MANUAL CHANGE TRANSMITTAL

NO. **09-1**

TITLE: Department of Transportation *Construction Manual*	APPROVED BY: Mark Leja Chief Division of Construction	DATE ISSUED: 08/31/2009
SUBJECT AREA Index and other sections of the *Construction Manual*	ISSUING UNIT Division of Construction	
SUPERSEDES CPB 07-4, 08-1, 08-4 , 09-7 and 09-8	DISTRIBUTION All Requested Manual Holders	

The purpose of this manual change transmittal is to provide updates and corrections to the 2001 edition of the Caltrans *Construction Manual.* Please update your manual in accordance with the table below. The relevant pages are indicated in the table.

The Publications unit is gradually converting the *Construction Manual* from PageMaker to InDesign. As a result of reformatting, you will notice more pages included in this transmittal than necessary to show the changes.

Section(s)	Remove Old Page(s)	Insert New/Revised Page(s)
Update: Goldenrod, Chapter 3, Section 707, "Indemnification and Insurance," and Examples.	3-7.i thru 3-7.ii	3-7.i thru 3-7.ii
Update: Chapter 3, Section 707, "Indemnification and Insurance," includes new requirements for contractors to submit insurance at contract execution. Responsibility and roles of Office of Risk Management. **CPB 08-1**	3-7.7 thru 3-7.16	3-7.7 thru 3-7.18
Update: Chapter 3, Section 9, Example 3-9.10, "Sample Notice of Opportunity…" removing blind copies for HQ record retention.	3-9.39 thru 3-9.40	3-9.39 thru 3-9.40
Update: Goldenrod, Chapter 4, Section 39, "Hot Mix Asphalt."	4-39.i	4-39.i thru 4-39.ii
Revision: Chapter 4, Section 39, "Hot Mix Asphalt," to agree with new *Standard Specifications.* **CPB 09-7**	4-39.1 thru 4-39.10	4-39.1 thru 4-39.37

Section(s)	Remove Old Page(s)	Insert New/Revised Page(s)
Update: Chapter 4, Section 82, "Markers and Delineators," from *Traffic Manual* to CA MUTCD and from Metric to English.	4-82.1 thru 4-82.2	4-82.1 thru 4-82.2
Add: Goldenrod, Chapter 4, Section 92, "Asphalt," for changes to the *Standard Specifications.*	None	4-92.i
Update: Chapter 4, Section 92, "Asphalt," for revisions to the *Standard Specifications.* **CPB 09-8**	4-92.1 thru 4-9.2	4-92.1 thru 4-92.9
Update: Goldenrod, Chapter 5, Section 0, "Conduct of the Work"	5-0.i	5-0.i
Update: Chapter 5, Section 007, "FHWA Involvement in Contract Administration," for High Profile and Delegated Projects. Delete reference to Form FHWA-47M. **CPB 07-4 and 08-4**	5-0.1 thru 5-0.11	5-0.1 thru 5-0.9
Update: Goldenrod, Chapter 5, Section 1, "Forms Used for Contract Administration," to add nine new forms.	5-1.i thru 5-1.vi	5-1.i thru 5-1.vi
Update: Chapter 5, Section 101, "Forms used for Contract Administration," to add nine new forms and make name changes to others. Changes also made for record retention.	5-1.1 thru 5-1.75	5-1.1 thru 5-1.76
Index	I-1 thru I-16	I-1 thru I-19

Section 7 Legal Relations and Responsibility

Some of the factors affecting public safety include the disposition, placement, movements, and actions of workers and equipment, and the placement and handling of materials.

Under the specifications, the engineer can point out the contractor's failure to carry out any of the specification requirements. The specifications do not relieve the contractor of the cost of protecting the public simply because the engineer has or has not called attention to an unsafe situation.

3-705A Clearance and Bridge Permit Rating Changes (Temporary)

The following guidelines apply to situations where temporary changes exist in vertical or horizontal clearance for vehicular traffic or where temporary changes exist in bridge permit ratings.

3-705A (1) Temporary Vertical and Horizontal Clearance Changes

Whenever the operation will reduce clearances available to public traffic, the specifications require the contractor to notify the resident engineer at least 18 days and not more than 90 days before the anticipated start of an operation that will change the vertical or horizontal clearance available to public traffic (including shoulders). At least fifteen days before implementing proposed vertical and horizontal clearance changes, notify the Transportation Permits Branch by fax of the proposed changes and their duration. If the clearance change is on a local jurisdiction roadway, notify the affected agency in writing at the same time. When vertical clearance is temporarily reduced to 15.5 feet or less, place low-clearance warning signs in accordance with Part 2 of the California MUTCD and the specifications.

3-705A (2) Temporary Bridge Permit Rating Changes

Fifteen days before implementing proposed bridge permit rating changes, the structure representative must notify the resident engineer in writing and the bridge rating engineer by fax of the proposed ratings and their duration. The bridge rating engineer must then immediately notify the Transportation Permits Branch of any rating changes.

Within three days of the removal of the temporary bridge permit rating, the structure representative must notify the resident engineer in writing and the bridge rating engineer by fax. The bridge rating engineer must then immediately notify the Transportation Permits Branch.

3-705B Clearance and Bridge Permit Rating Changes (Permanent)

The following guidelines apply to situations where permanent changes exist in vertical or horizontal clearance for vehicular traffic or where permanent changes exist in bridge permit ratings.

3-705B (1) Permanent Vertical and Horizontal Clearance Changes

Fifteen days before implementing proposed permanent vertical and horizontal clearance changes, the resident engineer must notify the Transportation Permits Branch by fax of the proposed changes. Also, to confirm the necessary information, the resident engineer must consult the Transportation Permits Branch before actual field measurements.

3-705B (2) Permanent Bridge Permit Rating Changes

Fifteen days before implementing the proposed bridge permit rating changes, the structure representative must notify the resident engineer in writing and the bridge

rating engineer by fax of the proposed bridge permit ratings. The bridge rating engineer must then immediately notify the Transportation Permits Branch of any rating changes.

3-705B (3) Notification Procedure

Submit changes to be reported in accordance with the above procedures to either the North Region or South Region construction/maintenance liaison in the Transportation Permits Branch. The North Region liaison is responsible for districts 1, 2, 3, 4, 5 (except San Luis Obispo and Santa Barbara Counties), 6 (except Kern County), and 10. The South Region liaison is responsible for districts 5 (San Luis Obispo and Santa Barbara Counties only), 6 (Kern County only), 7, 8, 9, 11, and 12.

To submit changes, use the following forms, maintained by the Office of Traffic Safety Program and Research:

- Form TR-0019, "Notice of Change in Clearance or Bridge Weight Rating"
- Form TR-0020, "Notice in Change in Vertical or Horizontal Clearance"
- Form TR-0029 "Notice of Change in Clearance or Bridge Weight Rating"

The Transportation Permits Branch will, within one business day, send a fax to the resident engineer confirming receipt of the change.

3-706 Preservation of Property

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The contract makes the contractor responsible for the preservation of all property involved in the project, including what is not in sight. The engineer must be diligent in determining and pointing out the existence of such property that Caltrans has knowledge of, especially that which is not in sight. For information about locating and protecting underground utilities, see Section 3-809, "Utility and Non-Highway Facilities," of this manual.

The plans and specifications may require that certain trees, shrubs, and other vegetation be preserved. Ensure that the contractor is aware of all plant life to be saved.

Also, ensure that the contractor does all that is required under the contract to protect and preserve property. However, the contractor's responsibility includes only what is necessary to protect against damage by the construction activity. If any permanent protection is ordered, such as rubble tree wells in the planned slope, pay for this work as you would for any other ordered additional work.

3-707 Indemnification and Insurance

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The contractor's obligation for insurance is contained in various sections of the *Standard Specifications* beginning with Section 3-1.025, "Insurance Policies," which stipulates the type of insurance documents required. Section 3-1.03, "Execution of Contract," requires contractors to submit those insurance documents at the time the contract is executed. Section 7-1.12, "Indemnification and Insurance," states the contractor's responsibility to indemnify Caltrans and to carry liability insurance without allowing it to lapse.

The contractor must also have railroad protective insurance when Section 13, "Railroad Relations and Insurance Requirements," is included in the contract's special provisions. This topic is covered later on in this section of the manual.

3-707A Responsibilities

The Division of Construction, Office of Risk Management is responsible for reviewing, approving, and monitoring contractor insurance documents.

After a contract is awarded, a contractor not pre-approved for insurance submits the required indemnification and insurance documents to the Office of Contract Awards and Services in the Division of Engineering Services which forwards the documents to the Office of Risk Management for review and approval.

When the contractor is approved, the Office of Risk Management sends an email notice of approval of the contractor's insurance to the Office of Contract Awards and Services and notifies the contractor of the insurance approval. The Office of Contract Awards and Services includes a copy of the email notice of approval with the executed contract that it sends to the district. File the email notice of insurance approval in the project records.

Each deputy district director of construction has designated one person in the district to be responsible for notifying resident engineers about insurance-related matters. That person serves as the resident engineers' contact for all insurance issues.

3-707B Evidence of Insurance

The contractor may show evidence of insurance in two ways:

- A contractor may be pre-approved for the insurance and indemnification requirements before bidding on a Caltrans' contract. If a contractor pre-approves, the Office of Risk Management will issue a certificate of pre-approved insurance valid until the next insurance policy expiration date. The Division of Construction has posted information and instructions for pre-approval of a contractor's insurance on its website at:

  http://www.dot.ca.gov/hq/construc/riskmanagement/insurancepreapproval/

- The contractor may bid on any Caltrans contract without first obtaining insurance. If the contractor wins a bid and is awarded the contract, it must first submit the insurance documents.

3-707B (1) Failure to Submit Evidence of Insurance Renewal

If the contractor has not submitted the renewed insurance documents ten days before expiration of their previous insurance, the Office of Risk Management will:

- Send notice to the contractor that it has failed to comply with the insurance requirements of the contract.
- Send a copy of the notice to the district's insurance contact and the deputy district director of construction.

If the contractor has not submitted the renewed insurance documents one day before the expiration of the contractor's insurance, the Office of Risk Management sends a second notice to the district's insurance contact with a copy to the deputy district director for construction and the Division of Construction's field coordinator.

3-707B (2) Actions Allowed by the Standard Specifications

After consultation with the deputy district director for construction and the Division of Construction's field coordinator, take one or both of the following actions:

- Suspend the contractor's operations in accordance with Section 8-1.05, "Temporary Suspension of Work," of the *Standard Specifications* until the contractor submits the insurance documents and the Office of Risk Management approves them. Inform the contractor's surety company in writing that the contractor has failed to maintain insurance as required by the contract and that the work has been suspended temporarily.
- Act in accordance with the provisions of Section 7-1.12B (4), "Enforcement," of the *Standard Specifications*, which allows Caltrans to maintain the required insurance coverage and withhold or charge the expense to the contractor or to terminate the contractor's control of the work in accordance with Section 8-1.08, "Termination of Control," of the *Standard Specifications*.

Example 3-7.3, "Notice of Contract Suspension of Work," can be used for either or both of the previous actions.

3-707C Railroad Protective Insurance

State highway construction occasionally requires that a contractor's operations be performed on or near a railroad's operating properties. This proximity varies from minor side encroachments to work involving the direct crossing of a railroad's tracks. Section 13 of the special provisions defines the relationships between Caltrans, the contractor, and the railroad.

Requirements for railroad protective liability insurance vary depending on the railroad company involved. The district railroad right-of-way agent within the Division of Right of Way and Land Surveys is the point of contact for all railroad insurance issues. Before the contractor performs contract work that encroaches on the railroad's operating properties, you must receive either a copy of the approved insurance documents from the contractor or district railroad right-of-way agent or confirm from the agent that the contractor has furnished railroad protective insurance.

For emergency contracts, obtain verbal release and authority to start work after the railroad has received all the insurance documents.

3-707C (1) Responsibility

Prohibit work that involves encroachment on railroad property by either a prime contractor or subcontractor until the following conditions are met:

- The railroad or the railroad right-of-way agent within the Division of Right of Way and Land Surveys advises that the contractor, subcontractor, or both, have furnished the specified insurance
- You receive a copy of the approved proof of insurance.

All correspondence with the railroad must be through the railroad right-of-way agent.

3-707C (2) Insurance Renewal

The contractor's or subcontractor's obligation to renew the required railroad protective insurance before expiration is specified in Section 13 of the special provisions. The responsibility to monitor the expiration of an approved railroad protective insurance rests with the railroad. The railroad right-of-way agent will notify you if the contractor fails to renew the railroad protective insurance.

3-708 Disposal of Material Outside the Highway Right-of-Way

3-708 Disposal of Material Outside the Highway Right-of-Way

Do not allow the contractor to dispose of material outside the right-of-way until the contractor has met all the requirements in Section 7-1.13, "Disposal of Material Outside the Highway Right of Way," of the *Standard Specifications*. When these requirements have been met, give the contractor written permission for disposal sites not covered by an agreement between the property owner and Caltrans.

When disposal of material on a property outside the highway right-of-way is not covered by an agreement between the property owner and Caltrans, you should provide the contractor with a copy of the model agreement titled, "Agreement for the Authorization between a contractor working on state facilities and a real property owner for the placement of construction related material outside of the State Right-of-Way." See Example 3-7.1. The contractor may use this sample agreement or provide an equivalent agreement.

After the contractor and property owner complete an agreement and obtain all necessary permits, licenses, and environmental clearances, the contractor must submit the signed agreement to you for approval. Provide written approval to the contractor for the disposal of the material after review and verification of the adequacy of the contractor's agreement, necessary permits, licenses, and environmental clearances submitted. A sample written approval and a sample agreement are located at the end of this section of the manual.

The agreement between the contractor and the property owner regarding disposal of material outside of the right-of-way is not required for the disposal of waste material to a commercial landfill or treatment facility. To verify the permit status of the landfill or treatment facility, access the California Water Resources Control Board or Department of Toxic Substances Control websites:

http://www.waterboards.ca.gov/water_issues/programs/#permit

http://www.dtsc.ca.gov/HazardousWaste/

Alternatively, contact the facility to obtain a copy of the facility's permit.

Approval of the disposal of materials outside the highway right-of-way guards against disposal that would harm the highway or cause environmental damage, disposal site damage, or unsightliness.

3-709 Relief From Maintenance and Responsibility

3-709 Relief From Maintenance and Responsibility

Under conditions specified in Section 7-1.15, "Relief From Maintenance and Responsibility," of the *Standard Specifications*, the contractor may be relieved from maintaining and protecting certain completed portions or sections of the work.

Caltrans policy recommends relief for only those portions of the work specifically mentioned in the specifications unless exceptions are fully justified in the request for relief.

For completed roadways, the specified length of 0.3 mile is the minimum practical length of completed main roadway upon which a recommendation can be made for relief from maintenance and responsibility. However, shorter units of completed work, such as on-ramps, off-ramps, frontage roads, or approaches to undercrossings and overcrossings, may also be eligible for relief from maintenance and responsibility. Do not recommend relief from maintenance and responsibility on 0.3 mile sections containing exceptions within that length unless you provide a valid reason presented with and supporting the recommendation.

Exceptions, if any, must be defined by longitudinal sections of highway or certain specified areas. For example, it is unacceptable to recommend relief from maintenance for a total project except for the inlet ditch to the right of stations 20 to 25. It is acceptable to recommend relief for the total project except for stations 15 to 27 (the section of highway that could be affected by the uncompleted ditch to the right of stations 20 to 25).

The following describes what constitutes a "bridge or other structure of major importance":

- For purposes of relief from maintenance and responsibility, a bridge is as defined in Section 1, "Definitions and Terms," of the *Standard Specification*s. A structure will be considered a bridge if it is so identified in the plans or other portions of the contract.
- Other structures that are to be considered of major importance are culverts in excess of 6.5 feet diameter or of approximate equivalent area.
- A facility not meeting the above criteria will be considered of major importance only if its final cost exceeds 5 percent of the original total bid for contract items (including mobilization).

  Projects with noncontiguous locations may be accepted location by location provided the work at each requested location is completed in all aspects. Noncontiguous areas of work outside of the right-of-way on major projects may also be accepted, provided that the procedures outlined in Section 3-513A, "Work for Other Agencies or Owners," of this manual have been followed.

Relief from maintenance and responsibility relieves the contractor of responsibility for repair of damage from the elements. Before recommending any request for relief from maintenance and responsibility, determine that the requested work will not be damaged as a result of incomplete adjoining work. For instance, a roadway section may be complete while an upstream culvert remains incomplete. Water flowing past the uncompleted culvert may damage a portion of the requested roadway section.

Before recommending relief from maintenance and responsibility, analyze each situation critically to determine if it qualifies in all respects. The project's proper completion must not be jeopardized by indiscriminate recommendations for relief from maintenance and responsibility. Once the contractor is relieved from maintaining and protecting a portion of the work, the contractor cannot be required to do more work on it except by agreement or to remedy defective work or materials.

If you have any doubts about the requested area's eligibility, deny the contractor's request for relief from maintenance and responsibility. Inform the contractor in writing so no doubt exists as to the status of the contractor's request and the nature of uncompleted work. The *Standard Specifications* clearly state that the portion of work must be complete in all respects before it becomes eligible for relief from maintenance and responsibility.

For landscape projects, a special provision is usually included to allow the granting of relief from maintenance and responsibility for items not directly connected with plant establishment work or highway planting and irrigation systems. Under the special provision, relief from maintenance and responsibility could be granted for typical items of work such as asphalt concrete placed as island paving or sidewalks and seal coats placed on islands, curbs, and fences. In many cases, these items would

not have a direct bearing on the success or failure of plant establishment, and it is unreasonable to require the contractor to maintain these items.

However, to be consistent with the policy for non-landscape contracts, this type of relief from maintenance and responsibility will not be granted item by item, but only for an entire group of items. Any item that protects the planting or is involved in plant establishment should not be submitted for relief from maintenance and responsibility. Items typical of this category include planter boxes, sprinkler systems, header boards, or mesh.

Roadside rests will not be accepted item by item, but they may be recommended as completed units.

Relief from maintenance and responsibility denotes recognition of completed work. Therefore, any recommendations for this action on work for other public agencies or owners also require their concurrence. Before recommending relief from maintenance and responsibility on such portions of the work, complete the procedures outlined in Section 3-513A, "Work for Other Agencies or Owners," of this manual. In the communication recommending relief, include a statement that the agency authorities concur, or in the absence of such concurrence, include a justification for relief.

For requests for relief from maintenance and responsibility, use Form CEM-0501, "Relief from Maintenance."

The resident engineer must conduct a maintenance review of areas for which relief from maintenance and responsibility is to be granted. For guidelines on maintenance reviews, see Section 3-5, "Control of Work," of this manual.

3-710 Acceptance of Contract

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On the day that project work is completed in accordance with all the requirements of the *Standard Specifications*, special provisions, plans, and approved contract change orders, send to the district construction office a fax recommending acceptance of the contract by the district.

For recommendations of acceptance, use Form CEM-6301, "Contract Acceptance."

Follow the same procedure for the acceptance of emergency contracts.

3-711 Rights in Land and Improvements

3-711 Rights in Land and Improvements

Generally, the contractor may use the right-of-way for purposes that are reasonably necessary to perform the required work. The contractor has no right to make use of the property or to allow others to use it when such use is not reasonably necessary to perform the required work. For example, residency trailers must not be placed within the right-of-way, although one trailer may be allowed for yard security purposes. Prohibit any use of a Caltrans right-of-way that conflicts with the above requirement. Discuss unusual or complicated situations with the construction field coordinator.

As stated in Section 7-1.19, "Rights in Land and Improvements," of the *Standard Specifications*, the contractor may enter into a rental agreement to use state-owned property outside the right-of-way.

3-711A Nonoperating Right-of-Way (Airspace)

Usable property under bridges or viaducts or other property that cannot be sold as excess, but can be leased, is classified as nonoperating right-of-way (also known as “airspace”). Each district involved with the development of such property has established an inventory. The special provisions will normally cover the use, or prohibit the use, of nonoperating right-of-way by the contractor. When the use of an airspace parcel is not part of the contract and a contractor later requests such use, the contractor must negotiate a lease for the parcel. A standard form is used for the lease and calls for payment based on fair market value. No special consideration will be given because the lessee is performing Caltrans work. Also, all normal provisions requiring insurance and parcel protection will be enforced.

Example 3-7.1

AGREEMENT BETWEEN A CONTRACTOR WORKING ON STATE FACILITIES AND A REAL PROPERTY OWNER FOR THE PLACEMENT OF CONSTRUCTION-RELATED MATERIAL OUTSIDE THE STATE RIGHT-OF-WAY

Contract No.: _____

County/Route/Kilometer post: _____

The contractor, _____, ("Contractor") has entered into Contract No. _____ ("Contract"), with the State of California, Department of Transportation ("Department"), for work that is described as follows: _____ _____ _____ ("Project").

The owner, _____, ("Owner") of the real property ("Property") located at_____ _____ (for example, address, location, county and parcel number(s), project station(s), offsets, and other property location information) agrees to allow the placement of approximately _____ cubic yards of _____ (such as soil, asphalt grindings and other material) ("Material") generated from the Project on the Owner's Property by the Contractor.

Owner agrees that the Contractor has assumed ownership of the Material that is being deposited on the Property from the Department.

Contractor and Owner agree to obtain and furnish to the Department's engineer, all necessary permits, licenses and clearances prior to placing Material on the Property.

By submission of this agreement to the Department's engineer, Contractor and Owner are acknowledging that they have been informed, or otherwise apprised, of all restrictions, laws and permit requirements associated with the transporting and placement of the Material on the Property and have agreed to abide by the same. These laws include but are not limited to:

- Local Ordinances—Grading permits for the placement, filling, excavation, storage, or disposal of soil or earthen material.
- California Fish and Game Code (Section 1602), "Lake or Stream Bed Alteration Agreement"—A permit required prior to the placement of material in a location where it can pass into waters of the state, directly or indirectly, through causes such as erosion or maintenance.

Example 3-7.1

- California Fish and Game Code (Section 5650)—A prohibition against the deposition of petroleum products (including asphalt), or any material deleterious to fish, plants, or birds where it can pass into the waters of the state.
- Federal Clean Water Act (Section 301 and 402), "General Permit for Discharges of Storm Water Associated with Construction Activity"—A permit is required prior to soil disturbance of an area of one acre or more.
- Federal Clean Water Act (Section 404), "Permit for Discharge of Dredged or Fill Material"—A permit from the United States Army Corps of Engineers may be required for the discharge of fill material into waters of the United States including wetlands.

Owner and Contractor agree that the Material will be transported, deposited and left in a manner that will not cause injury or harm to any person or property. If an injury or harm does occur to any person or property or should any environmental impacts or litigation arise as a result of the transportation, deposition, or the final form in which the Material is left on the Property, the Owner and Contractor regardless of manner or form, agree to indemnify, defend, protect, and hold harmless the Department in any action in law or equity.

Pursuant to the Contract, Owner acknowledges Contractor will submit this agreement to the Department as evidence that the Owner has authorized the placement of the Material on the Property. Owner acknowledges that the Contractor is not authorized to make any representations or agreements on behalf of the Department. Contractor and Owner agree that the Department is released from any and all obligations to Owner made by Contractor under this agreement.

Owner and Contractor acknowledge that they have had the opportunity to receive independent legal advice with respect to the meaning, implications and advisability of entering into and executing this agreement.

Date: _____ _____

(Signature of Property Owner)

Date: _____ _____

(Signature of Contractor's Authorized Representative per Std Spec 5-1.06)

Example 3-7.2

STATE OF CALIFORNIA—BUSINESS, TRANSPORTATION AND HOUSING AGENCY ARNOLD SCHWARZENEGGER, Governor

DEPARTMENT OF TRANSPORTATION
DIVISION OF CONSTRUCTION
1120 N STREET
P. O. BOX 942874
SACRAMENTO, CA 94273-0001
PHONE (916) 654-2157
FAX (916) 654-6345
TTY 711

Flex your power!
Be energy efficient!

Date: *[Month dd, yyyy]*

[Contractor's Name]
[Address]
[City, State ZIP]

Subject: Approval of Disposal of Material Outside the Highway Right-of-Way

Dear *[contractor name]*:

In accordance with the provisions of Section 7-1.13, "Disposal of Material Outside the Highway Right-of-Way," of the *Standard Specifications*, approval is granted for disposal of *[insert number]* cubic yards of *[type of material]* ("Material") to *[property owner name]'s* property. According to the submitted agreement, *[contractor name]* and *[property owner]* have represented all necessary permits, licenses, and clearances were obtained and submitted before the disposal of the Material and have released the Department of Transportation (Department) from any obligations from its disposal. The agreement also includes *[contractor]'s* and *[property owner]'s* promise to hold the Department harmless from all claims for injury to persons or damage to property resulting from the disposal.

The Department does not warranty or guaranty that the Material is of any particular type or is suitable for any particular purpose.

