STATE OF CALIFORNIA{PRIVATE }
DEPARTMENT OF TRANSPORTATION

MANUAL CHANGE TRANSMITTAL		NO. 06-1
TITLE: Department of Transportation *Construction Manual*	APPROVED BY: for Robert Pieplow Chief, Division of Construction	DATE ISSUED: August 31, 2006
SUBJECT AREA Index and other areas of the *Construction Manual*	ISSUING UNIT Division of Construction	
SUPERSEDES CPB 05-2, CPB 04-2, CPB 03-11, CPB 03-2, CPB 03-1 and CPB 02-5, CPD 04-5	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.

Section(s)	Remove Old Page(s)	Insert New/Revised Page(s)
Update: Golden Rod, Chapter 1, Section 105, "Construction Project Organization."	1-1.i	1-1.i
Update: Chapter 1, Section 105E, "Office Asst. Field Office Engineer," title is changed. Update: Chapter 1, Section 105F, "Specialists and Coordinators," is revised for 2 additional field specialists.	1-1.7 thru 1-1.8	1-1.7 thru 1-1.8
Update: Chapter 3, Section 403, "Changes," is revised for Scope of the Contract.	3-4.1 thru 3-4.6	3-4.1 thru 3-4.6
Update: Chapter 3, Section 511, "Differing Site Conditions," to change an office title and to add a web site.	3-5.3 thru 3-5.4	3-5.3 thru 3-5.4

Delete: Chapter 3, Section 707A, “Evidence of Insurance,” bullet two requirements to send a copy to Div. of Construction’s Progress Payment Section.	3-7.7 thru 3-7.8	3-7.7 thru 3-7.8
Update: Chapter 3, Section 708, “Disposal of Material Outside the Highway Right-of-Way” is revised to add information on the model agreement.	3-7.9 thru 3-7.16	3-7.9 thru 3-7.16
Update: Chapter 3, Section 803, “Progress Schedule,” is revised to add CPM manuals and web site.	3-8.9 thru 3-8.12	3-8.9 thru 3-8.12
Update: Chapter 3, Section 909, “Retentions,” and Section 3-909A, “Calculating Progress…” is revised.	3-9.21 thru 3-9.26	3-9.21 thru 3-9.26
Update: “Chapter 4, Section 37, “Bituminous Seals,” and Section 4-3703, “Slurry Seal,” to correct web addresses and formatting.	4-37.1 thru 4-37.2 4-37.5 thru 4-37.6	4-37.1 thru 4-37.2 4-37.5 thru 4-37.6
Update: “Chapter 4, Section 39, “Asphalt Concrete,” to revise the title of the QC/QA Manual. Sections 4-3902E and 4-3903B, “Street Operations,” are revised to replace paint binder with tack coat.	4-39.1 thru 4-39.10	4-39.1 thru 4-39.10
Update: Chapter 4, Section 42, “Groove and Grind Pavement” is revised to include Disposal of Materials Outside the Right of Way and disposal of PCC.	4-42.1 thru 4-42.4	4-42.1 thru 4-42.4
Update: Chapter 4, Section 56, “Signs,” to include responsibility for overhead sign structures.	4-56.1 thru 4-56.4	4-56.1 thru 4-56.4
Update: Chapter 4, Section 9002A, “Materials,” and Section 4-9002C, “Admixtures,” to correct web sites and formatting.	4-90.1 thru 4-90.4	4-90.1 thru 4-90.4
Update: Chapter 4, Section 92, “Asphalts,” and Section 94, “Asphaltic Emulsions,” to delete paint binder; reference the guidelines on the construction web site, and the name change to Tack Coat Guidelines.	4-92.1 thru 4-92.2 4-94.1 thru 4-94.2	4-92.1 thru 4-92.2 4-94.1 thru 4-94.2

