Each test consists of 5 measurements</td>
</tr>
<tr>
<td>Smoothness - Straightedge</td>
<td>Measurement with 12-ft straightedge</td>
<td>N/A</td>
<td>Pavement surface</td>
<td>Entire final surface</td>
<td>Areas exempt from Inertial Profiler</td>
</tr>
<tr>
<td>Modulus of rupture (3-days)</td>
<td>California Test 524</td>
<td>3 beams of 6x6x20 inches</td>
<td>Concrete truck discharge chute</td>
<td>1 per shift</td>
<td></td>
</tr>
</tbody>
</table>

Notes:
1. Refer to California Test 125 for sampling procedures.
### Table 6-1.16. Materials Acceptance Sampling and Testing Requirements: Concrete Structures (Standard Specifications Section 51)
See Table 6-1.17 for concrete materials

<table>
<thead>
<tr>
<th>Test</th>
<th>Test Method</th>
<th>Sample Size &amp; Container Size</th>
<th>Sampling Location (Note 1)</th>
<th>Acceptance Test Frequency</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>JOINT SEALS TYPE B (Section 51-2.02C)</td>
<td>Various properties; must comply with Standard Specifications Section 51-2.02C(2)</td>
<td>See Standard Specifications Section 51-2.02C(2)</td>
<td>1 piece, 3 ft</td>
<td>Job site</td>
<td>Each lot</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Certificate of compliance and certified test report required for each lot; test report must include the seal movement rating, manufacturer minimum uncompressed width and test results; submit samples at least 30 days before use</td>
</tr>
<tr>
<td>JOINT SEALS TYPE A AND TYPE AL (Section 51-2.02B)</td>
<td>Use Authorized Material List at: <a href="https://dot.ca.gov/programs/engineering-services/product-evaluation-program">https://dot.ca.gov/programs/engineering-services/product-evaluation-program</a></td>
<td>Type A and AL joint seals must be on the Authorized Materials List for Type A and AL joint seals</td>
<td>Submit a certificate of compliance for each batch of sealant at least 15 days before use</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes:
1. Refer to California Test 125 for sampling procedures.
### Table 6-1.17. Materials Acceptance Sampling and Testing Requirements: Concrete *(Standard Specifications Section 90)* (1 of 9)
Concrete, Except Minor Concrete and Rapid Strength Concrete

<table>
<thead>
<tr>
<th>Test</th>
<th>Test Method</th>
<th>Sample Size &amp; Container Size</th>
<th>Sampling Location (Note 1)</th>
<th>Acceptance Test Frequency</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>AGGREGATE: Coarse Aggregate</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Los Angeles Rattler (loss at 500 revolutions)</td>
<td>California Test 211</td>
<td>See Note 2</td>
<td>Stockpile</td>
<td>Before production and minimum 1 random test for every 25,000 cu yd</td>
<td>1 for every 4,000 cu yd, if initial test shows abrasion loss greater than 40%</td>
</tr>
<tr>
<td>Cleanliness Value</td>
<td>California Test 227</td>
<td>25 lb</td>
<td>Stockpile</td>
<td>Before production and minimum 1 for every 600 cu yd, 1 per day minimum</td>
<td>Recommend 1 acceptance test per day if 3 consecutive results exceed 80; increase sampling to 1 for every 300 cu yd (deductive lot) with engineer’s authorization</td>
</tr>
<tr>
<td>Sieve Analysis</td>
<td>California Test 202</td>
<td>50 lb</td>
<td>Belt Feed</td>
<td>Before production and minimum 1 for every 600 cu yd, 1 per day minimum</td>
<td>Recommend 1 acceptance test per day if 3 consecutive results are within operating range; increase sampling to 1 for every 300 cu yd (deductive lot) with engineer’s authorization</td>
</tr>
<tr>
<td><strong>AGGREGATE: Fine Aggregate</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Organic Impurities</td>
<td>California Test 213</td>
<td>See Note 2</td>
<td>Stockpile</td>
<td>Before production or when contamination is suspected</td>
<td></td>
</tr>
<tr>
<td>Durability</td>
<td>California Test 229</td>
<td>See Note 2</td>
<td>Stockpile</td>
<td>Before production</td>
<td></td>
</tr>
<tr>
<td>Sand Equivalent</td>
<td>California Test 217</td>
<td>25 lb</td>
<td>Stockpile</td>
<td>Before production and minimum 1 for every 600 cu yd, 1 per day minimum</td>
<td>Recommend 1 acceptance test per day if 3 consecutive results exceed 80; increase sampling to 1 for every 300 cu yd (deductive lot) with engineer’s authorization</td>
</tr>
</tbody>
</table>
Table 6-1.17. Materials Acceptance Sampling and Testing Requirements: Concrete (Standard Specifications Section 90) (2 of 9) Concrete, Except Minor Concrete and Rapid Strength Concrete