In accordance with the provisions of Section 7-1.12, "Indemnification and Insurance," of the *Standard Specifications*, *[contractor name]* shall defend, indemnify, and save harmless the state from any and all claims, demands, causes of action, damages, costs, expenses, actual attorneys' fees, losses or liabilities, in law or in equity, of every kind and nature whatsoever, arising out or in connection with *[contractor name]*'s performance of this contract.

Sincerely,

[Name of resident engineer]

c:
bc:

Example 3-7.3

STATE OF CALIFORNIA—BUSINESS, TRANSPORTATION AND HOUSING AGENCY ARNOLD SCHWARZENEGGER, Governor

DEPARTMENT OF TRANSPORTATION
DIVISION OF CONSTRUCTION
[Resident Engineer's Address]
[City, CA Postal Zip Code]
[PHONE: (Area Code) xxx-xxxx]
[FAX: (Area Code) xxx-xxxx]

Flex your power!
Be energy efficient!

Date: *[Month dd, yyyy]*

[Name of Surety Company]
[Address]
[City, State ZIP]

Subject: Notice of Contract Suspension of Work
[Contractor's Name]
[Contract Number / Project Description]

Dear Surety:

This is to notify you that *[insert contractor's name]* has failed to maintain insurance on Contract No. *[insert contract EA and project description]* as required under Section 7-1.12, "Indemnification and Insurance," of the *Standard Specifications*. In accordance with Section 8-1.05, "Temporary Suspension of Work," *[contractor's name]*'s operations on Contract No. *[insert contract EA]* are suspended effective *[effective date of temporary work suspension]*.

Your attention is directed to the provisions of Section 10253 of the Public Contract Code and to Section 8-1.08, "Termination of Control," of the *Standard Specifications* relating to the contractor's failure to comply with the insurance provisions of the contract. According to PCC §10253, unless the contractor submits proof of the required insurance as required by the contract, the Department of Transportation may issue a five-day written notice to terminate the contractor's control.

You will be notified if the contractor provides the required proof of insurance before a notice to terminate the contractor's control of the work.

If you have questions, please contact me at *[(area code) xxx–xxxx]*.

Sincerely,

[Name of resident engineer]
Resident Engineer

c:
bc:

Example 3-9.9 Schedule of Deductions

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PROGRAM CAS145   S C H E D U L E   O F   D E D U C T I O N S    PAGE NO.  1
DATE 01/02/01                                                   EST. NO.06
TIME 02:40 PM
R.E. NAME: ZINK, PHIL                                          03-441804
-------------------------------------------------------------------------
DEDUCTION DESCRIPTION          AMOUNT  EST          THIS          TOTAL
                                       NO.       ESTIMATE       ESTIMATE
-------------------------------------------------------------------------
EQUAL EMPLOYMENT OPPORTUNITY
MISSING PR-1391             -7,622.53   02
RECEIVED FORM PR1391         7,622.53   03
MISSING CEM 2402           -10,000.00   05
CEM 2402                    10,000.00   06
                                                10,000.00           0.00
LABOR COMPLIANCE VIOLATION
MISS P/R - RIOLO,O/O        -7,622.53   02
MISSING PAYROLLS            -4,327.59   03
MISSING PAYROLLS            -5,000.00   05
RETURN EST #2, EST#3        11,950.12   05
PAYROLLS                     5,000.00   06
                                                 5,000.00           0.00
                       TOTAL DEDUCTIONS         15,000.00           0.00
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Example 3-9.10 Sample Notice of Opportunity for Offset Hearing

STATE OF CALIFORNIA—BUSINESS, TRANSPORTATION AND HOUSING AGENCY ARNOLD SCHWARZENEGGER, Governor

DEPARTMENT OF TRANSPORTATION
DIVISION OF CONSTRUCTION
[Resident Engineer's Address]
[City, CA Postal Zip Code]
[PHONE: (Area Code) xxx-xxxx]
[FAX: (Area Code) xxx-xxxx]

Flex your power!
Be energy efficient!

Date: *[Month dd, yyyy]*

[Prime Contractor]
[Address]
[City, State ZIP]

[Bonding Company]
[Address]
[City, State ZIP]

[Offset Bonding Company]
[Address]
[City, State ZIP]

Dear Sirs and Madams:

This notice is to advise you of your rights upon determination of offset by the resident engineer in the amount of *[$XX,YYY.SS]* to clear an accounts receivable billing for contract number *[PP-RRRRRR*, awarded to you by the California Department of Transportation for highway construction on Route *[XX], [YYY]* County, near *[ZZZZZ]*.

You have the right to request an offset hearing pursuant to this offset, as provided for by *Government Code*, Section 12419.5.

Unless your written request for an offset hearing is received within 20 calendar days of the date of this notice, this offset will be taken against contract number *[SS-VVVVVV]*, effective *[Month dd, yyyy]*. Contract number *[SS-VVVVVV* was awarded to you by the California Department of Transportation, for highway construction on Route *[XX], [YYY]* County, near *[ZZZZZ]*.

If you request an offset hearing, one will be scheduled within approximately ten working days of receipt of your written request. Under the procedures outlined in Section 8790.3 of the *State Administrative Manual*, you are entitled to present any valid objection you may have to the use of the offset procedure. At the hearing, you will be provided opportunity to present facts that discredit the accounts receivable, the appropriateness of this offset action, or other evidence you believe is relevant to the determination of the appropriateness of this offset action.

If you have questions regarding this notice, you may contact me at *[(area code) xxx–xxxx]*.

Sincerely,

[Name of resident engineer]
Resident Engineer

Attachment / Enclosure
bc: District Division Chief Construction
Offset District Division Chief Construction
Offset Resident Engineer

Section 39 Hot Mix Asphalt

Section 39 Hot Mix Asphalt

Section 39
Hot Mix Asphalt

4-3901 General

4-3901 General

Producing high-quality hot mix asphalt pavement requires a partnership between Caltrans, the plant producing the hot mix asphalt, and the contractor placing the hot mix asphalt. The resident engineer must clearly communicate assignments of responsibility and commensurate authority for all Caltrans personnel, both at the jobsite and at the plant.

This section of the *Construction Manual* not only provides information for the resident engineer, as customary, but also outlines procedures for the plant inspector and for the paving inspector.

Construction of Hot Mix Asphalt Pavements, published by the Asphalt Institute contains information on the uses of various types of asphalts and the design and production of hot mix asphalt. All personnel responsible for hot mix asphalt should familiarize themselves with this publication.

4-3901A Paving Personnel

Plant inspection and testing is essential to ensure quality hot mix asphalt. A plant inspector at the hot mix asphalt 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 hot mix asphalt paving inspector. In addition, the paving inspector must be qualified on California Test 125, “Methods for Sampling Highway Materials and Products Used in the Roadway Structural Sections,” Part 7, “Method for Sampling Bituminous Paving Mixtures.”

4-3901B Hot Mix Asphalt Construction Processes

Hot mix asphalt may be placed using the standard, method, or Quality Control Quality Assurance (QCQA) process. The process is specified in the project’s special provisions. The processes are related to the level of quality control testing required for the project.

Standard process—the contractor performs quality control testing, and Caltrans performs acceptance testing.

Method process—Caltrans performs all testing, except that the contractor performs process control testing for aggregate moisture content, aggregate and reclaimed asphalt pavement moisture content, reclaimed asphalt pavement aggregate gradation and asphalt content, and asphalt rubber binder viscosity.

QCQA process—the contractor is responsible for plant inspection, paving inspection, and quality control sampling and testing. Caltrans must monitor contractor inspection

and quality control testing for compliance with the specifications. Caltrans must perform acceptance inspection, sampling and testing.

4-3902 Before Work Begins

4-3902 Before Work Begins

Section 39, "Hot Mix Asphalt," of the *Standard Specifications* requires the contractor to submit a job mix formula for all types of hot mix asphalt except for hot mix asphalt used for minor hot mix asphalt and miscellaneous areas and dikes. For standard and QCQA processes, the contractor must have a quality control plan for hot mix asphalt production and placement.

The contractor must use accredited laboratories and qualified testers, in accordance with the *Independent Assurance Manua*l, for the contractor mix design used to determine job mix formula and for QCQA process quality control testing. Hot mix asphalt plants must comply with the *Material Plant Quality Program*.

4-3902A General

Before the work begins the resident engineer will:

- Determine the type of hot mix asphalt to be used on the project and review the plans and the special provisions. The special provisions should specify the type of hot mix asphalt, aggregate size, asphalt binder grade, and construction process (standard, method, or QCQA) to be used.
- Review the project's specifications' measurement and payment clauses and determine what records must be kept.

4-3902B Job Mix Formula Submittal

Review the documents in the contractor's job mix formula submittal information (see below) to ensure they are complete. Notify the contractor immediately if the submittal is incomplete.

- Form CEM-3511, "Contractor Job Mix Formula Proposal," documents target values for aggregate sieves, percent of asphalt binder, and source information for all hot mix asphalt component materials. If applicable, form CEM-3511 will also include the percentage of reclaimed asphalt pavement and antistrip treatment method.
- Form CEM-3512, "Contractor Hot Mix Asphalt Design Data," documents the testing data developed by the mix design laboratory. If there is no form CEM-3513 attached, the completed mix design form CEM-3512 must be dated within the last 12 months.
- Form CEM-3513, "Caltrans Hot Mix Asphalt Verification," if submitted, documents Caltrans verification test results for the proposed job mix formula. The job mix formula verification form must have been signed by an engineer (preferably the district materials engineer) within 12 months of the start of planned hot mix asphalt production.
- Material Safety Data Sheets in accordance with Section 39-1.03C, "Job Mix Formula Submittal," of the *Standard Specifications*.

4-3902C Job Mix Formula Review

The resident engineer's review process includes:

- Reviewing the contractor's proposed job mix formula submitted on form CEM-3511 for compliance with Section 39, "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.
- Reviewing the contractor's proposed job mix formula submitted on form CEM-3511 to see if the asphalt binder supplier is on Caltrans' list of approved suppliers. 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 Section Q, "Requirements for Suppliers Supplying Asphalt Without a Certificate of Compliance," in the *Certification Program for Suppliers of Asphalt*.
- If the submitted job mix formula proposal complies with the specifications, notifying the contractor within five days of submittal that:
    1. The job mix formula is accepted if form CEM-3513 was issued within 12 months of proposed hot mix asphalt production. The resident engineer signs and returns form CEM-3511.
    2. The job mix formula must be verified if form CEM-3513 was not issued within 12 months of proposed hot mix asphalt production. The resident engineer requests that the contractor give notice for when hot mix asphalt will be produced for verification and notifies the district materials engineer.
    3. For open graded friction course hot mix asphalt if form CEM-3513 was not issued within 12 months of proposed hot mix asphalt production, the resident engineer requests that the contractor give notice for sampling of aggregate, binder, and additives.

4-3902D Job Mix Formula Verification

The contractor takes the following steps related to job mix formula verification:

If the proposed job mix formula has not been verified within 12 months of production, the contractor must furnish material samples according to Section 39-1.03C, "Job Mix Formula Submittal," 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 course aggregate, 80 pounds for each fine aggregate, and 10 pounds for each type of supplemental fines.
- Reclaimed asphalt pavement from stockpiles or reclaimed 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 shaped 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 shaped cans with open top friction lids.
- Antistrip additives if used.

The resident engineer's verification process includes:

- Notification from the contractor at least two business days before sampling material so that an inspector may be present during the sampling.
- Witnessing the contractor sampling hot mix asphalt 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.
- Provide job mix formula verification results to the contractor on form CEM-3513 within 20 days of receiving all samples.

4-3902D (1) 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, "Standard Method for Determining Optimum Bitumen Content for Open-Graded Asphalt Concrete."
- 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, with form CEM-3513 attached, to the contractor immediately following receipt of form CEM-3513 from the district materials laboratory.

4-3902D (2) Verification Process for Type A, Type B 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 hot mix asphalt verification samples from the plant that will be used for the project. The contractor samples in accordance with California Test 125, "Methods for Sampling Highway Materials and Products Used in Roadway Structural Section."

Samples are obtained at the following locations:

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

Test verification samples for compliance with the specifications. See Section 39-1.03E, "Job Mix Formula Verification," of the *Standard Specifications*.

If required by the special provisions, also perform California Test 371, "Method of Test for Resistance of Compacted Bituminous Mixture to Moisture Induced Damage." Use the test result for reporting only, not for specification compliance.

Ensure that the proposed job mix formula is verified by the district materials laboratory within 20 days of sampling hot mix asphalt or when requested in writing by the contractor within three business days for rubberized hot mix asphalt. Verification is done when the district materials engineer completes and returns form CEM-3513 to the resident engineer. Form CEM-3511 must also be completed by the resident engineer and returned to the contractor along with form CEM-3513 within this time frame.

4-3902D (3) 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 of the rejected job mix formula, attaching form CEM-3513, "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, or the contractor may adjust the job mix formula on form CEM-3511 with allowable adjustments specified in Section 39-1.03E.
- If the contractor disputes Caltrans verification test results, ensure that the contractor complies with Section 39-1.06, "Dispute Resolution," of the *Standard Specifications.*

4-3902D (4) 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, must be listed on the modified form CEM-3511.

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

Ensure that the proposed job mix formula is verified by the district materials laboratory within 20 days of sampling hot mix asphalt or when requested in writing by the contractor or with three days of sampling rubberized hot mix asphalt. Verification is done when the district materials engineer completes and returns form CEM-3513 to the resident engineer. Form CEM-3511 must also be completed by the resident engineer and returned to the contractor along with form CEM-3513 within 20 days of sampling hot mix asphalt.

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 39-1.06 of the *Standard Specifications*.

4-3902E Job Mix Formula Acceptance

Job mix formula acceptance requires the following:

- Review and acceptance of submitted form CEM-3511, with form CEM-3512 attached.
- Completed form CEM-3513 within 12 months of proposed hot mix asphalt production.

4-3902F Job Mix Formula Renewal

A verified job mix formula is good for only 12 months so the contractor may request a job mix formula renewal if the hot mix asphalt production will be stopped for more than 30 days or the contractor wants to use the accepted job mix formula on another contract.

The contractor takes the following steps for job mix formula renewal:

- Submits the proposed job mix formula on form CEM-3511, attaches the previously verified job mix formula on form CEM-3513 and attaches the mix design information for previously verified job mix formula on form CEM-3512.
- Notifies the resident engineer prior to sampling materials.
- Samples materials at the locations and quantities shown in 4-3902D, "Job Mix Formula Verification." Hot mix asphalt 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 hot mix asphalt job mix formula.

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

- Reviewing the proposed job mix formula on form CEM-3511. (See 4-3902C, "Job Mix Formula Review.") If the submitted job mix formula proposal complies with the specifications, the resident engineer notifies the contractor within five days that split sampled hot mix asphalt and component materials must be provided.
- Witnessing the contractor sampling hot mix asphalt 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 hot mix asphalt complies with the specification, request that the district materials laboratory perform hot mix asphalt verification testing.
- If the contractor's test results on form CEM-3514 comply with the specifications, shipping material samples to the district materials laboratory. They 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 contractor.

4-3902G Quality Control Quality Assurance Process

Contact the district QCQA coordinator for updated information and assistance.

Review the quality control plan for compliance with requirements in the manual for *Quality Control Manual for Hot Mix Asphalt*.

- Within five business days of quality control plan submittal, notify the contractor in writing of quality control plan acceptance or rejection. If the plan is rejected, provide written comments regarding deficiencies.
- The resident engineer and contractor must input the initial project information into the statistical evaluation program (HMA Pay) that will be used for the

project. Contact the district QCQA coordinator for statistical evaluation program (HMA Pay) assistance or training. Contact the headquarters QCQA coordinator for additional assistance if necessary.

The QCQA statistical evaluation program (HMA Pay) is available online:

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

4-3902H Plant Operations

Hot mix asphalt plants, in accordance with Section 39-1.08A, "General," of the *Standard Specifications* must be qualified under the *Materials Plant Quality Program*.

Before production begins, take the following steps related to hot mix asphalt plant operations:

- Verify with the district weights and measures coordinator that the proposed hot mix asphalt plant is Caltrans-qualified under the *Material Plant Quality Program*. Batch hot mix asphalt plants must be qualified annually, and continuous hot mix asphalt plants must be qualified at least every six months, in accordance with Chapter 1 II-C, "Frequency," of the *Material Plant Quality Program*.
- If the hot mix asphalt 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 five business days' notice to schedule hot mix asphalt plant qualification.
- Accept hot mix asphalt for up to 14 days from a non-qualified plant if startup approval has been granted in writing by the district weights and measures coordinator.

4-3902I Antistrip Treatment of Aggregates

Hot mix asphalt may be sensitive to moisture damage and require antistrip treatments. The treatment method can be either lime treatment (by slurry application or by dry lime applied to damp aggregate) or liquid antistrip. For the standard and the method processes, the special provisions will specify the treatment method if it is required. For the QCQA process, the treatment method will be determined by the contractor based on the results of California Test 371, "Method of Test for Resistance of Compacted Bituminous Mixture to Moisture Induced Damage." For the QCQA process, the special provisions will include all three antistrip treatment methods that may be chosen by the contractor based on test results.

When California Test 371 is required and the result is less than 70, the contractor must test the proposed hot mix asphalt aggregate blend for plasticity index in accordance with California Test 204, "Method of Tests for 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 the special provisions for the treatment method allowed.

4-3902I (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

Reclaimed asphalt pavement used in the production of hot mix asphalt 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 ensure 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 under the *Material Plant Quality Program.*
- 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, "Methods for Sampling Highway Materials and Products Used in Roadway Structural Section," to field test for moisture content and sand equivalent at the frequency shown in Table 6-1.6, "Hot Mix Asphalt," in Section 6-1, "Sample Type and Frequencies," of this manual.
- Test aggregate samples for sand equivalent at the frequency shown in Table 6-1.6. 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 California Test 226, "Method for Determining Moisture Content by Oven Drying," or California Test 370, "Method of Determining Moisture Content of Asphalt Mixtures or Mineral Aggregates," 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 39-1.04D, "Aggregate," 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 6-1.6, "Hot Mix Asphalt," in Section 6-1, "Sample Type and Frequencies," of this manual for aggregate acceptance testing.

  Label each aggregate sample with the contract number, date, type of mix, aggregate gradation (1/2 inch), aggregate source, hot mix asphalt 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 6-1.6. 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 6-105, "Field Tested Material Sample Identification," of this manual. Record the type of mix, the hot mix asphalt 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 course 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.

- Ensure 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.

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

Marination of the lime treated aggregates must be done when required in the special provisions or for the QCQA process if California Test 371 indicates treatment is necessary and California Test 204 indicates that the plasticity index is from 4 to 10.

Lime treated aggregate must marinate at least one and no more than 60 days before using it in hot mix asphalt 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.

4-3902I (3) Liquid Antistrip Treatment

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

Before production begins, take the following steps related to liquid antistrip treatment:

- Verify with the district weights and measures coordinator that the proposed liquid antistrip metering device and storage tank are Caltrans-qualified under the *Material Plant Quality Program*.
- Verify that the liquid antistrip is the same type and brand as shown on the accepted job mix formula.

4-3902J Prepaving Conference

Before work begins, the resident engineer holds a prepaving conference with the contractor to discuss hot mix asphalt 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 last 12 months.
- Confirm that the accepted job mix formula has not changed.

- Discuss with the contractor what atmospheric and pavement temperature the contractor has chosen that would result in a notification to stop production of hot mix asphalt at the plant.
- Ensure 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 five feet) that will not adversely affect the surfacing on the traffic lane.
- Make certain that rollers have the specified attributes. For method process, ensure that the specified number of rollers will be used based on the type of hot mix asphalt being placed.
- Determine the frequency for standard and QCQA core sampling (at least once every five business days).
- Discuss the contractor's method (for example, ski device) to produce smooth pavement that meets the specifications. Determine how smoothness quality control will be accomplished, if a straightedge will be available, and who on the paving crew is responsible for using it.
- 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. Also, discuss the contractor's proposed application rates and how far in advance of the paving operation the tack coat will be placed. For additional information about tack coats, refer to Section 4-3906A, "References," of this manual for the website for *Tack Coat Guidelines.*
- 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 hot mix asphalt.
- Confirm that the trucks used for tack coat application have the specified attributes. For distributor attributes, see Section 4-93, "Liquid Asphalts," of the *Standard Specifications*.

For standard and QCQA processes 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 inspection and testing reports.
- How the resident engineer will transmit required test results.

With the contractor, discuss who has responsibility in the field to:

- Monitor hot mix asphalt temperatures.
- Monitor atmospheric temperatures.
- Monitor pavement temperatures.
- Direct hot mix asphalt truck drivers when loads must be tarped.
- Defining the length of windrow, if applicable.

- Direct the hot mix asphalt plant to slow down or stop loading trucks because of truck queuing.
- Stop production when two consecutive quality control test results do not comply with the specifications.

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

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

Ensure 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 startup evaluation requirements for the first 750 tons of mix. For standard and QCQA processes, the contractor must report test results within three business days of sampling.

4-3902K Paving Operations

Before work begins, take the following steps related to hot mix asphalt paving operations:

- Review "Placing Hot-Mix Asphalt" in *Construction of Hot Mix Asphalt Pavements*, published by the Asphalt Institute.
- Ensure that the subgrade has been prepared as specified. If any hot mix asphalt leveling is required to smooth out an existing irregular surface, inform the contractor and determine the method of payment.
- Determine if crack sealing or digouts (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 digouts. Refer to *Maintenance Technical Advisory Guide* for more information about crack sealing or digouts.
- For standard and QCQA processes, review the accepted contractor's quality control plan.
- If resurfacing under structures will result in reduced clearance, follow the procedures in Section 3-705B, "Clearance and Bridge Permit Rating Changes (Permanent)," of this manual.
- Verify that personnel who will be taking mat samples and witnessing core sampling are qualified for California Test 125, "Methods for Sampling Highway Materials and Products Used in the Roadway Structural Sections."

4-3903 During the Course of Work

4-3903 During the Course of Work

4-3903A General

Quality production and placement of hot mix asphalt requires both quality control by the contractor and quality assurance by the state. While some of these functions may seem redundant, each serves a separate purpose.

4-3903A (1) Quality Control

Quality control (sometimes called process control) is the inspection and testing performed by the contractor to ensure that the hot mix asphalt being produced or placed meets the requirements of the specifications. Inspection should be performed at both the production unit and at the paving site. Quality control sampling should be performed at regular intervals and at locations similar to the engineer's such as plant, windrow, or mat to ensure that quality control test results are not influenced by sampling location.

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 startup evaluation both offer early opportunities for the contractor to compare quality control test results with acceptance test results. Unlike the comparison of quality control quality acceptance test results during production and placement, these results are on the same material (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 reclaimed asphalt pavement moisture, and reclaimed asphalt pavement gradation. Depending on the construction process being used, the specifications require additional levels of quality control testing.

Standard Process

The contractor is required to conduct quality control inspection and testing on a regular basis. 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. The contractor may choose any method for density testing including nuclear gauge, non-nuclear gauge, or cores. If the total layer thickness is less than 0.15-foot the contractor must follow the requirements of the method process listed in Section 39-3.03, "Spreading and Compacting Equipment," and Section 39-3.04, "Transporting, Spreading, and Compacting," of the *Standard Specifications.*

Method Process

The contractor is not required to conduct quality control inspection and testing, except for tests named above in this section. In method projects the contractor may depend on the acceptance test results for quality control. Since method projects should be small-quantity projects, the contractor will most likely depend on historical production data. The contractor has to comply with the specifications for placement such as temperature and roller requirements.

Quality Control Quality Assurance Process

The contractor is required to conduct quality control inspection and testing. For the QCQA process, the contractor must perform quality control testing at regular intervals defined by the quality control tables in the specifications. If the total layer thickness is at least 0.15-foot, the contractor is required to conduct density testing. The contractor may choose any method of density testing including nuclear gauge, non-nuclear gauge, or cores. If the total layer thickness is less than 0.15-foot, the contractor must follow the requirements of the method process in the *Standard Specifications*.

4-3903A (2) Quality Assurance

Quality assurance of hot mix asphalt comprises 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. Ensure 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.

Material acceptance sampling frequencies and material acceptance testing frequencies, shown in Table 6-1.6, "Hot Mix Asphalt," in Section 6-1, "Sample Type and Frequencies," of this manual are not the same. Caltrans limited the risk to the contractor by specifying in Section 39, "Hot Mix Asphalt," of the *Standard Specifications* that no single test result may represent more than the smaller of 750 tons or one day's production. Therefore, during the course of the work it is important to split sample materials at both the plant and behind the paver every 750 tons. Obtain a split sample for every sample taken, one to test 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. Store the remaining samples in case additional acceptance testing is necessary.

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.

Quality assurance must be performed regularly and the material acceptance test processed in a timely fashion. The resident engineer must make every effort to conduct the necessary inspection, ensure that sampling and testing staff are available, and have samples processed as quickly as possible so acceptance decisions can be made while there is time to make corrections.