Update: Golden Rod, Chapter 5, Section 101, “Forms Used for Contract Administration,” revised to include Form CEM-2004, “Notification of Construction (Desert Areas).”	5-1.i thru 5-1.ii	5-1.i thru 5-1.ii
Update: Chapter 5, Section 101B, “Construction Forms,” for CEM-2004, “Notification of Construction (Desert Areas),” is added. The reference noted for CEM-2025 is corrected. Update: Chapter 5, Section 102C, “Description of Categories,” is revised for Category 60 and Category 61 titles.	5-1.3 thru 5.1-4 5-1.29 thru 5-1.36 5-1.67 thru 5-1.68	5-1.3 thru 5.1-4 5-1.29 thru 5-1.36 5-1.67 thru 5-1.68
Update: Golden Rod, Chapter 5, Section 307, "Contract Change Order Memorandum,” revised to include new tables for coding.	5-3.i thru 5-3.iii	5-3.i thru 5-3.iii
Update: Chapter 5, Section 302, “Contract Change Order Policy,” to include additional contract scope issues. Update: Chapter 5, Section 307B, “Contract Change Order Category Codes,” is revised to include text with 4 letter code tables and a web site for the code generator.	5-3.1 thru 5-3.62	5-3.1 thru 5-3.62
Update: Chapter 5, Section 412A (3), “Project Chronology,” and Section 5-412A (4), “General Information,” delete “other days extension” and “estimate final cost” to agree with Example 5-410. Section 5-412A (13), “Summary of resolved claims in tabular format for all claims.”	5-4.33 thru 5-4.36	5-4.33 thru 5-4.36
Corrections: Example 5-4.10, “Sample Construction Claim Findings,” (6 of 10), (7 of 10), and (8 of 10) references are corrected. Example 5-4.10 (9 of 10) title is corrected.	5-4.61 thru 5-4.66	5-4.61 thru 5-4.66
Update: Chapter 5, Section 5, “Emergency Contract Administration,” to correct web address.	5-5.1 thru 5-5.2	5-5.1 thru 5-5.2

Update: Chapter 6, Section 2, "Acceptance of Manufactured Material and Sampling Methods," to correct the web address for SMARA and to add overhead sign structures.	6-2.1 thru 6-2.6	6-2.1 thru 6-2.6
Update: Golden Rod, Chapter 7, Section 2, "Environmental Commitments Record," and Section 7-103, "Protection of the Environmental Resources."	7-1.i thru 7-1.ii	7-1.i thru 7-1.ii
Update: Chapter 7, Section 102, "Environmental Commitments Records," Section 7-103C, "Migratory Bird Treaty Act," Section 7-106 "Environmental Hazards and Safety Procedures," are revised to include: environmental – construction liaison, Environmental Commitments Record, and Aerially Deposited Lead. Section 7-103D (1), (2), (3) and (4) "Disposal, Staging…," formatting and numbering of subsections.	7-1.1 thru 7-1.23	7-1.1 thru 7-1.23
Appendix: Add CEM-2004	A-1.18A thru A-1.18B	A-1.18A thru A-1.18B

Section 1 Construction Organization

1-101 General

1-102 Division of Construction Organization

1-102A Division of Construction, Chief
1-102B Office Chiefs and Staff
1-102C Construction Field Coordinator

1-103 District Construction Organization

1-103A District Director
1-103B District Construction Deputy Director
1-103C Construction Manager
1-103B Construction Engineer

1-104 Office of Structure Construction Organization

1-104A Office of Structure Construction, Chief
1-104B Area Structure Construction Manager
1-104C Structure Construction Engineer

1-105 Construction Project Organization

1-105A Using Personnel From the Office of Structure Construction
1-105B Resident Engineer
1-105C Structure Representative
1-105D Assistant Resident Engineer
1-105E Field Office Engineer
1-105F Specialist and Coordinators

1-106 Local Projects

The person responsible for the structural integrity of a construction contract must be a registered professional engineer. If the structure representative is not registered, that person must defer to the structure construction engineer any decisions and actions that constitute the practice of civil engineering, as defined by the Professional Engineer's Act.

1-105D Assistant Resident Engineer

The assistant resident engineer must ensure the performance of assigned work complies with the requirements of the plans, *Standard Specifications*, and special provisions. The duties of the position include the following:

- Ensuring the contractor complies with all contract requirements.
- Performing, or calling for, required tests to ensure work quality.
- Keeping complete, accurate, and concise records of the work and quantities.
- Keeping the resident engineer informed of work progress and problems.
- Responding to any contractor questions about plans and specifications. The assistant resident engineer must not direct the contractor's work but must immediately notify the contractor when work is not in compliance.
- As a representative of Caltrans, acting professionally at all times.
- Working effectively by knowing construction methods and inspection techniques.