<table>
<thead>
<tr>
<th>Test</th>
<th>Test Method</th>
<th>Sample Size &amp; Container Size</th>
<th>Sampling Location (Note 1)</th>
<th>Acceptance Test Frequency</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>AGGREGATE: Fine Aggregate</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sieve Analysis</td>
<td>California Test 202</td>
<td>50 lb</td>
<td>Belt feed</td>
<td>Before production and minimum 1 for every 600 cu yd, 1 per day minimum</td>
<td>Recommend 1 acceptance test per day if 3 consecutive results are within operating range; increase sampling to 1 for every 300 cu yd (deductive lot) with engineer’s authorization</td>
</tr>
<tr>
<td>AGGREGATE: Coarse &amp; Fine Aggregate</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Specific Gravity and Absorption</td>
<td>California Test 206, California Test 207</td>
<td>See Note 2</td>
<td>Stockpile</td>
<td>Before production and when aggregate source changes</td>
<td></td>
</tr>
<tr>
<td>Soundness</td>
<td>California Test 214</td>
<td>See Note 2</td>
<td>Stockpile</td>
<td>Before production</td>
<td>Soundness for fine aggregate waived if durability is ≥ 60</td>
</tr>
<tr>
<td>Sieve Analysis (combined gradation determined with fine and coarse aggregate sieve analyses)</td>
<td>California Test 202</td>
<td>N/A</td>
<td></td>
<td>Before production and minimum 1 for every 600 cu yd, 1 per day minimum</td>
<td>Recommend 1 acceptance test per day if 3 consecutive results are within operating range. Increase sampling to 1 for every 300 cu yd (deductive lot) with engineer’s authorization</td>
</tr>
</tbody>
</table>
Table 6-1.17. Materials Acceptance Sampling and Testing Requirements: Concrete (*Standard Specifications* Section 90) (3 of 9)
Concrete, Except Minor Concrete and Rapid Strength Concrete