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, Section 39 allows the contractor to continue producing and placing hot mix asphalt. Notify the contractor of a single failed quality assurance test, and do not take further action based on a single test failure because sampling and testing variability based on statistics is extremely large.

When two consecutive quality assurance tests for a single quality characteristic do not comply with the specifications:

- Immediately notify the contractor to stop production.
- See 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) Quality Control Quality Assurance

QCQA is the process normally used for large-volume hot mix asphalt projects. The contractor must perform inspection and testing at required intervals. The contractor's quality control tests for aggregate gradation and asphalt binder content are statistically

compared to the engineer's acceptance testing. If the contractor's quality control tests are "verified" they are used to determine lot acceptance and payment adjustment.

The contractor will perform quality control test for compaction (if required) by any method chosen. The resident engineer will use cores to determine compaction acceptance. The contractor may compare compaction test results with the resident engineer to ensure that the testing processes are comparable.

The contractor is responsible for plant and paving inspection, and quality control testing. Caltrans monitors the contractor's inspections and testing for compliance with the specifications.

If quality control personnel are not enforcing the specifications, the resident engineer should request in writing that the contractor replace the nonperforming personnel.

4-3903A (4) Dispute Process

A dispute resolution process for acceptance tests is specified in Section 39-1.06, "Dispute Resolution," of the *Standard Specifications* and additional dispute resolution for the QCQA process in Section 39-4.05C, "Dispute Resolution," of the *Standard Specifications*.

If the contractor disputes the acceptance test results, the specifications require the use of an independent third party. If you are satisfied with acceptance test results, and 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.

It is preferable to use split samples of disputed material for third-party evaluation. When an independent third party is part of the dispute process, the independent third-party may use any representative material available. Caltrans must retain possession of the split samples. For standard and method processes, Caltrans may discard stored split samples five days after the contractor has received the associated acceptance test results. For the QCQA process, Caltrans may discard the samples five days after determination of the quality factors for a lot.

4-3903B Production Startup Evaluation

Section 39-1.07, "Production Start-Up Evaluation," of the *Standard Specifications* applies to all construction processes. The production startup 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 hot mix asphalt 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 because 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 hot mix asphalt plant operations:

- Verifies that the security seal has not been tampered with. If tampering is suspected, contact the district weights and measures coordinator.
- Ensures that the portioning equipment is interlocked as specified in the *Material Plant Quality Program*. Refer to the *Weights and Measures Handbook* for procedures for checking interlocks.
- Ensures that 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 reclaimed asphalt pavement aggregate of more than five 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 Section Q, "Requirements For Suppliers Supplying Asphalt Without a Certificate of Compliance," in the certificate program for suppliers of asphalt. Notifies the contractor and resident engineer if asphalt binder testing has not been completed for a supplier not on the approved supplier list.
- Ensures that aggregate is stored separately, according to proposed sizes by comparing the material from each bin with Chapter 2, II-E, "Aggregate Storage," of the *Material Plant Quality Program*. If any segregation, degradation, or intermingling occurs, require that the contractor empty the storage facility and waste or re-screen the material.
- Ensures that supplemental fine aggregate remains dry and is stored separately as specified in *Material Plant Quality Program*.

During production, the plant inspector generally takes the following steps related to hot mix asphalt plant operations:

- Records daily hot mix asphalt 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.
- For the QCQA process, the plant inspector performs the following additional duties:

  1. Ensures that contractor personnel who sample or witness the contractor sampling at the hot mix asphalt plant are qualified to perform California

Test 125, "Methods for Sampling Highway Materials and Products Used in Roadway Structural Section."

2. Obtains samples for acceptance testing every 750 tons. Material samples must be split samples from both the plant and behind the paver.
3. Tests for aggregate gradation at least once for every five sub-lots.
4. Monitors the contractor's hot mix asphalt 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 hot mix asphalt 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

Marinated Lime Treated Aggregate

Aggregate that has been lime treated and stockpiled for marination is handled in the hot mix asphalt production process in the same manner as untreated aggregates. See Section 3902I, (1) "Lime Treatment of Aggregates," in 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.
- Ensure that the lime marination was performed within the past 60 days.

Reclaimed asphalt pavement used in the production of hot mix asphalt does not need to be lime treated.

Hot Mix Asphalt Aggregate Treatment—Slurry Method

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

Hot Mix Asphalt Aggregate Treatment – Dry Lime Method

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

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

- Obtain 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 6-1.6, "Hot Mix Asphalt," in Section 6-1, "Sample Type and Frequencies," of this manual. Sample aggregate in accordance with California Test 125, "Methods for Sampling Highway Materials and Products Used in Roadway Structural Section."

- Test aggregate samples for sand equivalent at the frequency shown in Table 6-1.6. If the aggregates are not combined before sampling, combine aggregate from individual stockpiles or belts in the job mix formula proportions to test for sand equivalent.
- It is good practice to test aggregate samples for moisture content in accordance with California Test 226, "Method for Determining Moisture Content by Oven Drying," or California Test 370, "Method of Determining Moisture Content of Asphalt Mixtures or Mineral Aggregates," 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 39-1.04D "Aggregate," of the *Standard Specifications*.

  Compare the contractor's aggregate moisture quality control test results against Caltrans test results. Notify both the contractor and the resident engineer if the test results are significantly different.

  Verify that the contractor is adjusting the hot mix asphalt plant controller based on the contractor's aggregate moisture quality control test results.
- 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 6-1.6, Hot Mix Asphalt," in Section 6-1, "Sample Type and Frequencies," of this manual for aggregate acceptance testing.
- Test aggregate for acceptance quality characteristics at the frequency shown in Table 6-1.6 for the following aggregate acceptance tests:

  1. Los Angeles Rattler
  2. Percent of crushed particles course 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 book and the information in Section 6-105, "Field Tested Material Sample Identification," of this manual. Record the type of mix, the hot mix asphalt 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 field construction laboratory for testing. If any tests results exceed the specified limits, the testing laboratory will immediately notify the resident engineer.

Ensure 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.

Liquid Antistrip Treatment

Ensure 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 required format.

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

4-3903*C (2) Production Startup Evaluation*

A production startup evaluation occurs within the first 750 tons produced on the first day of hot mix asphalt 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 startup evaluation:

- During the first 750 tons of production, the inspector witnesses the contractor sampling aggregate, asphalt binder, and reclaimed asphalt pavement on the first day of production in accordance with Section 39-1.07, "Production Start-Up Evaluation" of the *Standard Specifications* and California Test 125. The inspector retains three split samples for testing and dispute resolution as described earlier.

  Label each hot mix asphalt sample with enough information to identify the exact location. See the example below in Section 4-3903C (3). For QCQA process projects, indicate the lot and sublot as well.

- Ships one sample of asphalt binder to METS for testing as detailed in Section 6-2, "Acceptance of Manufactured Material and Sampling Methods," of this manual, noting that it is a production startup acceptance test.

- Immediately tests one aggregate sample for aggregate gradation and sand equivalent. If reclaimed asphalt pavement is used, tests reclaimed asphalt pavement sample and determines the aggregate gradation in accordance with Lab Procedure-9, "Hot Mix Asphalt Using Up to 15 Percent Reclaimed Asphalt Pavement," notifying the contractor of test results.

  1. For the method process, when test results fall outside the specification limits, the inspector notifies the contractor and requires and confirms that the contractor take corrective action.
  2. For the standard and QCQA processes, the inspector compares the contractor's quality control test results with Caltrans acceptance test results, notifying both the contractor and resident engineer if the test results are significantly different.

  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 6-105, "Field Tested Material Sample Identification," of this manual. Record the type of mix, the hot mix asphalt 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 Startup Evaluation Test" under remarks. Under remarks, identify the tests to be performed:

1. Los Angeles Rattler
2. Percent of crushed particles course 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 three days for test result turnaround, so samples must be shipped immediately. If any tests 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 hot mix asphalt plant operations:

- Observes the overall plant operation to ensure the contractor controls dust and smoke. Requests that the contractor correct any obvious violation and cease operation if necessary to prevent damage to hot mix asphalt mixture.
- Obtains aggregate samples and performs California Test 226, "Method for Determining Moisture Content by Oven Drying," or California Test 370, "Method of Determining Moisture Content of Asphalt Mixtures or Mineral Aggregates."

  1. Confirms that the contractor is performing sampling and testing for moisture content at the frequency shown in Section 39-1.04D "Aggregate," of the *Standard Specifications.* Because moisture influences proportioning, it is good practice to test both aggregate and reclaimed asphalt pavement for moisture content.
  2. 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.

- Verifies that the contractor is adjusting the hot mix asphalt 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 6-1.6. Tests aggregate samples before lime treatment for testing sand equivalent. (Reclaimed asphalt pavement does not need to be sampled for sand equivalent.) Do not use aggregate samplers that do not safely produce a manageable sized sample.

  Labels each aggregate sample with the contract number, date, type of mix, aggregate gradation (1/2-inch), aggregate source, hot mix asphalt producer and producer's mix identification number. Indicates the number of tons produced when the sample was taken. For QCQA process projects, indicate thes lot and sublot as well.

- Tests aggregate samples for aggregate gradation and sand equivalent at the frequency shown in Table 6-1.6 of this manual. If reclaimed asphalt pavement is

used, determines aggregate gradation in accordance with Lab Procedure–9 "Hot Mix Asphalt Using Up to 15 percent Reclaimed Asphalt Pavement."

1. For method process, 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.
2. For standard and QCQA processes, compares the contractor's quality control test results with Caltrans acceptance test results for aggregate gradation and sand equivalent, and notifies both the contractor and resident engineer if the test results are significantly different.

If aggregate gradation or sand equivalent test results fall outside the specification limits, notify 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 6-1.6 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. Reclaimed asphalt pavement does not need to be sampled.

  Label each aggregate sample with the contract number, date, type of mix, aggregate gradation (1/2-inch), aggregate source, hot mix asphalt producer and producer's mix identification number. Indicate the number of tons produced when the sample was taken. See the example in Section 4-3903D (5) below. For the QCQA process projects, indicate the lot and sublot as well.

- Tests aggregate at the frequency shown in Table 6-1.6. 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 book that contains the form and the information in Section 6-105, "Field Tested Material Sample Identification," of this manual. Record the type of mix, the hot mix asphalt 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 course 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.

  For the method and standard processes (and for the QCQA process for all requirements other than gradation, asphalt content, and compaction), if any single quality characteristic has two consecutive acceptance or quality control tests not in compliance with the specifications, ensure that before resuming production and placement of hot mix asphalt 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 hot mix asphalt on the project.

- Samples asphalt binder at the frequencies shown in Section 6-1 of this manual and, in accordance with Section 6-2, "Acceptance of Manufactured Material and Sampling Methods," of this manual, fills out form TL-0101, before shipping samples to METS for testing.
- Ensures asphalt binder quality by following Section 4-92, "Asphalts," of this manual.
- For asphalt rubber binder components:

  1. Collect certificates of compliance for each truckload of crumb rubber modifier and asphalt modifier.
  2. Collect a "Buy America" certificate for each truckload of crumb rubber modifier.
  3. Sample asphalt modifier binder at the frequencies shown in Section 6-1, of this manual. Ship to METS as detailed in Section 6-2, "Acceptance of Manufactured Material and Sampling Methods," of this manual.

- Ensure that the temperatures of the asphalt binder, aggregate, and hot mix asphalt do not exceed the limits specified in Section 39-1.08B, "Mixing," of the *Standard Specifications*.
- Ensure that the batch size and feed rates do not exceed the mixing capacity range used during plant dynamic testing.
- Hot mix asphalt must be tested for mix moisture content from samples taken behind the paver in accordance with California Test 370, "Method of Determining Moisture Content of Asphalt Mixtures or Mineral Aggregates." However, the hot mix asphalt 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 hot mix asphalt 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 drier's discharge chute.
  2. Notice any steaming or dark spots on the aggregate.
  3. Pass a cool, shiny, clean mirror, spatula, or other 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.

- Observe production to ensure the specified hot mix asphalt mixture conforms to project specifications and the *Material Plant Quality Program*.

  Batch Plants

  Do not approve a shorter mixing time than was used during the plant dynamic testing conducted for plant acceptance, according to Chapter 3, II, B of the *Material Plant Quality Program.*

  Ensure that the automatic batching equipment functions within the limits specified in Chapter 2, II, F of the *Material Plant Quality Program*.

  Continuous Mixing Plants

  For continuous mixing plants (drier drum or drier drum pugmill), ensure that the following are operating:

  1. Vibrating unit on the fine bins
  2. Low-level and no-flow interlock systems for aggregate and reclaimed 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 hot mix asphalt storage

  The mixing time depends on the length of the mixing area and the rate of drop in the drier 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 less or greater than the range of production used during the plant dynamic testing conducted for plant acceptance according to Chapter 3, II, B of the *Material Plant Quality Program.*

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:

- Ensure 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 hot mix asphalt, 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 ensure 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 onsite 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

Ensure that hot mix asphalt storage silos are in accordance with Chapter 2, II-J, "Hot Mix Asphalt Storage," of the *Material Plant Quality Program*.

4-3903C (6) Hot Mix Asphalt Transporting

Before the trucks are loaded, ensure 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 being used as parting agents.

After the trucks are loaded, be sure the hot mix asphalt mixture is homogeneous (that is, aggregate is coated with asphalt binder or load is not segregated). Notify the resident engineer if loads need to be rejected based on non-homogeneous hot mix asphalt mixture.

For the method process and when standard and QCQA processes are required to use Section 39-3.04, "Transporting, Spreading, and Compacting," of the *Standard Specifications*, ensure that rubberized hot mix asphalt gap-graded and open-graded friction course loads are covered with tarpaulins when the atmospheric temperature is below 70°F. 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 hot mix asphalt placement, the paving inspector generally takes the following related steps:

- Record daily hot mix asphalt 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 Daily Report."
- Refer to "Placing Hot-Mix Asphalt" in *Construction of Hot Mix Asphalt Pavements*, published by the Asphalt Institute as guidance for best practices during hot mix asphalt placement.

4-3903D (1) Atmospheric and Pavement Temperature

- Ensure that placement occurs within the specified temperature ranges by taking sufficient measurements of the atmosphere, pavement, and hot mix asphalt. Refer to Sections 39-1.11, "Transporting, Spreading, and Compacting," and Section 39-3.04, "Transporting, Spreading, and Compacting," of the *Standard Specifications* for atmospheric and surface temperature minimum requirements.
- Record temperatures and the time taken on form CEM-3502. Notify the contractor to stop hot mix asphalt placement when temperatures are below specified limits.

4-3903D (2) Tack Coat

- Ensure that tack coat is applied to surfaces to be paved. 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 surface to be paved is ≥140ºF.

For information on inspecting tack coat, refer to Section 4-3906A, "References" in this manual for the *Tack Coat Guidelines* website.

4-3903D (3) Transporting and Spreading

- Ensure that hot mix asphalt delivery trucks have load slips, and collect the load slips from the arriving trucks. If inspection resources are limited, collect load slips on a daily basis. If hot mix asphalt loads are rejected before placement, note on the back of the load slip and form CEM-4601, why the hot mix asphalt was rejected, such as cold mix, segregated mix, or contaminated mix.

  Watch for queuing of trucks to avoid excessive cooling of hot mix asphalt mixture.

- If windrowing is used, prevent overcooling of the hot mix asphalt by not allowing excessive windrowing.

  1. Windrow temperatures can be monitored with an infrared heat gun, and hot mix asphalt may be rejected for not meeting minimum first coverage of breakdown temperature shown in Section 39-3.04, "Transporting, Spreading, and Compacting," of the *Standard Specifications*.
  2. Be aware when using a heat gun that the instrument measures surface temperature only and that the interior of the windrow is hotter. When the hot mix asphalt is run through the paver, the mat temperature may be above the minimum specified.
  3. If windrow temperatures are inadequate or 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 placing hot mix asphalt against the edge of a longitudinal or transverse construction joint damaged or not placed to a neat line, be sure to saw cut or grind the pavement straight and vertically along the joint and to remove the extraneous material.

- Ensure that longitudinal joints between layers are offset 0.5 foot and that longitudinal joints on the finished surface correspond to the edge of traffic lanes.

- Ensure that the paver spreads the hot mix asphalt at the required thickness and that layer thickness does not exceed 0.25 feet.

- Ensure pavement thickness by comparing the hot mix asphalt spread rate with the theoretical rate and, if necessary, order 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 truck load slip.

  1. Calculate the weight of hot mix asphalt 0.15 foot thick required for one square foot:

     150 x 0.15 = 22.5 lbs./square foot

  2. Calculate the weight of hot mix asphalt for one linear foot:

     22.5 x 12 = 270 lbs./linear foot

  3. Calculate the linear feet that can be covered by one truckload:

(16 tons x 2000 lbs./ton) ÷ 270 lbs./linear foot = 118.5 linear feet

4. Calculate the linear feet covered by one ton of hot mix asphalt:

   2000 lbs/ton ÷ 270 lbs./linear foot = 7.40 feet

5. Calculate the linear feet the paver will travel to spread the load:

   11.0 tons x 7.40 feet/ton = 81.4 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 hot mix asphalt is based on the weight shown on the load slips. Because of the high cost of hot mix asphalt, it is important to monitor the spread rate so an excess of hot mix asphalt is not placed and project funding is not exceeded.

4-3903D (4) Production Startup Evaluation Samples

Section 39-1.07, "Production Start-Up Evaluation," of the *Standard Specification*s requires samples of hot mix asphalt 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, "Methods for Sampling Highway Materials and Products Used in Roadway Structural Section," and give the resident engineer three of the four split samples.
- Test the hot mix asphalt production startup 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 6-1.6. 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 6-105, "Field Tested Material Sample Identification," of this manual. Record the type of mix, the hot mix asphalt 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 hot mix asphalt sample with enough information to identify the exact location. For QCQA process projects, indicate the lot and sublot as well. See the example below in Section 4-3903D (5).

  Check the box on TL-0101 for acceptance test marked "Priority," and include "Production Startup Evaluation Test" under remarks. Also under remarks, list all required acceptance tests. The resident engineer must report the test results to the contractor within three business days of sampling, so samples must be shipped immediately.

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

- Obtain split samples of hot mix asphalt from the mat behind the paver or other location approved by the resident engineer, in accordance with California Test 125, "Methods for Sampling Highway Materials and Products Used in Roadway Structural Section." Table 6-1.6, "Hot Mix Asphalt," in Section 6-1, "Sample

Type and Frequencies," of this manual provides the frequency for sampling hot mix asphalt mix.

Label each hot mix asphalt sample 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). The label must have enough information to identify the exact location if the hot mix asphalt is rejected and must be removed. For QCQA process projects, indicate the lot and sublot as well.

- Test aggregate at the frequency shown in Table 6-1.6 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 6-105, "Field Tested Material Sample Identification," of this manual. Record the type of mix, the hot mix asphalt producer, and the producer's mix identification number. Check the acceptance tests box on the TL-0101, and identify the tests to be performed under remarks:

  1. Asphalt binder content
  2. Stability
  3. Voids in mineral aggregate (report only if an adjustment for asphalt binder content target value is less than ± 0.3 percent from optimum binder content)
  4. Voids filled with asphalt (report only if an adjustment for asphalt binder content target value is less than ± 0.3 percent from optimum binder content)
  5. Dust proportion (report only if an adjustment for asphalt binder content target value is less than ± 0.3 percent from optimum binder content)
  6. Maximum theoretical density (California Test 309, "Theoretical Maximum Specific Gravity and Density of Bituminous Paving Mixtures"), if applicable
  7. California Test 371, "Method of Test for Resistance of Compacted Bituminous Mixture to Moisture Induced Damage," if applicable.

  For the method and standard processes (and for the QCQA process for all requirements other than gradation, asphalt content, and compaction), if any single quality characteristic has two consecutive acceptance or quality control tests not in compliance with the specifications, ensure that before resuming production and placement of hot mix asphalt 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.

- For the QCQA process, in addition to the sampling and testing requirements described above, perform the following:

  1. Test the asphalt binder content of thehot mix asphalt mixture for verification testing at least once every five sub-lots. Contractor quality control test results are used in the QCQA process for acceptance test results if the quality control test results are verified.

2. Ensure that the contractor is complying with the minimum quality control testing frequencies in Section 39-4.03C, "Quality Control Inspection, Sampling, and Testing," of the *Standard Specifications*.

3. Ensure 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 39-4.03E, "Records of Inspection and Testing," of the *Standard Specifications*.

The contractor must stop production, notify the resident engineer, take corrective action, and demonstrate compliance with the specifications before resuming production and placement of hot mix asphalt on the project if any of the following occurs:

1. A lot's composite quality factor or individual quality factor (QFQCi when i = 3, 4, or 5) is below 0.90, determined under Section 39-4.03F, "Statistical Evaluation," of the *Standard Specifications*.

2. A QFQCi for i = 1 or 2 is below 0.75.

3. Quality characteristics with an undetermined quality factor have two consecutive acceptance or quality control tests not in compliance with the specifications.

Daily, ensure that the contractor is submitting both the form CEM-3502, "Hot Mix Asphalt Placement Report," and form CEM-3804, "Hot Mix Asphalt Inspection and Testing Summary," in accordance with Section 39-4.03E of the *Standard Specifications*.

4-3903D (6) Compaction

For standard and QCQA processes, the contractor must comply with the method process in Section 39-3.03, "Spreading and Compacting Equipment," and in Section 39-3.04, "Transporting, Spreading and Compacting," of the *Standard Specifications* if:

- The total paved thickness is less than 0.15 foot.
- The total paved thickness is less than 0.20 foot and a ¾-inch aggregate grading is specified and used.
- The hot mix asphalt is used in:

  1. Asphalt concrete remove-and-replace areas (digout).

  2. Leveling courses.

  3. Detours not included in final roadway prism.

  4. Areas the resident engineer determines that conventional compaction and compaction measurement methods are impeded.

Method Process Compaction

For the method process hot mix asphalt compaction:

- Use the MultiCool 3 program as a guide for determining the length of time available for achieving compaction, based on layer thickness, hot mix asphalt temperature, existing pavement temperature, and atmospheric temperature. The MultiCool 3 program is online:

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

- Ensure that:

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

  Refer to Section 39-3.03 of the *Standard Specifications* for additional compaction equipment requirements and to Section 39-3.04 of the *Standard Specifications* for detailed compaction temperature and coverage requirements.

- Visually inspect the finished hot mix asphalt surface for marks, tearing, and irregular texture that may be caused by segregated mix. Notify the contractor of defective areas.

Compaction Determination by Cores—
Standard and Quality Control Quality Assurance Processes

For standard and QCQA processes, 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.
- The contractor can use any method for quality control testing such as nuclear gauge, non-nuclear gauge, or cores to determine the relative compaction.
- The contractor will obtain the cores for the resident engineer within five days of hot mix asphalt 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 C, "Test Site Location," of California Test 375, "Determining the In-Place Density and Relative Compaction of Asphalt Concrete Pavement."
  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 book and the information in Section 6-105, "Field Tested Material Sample Identification," of this manual. Identify the stationing where they were taken and the area they represent (for example, "lane # 1, first layer"). Label the samples with enough information that the exact location the hot mix asphalt 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 308, Method A). The percentage of maximum theoretical density (compaction) will be determined from hot mix asphalt samples using California Test 309.

4-3903D (7) Smoothness

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 39-1.12B, "Straightedge," 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.

For smoothness, the contractor must profilograph the top layer of hot mix asphalt. Refer to Section 39-1.12C, "Profilograph," of the *Standard Specifications* for additional information about smoothness requirements.

- Witness the contractor profilograph the pavement in accordance with California Test 526, "Operation of California Profilograph and Evaluation of Profiles."
- The contractor must meet zero (null) blanking band Profile Index and must-grinds on the top layer of hot mix asphalt Type A, Type B, and RHMA-G when the total thickness is greater than 0.25 foot.
- The pavement surface must meet smoothness requirements for must-grinds for Type A, Type B, and RHMA-G when total thickness is less than or equal to 0.25 foot.
- The pavement surface for open graded friction course must meet the must-grind requirement if the open graded friction course is placed over hot mix asphalt constructed under the same project.
- Retain one copy of profile information in Microsoft Excel and one electronic copy of longitudinal pavement profiles in ".erd" or other ProVAL format.

4-3903D (8) Miscellaneous Areas and Dikes

The contractor must place hot mix asphalt at miscellaneous areas and place dikes where shown on the plans and in accordance with Section 39-1.13, "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 METS Office of Flexible Pavement 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 hot mix asphalt until its mid-depth temperature is below 160ºF. The contractor may request in writing and the resident engineer authorize cooling of hot mix asphalt Type A and Type B with water when rolling is complete.

For rubberized hot mix asphalt, the contractor must spread sand at a rate between one and two pounds per square yard before opening to public traffic.