1-105E Field Office Engineer

The field office engineer must maintain complete and accurate project records. These records may include the following:

- Monthly progress pay estimates
- Extra work reports
- Contract change orders
- Labor and equipment records
- Correspondence
- Personnel records

Once assigned, the field office engineer should remain on the project until its completion.

1-105F Specialists and Coordinators

The complexity of many Caltrans projects has resulted in the use of many district specialists and coordinators. These include the following:

- Materials and plant specialists
- Weights and measures coordinators
- Survey coordinators
- Labor compliance and civil rights personnel
- Safety coordinators
- Traffic handling, signing, and electrical specialists
- Landscape specialists

- Environmental - construction liaison
- Storm water coordinator
- Schedule analysts
- Claims engineers

In the absence of a Caltrans policy on any specific job problem, the authority of the resident engineer will prevail over that of a specialist or coordinator.

1-106 Local Projects

1-106 Local Projects

Local construction projects are either "State Administered," "Locally Administered," or "Administered by Private Sponsor." For the responsibility of state personnel on local projects, see Chapter 9, "Projects Funded by Other Agencies," of this manual.

Section 4 Scope of Work

Section 4
Scope of Work

3-401 Intent of Plans and Specifications

3-401
Intent of Plans and Specifications

The contractor must construct the project in accordance with the plans and specifications, including changes ordered in accordance with the contract. Both the contractor and the resident engineer must be familiar with the work to be done and the commonly accepted practices, customs, and terms used in the work.

Use judgment when dealing with problems arising from ambiguity or apparent conflict in the plans and specifications. Review the work from the contractor's viewpoint, as well as the engineer's. The resident engineer's interpretation should be one that a reasonable contractor, exercising prudence and caution, would obtain from the contract documents. Guard against decisions based on a reasonable doubt. Also, avoid searching out and using pure technicalities or making unreasonable inferences.

3-402 Final Cleaning Up

3-402
Final Cleaning Up

Section 4-1.02, "Final Cleaning Up," of the *Standard Specifications* requires the contractor to clean up the work site. In addition to this general requirement, Section 22, "Finishing Roadway," of the *Standard Specifications*, contains more detailed requirements for cleaning the roadway. For more information, see Section 4-22, "Finishing Roadway," of the *Construction Manual* (manual).

Before recommending relief of maintenance or acceptance of the contract, ensure the contractor meets all the requirements for cleaning up the site. Section 4-1.02 permits certain construction signs to be left in place until after contract acceptance. However, before contract acceptance, require the contractor to remove all construction signs except those necessary to cover work performed on the last day of the contract.

3-403 Changes

3-403
Changes

Project plans, specifications and other bid documents define the scope of the contract, and describe the details for the construction and completion of the whole work contemplated.

Section 10250, of the Public Contract Code allows Caltrans to increase or decrease quantities of work to be done under a unit basis contract during the progress of the work.

Caltrans inserts provisions in contracts for the performance of extra work and the furnishing of additional materials for the proper completion of the whole work contemplated, provided all "bidders had an equal opportunity of knowing the proposed terms for the extra work," under Section 10251of the Public Contract Code.

Section 10122, of the Public Contract Code provides four exceptions to contract work, two of which relate directly to the business of transportation. The Public Contract Code requires Caltrans to award contract work to the lowest responsible bidder, unless it is in the case of an emergency due to "the failure or threat of failure of any bridge or other highway structure," or if the director deems "it is not in the best interest of the state."

Caltrans policy is to limit changes to the contract's scope of work unless authorized as indicated in Section 5-302, "Contract Change Order Policy," of this manual and as required to complete the work as contemplated at the time the plans and specifications were approved. If proposed changes do not conform to this policy, the work must be performed by a separate contract.

To determine if a compelling reason exists to make changes to a current contract, follow the procedures outlined in Section 5-302, "Contract Change Order Policy," of this manual. If added work, which conforms to the policy, is not required immediately, consider performing the work with a separate contract.

When you determine that a change must be made, include the additional work by a contract change order. Discuss with the contractor all elements of that change, including the method of compensation and the effect on contract time. Your objective during the discussion is to develop full agreement or to identify elements that require negotiation or that could lead to protest. Your objective is also to ensure the contractor accurately understands all the elements of the change.