<table>
<thead>
<tr>
<th>Test</th>
<th>Test Method</th>
<th>Sample Size &amp; Container Size</th>
<th>Sampling Location (Note 1)</th>
<th>Acceptance Test Frequency</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>CEMENTITIOUS MATERIALS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cement, various properties; must comply with <em>Standard Specifications</em> Section 90-1.02B(2)</td>
<td>See <em>Standard Specifications</em> Section 90-1.02B(2)</td>
<td>8 lb</td>
<td>Concrete plant</td>
<td>Sample each 100 tons of cement, 2 per day maximum</td>
<td>Cement must be on Authorized Material List; cement accepted based on certificate of compliance with each shipment; recommend 1 verification test per 5 samples</td>
</tr>
<tr>
<td>Supplementary Cementitious Materials (SCM), various properties; must comply with <em>Standard Specifications</em> Section 90-1.02B(3)</td>
<td>See <em>Standard Specifications</em> Section 90-1.02B(3)</td>
<td>8 lb</td>
<td>Concrete plant</td>
<td>Sample each 100 tons of SCM, 2 per day maximum</td>
<td>SCM must be on Authorized Materials List; SCM accepted based on certificate of compliance with each shipment; recommend 1 verification test per 5 samples</td>
</tr>
<tr>
<td>WATER</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chlorides</td>
<td>California Test 422</td>
<td>Clean 2-qt plastic jug with lined, sealed lid</td>
<td>At point of use</td>
<td>1 per source</td>
<td>Water supplies for domestic use do not need to be tested</td>
</tr>
<tr>
<td>Sulfates</td>
<td>California Test 417</td>
<td>Clean 2-qt plastic jug with lined, sealed lid</td>
<td>At point of use</td>
<td>1 per source</td>
<td>Water supplies for domestic use do not need to be tested</td>
</tr>
<tr>
<td>Setting Time</td>
<td>ASTM C 191 or ASTM C 266</td>
<td>Contact METS for required quantity of water sample</td>
<td>At point of use</td>
<td>1 per source</td>
<td>Water supplies for domestic use do not need to be tested</td>
</tr>
</tbody>
</table>
Table 6-1.17. Materials Acceptance Sampling and Testing Requirements: Concrete (Standard Specifications Section 90) (4 of 9) Concrete, Except Minor Concrete and Rapid Strength Concrete

<table>
<thead>
<tr>
<th>Test</th>
<th>Test Method</th>
<th>Sample Size &amp; Container Size</th>
<th>Sampling Location (Note 1)</th>
<th>Acceptance Test Frequency</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>WATER (Cont.)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mortar Compressive Strength</td>
<td>ASTM C109</td>
<td>Contact METS for required quantity of water sample</td>
<td>At point of use</td>
<td>1 per source</td>
<td>Water supplies for domestic use do not need to be tested</td>
</tr>
<tr>
<td>Coloring Agents</td>
<td>Must comply with Standard Specifications Section 90-1.02D</td>
<td>Contact METS for required quantity of water sample</td>
<td>At point of use</td>
<td>1 per source</td>
<td>Water supplies for domestic use do not need to be tested</td>
</tr>
<tr>
<td>Alkalis</td>
<td>Must comply with Standard Specifications Section 90-1.02D</td>
<td>Contact METS for required quantity of water sample</td>
<td>At point of use</td>
<td>1 per source</td>
<td>Water supplies for domestic use do not need to be tested</td>
</tr>
<tr>
<td>Specific Gravity</td>
<td>Must comply with Standard Specifications Section 90-1.02D</td>
<td>Contact METS for required quantity of water sample</td>
<td>At point of use</td>
<td>1 per source</td>
<td>Water supplies for domestic use do not need to be tested</td>
</tr>
<tr>
<td><strong>ADMIXTURES: Air Entraining Agent</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Air entraining properties</td>
<td>Must comply with Standard Specifications Section 90-1.02E</td>
<td>See Standard Specifications Section 90-1.02E</td>
<td>1-qt can or plastic bottle of liquid, 2 lb of powder</td>
<td>Concrete plant</td>
<td>Sample each shipment; Must be on Authorized Materials List and certificate of compliance must accompany each shipment; recommend 1 verification test per 5 samples</td>
</tr>
</tbody>
</table>
Table 6-1.17. Materials Acceptance Sampling and Testing Requirements: Concrete (*Standard Specifications* Section 90) (5 of 9)
Concrete, Except Minor Concrete and Rapid Strength Concrete