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

4-3904 Contract Administration

4-3904 Contract Administration

The resident engineer must review the notice of materials to be used, review and accept the job mix formula for hot mix asphalt, review and accept the contractor's quality control plan when applicable, and verify inspection reports and acceptance testing results for contract compliance. The resident engineer makes decisions regarding non-compliant materials and placement, administers the HMA Pay program for QCQA process, and ensures that pay adjustments are made when required.

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 hot mix asphalt. 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 hot mix asphalt contract administration:

- Verifying the receipt and distribution of form CEM-3101, "Notice of Materials to Be Used." All component materials and materials sources used in hot mix asphalt must be shown on the form.
- Ensuring that the job mix formula for the project is verified and accepted before placement of hot mix asphalt.
- Ensuring that the contractor's quality control plan and its supplements for standard and QCQA processes are submitted and comply with the requirements of the specifications. The quality control plan must describe the organization and procedures used by the contractor to:

  1. Control the quality characteristics.
  2. Determine when corrective actions are needed, based on the contractor's action limit.
  3. Implement corrective actions.

  For standard process, a formal acceptance of the quality control plan is not required. The submitted quality control plan must address the following elements affecting hot mix asphalt quality: aggregate, asphalt binder, additives, and production paving.

  For the QCQA process, refer to Section 4-3902G, "Quality Control Quality Assurance Process," of this manual for review and acceptance of the contractor's quality control plan.

4-3904A Acceptance Testing and Evaluation

The resident engineer ensures that acceptance testing is performed at least at the minimum frequency shown in Table 6-1.6, "Hot Mix Asphalt," in Section 6-1, "Sample

Type and Frequencies," of this manual. Record test results on form CEM-3701, "Test Result Summary," so that minimum acceptance testing frequency is easily verified and documented.

The resident engineer ensures that production startup evaluation testing is completed and recorded on form CEM-3703, "Caltrans Production Startup Evaluation," and that the contractor is provided with a copy of the completed form.

4-3904A (1) Acceptance Test Results Outside Specified Limits

If any acceptance test result is outside the limits specified, notify the contractor in writing that the material may be defective. Attach a copy of the acceptance test result.

For the standard and QCQA processes, ask the contractor if any corrective action has been taken based on quality control test data for the time period when the acceptance sample was taken.

If acceptance test results are disputed within the time frame specified in Section 39-1.06, "Dispute Resolution," of the *Standard Specifications*, try initially to resolve these issues at the project level before involving the independent third party.

If an acceptance test is outside the acceptance specification limits, direct the field construction lab, district materials lab, or METS to test the most recent acceptance sample for compliance with the specifications. Designate this sample for priority testing.

4-3904A (2) Two Consecutive Acceptance Test Results Outside Specification Limits

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

- Inform the contractor in writing that the material represented by the two out-of-specification acceptance tests is defective, and cite Section 6-1.04, "Defective Material," of the *Standard Specifications*. Include a statement that the defective material is rejected and must be removed or remedied in accordance with Section 5-1.09, "Removal of Rejected 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. Use their test results to define the quantity of hot mix asphalt that will be rejected.

- Notify the contractor in writing of all additional acceptance tests results 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 defective and rejected in accordance with Section 6-1.04 and must be removed or remedied to comply with Section 5-1.09 of the *Standard Specifications*.

- Require the contractor to:

  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 hot mix asphalt 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 39-1.06 of the *Standard Specifications*. Try to resolve testing or sampling issues at the project level before involving the independent third party.
- If the contractor agrees that the hot mix asphalt placed is defective, the contractor may propose to the resident engineer in writing that the defective material will be remedied or that the defective material will be left in place for reduced compensation. Consult with district materials engineer and either the METS Office of Flexible Pavement, or 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 contract change order. Document all non-compliant materials test results including the action taken on the final Project Materials Certification. Refer to Section 6-108, "Project Certification," of this manual for documentation requirements.

4-3904B Testing for Significant Difference

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

1. A one-to-one comparison of the test results of a single split sample (job mix formula verification and production startup).
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).
3. The Quality Control Quality Assurance (QCQA) verification process.

The resident engineer should always examine the differences between contractor and state test results for job mix formula verification, production startup, and dispute resolution based on a one-to-one comparison of the test results. For job mix formula verification and production startup evaluation, the test result comparison will show whether the contractor and state can test properly sampled and split samples for aggregate and hot mix asphalt and get reasonably close test results. If a significant difference exists, the resident engineer should notify the contractor. Then both 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—that is, the state's 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 state's 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 the table below 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. Then both the resident engineer and contractor should examine and investigate the cause of test result differences.

In QCQA, the verification process using the t-value is a means of comparing groups of test results. While only the asphalt binder content and individual gradations are subjected to verification, it is reasonable to assume that the same process (equations and tcrit values) can be used to compare the contractor's quality control compaction results to the state's density core results or for other test comparisons. Although this process is somewhat cumbersome, it is statistically sound. However, a weakness with this process is that the statistics might define the two populations (quality control results compared to acceptance results) as unverified; yet both groups might be within the specification boundaries. Therefore, some measure of comparison to "fall back on" is necessary. The specifications for QCQA allow the contractor to continue to produce and place hot mix asphalt if the average of the quality control and acceptance test results are in specification and if the difference between these averages is less than or equal to 1.0 percent for any grading or 0.1 percent for asphalt binder content.

The resident engineer may use the QCQA t-test statistical verification equations and tcrit values to compare the contractor quality control test results and acceptance test results. The t-test is shown in Section 39-4.04B, "Verification Sampling and Testing," of the *Standard Specifications*. If the results of the statistical verification show that the contractor's test results are unverified, use the averages column in the table below as the measure of comparison to fall back on. If the test results are significant different, notify the contractor. Then both the resident engineer and contractor should examine and investigate what is causing the test result differences.

For QCQA, standard, or disputes in method projects, use the reasonable testing difference values in the table below to evaluate whether a significant testing difference exists.

Precision Index Table

Quality Characteristic	California Test	Reasonable Testing Differences	
		Single Results	Averages
Sand equivalent	217	6	2
Stabilometer value	366	10	4
Theoretical Maximum Specific Gravity [1]	309	0.05	0.02
Percentage of Maximum Specific Gravity [1]		3% [2]	1% [3]
		2% [4]	
Design air voids content [1]	367	2.8%	4.5

Asphalt binder content	379 382	0.3% 0.5%	0.1% 0.2%
Aggregate gradation	202		
3/4" or 1/2"		3%	1%
3/8"		3%	1%
No. 4		3%	1%
No. 8		3%	1%
No. 30		3%	1%
No. 200		3%	1%

[1] Examine the CT309 values also. Determine whether resolution of CT 309 is necessary and sufficient to resolve issues with % MTD or design air void content.

[2] Comparing one core to the average of QC test results within the same 250 tons.

[3] Comparing the average of the state's cores to the average of QC test results for the same volume of hot mix asphalt or the same area.

[4] Comparing the average of three of the state's cores in 750 tons to the average of QC test results for the same 750 tons of hot mix asphalt.

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 ensure 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.

Ensure that asphalt binder contract administration requirements are met by following Section 4-92 of this manual.

4-3904D Quality Control Quality Assurance Process

For the QCQA process, follow these additional contract administration requirements:

- Ensure the contractor is complying with the accepted quality control plan.
- Ensure contractor's compliance with the quality control testing requirements by reviewing the daily submittal of forms CEM-3501, " Hot Mix Asphalt Production Report, CEM-3502, "Hot Mix Asphalt Placement Report and CEM-3804, "Hot Mix Asphalt Inspection and Testing Summary," for each day of paving.
- Use the statistical evaluation program, "HMA Pay," to verify that the contractor's quality control tests for aggregate gradation and asphalt binder content can be used as acceptance tests.

- Ensure quality hot mix asphalt by determining that:
  1. A lot's composite quality factor (see Section 39-4.05B, "Statistical Evaluation, Determination of Quality Factors and Acceptance," of the *Standard Specifications*) is greater than or equal to 0.90.
  2. The individual quality factors for gradations for the number 200 sieve, asphalt content, and compaction are greater than or equal to 0.90.
  3. The individual quality factors for the largest sieve and the number 8 sieve are greater than or equal to 0.75.
  4. The individual quality factor for percent of maximum theoretical density, using the test results from the cores taken by the engineer, is greater than or equal to 0.90.

  If any of these conditions is not met, terminate the lot and adjust payment.

4-3905 Measurement and Payment

4-3905 Measurement and Payment

For details of measurement and payment, review Section 39-5, "Measurement and Payment," of the *Standard Specifications*.

For guidelines on how to weigh hot mix asphalt, refer to Section 3-903E, "Weighing and Metering Procedure," of this manual.

For measuring asphalts, liquid asphalts, and asphaltic emulsions used as tack coat, refer to Section 4-92, "Asphalts"; Section 4-93, "Liquid Asphalts"; and Section 4-94, "Asphaltic Emulsions," of this manual.

4-3905A Quality Control Quality Assurance Process Payment Adjustment

Process a contract change order to allow for payment increase or decrease based on monthly calculated payment adjustment.

Make QCQA payment adjustments on the next monthly estimate when a lot (20 sublots) is accepted. If the next lot consists of fewer than eight sublots, these sublots must be added to the previous lot for QCQA payment adjustment.

4-3905B Standard Process Payment Adjustment for Core Density

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 39-2.03, "Engineer's Acceptance," of the *Standard Specifications*." The core density (compaction) deduction should be taken on the next monthly estimate as an administrative deduction.

4-3905C Compensation Adjustment for Price Index Fluctuation

For compensation adjustments for price index fluctuation for asphalt binder, perform the following:

- Process a contract change order to allow for payment increases or decreases.
- Calculate the amount of asphalt used monthly in hot mix asphalt and tack coat.
- Calculate a paving asphalt adjustment if the California Statewide Paving Asphalt Price Index for the current month has fluctuated by more than the specified amount in the same index for the month in which the bid opening for the project occurred. Include the asphalt payment adjustment on the monthly estimate.

4-3905D 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 according to Section 8-1.09, "Right of Way Delays," of the *Standard Specifications* and processes a contract change order to allow for payment and adjustment.

4-3905E 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 8-1.09, of the *Standard Specifications*:

- Within 20 days of sampling for job mix formula verification.
- Within three days of rubberized hot mix asphalt production sampling for job mix formula verification.
- Within three days of sampling for production startup evaluation.

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

4-3906 References and Resources

4-3906 References and Resources

The following lists of references and resources provide construction personnel with additional sources of information.

4-3906A References

California Test Methods, METS:

http://www.dot.ca.gov/hq/esc/ctms/index.html

Certification Program for Suppliers of Asphalt, METS:

http://www.dot.ca.gov/hq/esc/Translab/fpmcoc/index.html

CEM forms, Division of Construction:

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

Independent Assurance Manual, Procedures for Accreditation of Laboratories and Qualification of Testers, METS:

http://www.dot.ca.gov/hq/esc/Translab/fpm/IAP.htm

Lab Procedures and Engineering Testing Services, Department of Transportation:

http://www.dot.ca.gov/hq/esc/ctms/index.html

Maintenance Technical Advisory Guide (MTAG), Office of Pavement Preservation, Division of Maintenance:

http://www.dot.ca.gov/hq/maint/MTA_Guide.htm

Materials Plant Quality Program, Division of Construction:

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

http://www.dot.ca.gov/hq/maint/MTA_Guide.htm

Construction of Hot Mix Asphalt Pavements, Asphalt Institute

Quality Control Manual for Hot Mix Asphalt, Division of Construction:

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

Standard Specifications, Department of Transportation

Tack Coat Guidelines, Division of Construction:

http://www.dot.ca.gov/hq/construc/publications/tackcoatguidelines.pdf

Weights and Measures Handbook, Division of Construction:

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

4-3906B Resources

Use available experts within your district or region to resolve issues and obtain additional information about hot mix asphalt production and placement. Contact the construction engineer and Division of Construction coordinator for issues about contract administration related to hot mix asphalt 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, "Hot Mix Asphalt," 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 Flexible Pavement
Materials and Engineering Testing Services
State of California, Department of Transportation

For quality control quality assurance issues:

Headquarters QCQA Coordinator
Office of Flexible Pavement
Materials and Engineering Testing Services
State of California, Department of Transportation

For contract administration, measurement or payment issues:

Chief, Office of Construction Engineering
Division of Construction
State of California, Department of Transportation

Section 82 Markers and Delineators

Section 82
Markers and
Delineators

4-8201 General

4-8201
General

This section describes the work for providing and installing markers and delineators at locations shown on the plans or where the engineer directs. Object markers are used to mark obstructions within or adjacent to the roadbed, including paved shoulders. Delineators are reflective devices mounted, in a series, at the side of the roadway to indicate the roadway alignment.

4-8202 Before Work Begins

4-8202
Before Work Begins

Before work begins, take the following steps:

- Review the marker and delineator lists shown on the plans, and inform the contractor of any changes, preferably before material is ordered or information is stenciled on the markers. The California *Manual of Uniform Traffic Control Devices* (California MUTCD), Part 3, provides design details for markers and delineators.
- Determine the proper receipt and distribution of form CEM-3101, "Notice of Materials To Be Used," which covers markers and delineators. All materials listed should be from the lists of approved products contained in the materials portion of the special provisions.
- Examine markers and delineators to ensure they meet specification. Verify that they match the materials shown on form CEM-3101 and that a correctly prepared Certificate of Compliance accompanies the material.
- Provide the contractor with a list of post mile values to be stenciled on highway post markers.
- Order and obtain the state-furnished material identified in the special provisions.

4-8203 During the Course of Work

4-8203
During the
Course of Work

Inspect the materials and method of installation according to the *Standard Specifications* and special provisions. This inspection will include, but is not limited to, the following steps:

- Ensure that the contractor's layout work conforms with the plans.
- Document and approve minor deviations from the plans.
- Before the material is incorporated, inspect material either by collecting the inspection tags or matching the material against information in the Certificate of Compliance.
- Ensure that the contractor follows the method of placement specified in the *Standard Specifications* and the special provisions.
- During the installations of target plates, check that the contractor has used washers and installed nuts and rivets properly.

- After installation, check for any damage to the installed material and document any rejections.
- Do a night inspection to check and document the reflectivity of the installed material. If you encounter any problems, notify the contractor immediately so the contractor can make corrections.

4-8204 Measurement and Payment

4-8204 Measurement and Payment

Count markers and delineators, and record the counts to support partial and final payments.

Section 92 Asphalt

Section 92 Asphalt

Section 92
Asphalt

4-9201 General

4-9201 General

Asphalt, as defined in Section 92, "Asphalts," of the *Standard Specifications*, is also referred to as asphalt binder or paving asphalt. Asphalt is used in hot mix asphalt, in asphalt-treated permeable base, as pre-coating for aggregate used in seal coats, and as a tack coat. At normal ambient temperatures, asphalt is a solid and must be heated before it is mixed with aggregates or is applied as tack coat.

A contract's special provisions may specify the type of asphalt to be used.

Construction of Hot Mix Asphalt Pavements, published by the Asphalt Institute, contains information on the uses of various types of asphalts and the design and production of hot mix asphalt.

4-9201A Performance Grade Asphalt

Performance-grade asphalts and performance-grade polymer-modified asphalts are selected based on the range of temperatures under which the asphalt must perform.

Performance-grade asphalt binders and performance-grade polymer-modified asphalt binders are tested to meet physical properties directly related to field performance of the pavement at extreme temperatures. An asphalt binder specified as performance grade PG 64-10 has the physical properties needed for field performance of pavement at an average seven-day maximum temperature of 64ºC and at a minimum pavement temperature of -10ºC.

Because of heavy traffic, the performance-grade asphalt binder specified for a climate region of the state may be "bumped" a grade. Performance-grade asphalt information and the pavement climate map are available on the Office of Pavement Engineering webpage.

http://www.dot.ca.gov/hq/esc/Translab/ope/Climate.html

4-9201B Asphalt Rubber Binder

Only two performance-grade asphalt binder grades are used as the base binder for asphalt rubber binder (ARB). Typically, the ARB base binder chosen for a project will be an asphalt grade less than what is specified for a Caltrans pavement climate region because of the additional binder stiffness provided by the crumb rubber modifier.

4-9201C Certification Program for Suppliers of Asphalt

The *Certification Program for Suppliers of Asphalt* specifies requirements and procedures to help ensure that quality asphalt is produced for Caltrans projects. This certification program is system-based and incorporates reviews and statistical evaluations of a supplier's product and testing program. The certification program also includes historical data analysis of supplier and Caltrans random testing of producer-supplied samples, as well as test results from quality assurance samples taken at project sites.

4-9201D Quality Assurance

The Caltrans quality assurance program specifies that acceptance samples taken at project sites must be used for acceptance of asphalt. For asphalt acceptance sampling, the plant inspector and the hot mix asphalt paving inspector have to be qualified on Part 6, "Method for Sampling Bituminous Materials," of California Test 125, "Method for Sampling Highway Materials and Products Used in the Roadway Structural Sections."

See the *Independent Assurance Manual: Procedures for Accreditation of Laboratories and Qualification of Testers* for California Test 125 qualification.

Asphalt binder and tack coat are very hot, so for safety, the Caltrans inspector must only witness the contractor obtaining the necessary asphalt samples before taking control of the samples.

4-9202 Before Work Begins

4-9202 Before Work Begins

Section 92, "Asphalt," of the *Standard Specifications* requires the contractor to comply with the *Certification Program for Suppliers of Asphalt*. Perform the following before work begins:

- Verify the receipt and proper distribution of form CEM-3101, "Notice of Materials to Be Used," which must detail asphalt used in various contract items.
- Verify that the asphalt binder supplier is on the Caltrans approved supplier list.
- If the asphalt supplier is not on the Caltrans approved supplier list, notify the contractor that before use, asphalt binder samples must be taken from each truckload and tested in accordance with Section Q, "Requirements for Suppliers Supplying Asphalt Without a Certificate of Compliance," of the *Certification Program for Suppliers of Asphalt*.

4-9202A Devices for Measuring Asphalt Volume

Ensure that the contractor properly equips delivery trucks, storage tanks, and hot mix asphalt plants with the specified devices for measuring asphalt volumes. See the *Materials Plant Quality Program* for detailed requirements.

4-9202B Tack Coat

When asphalt is used for tack coat:

- Review the *Tack Coat Guidelines* for information about application rates and general information.
- Ensure that the contractor will use a distributor truck that meets the requirements of Section 93-1.03 "Mixing and Applying," of the *Standard Specifications*.
- When tack coat is a contract item, inform the contractor at the prepaving conference that measurement will be made by scale weights or, if the engineer allows, by volumetric measurement.
- Review the contract's measurement and payment clauses, and determine if tack coat is included in other contract bid items or is paid separately

4-9203 During the Course of Work

Material acceptance sampling frequencies and testing frequencies shown in Section 6-1, "Sample Type and Frequencies," of this manual are not the same. Ship to Materials and Engineering Testing Services (METS) samples at the minimum testing frequency shown in Section 6-1, and store the remaining samples in case additional acceptance testing is necessary.

The contractor may request that the engineer split acceptance samples. If requested, witness the contractor splitting samples into four parts. Test one, provide one to the contractor, and store two for dispute resolution.

Section 39-1.06, "Dispute Resolution," of the *Standard Specifications* contains a dispute resolution process for hot mix asphalt. The dispute resolution process allows the contractor to dispute any acceptance test result within five days of receiving the result. It is important to split sample materials and for Caltrans to take possession of and store the split samples. If a dispute occurs, the independent third party laboratory uses split samples of disputed material for evaluation. To be used by the independent third party, split samples must be in the possession of and stored by Caltrans. Stored split samples may be discarded five days after the contractor has received the associated acceptance test result.

4-9203A Plant Operations

The plant inspector takes the following steps related to asphalt used in hot mix asphalt:

- Ensures 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 Section Q, "Requirements For Suppliers Supplying Asphalt Without A Certificate of Compliance," of the *Certification Program for Suppliers of Asphalt*.

  Notifies the contractor and engineer immediately if asphalt binder testing has not been completed for a supplier not on the approved suppliers list.

  Unless the resident engineer approves, does not allow use of asphalt from a non-approved supplier before receiving Caltrans test results.

- Ensures that certificates of compliance are received with each truckload of asphalt binder delivered to the plant. Confirms that the source of asphalt is the same source as shown on form CEM-3101, "Notice of Materials to Be Used," and for hot mix asphalt that the same source is shown on form CEM-3511 "Contractor Job Mix Formula Proposal."

  Each certificate of compliance must show:

  1. Name and location of supplier.
  2. Grade of the asphalt.
  3. The date and time of shipment.
  4. A unique shipment number, such as a bill of lading or manifest number.
  5. A statement confirming that the transport vehicle was checked before loading and was found acceptable for the asphalt shipped.

The certificate of compliance must include the following wording:

> ____(Supplier name)____ hereby certifies that the asphalt product accompanying this certificate was produced in accordance with the California Department of Transportation's *Certification Program for Suppliers of Asphalt* and that this product complies with all requirements of the applicable specifications for the asphalt product identified on this document. I certify by my signature that I have the authority to represent the supplier providing the accompanying asphalt product.

Notifies the resident engineer immediately if there appears to be a change in the source of asphalt binder.

- Witnesses the contractor obtaining split samples of asphalt binder.

  Ensures that the contractor samples in accordance with California Test 125, "Methods for Sampling Highway Materials and Products Used in Roadway Structural Section."

  Samples asphalt binder at the frequency shown in Section 6-1, "Sample Type and Frequencies," of this manual.

  To comply with the requirements of the Caltrans quality assurance program, samples asphalt binder in the presence of the engineer and ensures that the sample is in the possession of and stored by Caltrans for proper chain-of-custody control.

  Completes form TL-0101, "Field Tested Material Sample Identification," for each sample of asphalt binder taken, following the directions printed in this forms book and as directed in Section 6-2, "Acceptance of Manufactured Material and Sampling Methods," of this manual. Ships the random samples to METS for testing as detailed in the section.

4-9203B Street Operations

The street inspector takes the following steps related to asphalt used as tack coat:

- Ensures that the asphalt supplier is on the Caltrans approved supplier list or that asphalt samples have been taken from each truckload and tested in accordance with Section Q, "Requirements For Suppliers Supplying Asphalt Without a Certificate of Compliance," of the *Certification Program for Suppliers of Asphalt*. Notifies the contractor and resident engineer immediately if asphalt binder testing has not been completed for a supplier not on the approved suppliers list.

  Unless the resident engineer approves, does not allow use of asphalt from a non-approved supplier before receiving Caltrans test results.

- Ensures that the distributor truck used for tack coat complies with the requirements in Section 93-1.03 "Mixing and Applying," of the *Standard Specifications*.

- When tack coat is a contract item, it is good practice to measure the volume and temperature of asphalt in the distributor truck before discharge and to make a volumetric and temperature measurement whenever a partial load leaves the work. These actions result in a good check against scale weights, and the second measurement may be used if the contractor fails to submit a weight ticket for the unused asphalt.

- Ensures that tack coat is applied properly by following the application section in *Tack Coat Guidelines*.

- Witnesses the contractor obtaining split samples of asphalt used as tack coat and ensures that the contractor samples in accordance with California Test 125, "Methods for Sampling Highway Materials and Products Used in Roadway Structural Section."
- Samples asphalt used for tack coat at the frequency shown in Section 6-1, "Sample Type and Frequencies," of this manual.
- To comply with the requirements for the quality assurance program, asphalt samples must be taken by the contractor and witnessed by Caltrans must be in the possession of and stored by Caltrans for proper chain-of-custody control.

  Completes form TL-0101, "Field Tested Material Sample Identification," for each sample of tack coat taken, following the directions printed in this forms book and as directed in Section 6-2, "Acceptance of Manufactured Material and Sampling Methods," of this manual. Ships the random samples to METS for testing as detailed in the section.
- Ensures that certificates of compliance are received with each truckload of tack coat used in the work. Confirms that the source of tack coat is the same source as shown on form CEM-3101, "Notice of Materials to Be Used." Each certificate of compliance must show:

  1. Name and location of supplier.
  2. Grade of the asphalt.
  3. The date and time of shipment.
  4. A unique shipment number, such as a bill of lading or manifest number.
  5. A statement confirming that the transport vehicle was checked before loading and was found acceptable for the asphalt shipped.

  The certificate of compliance must include the following wording:

  > ____(Supplier name)____ hereby certifies that the asphalt product accompanying this certificate was produced in accordance with the California Department of Transportation's Certification Program for Suppliers of Asphalt and that this product complies with all requirements of the applicable specifications for the asphalt product identified on this document. I certify by my signature that I have the authority to represent the supplier providing the accompanying asphalt product.

  Notifies the resident engineer immediately if there appears to be a change in the source of tack coat.

4-9204 Contract Administration

4-9204 Contract Administration

The resident engineer ensures that the asphalt used in the work meets the specifications and that payment adjustments are made when required. The resident engineer performs the following contract administration to ensure asphalt quality.

4-9204A Acceptance Test Results

Ensure that acceptance testing is being performed at the minimum frequencies shown in Section 6-1, "Sample Type and Frequencies," of this manual. Record test results on form CEM-3701 "Test Result Summary," so that minimum acceptance testing frequency is easily verified and documented.