Analyze all proposed changes for environmental considerations, for obligations or commitments to other agencies, and for effects on the orderly completion of the entire contract. When a project nears completion, evaluate carefully the effects of changes on the contract's time of completion. Changes ordered near the contract's completion could disrupt the contractor's schedule and costs. They could also substantially delay the public's use of the facility and disrupt the planned use of Caltrans forces.

3-403A Procedure and Protest

The contractor may protest the terms or conditions of an approved contract change order. The protest must be made in accordance with the requirements in Section 4-1.03A, "Procedure and Protest," of the *Standard Specifications*. The protest must be concerned solely with compensation or time. Moreover, no basis exists for protesting the requirement to perform the added or revised work because the specifications require the contractor to perform ordered work.

The specifications allow the resident engineer to order work before the approval of a contract change order providing for that work. However, an approved contract change order should be issued as soon as possible. If the contractor does protest the contract change order, the sooner the protest is made, the sooner the issue can be addressed and resolved.

3-403B Increased or Decreased Quantities

When the total pay quantity of a contract item varies from the engineer's estimate by more than 25 percent, the variation may be the result of more or fewer units than shown in the engineer's estimate required to complete the planned work. The variance may also result from ordered changes or a combination of both of these factors. When the variation does exceed 25 percent, adjust the compensation in accordance with Section 4-1.03B, "Increased or Decreased Quantities," of the *Standard Specifications* or document in the contract records the reason for not making an adjustment in compensation. When the accumulated increase or decrease in contract item units shown on a contract change order exceeds 25 percent of the engineer's estimate, the overrun or underrun must be acknowledged and provided for in the current contract change order. You can provide for this overrun or underrun through one of the following options, whichever is applicable:

- Adjust the contract price in accordance with Section 4-1.03B.

- Defer any adjustment in compensation due to the overrun or underrun.
- State in writing that the contract item is not subject to adjustment. See Section 5-3, "Contract Change Orders," of this manual for a discussion and examples of contract change orders providing for adjustments in compensation resulting from increased or decreased quantities.

3-403B (1) Increases of More Than 25 Percent

It is usually appropriate to defer adjustment if work on the contract item has not been completed. Additional contract change orders may be affecting the quantity, or the number of units required to complete planned work may not be known. However, as soon as unit costs and final quantities can be reasonably determined, calculate any required unit adjustment and provide for it through a contract change order. When work on the contract item is completed, you may apply the unit adjustment to the total number of units in excess of 125 percent of the engineer's estimate.

Unless requested by the contractor in writing, the engineer does not have to adjust the contract price of an item if the contract item cost of the work in excess of 125 percent of the engineer's estimate is less that $5000. However, before exercising this right, ensure Caltrans will not gain any economic benefit from an adjustment. On the other hand, make an adjustment if it would decrease cost and the amount of the decrease would exceed the cost of making the adjustment.

3-403B (2) Decreases of More Than 25 Percent

If a contract item underruns the engineer's estimate by more than 25 percent, inform the contractor in writing as soon as work on the item has been completed. Unless the contractor requests an underrun adjustment in writing, no adjustment will be made.

3-403B (3) Eliminated Items

Section 4-1.03B(3), "Eliminated Items," of the *Standard Specifications* applies only to contract items eliminated in their entirety. Advise the contractor as soon as it is known that an item will be eliminated. Caltrans will not be responsible for costs incurred for material ordered after notification.

In the contract change order providing for the elimination of a contract item, ensure you cover the disposition of surplus material. Refer to the information below, titled "Surplus and Salvaged Material," for how to handle surplus material resulting from an eliminated item that cannot be returned to the vendor.

3-403B (4) Surplus and Salvaged Material

Minor differences between quantities of material required to complete the planned work and quantities shown in the engineer's estimate or shown in quantity summaries on the contract plans are normal operating differences. Caltrans is not liable for a surplus of material resulting from these operating differences.

If the final quantity of an item is less than 75 percent of the engineer's estimate, include any actual loss due to excess material in the costs as computed in accordance with s ection 4-1.03B(2), "Decreases of More Than 25 Percent," of the *Standard Specifications*. Do not make any allowance for material the contractor keeps.