<table>
<thead>
<tr>
<th>Test</th>
<th>Test Method</th>
<th>Sample Size &amp; Container Size</th>
<th>Sampling Location (Note 1)</th>
<th>Acceptance Test Frequency</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEMICAL ADMIXTURE: Water Reducers or Set Retarders</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Claimed properties, chloride identification</td>
<td>ASTM C494 Type A, B, D, F or Type G California Test 415</td>
<td>1-qt can of liquid, 2 lb of powder</td>
<td>Concrete plant</td>
<td>Sample each shipment</td>
<td>Must be on Authorized Materials List and certificate of compliance must accompany each shipment; recommend 1 verification test per 5 samples</td>
</tr>
<tr>
<td>CONCRETE for Pavement and Structures</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shrinkage</td>
<td>AASHTO T 160 Modified See <em>Standard Specifications</em> Section 90-1.01D(3)</td>
<td>Set of three: 4x4x11¼ in.</td>
<td>During mix design process</td>
<td>Before production</td>
<td>Engineer may use contractor-provided test result for acceptance; test results must be within 3 years of contract authorization date</td>
</tr>
<tr>
<td>CONCRETE Designated Compressive Strength 3600 psi or Greater</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yield</td>
<td>California Test 518</td>
<td>See test method</td>
<td>Concrete truck discharge chute; (See Note 3)</td>
<td>As necessary to assure accuracy of mix design; minimum 2 per each mix design</td>
<td>No deductions for cement content will be made based on the results of California Test 518</td>
</tr>
<tr>
<td>Concrete Uniformity</td>
<td>ASTM C143, California Test 533</td>
<td>See test method</td>
<td>Concrete truck discharge chute (See Note 3)</td>
<td>When compressive test specimen is fabricated and when consistency or uniformity is questionable, minimum 2 per day</td>
<td></td>
</tr>
</tbody>
</table>
### Table 6-1.17. Materials Acceptance Sampling and Testing Requirements: Concrete (Standard Specifications Section 90) (6 of 9)
Concrete, Except Minor Concrete and Rapid Strength Concrete

<table>
<thead>
<tr>
<th>Test</th>
<th>Test Method</th>
<th>Sample Size &amp; Container Size</th>
<th>Sampling Location See Note 1</th>
<th>Acceptance Test Frequency</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CONCRETE Designated Compressive Strength 3600 psi or Greater (Cont.)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Concrete Uniformity</td>
<td>California Test 529</td>
<td>100 lb</td>
<td>Concrete truck discharge chute (See Note 3)</td>
<td>When uniformity is questionable</td>
<td></td>
</tr>
<tr>
<td>Compressive Strength</td>
<td>ASTM C172, California Test 540</td>
<td>1 set of 2 cylinders 6x12 in. or 1 set of 3 cylinders 4x8 in. for each test</td>
<td>Concrete truck discharge chute (See Note 3)</td>
<td>1 set per age for every 300 cu yd concrete or as required for acceptance, minimum 1 set per project</td>
<td>For trial batches, see Standard Specifications or job special provisions and Section 6-3, “Field Tests,” of this manual</td>
</tr>
<tr>
<td>Air Content</td>
<td>California Test 504</td>
<td>See test method</td>
<td>Concrete truck discharge chute (See Note 3)</td>
<td>1 every 4 hours of production and when test specimens are fabricated</td>
<td>Where air is specified for freeze-thaw resistance, a minimum of 1 every 30 cu yd</td>
</tr>
<tr>
<td><strong>CONCRETE WITH COMPRESSIVE STRENGTH LESS THAN 3,600 psi</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Concrete Uniformity</td>
<td>ASTM C143, California Test 533</td>
<td>See test method</td>
<td>Concrete truck discharge chute (See Note 3)</td>
<td>When compressive test specimen is fabricated and when uniformity is questionable</td>
<td></td>
</tr>
</tbody>
</table>
Table 6-1.17. Materials Acceptance Sampling and Testing Requirements: Concrete *(Standard Specifications* Section 90) (7 of 9)
Concrete, Except Minor Concrete and Rapid Strength Concrete