- If any acceptance test result is outside the specified limit(s) per Section 6-1.04 "Defective Material," of the *Standard Specifications*, notify the contractor in writing that the material may be defective. Ask the contractor if corrective action has been taken based on quality control test data for the time period the acceptance sample was taken. Attach a copy of the test result indicating that material is outside specification limit(s).
- For hot mix asphalt, the contractor may dispute an acceptance test result within five days of receiving the test result by notifying the engineer in writing, according to Section 39-1.06, "Dispute Resolution," *Standard Specifications*. Try to resolve testing or sampling issues at the project level before involving an independent third party.
- If an acceptance test is outside the acceptance specification limit(s), verify that METS is testing the most recent acceptance sample for compliance with the specifications. When there are failing acceptance tests, do not follow minimum acceptance sample frequencies shown in Section 6-1, "Sample Type and Frequencies," of this manual for conducting the next acceptance test.

4-9204B Stop Production

- If two consecutive acceptance test results do not comply with the specifications, notify the contractor to stop the work. Inform the contractor in writing that the material represented by the two out-of-specification acceptance tests is defective according to Section 6-1.04, "Defective Material," of the *Standard Specifications* and that the defective material is rejected and must be removed or remedied in accordance with Section 5-1.09, "Removal of Rejected and Unauthorized Work," of the *Standard Specifications*. Attach a copy of the test result indicating that material is outside specification limit(s).
- When the work has been stopped because two consecutive acceptance test results do not comply with the specifications, require the contractor to:

  1. Provide written documentation of corrective action taken to correct the cause of out-of-specification material.
  2. Take samples in the engineer's presence, and split the samples into four parts. To avoid placing additional out-of-specification material do not take samples on an active project.
  3. Test one part of the split sample for compliance with the specifications to verify that the corrective action taken by contractor has corrected any problem. If both Caltrans and contractor's test results are within specifications and are not significantly different (that is, test results within multi-laboratory precision), the contractor has demonstrated compliance with the specifications and may resume production.

- As above, the contractor may dispute the second out-of-specification acceptance test result within five days of receiving the test result by notifying the engineer in writing per Section 39-1.06, "Dispute Resolution," of the *Standard Specifications*. Try to resolve testing or sampling issues at the project level before involving an independent third party.

- When two consecutive acceptance tests are outside the acceptance specification limit(s), notify METS to test all samples collected between the two out-of-specification acceptance tests. Start testing samples backward from the first out-of-specification acceptance test until the test result obtained is within specification limit(s). Notify the contractor in writing of additional acceptance tests results conducted to ascertain the extent of the defective material. Tell the contractor that material represented by out-of-specification material is defective and rejected in accordance with Section 6-1.04, "Defective Material," of the *Standard Specifications* and that the defective material is rejected and must be removed or remedied in accordance with Section 5-1.09, "Removal of Rejected and Unauthorized Work," of the *Standard Specifications*.
- The contractor may notify the engineer in writing that defective material will be remedied or left in place at reduced compensation. Consult with the district materials engineer and the METS Office of Flexible Pavement about acceptance of the contractor-proposed remedy. Document material remediation or reduced pay by issuing a contractor-requested contract change order, including the action taken on final project materials certification. Refer to Section 6-108, "Project Certification," of this manual for material certification and the requirement to list all nonconforming materials.

4-9204C Certificates of Compliance

For certificates of compliance for asphalt:

- Verify that the source and grade of asphalt used as asphalt binder or tack coat has not changed during the course of the work, except with engineer's approval.
- Verify that the appropriate number of certificates of compliance have been received to cover the quantities of asphalt binder and tack coat used in the work. Calculate the tons of asphalt binder required based on the percentage of binder in the hot mix asphalt placed, and compare the result with the amount covered by the certificates of compliance. For tack coat summarize the daily tons used and compare to the amount covered by the certificates of compliance.
- Document action taken on final project materials certification if certificates of compliance are missing. Refer to Section 6-108, "Project Certification," of this manual for material certification and the requirement to list all non-conforming materials.

4-9204D Compensation Adjustments for Price Index Fluctuation

For compensation adjustments for price index fluctuation, perform the following for asphalt binder and asphalt used as tack coat:

- Process a contract change order to allow for payment adjustments—increase or decrease—based on total estimated potential payment adjustment.
- Calculate the amount of paving asphalt used monthly in hot mix asphalt and tack coat.
- If the index for the current month has fluctuated by more than 5 percent from the index for the month in which the bid opening for the project occurred, calculate the asphalt payment adjustment including the adjustment on the monthly estimate.

4-9205 Measurement and Payment

Section 92, "Asphalt," of the *Standard Specifications* does not contain provisions for payment. Payment clauses for asphalt are found in the sections covering the work in which asphalt is used. For details on asphalt measurement, review Section 92-1.04 "Measurement," of the *Standard Specifications.*

- When making volumetric measurements of asphalt used as tack coat, measure the temperature, and apply the proper factors for converting volume to mass.
- If applicable, when asphalt is used in hot mix asphalt and dispute resolution determines the contractor's test results are correct, the state pays the independent third party testing costs. When the contractor's test results are correct, the resident engineer adjusts payment and contract time under Section 8-1.09, "Right of Way Delays," of the *Standard Specifications*.

4-9206 References and Resources

4-9206A References

California Test _____, METS

Certification Program for Suppliers of Asphalt, METS

http://www.dot.ca.gov/hq/esc/Translab/fpmcoc/index.html

Independent Assurance Manual, Procedures for Accreditation of Laboratories and Qualification of Testers, METS

http://www.dot.ca.gov/hq/esc/Translab/fpm/IAP.htm

Materials Plant Quality Program, Division of Construction

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

Performance Grade Binder, Division of Design, Office of Pavement Engineering

http://www.dot.ca.gov/hq/esc/Translab/OPD/Divisionof Design-Pavement-Program.htm

Construction of Hot Mix Asphalt Pavements, published by the Asphalt Institute

Standard Specifications, Caltrans

Tack Coat Guidelines, Division of Construction

http://www.dot.ca.gov/hq/construc/publications/tackcoatguidelines.pdf

4-9206B Resources

Use available experts within your district or region to resolve issues or obtain additional information about asphalt. Contact the construction engineer and the Division of Construction field coordinator for issues about contact administration related to asphalt specifications. When district or region experts cannot address questions about Section 92, "Asphalt," of the *Standard Specifications* or related special provisions, or if the construction engineer advises the resident engineer to contact the Division of Construction for assistance, please contact one of the following:

Materials or testing issues:

Chief, Office of Flexible Pavement
Materials and Engineering Testing Services
State of California, Department of Transportation

Quality control quality assurance issues:

Headquarters QCQA Coordinator
Office of Flexible Pavement
Materials and Engineering Testing Services
State of California, Department of Transportation

Contract administration, measurement or payment issues:

Chief, Office of Construction Engineering
Division of Construction
State of California, Department of Transportation

Conduct of the Work

Section 0 Conduct of the Work

5-001 Resident Engineer's Pending File

For guidance and information, the project engineer assembles and forwards to the resident engineer a set of letters, memoranda, and other data titled "resident engineer's pending file." This file must contain all pertinent information, comments, and advice that may be useful on the specific project to which the resident engineer is assigned. A detailed list of the information that should be included in the resident engineer's pending file is contained in Chapter 15, "Final Project Development Procedures," Section 2, "Construction," of the *Project Development Procedures Manual*. The file usually includes the following:

- Memoranda between programs, service centers, and districts, especially comments about preliminary reports and dummy special provisions.
- Special requirements that are enumerated in the freeway agreement and that may require action by the resident engineer. For instance, a special requirement may be notification of the date work begins on locally owned facilities.
- Memoranda about materials from the Office of Materials Engineering and Testing Services or the district materials unit.
- Copies of right-of-way agreements that require work to be done under the contract or that affect the project's construction.
- Copies of "Notice to Owner," which covers utilities and their completion status.
- Copies of the partially completed Form FA-2134, "Utility Service Request," which the resident engineer will use for the installation and coordination of utility services. Forward this form to the Division of Accounting and the district signals and lighting coordinator. If there is no form and the plans have utilities, contact the district signals and lighting coordinator to ensure proper procedures are followed. This form is available on the Division of Accounting's website at:

  http://cefs.dot.ca.gov/

- Copies of correspondence giving the background of any unusual project features.
- All pertinent engineering data previously prepared in connection with the project. This data should include the project engineer's quantity calculations.
- Copies of the project report, preliminary report, and materials reports.
- A copy of the "materials information" as given to prospective bidders.
- A copy of the environmental document, including any permits, agreements, and commitments.
- A separate summary of all environmental commitments, as well as any special instructions or explanations for meeting permit and other legal requirements and commitments to other agencies.

The resident engineer must consult with the project engineer who forwarded the file if the file has any of the following problems:

- Information appears to conflict.
- Information appears to be missing.
- Additional information or explanations are required.

5-002 Preconstruction Conference With Caltrans Personnel

5-002 Preconstruction Conference With Caltrans Personnel

Before the start of construction, the resident engineer should review the job with the following people:

- Project manager
- Project engineer
- Right-of-way agent
- Hydraulics engineer
- Traffic engineer
- Materials engineer
- Maintenance superintendent
- Environmental—construction liaison
- Construction storm water coordinator
- Environmental planner
- Public information officer
- Landscape architect (if landscape work is included in the project)
- Local agencies and communities
- Affected utility companies
- Others who may have a direct interest in the project

At this preconstruction stage, such a review will significantly aid in explaining the reasons for certain design features such as the following:

- Right-of-way obligations
- Signing and traffic handling difficulties
- Materials sites
- Selected material
- Foundation treatment
- Potential slides
- Environmental commitments
- Potential drainage and maintenance problems, including erosion control and water pollution

The resident engineer must ensure implementation of environmental mitigation measures included in the project approval. To be fully informed of the environmental mitigation measures, commitments, or concerns on projects that include environmental commitments, the resident engineer must review the environmental commitment record and meet with the assigned environmental staff. At the same time, the resident engineer can reach agreement on both the assistance required from environmental specialists and also the tentative schedule and plan for environmental monitoring.

On projects involving structure construction personnel, preconstruction conferences are mandatory and should be held as soon as possible after bids are opened. The conferences should include structure and construction engineers, the resident engineer, and the structure representative. These personnel should reach agreement regarding the following items:

- Office facilities. The district must provide suitable office space and furniture for both district and structure field personnel. When the office facilities are trailers, the resident engineer and structure representative should both occupy the same trailer. When the office facilities are in a building, the engineer and the representative should occupy adjacent rooms. This arrangement facilitates the assignment of the structure engineer as acting resident engineer during extended absences of the assigned resident engineer.
- Personnel for the total work. Conference participants must discuss the total work (both road work and structure work) and take full advantage of instances where people could be used interchangeably to reduce the number of people on the project. When the contractor's schedule is available, meeting participants must review the personnel required.
- Division of the work. The items should be categorized as roadwork and structure work, In some cases, the item may be divided by portions of items or by phases of the work. Before the start of work, the Office of Structure Construction requires from the structure representative a written report on this categorization of the work.

5-003 Preconstruction Conferences With the Contractor

5-003 Preconstruction Conferences With the Contractor

Before the start of work, a conference must be held. Depending on the project's complexity, more than one conference may be desirable to limit the scope and number of individuals attending. The conferences must include the resident engineer and structure representative and may include principal assistants, the construction engineer, the district construction deputy director, the contractor's superintendent, and other key personnel. Specialists should be included too, such as the district labor compliance officer and the district safety coordinator, among others. Alternatively, the resident engineer may cover the respective responsibilities.

When environmental commitments have been made that affect or constrain the contractor's operations, the environmental—construction liaison and other appropriate environmental specialists should also attend the preconstruction conference with the contractor.

Meeting participants should discuss, among other items, the following:

- Work plans
- Equipment to be used

- Progress schedule
- Layout of job
- Labor compliance
- Equal employment opportunity
- Safety requirements
- Environmental commitments and permits
- Water pollution control requirements

This discussion affords both parties a common understanding of the proposed work and the problems and possible solutions that may be expected during the life of the contract.

The contractor should receive advance notice of the items that will be discussed. Among other documents, the contractor must bring a copy of the contractor's "Code of Safe Practices" and a water pollution control plan. The project file must contain a record of the conferences (or the reason for omitting a conference). Depending on the conference's complexity, the record can be a relatively complete set of minutes or a copy of the resident engineer's daily report.

The police, fire department, public transportation agency, schools, and other affected agencies should receive any information developed from the meetings that will affect these agencies' operations.

In the list below, we present the guidelines for the preconstruction conference. However, bear in mind that these are reminders only. Items will or will not be included depending upon their applicability to a specific project. Also, consider any previous experience of a particular contractor with Caltrans projects. Further, the district construction office may have completed some of the items listed below, and therefore, these items need not be included at the conference.

- Introduce all participants, including in your introduction statements about each person's responsibilities for the project.
- Discuss superintendence as well as lines of authority for both contractors and Caltrans personnel. If you have not yet received it, request the written information required by Section 5-1.06, "Superintendence," of the *Standard Specifications*.
- Discuss the subcontracting requirements covered in Section 8-1.01, "Subcontracting," of the *Standard Specifications*.
- When required by the special provisions, discuss railroad insurance.
- Discuss requirements related to labor compliance and equal employment opportunity. Advise the contractor of the deadlines for submitting payrolls and other required documents. Also advise the contractor of the contractual and administrative deductions that will be applied for noncompliance. Provide the necessary state—furnished forms and posters.
- Review the contract's safety requirements.

- Discuss the procedure for inspecting materials, particularly the early submittal of Form CEM-3101, "Notice of Materials to Be Used."
- When the contract requires, discuss the contractor's quality control plans.
- Discuss the requirements for submitting working drawings.
- Discuss the progress schedule (if the contract requires). If the contract requires a critical path method schedule, discuss the provisions for submitting, reviewing, updating, and revising it. See Section 3-803, "Progress Schedule," of this manual.
- Discuss weighing procedures, weight limitations, and the Caltrans policy on overloads. For more information, see Section 3-702, "Load Limitations," of this manual.
- Advise the contractor of administrative procedures and deadlines for payment for material on hand. Give the contractor the required Form CEM-5101, "Request for Payment for Materials on Hand."
- Discuss the requirements for submitting survey requests and any significant survey issues.
- Review the contract's provisions about water pollution control. Discuss the contractor's water pollution control plan.
- Review the contract's provisions and the environmental commitments record for environmental permits and agreements. Discuss the contractor's plan for implementing environmental commitments and environmental work windows.
- Remind the contractor to submit a program to control water pollution before beginning work.
- Discuss the requirements for handling public traffic.
- Discuss any unusual project features.
- Remind the contractor of the contractual procedures to follow in the event of disagreements. Emphasize the necessity for timely written notices. Furnish Form CEM-6201, "Notice of Potential Claim."
- Discuss the scheduling of utility work. For a discussion of utility preconstruction conferences, see Section 3-809, "Utility and Non-Highway Facilities," of this manual.

5-004 Resident Engineer's Daily Report

5-004 Resident Engineer's Daily Report

The following instructions are directed to the resident engineer who must do the following:

- For each contract day during the project's life, make a daily report on Form CEM-4501, "Resident Engineer's Daily Report/Assistant Resident Engineer's Daily Report."

- Include any information that may be pertinent even though no activity may have occurred. For example, such information could include support for determining working or nonworking days. Include the following in the daily report:

    1. Important discussions and agreements with the contractor. Record these on the day discussed. Give the names of specific persons to whom instructions were given or with whom agreements were made. If the contractor objects or comments, note these items, too. Actual quotations on significant discussion points can be useful. Through letters to the contractor, confirm important verbal instructions. (Also, see Section 5-403, "Response to Disputes," of this manual.)
    2. A general statement about the type of work done. Include the controlling operation and any facts concerning the work's progress.
    3. Weather conditions such as maximum and minimum temperatures and precipitation, among other items. Expand on exceptional weather conditions.
    4. Statements of any other important facts pertaining to the contract that are not specifically covered elsewhere in the contract records.

- Keep the report concise, yet include any important information. The report should not contain routine matters, such as quantities placed, that can be found in other records.
- Promptly send one copy of the daily report to the construction engineer, who will review the copy. After the review, the construction engineer may discard the copy or file it until the project's completion, in accordance with district policy. Retain the original copy with the project records.

5-005 Assistant Resident Engineer's Daily Report

5-005 Assistant Resident Engineer's Daily Report

To report the activity for a contract item, assistant resident engineers must submit a report for each contract day. Complete the report on Form CEM-4601, "Assistant Resident Engineer's Daily Report." Also, use this form for reporting extra work and for labor compliance. The form contains a narrative portion and a tabular portion.

The narrative portion of the assistant resident engineer's report should include statements about the contractor's operation and the activities of the individual preparing the report. The description of the contractor's operation should include the following:

- The location where the work was performed
- A brief description of the operation
- The quantities placed or the amount of work completed for the day
- Significant statements by the contractor

The statement of the assistant resident engineer's activities should be sufficient to demonstrate the performance of duties such as those outlined in Chapter 4, "Construction Details," of this manual. Record observations of contractor compliance or noncompliance, actions taken, statements made to the contractor, and approvals given.

Use the tabular portion of Form CEM-4601, to report the following:

- Extra work. For details, see Section 3-904D, "Extra Work Records," of this manual.
- Hours worked by labor and equipment. Provide sufficient detail to permit a review of the contractor's costs in a manner similar to force account. Using the publication titled *Labor Surcharge and Equipment Rental Rates (Cost of Equipment Ownership)*, sufficiently identify equipment to enable the determination of applicable rental rates. Sufficiently identify the labor classification to enable determination of the appropriate wage rate. Also record the equipment's arrival and departure dates, as well as idle time for breakdowns or other reasons. This information can be used to make a possible adjustment of compensation due to an overrun or an underrun of quantities, a change in character, a protest, or a potential claim.
- The name of the contractor or subcontractor performing the work. When the report will be used to determine compliance with the contract's labor provisions, you must include the names or identification numbers of the contractor's personnel or report these separately. However, if the report is not for determining compliance with the contract's labor provisions, you only need to include in the tabular portion of the daily report the respective classifications of the work being performed and the number of hours worked on the date the report covers.

Distribute the assistant resident engineer's reports as follows:

- Retain the original of all reports in the project files in the field office.
- File reports covering extra work according to the procedure in Section 3-01, "Organization of Project Documents," of this manual.
- Distribute all other copies in accordance with district policy.

See Section 5-102, "Organization of Project Documents," of this manual for details to consider when establishing a system for handling assistant resident engineer's reports on a specific project.

5-006 Maintenance Reviews

5-006 Maintenance Reviews

Keep maintenance superintendents and supervisors informed of the start of work and job progress for all construction projects within the superintendents' and supervisors' maintenance areas. Before the start of construction, send a copy of Form CEM-0101, "Resident Engineer's Report of Assignment," to the maintenance region manager.

Provide the maintenance superintendents and supervisors an opportunity to review the contract with the resident engineer and to conduct a joint field review of the job site within the first two weeks of construction. The intent of this field review is to accomplish the following:

- Discuss the scope of the project.
- Coordinate contingency planning for traffic management.
- Discuss Caltrans' maintenance responsibility as described in Section 3-704E, "Maintenance Within Construction Limits," of this manual.

- Discuss complex construction activities that could affect adjacent maintenance operations.
- Discuss features requiring special attention.
- Discuss manufacturers' warranties and service instructions.
- Schedule regular reviews. When the contract work is 50 percent complete schedule at least one review, unless both construction and maintenance representatives agree the review is unnecessary.

When the project nears 90 percent completion, invite the maintenance superintendent, supervisor, or both for a final field review of the project. Ensure this review includes identifying all items necessary to comply with the construction National Pollutant Discharge Elimination System permit, Section A, "Storm Water Pollution Prevention Plan," Subsection 7, "Stabilization." A copy of the permit can be obtained from the State Water Resources Control Board at the following website:

http://www.waterboards.ca.gov/water_issues/programs/stormwater/gen_caltrans.shtml

The resident engineer should work closely with the district maintenance personnel to make minor field adjustments to the project. The project manager must approve any amendments to the contract plans or specifications that significantly affect project cost, scope, or schedule.

When the work nears completion and just before contract acceptance, the resident engineer must notify the maintenance superintendent or supervisor to facilitate the transfer of maintenance and responsibility from the contractor to Caltrans forces.

5-007 Federal Highway Administration Involvement in Contract Administration

5-007 Federal Highway Administration Involvement in Contract Administration

When a resident engineer is assigned the responsibility for a construction contract, they first must determine if it is a federal-aid contract and, if so, the federal-aid classification for the contract. Resident engineers should review the construction contract, resident engineer's pending file and talk to the project manager to determine the project's federal-aid classification.

Federal Highway Administration (FHWA) funded projects are classified as either high-profile or delegated projects to indicate the FHWAs involvement in the project as stated in the stewardship agreement between FHWA and Caltrans. Information on this stewardship agreement can be found by visiting the Division of Design's website:

http://www.dot.ca.gov/hq/oppd/stewardship/index.htm

Caltrans assigns project numbers to federally funded projects, and Caltrans and FHWA jointly determine project classifications. Caltrans then adds a suffix "N" or "E" to the end of the project number. Projects with the suffix "N" are high-profile projects. Projects with the suffix "E" are delegated projects.

5-007A Federal Highway Administration Involvement on High-Profile Projects—N

Caltrans and FHWA will jointly determine high-profile project responsibilities on a project by project basis and usually as part of the project development team process. They will establish which project responsibilities will be retained by FHWA and which responsibilities will be delegated to Caltrans for the projects in a high-profile project agreement. The resident engineer should receive a copy of the high-profile project agreement in the resident engineer's pending file or from the project manager. Before the start of construction, the construction senior must review the agreement with the FHWA transportation engineer and discuss FHWA's involvement on the project.

Additional information for high-profile projects can be found at:

http://www.dot.ca.gov/hq/oppd/stewardship/Process_for_Identifying_and_Selecting_High_Profile_Projects.pdf

The resident engineer is required to submit a copy of the CEM-6303, "Final Acceptance Checklist for Federal-Aid High-Profile Projects," to the FHWA transportation engineer along with a copy of the proposed final estimate. FHWA will document the project status and final voucher the project with these documents.

5-007B Federal Highway Administration Involvement on Delegated Projects—E

Caltrans is responsible for most federal approvals and oversight requirements on delegated projects. Resident engineers are not formally required to communicate with the FHWA transportation engineer except for Buy America and when there are changes to the federal environmental requirements. FHWA has delegated to Caltrans some of FHWA's authority and responsibility for compliance with National Environmental Policy Act (NEPA) and other environmental laws. Resident engineers should review the project NEPA documents and discuss with the district environmental – construction liaison, to determine if FHWA involvement is necessary when there are changes to the environmental requirements for the project. Information on Buy America requirements and FHWA involvement can be found in Section 3-605A, "Buy America Requirements" of this manual. Informal discussions with FHWA for technical guidance are still encouraged.

Caltrans receives federal-aid funds indirectly from the California Office of Traffic Safety (OTS). Construction projects with a federal-aid number and OTS designation contain the same special provisions as delegated projects. The same procedures apply to OTS projects as delegated projects.

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Section 1 Project Records and Reports

5-101 Forms Used For Contract Administration

5-101A General

5-101B Construction Forms

Form CEM-0101,	*Resident Engineer's Report of Assignment*
Form CEM-0501,	*Relief from Maintenance*
Form CEM-0601,	*Construction Safety Report*
Form CEM-0602,	*Project Safety Program Statement*
Form CEM-0603,	*Major Construction Incident Notification*
Form CEM-1101,	*Documents Bond of State Highway Oversight Projects*
Form CEM-1201,	*Subcontracting Request*
Form CEM-1202,	*Contractor Action Request—Change of Name/Address Assignment of Contract Monies*
Form CEM-1203,	*Contractor Action Request—Assignment of Contract Performance*
Form CEM-1204,	*American Recovery and Reinvestment Act (ARRA) Monthly Employment Report*
Form CEM-2001,	*National Pollution Discharge Elimination System Annual Certification*
Form CEM-2002,	*Notification of Construction (NOC)*
Form CEM-2003,	*Notification of Completion of Construction (NCC)*
Form CEM-2004,	*Notification of Completion of Construction (Desert Areas)*
Form CEM-2101,	*COZEEP Daily Report*
Form CEM-2102,	*COZEEP/MAZEEP Task Order*
Form CEM-2103,	*COZEEP/MAZEEP Cancellation Form*
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-2403(F),	*Disadvantaged Business Enterprises (DBE) Certification Status Change*
Form CEM-2404(F),	*Monthly DBE/UDBE Trucking Verification*
Form CEM-2501,	*Fringe Benefit Statement*
Form CEM-2502,	*Contractor/Subcontractor Payroll*
Form CEM-2503,	*Statement of Compliance*
Form CEM-2504,	*Employee Interview: Labor Compliance/EEO*
Form CEM-2504	*(Spanish), Entrevista de Empleado: Labor Compliance/EEO*

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 and a number that is related to the form's uniform filing system category. If an existing form no longer meets the need that it was designed for, use the following procedure to implement a change:

- Complete Form CEM-9001, "Construction Manual Proposed Change," 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 Office of Materials Engineering and Testing Services (METS) are listed in this manual. If a test method includes a specific form, contact METS.