Caltrans recognizes that certain materials or manufactured items required for the planned construction may be unique and not useable by the contractor, the supplier,

or for other projects or customers. If such materials or items become surplus by reason of an ordered change, resulting in a direct and unavoidable loss to the contractor, such loss must be compensated. Determine compensation on the basis of actual cost as provided in Section 4-1.03B(3), "Eliminated Items," of the *Standard Specifications*. The guidelines below describe how to dispose of material that the contractor cannot economically dispose of.

Base a determination to salvage items made surplus by ordered changes on economic benefit to Caltrans, conservation of the energy and materials required to fabricate the items, or both. Base economic benefit on the following:

- The item's condition is adequate to perform its function satisfactorily. Damage does not necessarily make an item unsuitable for salvage. Caltrans has the capability to repair some items, so investigate this approach before deciding to dispose of a damaged item. Also consider repair costs when determining the cost-effectiveness of salvaging.
- The value equals or exceeds the difference in the cost of salvaging (including hauling) and the cost of removal and disposal.

Additionally, an item should be salvaged if it meets one or more of the following conditions:

- It is a stock item with a definite, foreseeable use. Stock items include all items that Caltrans normally uses.
- It is not a stock item, but can be put to immediate use or has a definite, foreseeable use. This classification would include items that can be reinstalled in the immediate project or could be installed on future projects.
- It is part of an electrical installation owned jointly with another agency, and the other agency requests its salvage.
- It can be used immediately for some other beneficial purpose.

Most districts maintain a district salvage yard or other designated areas for receiving salvaged material. Each district also has a district recycle coordinator. Before the delivery of potentially salvageable items, make arrangements with the appropriate person. Materials should not be salvaged until such arrangements are made.

3-403C Changes in Character of Work

Before work can be considered "changed in character," the engineer must have ordered a change to the plans or specifications. If such an ordered change materially increases or decreases the unit cost of a contract item, then a change in character has occurred. Changes in character of work are not to be confused with "differing site conditions." For a discussion of differing site conditions, see Section 3-5, "Control of Work," of this manual.

When calculating the adjustment for a change in character of work, the original bid price bears no relation to the adjustment unless it can be demonstrated that the bid price actually represents the cost of the work. Section 5-3, "Contract Change Orders," of this manual contains examples of calculations and sample contract change orders.

3-403D Extra Work

Extra work is any new and unforeseen work that cannot be covered by a contract item or a combination of contract items, or it may be work designated as extra work in the specifications. Extra work is not a payment method. See Section 3-9,

"Measurement and Payment," and Section 5-3 of this manual for a discussion of payment methods for extra work.

All new and unforeseen work is not necessarily extra work. Caltrans policy requires you to use as a guide the specifications' definitions of the various contract items. If the added work involved in an ordered change can be defined as the same as items included in the contract, payment must be at the contract item price.

If the added work in the change can be defined as contract items, but a change exists in the unit cost, make payment under the provisions of Section 4-1.03C, "Changes in Character of Work," of the *Standard Specifications*," rather than for the entire added work as extra work.

New and unforeseen work, whether paid for under an item or classified as extra work, becomes a part of the contract when added by an approved contract change order. The contractor bears the same responsibility for this added work as for any other work under the contract.

3-404 Construction-Evaluated Research

3-404 Construction-Evaluated Research

One of Caltrans' goals is to continue to improve the effectiveness of our products, information, and services. The Division of Construction participation is important in demonstrating the effectiveness of new products and services.

Construction contracts that include evaluations of new products require the resident engineer to participate in the new product evaluation. The form and evaluation criteria should be included in the resident engineer's pending file. If the evaluation information is not in the file, the resident engineer should contact the new products coordinator in the Office of Materials Engineering and Testing Services (METS).

To add and evaluate a new product for an ongoing construction contract requires a contract change order. To approve the contract change order, the following is required:

- Confirmation from the new products coordinator of METS that the assessment is necessary and the evaluation criteria are readily available.
- Determination from the resident engineer that the addition of the new product is incidental to the work.
- Concurrence from the Division of Construction new products coordinator.

Forward the evaluation report for all construction-evaluated research to the new products coordinator of METS within 30 days of completing the evaluation of the new product.