<table>
<thead>
<tr>
<th>Test</th>
<th>Test Method</th>
<th>Sample Size &amp; Container Size</th>
<th>Sampling Location (Note 1)</th>
<th>Acceptance Test Frequency</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>CONCRETE WITH COMPRRESSIVE STRENGTH LESS THAN 3,600 psi</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Concrete Uniformity</td>
<td>California Test 529</td>
<td>100 lb</td>
<td>Concrete truck discharge chute (See Note 3)</td>
<td>When uniformity is questionable</td>
<td></td>
</tr>
<tr>
<td>Compressive Strength</td>
<td>California Test 540, California Test 521</td>
<td>1 set of 2 cylinders, 6x12 in. or 1 set of 3 cylinders 4x8 in. for each test</td>
<td>Concrete truck discharge chute (See Note 3)</td>
<td>1 set per age for every 300 cu yd, minimum 1 set per project</td>
<td></td>
</tr>
<tr>
<td>Air Content</td>
<td>California Test 504</td>
<td>See test method</td>
<td>Concrete truck discharge chute (See Note 3)</td>
<td>When compressive test specimens are fabricated</td>
<td>Where air is specified for freeze-thaw resistance, a minimum of 1 every 100 cu yd</td>
</tr>
<tr>
<td>CURING COMPOUND</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Curing Compound; must comply with <em>Standard Specifications</em> Section 90-1.03B(3)</td>
<td>ASTM C309</td>
<td>1-qt can</td>
<td>At time of use (See Note 1)</td>
<td>1 every shipment</td>
<td>Each shipment must have certificate of compliance that includes: 1. Test results for tests specified in Section 90-1.01D(6) of <em>Standard Specifications</em> 2. Certification that material was tested within 12 months before use</td>
</tr>
</tbody>
</table>
Table 6-1.17. Materials Acceptance Sampling and Testing Requirements: Concrete *(Standard Specifications* Section 90) *(8 of 9)*
Concrete, Except Minor Concrete and Rapid Strength Concrete

<table>
<thead>
<tr>
<th>Test</th>
<th>Test Method</th>
<th>Sample Size &amp; Container Size</th>
<th>Sampling Location (Note 1)</th>
<th>Acceptance Test Frequency</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>CEMENTITIOUS MATERIALS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cement, various properties; must comply with <em>Standard Specifications</em> Section 90-1.02B(2)</td>
<td>See <em>Standard Specifications</em> Section 90-1.02B(2)</td>
<td>8 lb</td>
<td>Concrete plant</td>
<td>Sample and test if cement quality is questionable</td>
<td>Cement source must be shown on Authorized Materials List; certificate of compliance must accompany each cement shipment</td>
</tr>
<tr>
<td>Supplementary cementitious materials (SCM), various properties; must comply with <em>Standard Specifications</em> Section 90-1.02B(3)</td>
<td>See <em>Standard Specifications</em> Section 90-1.02B(3)</td>
<td>8 lb</td>
<td>Concrete plant</td>
<td>Sample and test if SCM quality is questionable</td>
<td>SCM source must be shown on Authorized Materials List; certificate of compliance must accompany each SCM shipment</td>
</tr>
<tr>
<td>ADMIXTURES: Air Entraining Agent</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Air entraining properties; must comply with <em>Standard Specifications</em> Section 90-1.02E</td>
<td>See <em>Standard Specifications</em> Section 90-1.02E</td>
<td>N/A</td>
<td>N/A</td>
<td></td>
<td>Must be on Authorized Materials List and certificate of compliance must accompany each shipment</td>
</tr>
<tr>
<td>CHEMICAL ADMIXTURES: Water Reducers or Set Retarders</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Claimed properties, chloride identification</td>
<td>ASTM C494 Type A, B, D, F or Type G California Test 415</td>
<td>N/A</td>
<td>N/A</td>
<td></td>
<td>Must be on Authorized Materials List and certificate of compliance must accompany each shipment</td>
</tr>
</tbody>
</table>
Table 6-1.17. Materials Acceptance Sampling and Testing Requirements: Concrete (*Standard Specifications* Section 90) (9 of 9)