A list of forms issued by the Division of Structure Construction is shown in Volume I, Section 16 of the *Bridge Construction Records and Procedures Manual*.

5-101B Construction Forms

All Division of Construction forms are available on the Caltrans Electronic Form System's (CEFS) intranet website:

http://cefs.dot.ca.gov/

or on the Division of Construction's internet site at:

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

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 must use Form CEM-0101, "Resident Engineer's Report of Assignment." This provides 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 Form CEM-0501, "Relief from Maintenance," to recommend that the contractor be relieved from maintenance and responsibility in accordance with Section 7-1.15, "Relief from Maintenance and Responsibility," of the *Standard Specifications.* For more information see Section 3-709, "Relief from Maintenance and Responsibility," of this manual.

Form CEM-0601, Construction Safety Report

The resident engineer or the project safety coordinator uses Form CEM-0601, "Construction Safety Report," to document monthly project safety reviews.

Form CEM-0602, Project Safety Program Statement

The resident engineer uses Form CEM-0602, "Project Safety Program Statement," to list the Code of Safe Practices which 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 Form CEM-0603, "Major Construction Incident Notification," to report major construction incidents. Instructions for completion are included on the last page of the form.

Form CEM-1101, Documents Bond of State Highway Oversight Projects

The local agency and Caltrans project manager complete Form CEM-1101, "Documents Bond of State Highway Oversight Projects." The project manager submits the form to the encroachment permits unit when local agencies have failed, in the past, to produce and submit required documents at the completion of a previous contract they administered on the state highway system. For details on the use of this form, see Section 4-101, "Projects with Documents Bond," of the Caltrans *Oversight Engineer Field Guidelines*.

Form CEM-1201, Subcontracting Request

The contractor submits Form CEM-1201, "Subcontracting Request." The resident engineer uses the form to calculate the percentage of work to be performed by the contractor. Section 3-8, "Prosecution and Progress," of this manual describes the procedures. The resident engineer must approve 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 Division of Construction's website.

Form CEM-1202, Contractor Action Request—Change of Name/Address - Assignment of Contract Monies

The contractor submits Form CEM-1202, "Change of Name/Address -Assignment of Contract Monies," to the resident engineer to request a change in the contractors name or address or to request an assignment of monies due or to become due the contractor under the contract in accordance with Section 8-1.02, "Assignment," of the *Standard Specifications.*

Form CEM-1203, Contractor Action Request—Assignment of Contract Performance

The original contractor or the contractor's surety submits Form CEM-1203, "Assignment of Contract Performance," to the resident engineers in accordance with Section 8-1.02, "Assignment," of the *Standard Specifications.*

Form CEM-1204, American Recovery and Reinvestment Act (ARRA) Monthly Employment Report

The contractor submits the CEM-1204 monthly. The resident engineer reviews the information and retains the form in the construction project records. The FHWA-1587 form is populated using the information provided in the "American Recovery and Reinvestment Act (ARRA) Monthly Employment Report forms."

Form CEM-2001, National Pollution Discharge Elimination System Annual Certification

The resident engineer uses Form CEM-2001, "National Pollution Discharge Elimination System Annual Certification," to file the annual storm water permit certification by July 1 of each year. See Chapter 7, "Environmental," for details on the storm water permit certification.

Form CEM-2002, Notification of Construction (NOC)

The resident engineer, with the assistance of the district construction storm water coordinator, fills out Form CEM-2002, "Notification of Construction (NOC)." The Caltrans National Pollutant Discharge Elimination System Permit requires Caltrans to submit the notification to the Regional Water Control Board. Instructions are included on the last page of the form.

Form CEM-2003, Notification of Completion of Construction (NCC)

Submits Form CEM-2003, "Notification of Completion of Construction (NCC)," for projects requiring a storm water pollution prevention plan to the Regional Water Quality Control Board upon completion of construction. Usually, the resident engineer submits the notification. However, districts may elect to have the storm water coordinator, project manager, construction engineer, or other responsible staff submit this form. This form is not required for water pollution control plan projects. Directions are on the last page of the form.

Form CEM-2004, Notification of Completion of Construction (Desert Areas)

The resident engineer or district storm water coordinator submits Form CEM-2004, "Notification of Completion of Construction (Desert Areas)," for projects requiring a storm water pollution prevention plan for region 6 or 7 of the California Regional Water Quality Control Board.

Form CEM-2101, COZEEP Daily Report

Jointly, the California Highway Patrol and Caltrans use Form CEM-2101, "COZEEP Daily Report," to report highway patrol resources used for the Construction Zone Enhanced Enforcement Program. Chapter 2, "Safety and Traffic," of this manual describes the use of Form CEM-2101.

Form CEM-2102, COZEEP/MAZEEP Task Order

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

Form CEM-2103, COZEEP/MAZEEP Cancellation Form

The resident engineer uses Form CEM-2103, "COZEEP/MAZEEP Cancellation Form," to cancel any previously requested highway patrol support for the Construction Zone Enhanced Enforcement Program. The use of this form is described in Section 2, "Safety and Traffic," 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 Form CEM-2401 to the resident engineer who uses the information to approve DBE subcontractor substitutions. Sections 3-8, "Prosecution and Progress," and 8-3, "Disadvantaged Business," 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 fills out and certifies Form CEM-2402(F), "Final Report- Utilization of Disadvantaged Business Enterprises (DBE), First-Tier Subcontractors." The resident engineer verifies the form. It describes work performed and materials provided by disadvantaged business enterprise subcontractors. See Section 8-3, "Disadvantaged Business," of this manual for details.

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

The contractor fills out and certifies Form CEM-2403(F), "Disadvantaged Business Enterprises (DBE) Certification Status Change." The resident engineer uses this 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. See Section 8-3, "Disadvantaged Business," of this manual for details.

Form CEM-2404(F), Monthly DBE /UDBE Trucking Verification

The contractor must submit Form CEM-2404(F), "Monthly DBE/UDBE Trucking Verification," 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 located on the last page of the form.

Form CEM-2501, Fringe Benefit Statement

The contractor completes Form CEM-2501, "Fringe Benefit Statement," for labor compliance purposes. See Section 8-1, "Labor Compliance," of this manual for more information.

Form CEM-2502, Contractor/Subcontractor Payroll

When it is requested, furnish "Form CEM-2502, Contractor/Subcontractor Payroll," to the contractor. It is used to fulfill the payroll submittal requirements of the contract. See Section 8-1, "Labor Compliance," of this manual for more information.

Form CEM-2503, Statement of Compliance

The contractor may use Form CEM-2503 for the required statement of compliance with payroll submittals. See Section 8-1, "Labor Compliance," of this manual for more information.

Form CEM-2504, Employee Interview: Labor Compliance/EEO
(Stock # 7541-3512-3)

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

Form CEM-2504, (Spanish), Entrevista de Empleado: Labor Compliance/EEO

Same as previous. Form printed in Spanish.

Form CEM-2505, Owner–Operator Listing Statement of Compliance

If they do not include this data on their certified payrolls, contractors may use Form CEM-2505, "Owner-Operator Listing Statement of Compliance," for reporting payments made to owner-operators. See Section 8-1, "Labor Compliance," of this manual for more information.

Form CEM-2506, Labor Compliance–Wage Violation

The district labor compliance officer uses Form CEM-2506, "Labor Compliance–Wage Violation," to document labor compliance wage violations. See Section 8-1, "Labor Compliance," of this manual for more information.

Form CEM-2507, Labor Violation: Case Summary

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

Form CEM-2508, Contractor's Payroll Source Document Review

The district labor compliance officer uses Form CEM-2508, "Contractor's Payroll Source Document Review" to document the verification of the contractors' payroll source document review. See Section 8-1, "Labor Compliance," of this manual for more information.

Form CEM-2509, Checklist–Source Document Review

The district labor compliance officer uses Form CEM-2509, "Checklist – Source Document Review," during the contractor's payroll source document review. See Section 8-1, "Labor Compliance," of this manual for more information.

Form CEM-2510, Truck Owner-Operator Certification of Ownership

The truck owner-operator uses Form CEM-2510, "Truck Owner-Operator Certification of Ownership," to identify the vehicle used and certify ownership or lease of the vehicle. The Form CEM-2510 should be submitted once per project to the district labor compliance office unless changes to the data would necessitate a new form. See Section 8-1, "Labor Compliance," of this manual for more information.

Form CEM-2601, Construction Progress Chart

The resident engineer maintains Form CEM-2601, "Construction Progress Chart," for each project. See Section 3-8, "Prosecution and Progress," of this manual for details.

Form CEM-2701, Weekly Statement of Working Days (Stock # 7541-3528-7)

The resident engineer uses Form CEM-2701, "Weekly Statement of Working Days," to track contract time on construction contracts. The last page of the form and Section 3-8, "Prosecution and Progress," of this manual contains instructions for filling out the weekly statement of working days.

Form CEM-2702, Overrun in Contract Time

The Division of Construction uses Form CEM-2702, "Overrun in Contract Time," to approve "director days." For more information see Section 3-8, "Prosecution and Progress," of this manual.

Form CEM-3101, Notice of Materials to Be Used (Stock # 7541-3511-1)

The contractor must use Form CEM-3101, "Notice of Materials to Be Used," to list all materials to be used on the project. See Section 6-2, "Acceptance of Manufactured Material and Sampling Methods," of this manual for details on the use of this 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 Form CEM-3501, "Hot Mix Asphalt Production Report," 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 Form CEM-3502, "Hot Mix Asphalt Placement Report," 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 Form CEM-3511, "Contractor Job Mix Formula Proposal," to submit to the resident engineer, before the work begins, the hot mix asphalt mix formula they have tested and intend to use on the project. Form CEM-3511 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 Form CEM-3512, "Contractor Hot Mix Asphalt Design Data," to document the testing data developed by the mix design laboratory. See Section 4-39, "Hot Mix Asphalt," of this manual for more information.

Form CEM-3513, Caltrans Hot Mix Asphalt Verification

On Form CEM-3513, Caltrans verifies that the proposed job mix formula complies with the specifications. The resident engineer signs and returns Form CEM-3513 to the contractor. See Section 4-39, "Hot Mix Asphalt," 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 Form CEM-3514 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. See Section 4-39, "Hot Mix Asphalt," of this manual for more information.

Form CEM-3701, Test Result Summary

Resident engineers may use Form CEM-3701, "Test Result Summary" to summarize acceptance tests on each material. See 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

Resident engineers may use Form CEM-3702, "Relative Compaction Summary," 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

Resident engineers use Form CEM-3703, "Caltrans Production Start-Up Evaluation," to record the testing results at the beginning of production. Refer to Section 4-39, "Hot Mix Asphalt," of this manual for more information.

Form CEM-3801, Request for Assignment of Inspectors, Samplers, and Testers

The contractor uses Form CEM-3801 to submit the names of quality control staff for hot mix asphalt projects using the QCQA process. See the *Quality Control Manual for Hot Mix Asphalt* for more information.

Form CEM-3802, Quality Control Inspector Affidavit of Proficiency

The contractor uses Form CEM-3802 to document the hot mix asphalt experience and training of proposed hot mix asphalt quality control inspectors for projects using the QCQA process. Refer to the *Quality Control Manual for Hot Mix Asphalt,* for additional information.

Form CEM-3803, Hot Mix Asphalt Daily Summary of Quality Control Testing

The contractor uses Form CEM-3803 to provide a summary of quality control test results for each day that hot mix asphalt is placed on a QCQA process project. See the *Quality Control Manual for Hot Mix Asphalt,* for more information.

Form CEM-3804, Hot Mix Asphalt Inspection and Testing Summary

The contractor uses Form CEM-3804 to provide a checklist that shows the inspections and testings for each day that hot mixt 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. See the *Quality Control Manual for Hot Mix Asphalt,* for more information.

Form CEM-4101, Materials Release Summary

Resident engineers use Form CEM-4101, "Materials Release Summary," to summarize the materials released by METS and materials inspected at the jobsite.

Form CEM-4102, Material Inspected and Released on Job

Resident engineers use Form CEM-4102, "Material Inspected and Released on Job," to list certain materials that may arrive on the jobsite without a Form TL-0029, "Report of Inspection of Material." See Section 6-3, "Field Tests," of this manual for details.

Form CEM-4202, Material Plant Safety Checklist

The materials plant inspector uses Form CEM-4202, "Material Plant Safety Checklist," when checking a materials plant for safety.

Form CEM-4204, California Test 109 Sticker

The district weights and measures coordinator affixes Form CEM-4204, "California Test 109 Sticker" to each scale tested in accordance with California Test 109. Obtain the form from the Division of Construction weights and measures coordinator. See Section 3-903E, "Weighing and Metering Procedures," of this manual for details.

Form CEM-4401, Solid Waste Disposal and Recycling Report

The contractor completes and certifies the information reported on CEM-4401, "Solid Waste Disposal and Recycling Report." The resident engineer reviews then submits the approved 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-4501, Resident Engineer's Daily Report/Assistant Resident Engineer's Daily Report (Stock # 7541-3506-1)

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

*Form CEM-4601, Assistant Resident Engineer's Daily Report (*Stock # 7541-3504-6*)*

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

Form CEM-4701, Drainage System Summary

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

*Form CEM-4801, Quantity Calculations (*Stock # 7541-3520-0*)*

Resident engineers and assistant resident engineers use Form CEM-4801, "Quantity Calculations," for the basic source document for most contract item quantity calculations.

Form CEM-4900, Contract Change Order

Resident engineers use Form CEM-4900, "Contract Change Order," for contract change orders. See Section 5-3, "Contract Change Orders," of this manual for information about contract change orders.

Form CEM-4901, Contract Change Order Input (Stock # 7541-3516-2)

Resident engineers and assistant resident engineers use Form CEM-4901, "Contract Change Order Input," to input contract change orders for the project record and estimate data. See Section 5-103D, "Contract Change Orders," of this manual for details.

Form CEM-4902, Extra Work Bill (Short Form) (Stock # 7541-3500-8)

Contractors use Form CEM-4902, "Extra Work Bill (Short Form)," for billing extra work. Details for use are on the last page of the form and are also included in Section 5-103E, "Extra Work Billing," of this manual. The resident engineer may approve contractor-designed forms. With prior approval from the Division of Construction, the contractor may submit extra work bill data on a computer report identical to Form CEM-4902 for all Caltrans projects.

*Form CEM 4902A, Extra Work Bill—Title Page (*Stock # 7541-3496-7)

Contractors use Form CEM 4902A, "Extra Work Bill - Title Page," for billing extra work. It is the first page of the 4-part extra work bill. It identifies the project, contract 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 also included in Section 5-103E, "Extra Work Billing," of this manual. The resident engineer may approve contractor-designed forms. With prior approval from the Division of Construction, the contractor may submit extra work bill data on a computer report identical to Form CEM-4902A for all Caltrans projects.

Form CEM-4902B, Extra Work Bill—Labor Charges (Stock # 7541-3497-9)

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

Form CEM-4902C, Extra Work Bill—Equipment Charges

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

Form CEM-4902D, Extra Work Bill—Material Charges

Contractors use Form CEM-4902D, "Extra Work Bill - Material Charges," for billing extra work. It is used to enter material charges to the extra work bill. This form is used with CEM-4902A, "Extra Work Bill - Title Page." Details for use are on the last page of the form and are also included in Section 5-103E, "Extra Work Billing," of this manual. The resident engineer may approve contractor-designed forms. With prior approval from the Division of Construction, the contractor may submit extra work bill data on a computer report identical to Form CEM-4902D for all Caltrans projects.

Form CEM-4903, Contract Change Order Memorandum

Resident engineers use Form CEM-4903, "Contract Change Order Memorandum" in conjunction with Form CEM-4900, "Contract Change Order," to report the necessary engineering and administrative data relative to the change. See Section 5-3, "Contract Change Orders," of this manual for details.

Form CEM-4904, Caltrans Authorization for Using Internet Extra Work Bill System

To authorize a contractor's access to the Caltrans Extra Work Billing (EWB) System, the resident engineer completes Form CEM-4904, outlining contract markups and EWB roles. The resident engineer submits CEM-4904, along with completed Form CEM-4905 from the contractor, to the appropriate district EWB administrator.

Form CEM-4905, Contractor Authorization for Using Internet Extra Work Bill System

Section 9-1.03C, "Records," of the *Standard Specifications* requires contractors to furnish the resident engineer with daily reports of any extra work. The prime contractor completes contractor authorization Form CEM-4905 for authority to use the internet to submit extra work bills. The contractor submits CEM-4905, usually at the preconstruction meeting, to the resident engineer or to the managing partner if the contract is a joint venture. Required EWB training and the EWB website provide additional information.

http://www.dot.ca.gov/hq/construc/ewb/ewbindex.htm

Form CEM-5101, Request for Payment for Materials on Hand

Contractors use Form CEM-5101, "Request for Payment for Materials on Hand," to request payment for materials on hand. Instructions for the form and administrative procedures are covered in Section 3-9, "Measurement and Payment," of this manual.

Form CEM-5501 Partnering Facilitator Evaluation - Kick-Off

When partnering is implemented on a Caltrans construction project, the resident engineer uses Form CEM-5501 to gather project team evaluations of the partnering facilitator's performance following the kick-off partnering workshop.

Form CEM-5502, Partnering Facilitator Evaluation - Close-Out

The resident engineer uses Form CEM-5502 to gather project team evaluations of the partnering facilitator's performance following the close-out partnering workshop.

Form CEM-6002, Contract Administration System (CAS)—Report Requests

Use Form CEM-6002, "Contract Administration System (CAS)—Report Requests," to obtain reports available from the contract administration system. See Section 5-103, "The Contract Administration System," of this manual for details.

Form CEM-6003, Progress Pay—Estimate Project Initiation or Update

Use Form CEM-6003, "Progress Pay—Estimate Project Initiation or Update," to add new information or to change information in the contract administration system. For details see Section 5-103B, "Project Initiation and Update," of this manual.

Form CEM-6004, Contract Transactions Input

Use Form CEM-6004, "Contract Transactions Input," to input estimate data into the contract administration system for the project record and estimate. See Section 5-103C, "Contract Transactions," of this manual for details.

Form CEM-6101, Project Record—Estimate Request

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

Form CEM-6201, Notice of Potential Claim

Contractors use Form CEM-6201, "Notice of Potential Claim," to submit notices of potential claims to the resident engineer. For details on the use of this form see Section 5-4, "Disputes," of this manual.

Form CEM-6201A, Initial Notice of Potential Claim

Contractors use Form CEM-6201A , "Initial Notice of Potential Claim," to submit an early notice of a potential claim issue. For details on the use of this form, see Section 5-4, "Disputes," of this manual.

Form CEM-6201B, Supplemental Notice of Potential Claim

Contractors use Form CEM-6201B, "Supplemental Notice of Potential Claim," 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

Contractors use Form CEM-6201C, "Full and Final Documentation of Potential Claim," 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, see Section 5-4, "Disputes," of this manual.

Form CEM-6202, Dispute Review Board (DRB) Establishment

Resident engineers complete and submit Form CEM-6202, "Dispute Review Board (DRB) Establishment Report," to the Division of Construction after the initial DRB meeting has been held. For details on the use of this form, see Section 5-4, "Disputes," of this manual.

Form CEM-6203, Dispute Review Board (DRB) Update Report

Resident engineers complete and submit Form CEM-6203, "Dispute Review Board (DRB) Update Report," to the Division of Construction yearly beginning on the anniversary of the contract first working day. For details on the use of this form, see Section 5-4, "Disputes," of this manual.

Form CEM-6204, Dispute Review Board (DRB) Issue Report

Resident engineers complete and submit Form CEM-6204, "Dispute Review Board (DRB) Issue Report," to the Division of Construction when Caltrans has sent a response to DRB recommendation and the contractor's response has been received or has been accepted by default. For details on the use of this form see Section 5-4, "Disputes," of this manual.

Form CEM-6205, Dispute Review Board (DRB) Completion Report

Resident engineers complete and submit Form CEM-6205, "Dispute Review Board (DRB) Completion Report," 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 see Section 5-4, "Disputes," of this manual.

Form CEM-6301, Contract Acceptance

Resident engineers use Form CEM-6301, "Contract Acceptance," 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 see Section 3-710, "Acceptance of Contract," of this manual.

Form CEM-6302, Final Materials Certification

Resident engineers use Form CEM-6302, "Final Materials Certification," 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 approved plans and specifications.

Form CEM-6303, Final Acceptance Checklist for Federal-Aid High-Profile Projects

Resident engineers use Form CEM-6303 to document project status for FHWA and to help with the final vouchering process once the final estimate is produced.

Form CEM-9001, Construction Manual Proposed Change

Caltrans personnel may use Form CEM-9001, "Construction Manual Proposed Change," to submit a recommendation for a change to the *Construction Manual*. Forms should be sent to the Division of Construction, publications unit.

5-101C Materials Engineering and Testing Services Forms

Office of Structural Materials, under Materials Engineering and Testing Services (METS), is responsible for TL forms. They may be ordered by stock number from district warehouses or stockrooms. Find forms without stock numbers on the Office of Structural Material's intranet website.

http://onramp.dot.ca.gov/hq/esc/mets/structure_materials/index.shtml

Form TL-0015, Quality Assurance-Nonconformance Report

METS uses Form TL-0015, "Quality Assurance-Nonconformance Report," when METS personnel discover that structural material or quality control procedures do not meet specific contract requirements. METS sends a copy of TL-0015 to the resident engineer.

Form TL-0016, Quality Assurance-Nonconformance Resolution

METS uses Form TL-0016, "Quality Assurance-Nonconformance Resolution," to document the resolution to an outstanding Form TL-0015. METS sends a copy of TL-0016 to the resident engineer.

Form TL-0028, Notice of Materials to be Inspected at the Jobsite

METS uses Form TL-0028, "Notice of Materials to be Inspected at the Jobsite," to assign inspection duties. METS sends a copy of TL-0028 to the resident engineer.

Form TL-0029, Report of Inspection of Material

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

Form TL-0038, Inspection Request Form

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

Form TL-0101, Sample Identification Card

Use Form TL-0101, "Sample Identification Card," 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 (Stock #7541-6018-8)

Use Form TL-0502, "Field Sample of Portland Cement Concrete Sample Card," to submit compressive strength samples of concrete. Refer to Section 6-3, "Field Tests," for details on marking of samples.

Form MR-0518, Job Cement Samples Record (Stock # 7541-6019-0)

Use Form MR-0518, "Job Cement Samples Record," to submit cement samples for testing. Instructions for the use of this form are found in Section 6-2, "Acceptance of Manufactured Material and Sampling Methods," of this manual.

Form TL-0608, Notice of Materials to be Furnished

METS uses Form TL-0608, "Notice of Materials to be Furnished," to inform all parties that METS will inspect and release material before its sent to the jobsite. A TL-0038,"Inspection Request form 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 Form TL-0624, "Inspection Release Tag," with lot numbers, inspector's initials, and date of inspection. For materials where it is not practicable to attach tags, the inspector will mark lot numbers on the material in lieu of attaching the tags.

Form TL-0625, Materials Suitability Tag

METS uses Form TL-0625, "Materials Suitability Tag," as part of the Blue Tag process to verify that a quality assurance inspector has inspected the material and released it to the jobsite. The blue tag attached to the material includes the contract number, state lot number, Blue Tag number, inspector's initials, and date of inspection. For materials where it is not practicable to attach tags, the inspector will mark lot numbers of materials in lieu of attaching the tags.

Form TL-0649, Inspector's Report of Material on Hand

METS uses Form TL-0649, "Inspector's Report of Material on Hand," to verify that material has been inspected and is in acceptable condition. See Section 3-9, "Measurement and Payment," of this manual for details.

Form TL-3096, Pavement Core Record

The district materials unit uses Form TL-3096, "Pavement Core Record," to record the data on cores that are taken to determine pavement thickness. See Section 4-40, "Portland Cement Concrete Pavement," of this manual for details.

Form TL-6013, Materials Suitability Documentation Report

METS structural material representative, in consultation with the resident engineer and design staff as needed, completes TL-6013, "Materials Suitability Documentation Report," as part of the Blue Tag process. This form documents the decision to release material that is tagged with TL-6025 and is listed in TL-6014.

Form TL-6014, Materials Suitability Report

Form TL-6014 is completed by the METS quality assurance inspector and is used to list the material to be released with TL-0625, "Materials Suitability Tag." The report includes material description, Blue Tag number and description of the nonconformance.

Form TL-6037, Fabrication Progress Report

METS uses Form TL-6037, "Fabrication Progress Report," to notify resident engineers of progress being made on fabrication of various items. See Section 3-9, "Measurement and Payment," for details.

5-101D Other State Forms

Following is a list of state forms used in contract administration that are not issued by the Division of Construction or METS. With the exception of the DAS-1 form, all of these forms are available on the Caltrans Electronic Forms System's intranet website at:

http://cefs.dot.ca.gov/

Form DAS-1, Apprentice Agreement

Form DAS-1, "Apprentice Agreement," provides evidence of registration of the contractor's apprenticeship program. Contractors obtain Form DAS-1 from the California Department of Industrial Relations, Division of Apprenticeship Standards

http://www.dir.ca.gov/das/forms.htm

Form DPD-3013, Request for Construction Staking (Stock #7541-4542-7)

The contractor uses Form DPD-3013, "Request for Construction Staking," 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 Form DPD-3013, see Chapter 12, "Construction Surveys," of the Caltrans Surveys Manual.

Form LA-16, Product, Material, or Method Report (For Highway Planting or Erosion Control)

Use Form LA-16, "Product, Material, or Method Report (For Highway Planting or Erosion Control)," to report new products, materials, or methods for erosion control and highway planting. Send the completed report to the district landscape architect and to the Landscape Architecture Program. See Section 4-2001, "General," of this manual for details.

Form LA-17, Report of Chemical Spray Operations

The contractor uses Form LA-17, "Report of Chemical Spray Operations," to submit the required weekly pesticide application report. See Section 4-2003C (2), "Pesticides," of this manual for details.

5-101E Traffic Operations Forms

The following forms are from the Division of Traffic Operations and used to change clearances or Bridge Weight Rating, and located at:

http://www.dot.ca.gov/hq/traffops/permits/

Form TR-0019, Notice of Change in Clearance or Bridge Weight Rating

Use Form TR-0019, "Notice of Change in Clearance or Bridge Weight Rating," to report permanent changes to vertical or horizontal clearance for vehicular traffic or permanent changes in bridge permit ratings on divided roadways. See Section 3-705B, "Clearance and Bridge Permit Rating Changes (Permanent)," of this manual for details.

Form TR-0020, Notice of Change in Vertical or Horizontal Clearance

Use Form TR-0020, "Notice of Change in Vertical or Horizontal Clearance," to report permanent changes to vertical or horizontal clearance for vehicular traffic. See Section 3-705B, "Clearance and Bridge Permit Rating Changes (Permanent)," of this manual for details.

Form TR-0029, Notice of Change in Clearance or Bridge Weight Rating

Use Form TR-0029, "Notice of Change in Clearance or Bridge Weight Rating," to report permanent changes to vertical or horizontal clearance for vehicular traffic or permanent changes in bridge permit ratings on undivided roadways. See Section 3-705B, "Clearance and Bridge Permit Rating Changes (Permanent)," of this manual for details.

5-101F Federal Forms

Following is a list of some federal forms that are used in contract administration. Obtain the forms from the United States Department of Transportation, Federal Highway Administration's website:

http://www.fhwa.dot.gov/

Form FHWA-1022, United States Department of Transportation Notice

The contractor must post Form FHWA-1022 "United States Department of Transportation Notice," on each federal-aid highway project in one or more places where it is readily available to all personnel associated with the project. The resident engineer must also post the notice at the Caltrans field office.

Form FHWA-1391, Federal-Aid Highway Construction Contractors Annual EEO Report

The contractor must submit Form FHWA-1391 "Federal-Aid Highway Construction Contractors Annual EEO Report," on all federal aid contracts over $10,000. All subcontractors on federal aid projects whose subcontracts exceed $10,000 must also submit the report. Contractors and subcontractors include project employment data for the last full week of July on the report.

Form DOL SF-308, Request for Wage Determination and Response to Request

On federal-aid contracts, request wage rate determinations on the United States Department of Labor Form SF-308, "Request For Wage Determination and Response to Request." Obtain the form from the United States Department of Transportation, Federal Highway Administration's website:

http://www.dol.gov/ESA/programs/dbra/sf308.htm

Equal Employment Opportunity Is The Law—Poster

The contractor must post the "Equal Employment Opportunity Is The Law Poster" on each federal-aid highway project in one or more places where it is readily available to all personnel associated with the project. The resident engineer must also display the poster at the Caltrans field office. Obtain the poster from the United States Department of Transportation, Federal Highway Administration's website listed at the beginning of this section or the district labor compliance officer.

Form FHWA-1495 Wage Rate Information Federal-Aid Highway Project

The contractor must post Form FHWA-1495 "Wage Rate Information Federal-Aid Highway Project," with the Secretary of Labor minimum wage rate schedule attached, at the jobsite where the workers can easily see it. The form is available on the FHWA website listed at the beginning of this section.

5-102 Organization of Project Documents

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 hanging file). The filing system will then be correct when records are brought together after project completion.

Obtain preprinted category labels, stock number 7690-0150-6, from the district warehouse.

5-102B Indexing

Use a category index, similar to the sample shown at the end of this section, or an index of categories that is supplied with the labels, 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 appropriate heading.

5-102C Description of Categories

The discussion below 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
- Monthly Time Sheets
- Overtime Requests and Authorizations
- Absence Requests
- Personnel Transfer Records
- Personnel Roster
- Travel Expense Claims and Records
- Individual Personnel File. Use this for a file on each individual containing emergency telephone numbers, experience or training records, among other things.

Category 2, Project Office Equipment and Supplies

In this category, file those 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.

Category 4, Service Contracts

In this category, file those documents related to the project office utilities and services. File requests for service along 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 as follows:

- Rent
- Electricity
- Gas
- Telephone
- Water
- Additional service agreements, as required

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

Category 5, General Correspondence

In this category, file those 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 contract change order in the contract change order category file.

File correspondence filed 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 contract change order to solve the problem. At this point, the resident engineer should transfer all of the correspondence related to the contract change order to the contract change order category file.

A letter might cover subjects in different 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 the appropriate category.

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

- To district office
- From district office
- To contractor
- From contractor
- Property owners
- Utility companies
- 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 shown below:

- Employee Safety
- Contract Documents Relating to Safety
- Correspondence with the Division of Occupational Safety and Health (Cal/OSHA)
- A copy of the contractor's Code of Safe Practices in use for the project

Category 7, Public Relations

File the various 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 for those where staking has not been completed. Cross-file staking requests that include restaking charges in Category 54, "Deductions from Payment to Contractor."

Category 9, Welding

In this category, file documents relative to welding in accordance with instructions in Section 180, "Welding," of the *Bridge Construction Records and Procedures Manual*.

Category 10, Extra Category Number

Use this extra category number for project documents that do not fit in presently 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. This category should contain the following items. Create subcategories as necessary because of the volume of documents.

- Project Report
- Preliminary Report
- Project Expenditure Authorization, (including Supplemental Allotments)
- Detailed 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 various documents that the contractor is required to submit. Do not use it for general correspondence or documents appropriate to another specific 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 5-1.06, "Superintendence," 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 another appropriate category
- Falsework plans
- Insurance documents as required in Section 7-1.12, "Indemnification and Insurance," of the *Standard Specifications*

Category 13, Signs and Striping

In this category, file all documents relayed to signing, delineation, and handling public traffic during construction. Suggested subcategories are listed below.

- Layout of Construction Signs
- Detour Design, Striping and Signing
- Traffic Striping Diagrams

Category 14, Photograph Records

File routine photographs and their identification in this category. File photographs relating to claims in Category 62, "Disputes." It is a good practice to take photographs on a monthly basis to document the work during construction. Maintain videotapes and digital photo files in an organized manner. Note the location of these items in this category file.

Suggested subcategories for this category 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 Accidents.

Category 16, Utility Agreements

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

Create subcategories for the various 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 Co.
- 16.3 Southern Pacific RR Co.

Category 17, Utility Work Performed

In this category, file daily reports and other records of utility facility work. Create the same the 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, where the work would develop just daily reports and receiving records of 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 may be advisable.

Category 18, Agreements

In this category, file agreements (except 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 follows:

- Right-of-Way Agreements—Without Obligations
- Right-of-Way Agreement—With Obligations
- Forest Service Agreements
- Borrow Agreements (between Caltrans and owner)
- Disposal Agreements (between Caltrans and owner)
- Service Agreements (these 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 is shown below:

- 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 contract change order number if the required work is being done by contract change order.

Category 19, *Hazardous Waste and Hazardous Materials*

File any information regarding the discovery and removal of hazardous waste in this category.

Category 20, *Water Pollution Control Plan or Storm Water Pollution Prevention Plan*

File all correspondence regarding water pollution control plans (WPCP) or storm water pollution prevention plans (SWPPP) in this category. A list of suggested subcategories follows:

- Approved 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 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/MAZEEP Cancellation Form.”
- Form CEM-2102, “COZEEP/MAZEEP 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 traffic management center

- Approved lane closures
- Contractor contingency plans
- Traffic count data

Category 23, Extra Category Number

Use this extra category number for project documents that do not fit in presently established categories. When using an extra category, enter the category number and title in the index.

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."
- 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. See 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 those 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 follow:

- Materials information
- Report of foundation investigation

- Report of tests on aggregate base (preliminary tests)
- Report of tests on aggregate subbase (preliminary tests)

Category 30, Basement Soil Test Results

In this category, file basement soil test results taken to determine structural section adequacy (taken during design phase).

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-3101's that contain information for structure items available for use by the structure representative. Consider filing the Form CEM-3101's listing structure items in a separate subcategory of this category.

Category 32, Notice of Materials to be Inspected at the Jobsite

In this category, file Form TL-0028, "Notice of Materials to be Inspected at the Jobsite."

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 those documents that are to be filed in other specific categories such as 37 and 48.

Use subcategories similar to the examples shown below. 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 also identifies the subcategory, and the 3 is the second level subcategory identifying the particular document.

- 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 other specific categories such as in 37 and 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, Portland Cement Concrete (other than structure items)

In this category, file documents related to portland cement concrete. Do not include documents that are to be filed in other specific categories such as 37, 43 and 48. For structure items, the project documents are to be filed in Category 43. See the *Bridge Construction Records and Procedures Manual* for details. Following are suggested subcategories for this category:

- 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 examples shown below. Create a numbering system that identifies the category, item and subcategory. For example, 37.21.3 indicates Category 37 "Acceptance Tests," 21 is the contract item number of the material and also identifies the subcategory, and the 3 is the second level subcategory identifying the particular test result.

- Form CEM-3701, "Test Results Summary"
- Form CEM-3702, "Relative Compaction Summary"
- Form CEM-3703, "Caltrans Production Start-Up Evaluation"
- 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 the 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 the measurements are made)

- Hot Mix Asphalt

  37.31.1 Aggregate Gradation

  37.31.2 Asphalt Binder Content

  37.31.3 Maximum Theoretical Density (%)

  37.31.4 Sand Equivalent (min)

  37.31.5 Stabilometer Value (min)

  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

37.42.7 Profilograph Summary

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 Office of Structure Construction personnel in this category in accordance with instructions contained in the *Bridge Construction Records and Procedures Manual*.

Category 38, Quality Control and Quality Assurance

In this category, include all documents relating to quality control and quality assurance. 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 Affadavit of Proficiency"
- Form CEM-3803, "Hot Mix Asphalt Daily Summary of Quality Control"
- 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 out by the project's materials tester. For more than one type of report, such as a report and a summary form, provide separate 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-6013, "Material Suitability Documentation Report"
- Form TL-6014, "Material Suitability Report"
- Form TL-0624, "Inspection Release Tag"
- Form TL-0625, "Materials Suitability Tag"
- 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 an Office of Materials Engineering and Testing Services 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, "Materials Suitability Tag," should be attached to the TL-6014, "Materials Suitability Report," received from the Office of Materials Engineering and Testing Services 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 lieu of source inspection in the appropriate subcategory of this category, not in Category 37.

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 the 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. Follow the procedures described below to 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 together. An example of a system for a relatively large project follows on the next page.

Modify the above 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 ensure 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 the example below, set up a separate subcategory for each structure.

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

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 extra work bill report and approving payment, record the extra work 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.

   Extra work 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 the 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 the following subcategories:

- 47.1 Before Work Starts
- 47.2 Staked and Being Worked On
- 47.3 Drainage System Complete, Final Quantities Not Complete
- 47.4 Final Quantities Completed

Example:

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, Contract 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 various 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, "Contract Item Quantity Documents." Some drainage item quantity documents may be filed in Category 47.

Category 49, Contract Change Orders

In this category, file contract 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, "Contract Change Order," Form CEM-4903, "Contract Change Order Memorandum," and any accompanying correspondence.
- Form CEM-4901, "Contract Change Order Input."
- Daily extra work 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)* book(s) 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 contract change order is written, the supporting project documents may be transferred to the contract 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:

- State Furnished Material and Expenses.

  In this subcategory, file the contractor's letters requesting delivery of state furnished materials. Also, file the receiving records or other records of material furnished by Caltrans. When state furnished material is received as evidenced by a shipping record and a receiving record, file the related shipping and receiving 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 which cover repair of damage to state property by third parties (see "Reports of Damage to State Highway Property" in the *Caltrans Safety 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 (see Section 2.01, "General," of the *Standard Specifications*).
- Engineering and inspection charged to the contractor (see Section 3-506, "Lines and Grades," of this manual for restaking charges).
- Costs of damaged or missing state-owned signs.
- Railroad flagging charges.
- Noncompliance with the equal employment opportunity provisions of the contract.
- Liquidated damages (See Section 3-908, "Deductions," of this manual.
- Any other deductions. (See Section 3-9, "Measurement and Payment" of this manual.

Categories 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 - Close-Out"

Categories 56 through 58, Extra Category Numbers

These are extra numbers that may be used for project documents that do not fit in presently established categories. When used, enter them on the index sheets.

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 the contract administration system. Possible subcategories are:

- Form CEM-6002, "Contract Administration System (CAS) - Report Requests"
- Form CEM-6003, " Progress Pay - Estimate Project Initiation or Update"
- Form CEM-6004, "Contract Transactions Input"

The following contract administration system reports are cumulative, usually requested after each progress estimate payment using CEM-6002. Only the most current results needs to be retained.

- Status of Contract Items
- Project Record Item Sheets
- Status of Contract Change Orders
- Contract 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. These numbers may then be used 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

Category No.	Heading
1	Project Personnel
2	Project Office Equipment and Supplies
3	Equipment and Personnel Cost Reports
4	Service Contracts
5	General Correspondence
6	Safety
7	Public Relations
8	Construction Surveys
9	Welding
10	(Extra category number)
11	Information Furnished at Start of Project
12	Contractor
13	Signs and Striping
14	Photograph Records
15	Accidents
16	Utility Agreements
17	Utility Work Performed
18	Agreements
19	Hazardous Waste and Hazardous Materials
20	Water Pollution Control Plan or Storm Water Pollution Prevention Plan
21	Construction Zone Enhanced Enforcement Program
22	Traffic Management Information
23	(Extra Category Number)
24	Disadvantaged Business Enterprises and Disabled Veteran Business Enterprises
25	Labor Compliance and Equal Employment Opportunity
26	Progress Schedule
27	Weekly Statement of Working Days
28	Weekly Newsletter
29	Materials Information and Preliminary Tests
30	Basement Soil Test Results
31	Notice of Materials to Be Used (CEM-3101)

32	Notice of Materials to be Inspected (TL-0028)
33	Notice of Materials to be Furnished (TL-0608)
34	Treated Base
35	Hot Mix Asphalt
36	Portland Cement Concrete (other than structure items)
37	Initial Tests and Acceptance Tests
38	Quality Control Quality Assurance
39	Materials Testing Qualifications of Employees
40	Field Laboratory Assistant Reports to Resident Engineer
41	Report of Inspection of Material
42	Material Plants
43	Concrete and Reinforcing Steel
44	Recycle Materials and Diversion of Solid Waste
45	Resident Engineer's Daily Reports
46	Assistant Resident Engineer's Daily Reports
47	Drainage Systems
48	Contract Item Quantity Documents
49	Contract Change Orders
50	Adjustment in Compensation Calculations
51	Materials on Hand
52	Charges to Total Contract Allotment
53	Credit to Contract
54	Deductions from Payment to Contractor
55	Partnering
56-58	(Extra category numbers)
59	Bridge Estimate Data
60	Contract Administration System Inputs and Reports
61	Estimate and Project Status
62	Disputes
63	Project Completion Documents

5-102E Alphabetical Listing Of Categories

Heading	Category No.
Accidents	15
Adjustment of Compensation Calculations	50
Agreements	18
Assistant Resident Engineer's Daily Reports	46
Basement Soil Test Results	30
Bridge Estimate Data	59
Treated Base	34
Charges to Total Contract Allotment	52
Concrete and Reinforcing Steel	43
Construction Surveys	8
Construction Zone Enhanced Enforcement Program	21
Contract Administration System Inputs and Reports	60
Contract Change Orders	49
Contract Item Quantity Documents	48
Contractor	12
Credit to Contract	53
Daily Reports, Assistant Resident Engineer's	46
Daily Reports, Resident Engineer's	45
Deductions from Payment to Contractor	54
Disadvantaged Business Enterprises and Disabled Veterans Business Enterprises	24
Disputes	62
Drainage Systems	47
Estimate and Project Status	61
Equipment and Personnel Cost Reports	3
Extra Categories	10, 23, 56, 57, 58
Field Laboratory Assistant Reports to Resident Engineer	40
General Correspondence	5
Hazardous Waste and Hazardous Materials	19
Hot Mix Asphalt	35
Information Furnished at Start of Project	11
Initial Tests and Acceptance Tests	37
Labor Compliance and Equal Employment Opportunity	25

5-103 The Contract Administration System

5-103A General

This section describes the Contract Administration System, sometimes referred to as "the progress pay system." The primary purpose of this computer system is to help administer Caltrans construction projects. Various functional units within construction update and maintain records on individual contracts in the contract administration system from the award and approval of the contract through to the completion and final payment.

Contract administration system is one of three subsystems of the Project Information System and Analysis (PISA). The three subsystems of PISA make up the primary computer system that Caltrans uses for tracking contract capital costs. These subsystems are: planning and design, bidding and award, and project construction. In essentially a straight line, each module of PISA passes data to the next module as a project progresses from conception to completion. See Table 5-1, "Contract Administration System, Systems Interface," for a general overview of how the contract administration system relates to the other components of the Caltrans computer system used for tracking and paying contract capital costs.

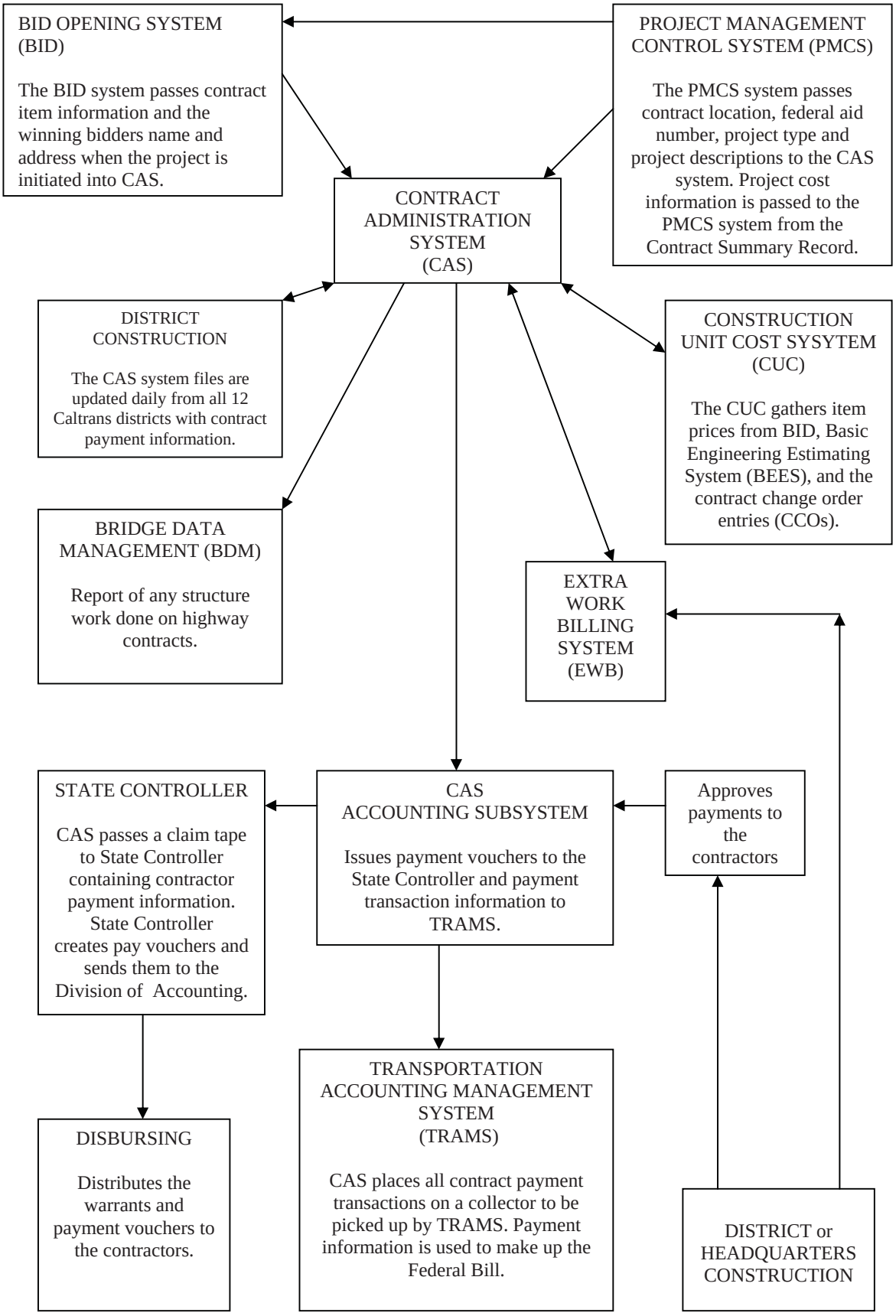
Contract administration system is also composed of separate modules, each of which accomplishes a distinct function. The following are the most common of contract administration systems many modules:

- Project initiation and update
- Contract transactions
- Contract 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

Table 5-1.1 Contract Administration System, Systems Interface



5-103B Project Initiation and Update

When Caltrans has determined the lowest responsible bidder, the Office of Office Engineer will transfer project data from the Bid Opening System to the contract administration system. 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 then update the computer file (by adding to or changing existing information).

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 then 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, "Project Pay—Estimate Project Initiation or Update" which is explained in more detail under the heading "Filling Out Form CEM-6003," below.

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 style address change. The district must maintain the accuracy of local address information in the contract administration system using Form CEM-6003, "Project Pay-Estimate Project Initiation or Update." The State Controller mails progress payment checks to the legal name style address. Only the Division of Construction's progress pay coordinator is authorized to make changes to the legal name style address from Form CEM-1202, "Contractor Action Request - Change of Name/ Address- Assignment of Contract Monies," verified by the resident engineer with the Division of Construction field coordinators concurrence.

5-103B (1) Completing Form CEM-6003, "Project 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 such 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 (1a) Project Key

Enter the letter "U" under "FB," and in the remaining spaces, enter the district and contract number.

5-103B (1b) Card type C05 (each field is independent and can be updated separately)

For the following data fields under card type C05, do the following:

- Resident engineer's phone number.

- Responsible unit: 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 jobsite. If work 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 one 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.
- Plant establishment: For projects requiring retentions be held at 5 percent for the contract's life, enter an "X" in the "PE" column.
- Begin construction date: 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 (1c) 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 (1d) Card type C09 to C14

Only the Division of Construction progress pay coordinator can change the legal name style address in the contract administration system.

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 (1e) 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: This unit is the source unit that the Office of Structure Construction uses to code its time sheet. 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, the Office of 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 (2) Processing

The contract administration system analyzes the changes made to the computer file and does the following:

- The contract administration system notes whether the district is updating the "Responsible Unit" field for the first time. If so, the contract administration system prints a dummy Project Record-Estimate form and a Contract Contents Report.
- If this update is not the first update, the contract administration system prints only the first page of the Contract Contents Report. The contract administration system prints the dummy Project Record-Estimate form only if the contractor's name and address field has been changed.
- The contract administration system 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 the contract administration system 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.
- Contract change order transactions: These consist of three types of transactions that refer to contract change orders.

The Contract Transaction Processing Module processes this total of 12 transaction types. Together with the services that the CCO and DEWR 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

The contract administration system provides five different ways to refer to a contract item in Form CEM-6004, "Contract Transactions Input." Another way is by including the item as part of a contract change order. This will cause the approved quantity to be adjusted automatically. Thus, you do not have to account for status changes due to contract 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 random 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 Volume I, Section 6, of the *Bridge Construction Records and Procedures Manual*.
- Contract item quantity balance: You may adjust the authorized quantity if necessary by submitting quantity balances as line entries on Form CEM-6004. 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 impact on the contingency balance. This transaction type adjusts the authorized final cost for your project, as we will show in our later discussion of progress pay estimates.
- Contract item anticipated change: This transaction's purpose is to give 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 also the estimated final cost for the project. The effect of these transactions is cumulative. If additional work is authorized by contract change order, a reversing entry is necessary.
- 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.
- 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.