Minor Concrete

<table>
<thead>
<tr>
<th>Test</th>
<th>Test Method</th>
<th>Sample Size &amp; Container Size</th>
<th>Sampling Location</th>
<th>Acceptance Test Frequency</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CONCRETE</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yield</td>
<td>California Test 518</td>
<td>See test method</td>
<td>Concrete truck discharge chute (See Note 3)</td>
<td>As necessary to assure accuracy of mix design; minimum 1 per each mix design</td>
<td>No deductions for cement content will be made based on the results of California Test 518</td>
</tr>
<tr>
<td>Compressive Strength</td>
<td>California Test 540, California Test 521</td>
<td>1 set of 2 cylinders 6x12 in. or 1 set of 3 cylinders 4x8 in. for each test</td>
<td>Concrete truck discharge chute (See Note 3)</td>
<td>Sample and test if concrete quality is questionable; minimum 1 per mix design</td>
<td>Minor concrete must have the strength described or 2,500 psi, whichever is greater; see <em>Standard Specifications</em> Section 90-1.02A</td>
</tr>
<tr>
<td>Air Content</td>
<td>California Test 504</td>
<td>See test method</td>
<td>Concrete truck discharge chute (See Note 3)</td>
<td>Where air is specified for freeze-thaw resistance, a minimum of 1 every 100 cu yd</td>
<td></td>
</tr>
</tbody>
</table>

**CURING COMPOUND**

| Curing Compound; must comply with *Standard Specifications* Section 90-1.03B(3) | ASTM C309 | 1 qt can | At time of use; (See Note 1) | 1 every shipment | Each shipment must have certificate of compliance that includes: 1. Results for tests specified in Section 90-1.01D(6) of *Standard Specifications* 2. Certification that material was tested within 12 months before use |

Notes:

1. Refer to California Test 125 for sampling procedures.
2. For initial testing, provide 100 lb of 1-1/2 in. x 3/4 in., 75 lb of 3/4 in. x No. 4, 75 lb of pea gravel, and 50 lb of sand. Use this material for California Test 202, 206, 207, 211, 213, 214, 217, 227 and 229.

3. Refer to California Test 539 for method of sampling fresh concrete.
### Table 6-1.18. Materials Acceptance Sampling and Testing Requirements: Miscellaneous Materials (1 of 5)