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 contract 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.

- Material on hand payments: These transactions are placed in the computer file, and their sum will appear on the next progress pay estimate that generates payment. For more information about materials on hand, see Section 3-9, "Measurement and Payment," of this manual.
- State-furnished materials allotment transfer: Use this transaction to increase or decrease the value of the state-furnished materials allotment for your contract. The construction allotment will automatically adjust. To increase the state-furnished materials allotment, enter a positive number. (This type of entry will decrease the contingency balance.)
- 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 state-furnished materials allotment.

5-103C (1c) Contract Change Order Transactions

The three transaction types listed below comprise "contract change order transactions," the final category of contract transactions:

- Contract change order anticipated change: This transaction has the same effect as does the contract item anticipated change except that a contract change order is being changed.
- Contract change order final balance: This transaction has the same effect as does a contract item balance. When work on a contract change order is finished, mark it "Complete" by entering this transaction. As with contract items, additional extra work bills may be paid, and the system will continue to balance the contract change order.
- Contract change order final balance ("Reopen"): This transaction allows you to reverse the status of the contract change order from "Complete" to "Active."

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 the contract administration system. Page 2 of the form provides instructions for completing it, and this section contains a complted sample of the form. See Example 5-1.2, "Contract Transaction Input."

We cannot overemphasize the importance of legible entries that conform to the instructions for completing the form. Also, 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 +/- 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. See Example 5-1.1, "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.
- Mark the structure field with the character "B" if this transaction concerns "structure work." Otherwise, leave the space blank. If you use the report titled *Bridge Quantities by Structure* you will also need to enter the structure number in accordance with the instructions in Volume I, Section 6, of the *Bridge Construction Records and Procedures Manual.*

The form's remaining fields are divided into two sections, "ontract 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. Fill in the various fields as shown on page 2 of Form CEM-6004. The following are the rules for making contract item entries:

- Quantity balance transactions:
  1. Lump sum items cannot be quantity balanced. If you attempt to quantity balance them, the transaction will be rejected.
  2. If the quantity balance is greater than the bid quantity, a warning message is issued.
  3. If the value of the quantity balance exceeds $100,000, a warning message is issued.
  4. The new authorized quantity is calculated. If it is negative, the transaction will be rejected.
  5. 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 inputting 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:
  1. If the anticipated quantity change is greater than the bid quantity, a warning message is issued.
  2. If the value of the anticipated quantity change exceeds $100,000, a warning message is issued.

3. A new estimated final quantity is calculated. If this estimated final quantity is negative, a warning message is issued.
4. If the new estimated final quantity is less than the total payment for the next estimate, a warning message is issued.

- Item payment:
  1. Any transactions for the item "Mobilization" are rejected.
  2. Any transactions for a void item will be rejected.
  3. If the payment quantity is greater than the bid quantity, a warning message is issued.
  4. If the value of the payment quantity exceeds $100,000, a warning message is issued.
  5. 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.)
  6. 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.
  7. 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:
  1. If the amount anticipated exceeds $100,000, a warning message is issued.
  2. If the amount anticipated exceeds 10 percent of the construction allotment, a warning message is issued.
- Material on hand payments:
  1. If the amount exceeds $100,000, a warning message is issued.
  2. 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.)
  3. 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.
- State-furnished materials allotment transfer:

1. If the amount of the transfer exceeds $100,000, a warning message is issued.
2. A new total is calculated for the state-furnished materials allotment. If it is negative, the transaction is rejected.

- Total allotment changes:
  1. If the amount exceeds $100,000, a warning message is issued.
  2. If the amount exceeds 10 percent of the total allotment, a warning message is issued.
  3. If the amount of the change is negative, a warning message is issued.
  4. A new total allotment is calculated. If the amount is negative, the transaction is rejected.
  5. 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) Contract Change Order Transactions

The following are the rules for contract change order transactions:

- For the contract change order anticipated change, the new estimated final cost is computed for the contract change order and reported. The system does not do any checking.
- Contract change order final balance and final balance ("Reopen"):
  1. The contract change order status is set to "Complete," or "Active," respectively. The system does not do any checking.
  2. For a contract 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 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 ensure 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. Contract change orders and daily extra work reports carry unique identifying numbers that Contract Administration System 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.

The Contract Administration System 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.

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
QUANTITY CALCULATIONS
CEM-4801 (REV 11/1992) CT# 7541-3520-0

JOB STAMP

07-1381U4
07-LA-210-47.5/57.3
Fed. No.: None

ITEM: 8 Temp. Railing (Type K)	FILE NO.: 48-8-2
LOCATION: Ramp 3	SEGREGATION: YES ☐ NO ☐
CALC. BY: I.M. Engineer	DATE:
CHK. BY: U.R. Wright	DATE:

Field Measurement:
Field Counted: ✓
Final Pay Item:

Estimated Quantity: 450
Unit of Measure: meter
Unit Price: $20.00
75% = 337.50
125% = 562.50

Remarks or Other Calculations:

152.4 meters placed on 5-03-01 at Maple St. onramp ✓

Material Inspection/Release: Certificates of compliance obtained on 07-09-08.

PAY THIS ESTIMATE: 152.4 ✓
PREVIOUSLY PAID: 140.2 ✓
TOTAL TO DATE: 292.6 ✓

Office Engineer 08/08/08 CEM-6004, page 4, line 5

STATE OF CALIFORNIA • DEPARTMENT OF TRANSPORTATION
CONTRACT TRANSACTIONS INPUT
CEM-6004 (Rev. 10/1983) CT#7541-3515-0

0 7 Dist | 1 3 8 1 U 4 Contract No. | Password

CAS0AT

LINE NO. 18	DATE MO. 20	DATE DAY 22	SOURCE DOCUMENT DESCRIPTION	BRIDGE ITEM 4 NO.	+ 48	CONTRACT ITEM ENTRIES QUANTITY (UNITS) 49	CONTRACT ITEM ENTRIES CODE 60	CONTRACT ITEM ENTRIES CEO NO. 66	CONTRACT ITEM ENTRIES + 674	ALL OTHER ENTRIES AMOUNT($) 66	ALL OTHER ENTRIES TYPE 74		
01	05	19	48-14-17	014		1,273000						Time	URW
02	05	19	MAIL BOX ON ELM ST	028		150000	Q					Time	URW
03	05	19	ANT. ELIM. AC ON FL	038		1,500000	A					Time	URW
04	05	19	BAL. COMPL. ITEM 6	006			F					Time	URW
05	05	19	48-8-2	008		152400						Time	URW
06	05	19	RESTORE STATUS	039		REOPEN	F					Time	URW
07	05	19	REV GRADE FR2 LINE							15,000000	ANI	Time	URW
08	05	19	51-4-2							2,174737	MHS	Time	URW
09	05	19	52-4-1							2,000000	SFM	Time	URW
10	05	19	11-3-1							315,000000	TAC	Time	URW
11	05	19	DELET DRAINAGE					029		10,000000	ACC	Time	URW
12	05	19	BAL. COMPL. CCO 18					018			BAL	Time	URW
13	05	19	RESTORE STATUS					005		REOPEN	BAL	Time	URW
14													
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IN CASE OF QUESTION CONTACT: NAME _____ PHONE _____

93 95682

5-103C (3) Computer Processing

The contract item totals listed below are kept for contract work and also 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.
- Approved quantity: This item is the total of the bid quantity and the algebraic sum of the quantity changes due to contract change orders that have been filed.
- Authorized quantity: This item is the total of the approved 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 Contract Change Orders

The Contract Administration System maintains separate records for each approved contract change order on a project. As each contract change order is approved, it must be entered into the Contract Administration System through the use of Form CEM-4901, "Contract Change Order Input."

The method of entering each contract change order into the system may vary from district to district, but can be done as follows:

- The resident engineer writes a contract change order and completes Form CEM-4901. For approval procedures, see Section 5-3, "Contract 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 the contract administration system.
- The result of entering the form data for each contract change order will consist of a contract change order report and a disposition report.
- The resident engineer should review the contract change order report and correct any errors. The contract administration system automatically makes the following changes to the contract records:
    1. The authorized final cost, the estimated final cost, the authorized contingency balance, and the estimated final contingency balance are adjusted to new values.
    2. The totals for changes in extra work, adjustment of compensation, and contract items are adjusted to new values.
    3. Each affected contract item will have the approved quantity adjusted to reflect the change.
- Immediately after Form CEM-4901 has been processed, the contract administration system will accept extra work bills and anticipated changes that refer to the contract change order.
- When the contract administration system processes a supplemental contract change order, the daily extra work reports in the holding file (due to insufficient funds in the original contract change order) will be made available for payment.

5-103D (1) Completing Form CEM-4901, "Contract Change Order Input"

Use Form CEM-4901 to perform the following functions:

- File a new contract change order in the computer file.
- Update (change existing information) a contract change order in the computer file.
- Replace a filed contract change order with another contract change order.
- Delete a contract change order from the computer file.

Completing the form depends on which of the above functions you desire.

5-103D (1a) File

Enter the contract and contract change order numbers at the top of the form. The original contract 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 contract change order was written with a deferred time adjustment clause. Enter a category code on every contract change order. Left-justify this code.

Card Type 2: If extra work or adjustment of compensation is not part of your contract change order, leave these fields blank. Otherwise, define the payment method by making three entries for each change:

- Make the first entry by checking either the "EW" or "AC" box to indicate extra work or adjustment of compensation.
- 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.
- 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 contract 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 contract change order is structure work, enter the net dollar amount involved. This amount will contribute to the contract 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 contract 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 contract 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 contract 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 contract 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 contract change orders will replace the data stored in the computer file with the new contract 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 contract 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 extra work 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 extra work bills to reduce payments below the authorized amount.
- Submit the replace request.
- After the contract change order has been replaced, reenter the extra work bills that were reversed.

When possible, use the update function instead of the replace function.

5-103D (1d) Delete

You can eliminate a contract change order from the computer file as follows:

- Enter the contract and contract change order numbers.
- Place the letter "D," in the function box at the top right of the form.

As with the replace function, a contract 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 contract change order must pass through before the system will accept it:

- The contract change order number and the change order supplement number must be filled in or the change order will be rejected.
- The contract change order description cannot be blank, or the contract 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 file the contract change order.
- The approval date must be after the bid opening date and less than or equal to "today's" date; otherwise, the contract 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 still file the contract change order.
- If any payment method appears more than once on the input cards, the contract change order will be rejected.
- If you enter any contract item change for a void item, the system will reject the contract change order.
- Lump sum items may appear on contract 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 contract change order as an increase and also as a decrease. If the item appears a third time, the system will reject the contract change order.
- If the contract item "mobilization" appears on a contract change order, the contract 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 contract change order must be greater than the sum of the negative changes and less than the sum of the positive changes, or the contract change order will be rejected.
- The net dollar change for the contract 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 contract change order will be rejected.
- If the contract change order is already on file, the system will reject this duplicate entry. Additionally, if this contract change order's number exceeds by five the largest contract change order number on file, or if the supplement's number is more than two above the latest supplement on file for this contract change order, the system will reject the contract change order. However, if you checked the override field on the input field, the system will bypass 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 this unacceptable situation.

The following is an example of this type of problem:

- A contract change order is entered for extra work at force account and accepted by the system.
- Subsequently, extra work bill payments are recorded against the contract change order.
- A request is entered to delete the contract change order from the computer file. In this case, the system will reject the delete request because the payment method would be eliminated. There are no other supplements to this contract change order. The system requires that entries to correct extra work 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 contract change order exist, the system makes similar demands.

At this point, the processing of the contract change order is complete. However, when a supplemental contract change order is processed, the daily extra work reports in the holding file (due to insufficient funds in the original contract 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 Extra Work Billing

This module's purpose is to compute the amount of payment for extra work performed under a contract change order. This includes the following:

- Editing input information
- Retrieving and updating the contract change order
- Performing logic edits
- Conducting audit checks
- Performing computations
- Filing the extra work bill for payment
- Producing an edit report and daily extra work report

In addition to these functions, this module allows for entering corrections to filed extra work bills. Extra work bills or corrections to filed extra work bills will not be rejected because of insufficient funds (subject to the limitations in Section 3-904, "Payment for Extra Work," of this manual). Instead, the system will place the extra work bills or the corrections to filed extra work bills in a holding file to await the resident engineer's further action. Usually, the resident engineer must write a supplemental contract change order to provide additional funds; the supplemental contract change order will make the appropriate extra work bills available for payment.

Use Form CEM-4902, "Extra Work Bill (Short Form)," to enter basic information related to extra work performed under a contract change order. The following describes the 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 may enter extra work bills on the Form CEM-4902, "Extra Work Bill (Short Form)." Or, if more entries are required for equipment, labor, or material, the contractor must use the four part forms CEM-4902A, CEM-4902B, CEM-4092C, and CEM-4902D.

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)

Do the following for the basic information:

- The contract change order number: Right-hand justify this number; for instance, contract change order 1 is 001, contract change order 10 is 010.
- Report number: The contractor should leave the report number blank. Duplicate numbers will be rejected (except for corrections to previous bills).
- Date performed: A separate extra work 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 extra work 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: Ensure the method selected matches one of the methods authorized by the contract 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.
- Fifty percent flagging: You must include on the extra work bill the total hours spent on flagging because the computer will make payment of only 50 percent of the total. For flagging that is not subject to the 50 percent split, submit separate extra work bills.
- 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 percent from the effective Labor Surcharge & 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 extra work bill is for an invoice only, enter the name of the organization to which the invoice was addressed. Submit a separate daily extra work 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 & Equipment Rental Rates (Cost of Equipment Ownership) book. Make a copy of this publication available to the contractor. You can obtain from the Division of Construction's website a listing of miscellaneous equipment, for equipment not shown in the Labor Surcharge & Equipment Rental Rates (Cost of Equipment Ownership) book.
- For equipment that is neither in Labor Surcharge & Equipment Rental Rates (Cost of Equipment Ownership) book nor available from the web site's miscellaneous listing, the contractor must request a rate from the resident engineer. The resident engineer will obtain an approved rate from the Division of Construction's rental rate engineer.
- Equipment for which a contract 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, lines 24–33 of the daily extra work report.
- The following explains the procedures for "Class," "Make," "Code," and "Attach," within equipment description:

    1. Class: This portion of the equipment description will be found in the Labor Surcharge & 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."
    2. Make: For the equipment illustrated under "Class" above, 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."
    3. Code: For the equipment illustrated under "Class" and "Make" above, 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."
    4. Attach: 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 & 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 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:
  1. 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.
  2. Invoice description: Enter a brief description of material.
  3. Units: Normally, enter the unit one (1.00) for materials used.
  4. 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 the procedures below 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 CCO 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 contract 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 contract 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 extra work 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 extra work bill and approves it for entry into the contract administration system. When reviewing the submitted extra work bill, the resident engineer must be guided by the policy contained in Section 3-9, "Measurement and Payment," of this manual. The following explains how the system will process Form CEM-4902:

- You must request the contract administration system print a copy of the extra work bill after it has been entered into the system before it will be paid.
- Computer programs will perform the following processes:
    1. Edit all information for acceptability. For example, numeric data must be in numeric form, or the program will issue a warning.
    2. Select information from the equipment database, for example, rates, descriptions, and attachments.
    3. Validate the contract number, contract change order number, report number, type of work (payment method), dates, corrections, labor surcharge, and equipment description.
    4. Audit right-of-way delay and the hours equipment and labor are used for work.
    5. Compute extensions, markups and summaries.
    6. Ensure the authorized amount (for instance 100 percent or $15,000) is not exceeded.
    7. File a validated extra work bill for payment at the estimate time.
    8. Produce a daily extra work report. This report will contain all the information as entered on the extra work bill plus equipment descriptions, extensions, markups, total payment, and contract information.
    9. Produce an edit report. This report will contain processing results. These results are tabulated by contract 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 extra work 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, one for the resident engineer.

5-103E (3) Corrections to Extra Work Bills

You can make corrections to the extra work bill after it has been entered into the system, but there is a limit of four corrections per extra work bill. See *Entry of Extra Work Bills Manual (CASEWBM)*

5-103F Generating Estimates

CAS produces the following 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, the contract administration system 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 involves the following steps:

- Preparing Form CEM-6101, "Project Record-Estimate Request," and verifying the estimate. Transmit these to the district office.
- Computer processes your estimate and prints the reports.
- The district construction office verifies the estimate results.
- 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, prepare Form CEM-6101, "Project Record-Estimate Request." Complete this form accurately in accordance with the following:

5-103F (1b) Estimate Parameters

For the estimate parameters follow the instructions below.

- 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's 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, approved time extension days (contract change order), and approved time extension days (other) in the four matching fields of the form. 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 where, 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 see the second bullet below this one 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" (see the bullet two up from this one that discusses overriding the system) or entered a number in percent time elapsed (see the previous bullet), enter a short explanation in the 25 spaces immediately below these fields on the form. Typical entries might be "CCO 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 prior successful estimate, check the recalculation box. Note that, if the last 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 prior 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 prior 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 $1000.
- 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 $1000.
- Liquidated damages deductions: Enter "LIQ" in the type field. Both plus and minus deductions are allowed. Plus deductions reverse earlier deductions.
- 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 the contract administration system it 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 contract 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:

    1. If the resident engineer has submitted an EEO deduction, the contract administration system 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.
    2. If the resident engineer has submitted an LCV deduction, the system performs the same calculation as for EEO deductions described above.
    3. If the resident engineer has submitted an OOD deduction, the system will compute the deduction under the following conditions:

        a. 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.

        b. 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.

        c. 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:
    1. If the total to date for an OOD deduction is negative, the system will check whether the value for 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."
    2. 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.
    3. 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.
    4. 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.
    5. The system automatically computes overbid item deductions as required. These deductions are taken and returned at the appropriate times.
- Makes 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, the contract administration system prints your estimate.
- If this estimate is for a zero or negative progress payment, the system prints a status purpose only estimate.
    1. If the total authorized final cost is greater than the construction allotment, the contract administration system will issue a severe warning.
    2. 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 office of 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 the first three reports listed above and the last report listed above.

In addition to the estimate documents listed above, the contract administration system 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 your 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. You must 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.
- Contract change order processing: This lists any balancing of contract change orders by the system. Occasionally, the list contains warning messages, too.
- Contract item processing: This part of the report does the same things as described in the bullet above, but for contract items instead of contract 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 previously under the heading "Generating Estimates," 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 transaction: 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:

- Input edit of the CEM-6101, "Project-Record Estimate Request."
- Select from the computer file the extra work 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 contract change orders.
- Process contract items.
- Process deductions.
- Conduct miscellaneous computations.
- Generate reports.

5-103G Approval of Estimates

The authority to approve 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) The Resident Engineer

After an estimate has been run, the resident engineer must approve it before the process of payment is continued. To expedite payment, the resident engineer can approve through a memo, form letter, or telephone call with subsequent written confirmation to the district office.

5-103G (2) The District Director

At the time the estimate was produced, so was Form FA 729A, "Progress 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 Form FA 729A has been verified and approved.

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

The Contract Administration System (CAS) provides reports that must be requested specifically. Normally, resident engineers must request reports through the district construction office. Use Form CEM-6002, "Contract Administration System (CAS)-Report Requests," to obtain the reports. The following are the instructions for completing Form CEM-6002.

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 approved
- 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) The 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) The 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-kilopost
- Date of the last estimate
- Percent complete
- Percent 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 Office of Structure Construction (Copies)

This report is for use by the Office of Structure Construction. For details, see Volume I, Section 6, of the *Bridge Construction Records and Procedures Manual.*

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. Normally, therefore, 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

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."

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 approved quantity differs from the bid quantity, the project record item sheets describe, under the item number, any changes due to contract 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

Normally, the district office requests this report monthly for all ongoing contracts. The report must be filed in Category 60.

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 contract 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 Contract 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 contract change order.

Use the report to determine when supplemental contract change orders will be necessary to complete the work. The report also facilitates a review of those contract change orders where a credit is due Caltrans.

When applicable, flag contract change orders "COMPLETE" (using the contract change order final balance transaction) so that an accurate project status can be produced. Similar to flagging a contract item, flagging a contract change order "COMPLETE" means only that you have commanded the system to keep the contract change order in balance at all times.

5-103H (9) Contract 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 contract change orders stored in the computer file. It also contains the contract change order time extension and contract 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 contract change orders, must be retained in the project's files.

5-103H (10) Bridge Quantities by Structure

This report is for use by Office of 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 Volume 1, Section 6 of the *Bridge Construction Records and Procedures Manual*.

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 prior 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 various other reports that are produced automatically. Therefore, you do not need it for routine contract administration.

5-103H (16) DEWRs in Holding File

This report lists extra work bills that are in the holding file for all contracts in the district. If there are reports in the holding file, process supplemental contract change orders to provide additional funds. The system will then automatically release the bills for the next estimate.

5-103H (17) Daily Extra Work Report

Copies of daily extra work reports are produced under the procedure outlined earlier in this section under "Extra Work Billing." You can obtain copies by using the second page of the report request form.

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 the Office of Structure Construction

In addition to the reports discussed above, the contract administration system provides reports for the Office of Structure Construction. For details, see Volume I, Section 6, of the *Bridge Construction Records and Procedures Manual*.

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

5-104 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 the Division of Construction office. This section contains guidelines for the disposition of construction project records after Caltrans makes the final payment. 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 information about this history project file, see Chapter 7, "Uniform File System," of the *Project Development Procedures Manual*.

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, see Section 7-1.01A(3), "Payroll Records," 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.

The district construction office must establish a procedure for handling construction project records. This procedure must meet Caltrans record keeping policy and achieve 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 as follows:

    1. For projects that involve federal participation, retain the records for a minimum of three years after submission of the final voucher.
    2. For projects that do not involve federal participation, retain the records for a minimum of three 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 three years after settlement. The district construction office must send a memorandum to the district records officer to hold these records until further notice.

When the district no longer needs the records in categories 1, 2, 3, 4, 7, and 28, destroy them. Do not retain them as part of the project construction records.

After records from the resident engineer's office are sent to the district construction office, eliminate duplicate records.

Copies of Form CEM-6301, "Contract Acceptance," and the final Form CEM-2701, "Weekly Statement of Working Days," are retained in the project records in the district.

When records are sent from the district construction office to the State Record Center or to another district, prepare a transmittal list specifying the contents of each box. In a separate file in the district construction office, retain a copy of the transmittal list.

The Division of Construction also retains project records to ensure that adequate records are available to defend Caltrans in civil suits, especially those related to contractor's claims. After projects have been completed, the Division of Construction transfers files listed in the current "records retention schedule" for the Division of Construction to the State Records Center.

The *Bridge Construction Records and Procedures Manual* should be referenced for bridge and structure's related records that are transmitted to the Office of 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 the Office of 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 afterwards 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:

- Contract change order number.
- Revisions in alignment and right of way.
- Grade revisions in excess of 30 mm.
- 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, 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, but no later than 60 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, see Chapter 15, "Final Project Development Procedures," of the *Project Development Procedures Manual*.

5-104D (2) Procedure on As-Built Plans for Bridges and Structures

The Office of 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 the Office of Structure Design.

- The structure representative will make the as-built corrections to these prints and forward them to the Sacramento office of the Office of 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 rests or maintenance facilities, the Sacramento office of the Office of Structure Construction must forward the prints directly to the Office of Structure Design, documents unit. All other projects must be forwarded to the Office of Structure Maintenance and Investigations, which determines which sheets should be microfilmed for the structure files. In identifying prints to be processed, the Office of Structure Maintenance and Investigations must include all sheets prepared by the Office of Transportation Architecture. This office will then forward all the prints to the Office of Structure Design, documents unit.
- Those prints not identified for filing by the Office of Structure Maintenance and Investigations will be forwarded to the appropriate district office for the preparation of as-built plan sheets. The Office of Structure Design will make the as-built corrections on the original plan sheets. If the original plan sheet is not presently stored in the Office of Structure Design, it may be obtained from the district.

On state projects that do not have a representative from the Office of Structure Construction, the resident engineer must make the as-built changes on the full-size prints bearing "Structure" signature blocks. As soon as possible after completion of the structures, forward the prints to the Office of Structure Construction in Sacramento. The procedure outlined above must then be followed.

When the corrections have been made, the as-built plan sheets will be forwarded to headquarters microfilm services unit for microfilming and distributing.

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 the Office of Special Funded Projects' *Information and Procedures Guide and* the *Encroachment Permits Manual.*

For additional guidelines and details for completing structure as-built plans, see 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 the district desires for its own records, these plans may be sent to headquarters microfilm services unit for microfilming before being returned to the local government.

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 the Office of Structure Design, Local Assistance Section, 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.

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