<table>
<thead>
<tr>
<th>Test</th>
<th>Test Method</th>
<th>Sample Size &amp; Container Size</th>
<th>Sampling Location</th>
<th>Acceptance Test Frequency</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>BARBED WIRE AND WIRE MESH FENCES (Section 80-2)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barbed Wire, various properties; must comply with Standard Specifications Section 80-2.02D</td>
<td>ASTM A121</td>
<td>1 yd length</td>
<td>Job site</td>
<td>As necessary for verification if quality is questionable</td>
<td></td>
</tr>
<tr>
<td>BOLTS AND HARDWARE (Section 75)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2 samples each diameter</td>
<td>Each lot</td>
<td>Sample and test if not previously inspected at the source</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CHAIN LINK FENCES (Section 80-3)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wire Mesh, various properties; must comply with Standard Specifications Section 80</td>
<td>ASTM A116, Class 1</td>
<td>2 ft width</td>
<td>Job site</td>
<td>Each lot for verification if quality is questionable</td>
<td>Certificate of compliance required for vinyl clad fencing</td>
</tr>
<tr>
<td>CONCRETE PIPE (Section 65)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Compliance with specifications</td>
<td>Contact METS for instructions</td>
<td>Contact METS for instructions</td>
<td>Sample and test if not previously inspected at source</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CONDUIT (Section 86-1.02B)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Conduit, various properties; must comply with Standard Specifications Section 86-1.02B</td>
<td>See Standard Specifications Section 86-1.02B</td>
<td>2 ft. long from center of length, 2 samples each size</td>
<td>Job site</td>
<td>As necessary for verification if quality is questionable</td>
<td></td>
</tr>
<tr>
<td>Test</td>
<td>Test Method</td>
<td>Sample Size &amp; Container Size</td>
<td>Sampling Location</td>
<td>Acceptance Test Frequency</td>
<td>Remarks</td>
</tr>
<tr>
<td>------</td>
<td>-------------</td>
<td>-------------------------------</td>
<td>-------------------</td>
<td>--------------------------</td>
<td>---------</td>
</tr>
<tr>
<td><strong>ELECTRICAL CONDUCTORS AND CABLES (Section 86-1.02F)</strong></td>
<td>Electrical conductors and cables, various properties; must comply with <em>Standard Specifications</em> Section 86-1.02F</td>
<td>See <em>Standard Specifications</em> Section 86</td>
<td>2 ft. long, include markings, 2 samples per gauge</td>
<td>Job site</td>
<td>Each lot for verification if quality is questionable</td>
</tr>
<tr>
<td><strong>EXPANSION JOINT FILLER</strong></td>
<td>Compliance with specifications</td>
<td>6 in. long, full width of sheet</td>
<td>Each 1,000 sq ft not less than 2 per shipment</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>GEOSYNTHETICS (Section 96)</strong></td>
<td>Various properties; must comply with <em>Standard Specifications</em> Section 96</td>
<td>See <em>Standard Specifications</em> Section 96</td>
<td>1 piece, 3 ft x full width of roll</td>
<td>Job site</td>
<td>Each lot for verification if quality is questionable. See Remarks</td>
</tr>
<tr>
<td><strong>PAINT (Section 91)</strong></td>
<td>Paint, various properties; must comply with <em>Standard Specifications</em> Section 91</td>
<td>See <em>Standard Specifications</em> Section 91</td>
<td>For miscellaneous painting, 1 qt (see Section 6-2 of this manual)</td>
<td>Job site</td>
<td>Each batch</td>
</tr>
<tr>
<td><strong>PAVEMENT MARKERS (Section 81-3)</strong></td>
<td>Pavement Markers, various properties; must comply with <em>Standard Specifications</em> Section 81-3</td>
<td>See <em>Standard Specifications</em> Section 81-3</td>
<td>20 markers</td>
<td>Job site</td>
<td>As necessary for verification if quality is questionable</td>
</tr>
</tbody>
</table>
### Table 6-1.18. Materials Acceptance Sampling and Testing Requirements: Miscellaneous Materials (3 of 5)

<table>
<thead>
<tr>
<th>Test</th>
<th>Test Method</th>
<th>Sample Size &amp; Container Size</th>
<th>Sampling Location</th>
<th>Acceptance Test Frequency</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>PERMEABLE MATERIALS: (Section 68-2.02F)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Durability Index</td>
<td>California Test 229</td>
<td>50 lb</td>
<td>Stockpile</td>
<td>Before use</td>
<td></td>
</tr>
<tr>
<td>Sieve Analysis</td>
<td>California Test 202</td>
<td>50 lb</td>
<td>Stockpile</td>
<td>Before use, 1 every day</td>
<td></td>
</tr>
<tr>
<td>PERMEABLE MATERIALS: Class 3 (Section 68-2.02F)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Crushed Faces</td>
<td>California Test 205</td>
<td>50 lb</td>
<td>Stockpile</td>
<td>Before use</td>
<td></td>
</tr>
<tr>
<td>PRESTRESSED TENDON GROUT (Section 50)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Efflux time</td>
<td>California Test 541</td>
<td>One 6x12 in. cylinder mold can</td>
<td>From batch immediately after mixing for prequalification, thereafter from outlet end of tendon, storage tank, or both</td>
<td>At the start of each day’s work, and thereafter 1 test per each 5% of ducts; see Remarks</td>
<td>Repeat acceptance tests whenever source of material is changed</td>
</tr>
<tr>
<td>RAISED BARS (PRECAST)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Compliance with specifications</td>
<td></td>
<td>1 unit or full size bar</td>
<td>Each lot</td>
<td>Sample and test if not previously inspected at the source</td>
<td></td>
</tr>
<tr>
<td>REINFORCING STEEL (Section 52)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reinforcing Steel, various properties</td>
<td>See Standard Specifications Section 52</td>
<td>2 samples, 30 in., except 40 in. for No. 14 and No. 18</td>
<td>Job site</td>
<td>As necessary for verification if quality is questionable</td>
<td>Each shipment must be accompanied by a certificate of compliance</td>
</tr>
<tr>
<td>SLOPE PROTECTION (Section 72)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Size</td>
<td>N/A</td>
<td>Quarry or stockpile</td>
<td>As required for acceptance</td>
<td>Adequate size of slope protection documented by measuring or weighing the material</td>
<td></td>
</tr>
<tr>
<td>Apparent Specific Gravity</td>
<td>California Test 206</td>
<td>75 lb</td>
<td>Quarry or stockpile</td>
<td>Before use</td>
<td></td>
</tr>
</tbody>
</table>
### Table 6-1.18. Materials Acceptance Sampling and Testing Requirements: Miscellaneous Materials (4 of 5)

<table>
<thead>
<tr>
<th>Test</th>
<th>Test Method</th>
<th>Sample Size &amp; Container Size</th>
<th>Sampling Location</th>
<th>Acceptance Test Frequency</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>SLOPE PROTECTION (Section 72) (Cont.)</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Absorption</td>
<td>California Test 206</td>
<td>75 lb</td>
<td>Quarry or stockpile</td>
<td>Before use</td>
<td></td>
</tr>
<tr>
<td>Durability Index</td>
<td>California Test 229</td>
<td>75 lb</td>
<td>Quarry or stockpile</td>
<td>Before use</td>
<td></td>
</tr>
<tr>
<td>STEEL PRODUCTS</td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>STRUCTURAL STEEL AND MISCELLANEOUS METAL (Sections 55 &amp; 75)</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>STRUCTURAL STEEL COATINGS (Section 59)</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>WATER-PROOFING MATERIALS (Section 54)</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

- **Paint, various properties; must comply with Standard Specifications Section 59**
  - Test Method: See Standard Specifications Section 59
  - Sample Size: For bridge or major structure, send an unopened 5-gal can
  - Sampling Location: Job site
  - Acceptance Test Frequency: Each batch; see Remarks
  - Remarks: Unused portion of 5-gal sample will be returned to job; see Section 6-2, “Acceptance of Manufactured or Fabricated Materials and Products,” of this manual

- **Glass Fiber**
  - Test Method: ASTM D1668, Type 1
  - Sample Size: 9 sq ft of asphalt saturated cotton fabric
  - Sampling Location: Job site
  - Acceptance Test Frequency: 1 sample from each lot

- **Asphalt**
  - Test Method: ASTM D449
  - Sample Size: 5 lb of asphalt
  - Sampling Location: Job site
  - Acceptance Test Frequency: 1 sample from each lot

- **Primer**
  - Test Method: ASTM D41
  - Sample Size: 1 qt of asphalt primer
  - Sampling Location: Job site
  - Acceptance Test Frequency: 1 sample from each lot
### Table 6-1.18. Materials Acceptance Sampling and Testing Requirements: Miscellaneous Materials (5 of 5)

<table>
<thead>
<tr>
<th>Test</th>
<th>Test Method</th>
<th>Sample Size &amp; Container Size</th>
<th>Sampling Location</th>
<th>Acceptance Test Frequency</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>WELDED WIRE REINFORCEMENT (Section 52-1.02C)</td>
<td>Welded Wire Reinforcing Steel, must comply with Standard Specifications Section 52-1.02C</td>
<td>ASTM A 1064/A 1064M</td>
<td>9 sq ft</td>
<td>Job site</td>
<td>As necessary for verification if quality is questionable</td>
</tr>
</tbody>
</table>

WELDED WIRE REINFORCEMENT (Section 52-1.02C)