3-405 Detours

3-405 Detours

The contract plans may include detour plans required for traffic passing through the project. Pay for the construction of these planned detours, temporary signing, and other traffic control devices at contract item prices. The cost of repairing damage to detours caused by public traffic will be paid for as extra work.

If it is necessary to construct detours that are not provided for in the project plans and specifications, contract change orders must provide for these detours. For design details, you may consult with the district design unit if necessary. In all cases, the district traffic unit must concur with detour design and signing provided for by contract change order.

3-405A Use of Local Streets and Roads

Use of local streets and roads to detour state highway traffic requires agreements or other arrangements to be made with the local agency. When the use of local roads for detours is included in the project plans, the district design unit will have made these arrangements. When contract changes require the use of local streets and roads, contact the project manager for assistance in making the proper arrangements with the local agency.

3-406 Use of the Materials Found on the Work

3-406 Use of the Materials Found on the Work

The engineer's designation of selected material takes precedence over the contractor's request for the use of materials found on the work.

The specifications provide that the engineer's approval is necessary for the contractor to use materials from within the planned slopes and grade lines, and written authorization is required for the use of materials outside the planned slope and grade lines. "Approval for the use of materials found on the work" shall be given in writing from the resident engineer, but "written authorization to use materials outside of planned lines and grades" must be by contract change order.

The authorization for excavation outside the planned slopes and grade must be justified as a benefit to the Caltrans. Under no circumstances should such work be authorized if it in any way adversely affects the appearance or function of the planned project.

3-506 Lines and Grades

3-506
Lines and Grades

Section 5-1.07, "Lines and Grades," of the *Standard Specifications* requires the engineer to establish any lines and grades necessary to permit satisfactory completion of the specified work. For information on construction surveys, see Chapter 12, "Construction Surveys," of the *Caltrans Surveys Manual*.

To establish line and grade, the district surveys unit must set the construction marks and stakes.

3-507 Inspection

3-507
Inspection

The resident engineer and assistant resident engineers have a primary duty to obtain compliance with the *Standard Specifications*, special provisions, and plans within the tolerances specified in these documents. When tolerances are not specified, the engineer must use judgment in determining the allowable deviation consistent with the usage of the trades involved.

Section 5-1.08, "Inspection," of the *Standard Specifications*, allows the engineer access to the work for the purpose of an inspection. The engineer must take full advantage of this access. Rarely can an engineer adequately inspect work from the seat of a car or pickup truck.

3-508 Removal of Rejected and Unauthorized Work

3-508
Removal of Rejected and Unauthorized Work

Section 5-1.09, "Removal of Rejected and Unauthorized Work," of the *Standard Specifications*, specifies the contractor's responsibility for rejected or unauthorized work.

Unauthorized work includes excavation outside planned slopes and below the grading plane. Unless an approved contract change order authorizes such excavation, do not permit it.

Section 3-603, "Defective Materials," in this manual, discusses the rejection of material that fails to meet specified requirements. Rejected material must be removed and replaced. When rejected material is remedied, it may remain in place only when the engineer gives written approval. In most cases, this approval requires a contractor requested contract change order. For instance, a contract change order would be necessary to approve a contractor's proposal to remedy out-of-specification aggregate base by adding additional aggregate to material deposited previously. A contract change order in this situation is necessary because the remedy requires a change in specifications. However, the engineer's written approval is not required when the remedy is specified, such as the remedy for damaged galvanizing of pipe or guardrail.

For all material used in the work, make the payment in accordance with the specifications. As an alternative to removal and replacement, do not allow defective material to remain in place without contract payment. Any such action must be provided for in the specifications under "operating range" and "contract compliance" or provided by an approved contract change order.

3-509 Equipment and Plants

3-509
Equipment and Plants

Section 5-1.10, "Equipment and Plants," of the *Standard Specifications*, requires each piece of equipment to have a number stamped or stenciled upon it. The identifying number should further be referenced to the license plate issued for the piece of equipment. This additional reference is especially important in the case of tractor and trailer combinations where the tractor may pull different trailers on separate occasions.

The engineer must use the identifying numbers to keep records of working and idle time for both the equipment and operators, including, among other items, contract items, extra work, move in and out, and plant erecting. Some items of work will require more complete records than other items. The resident engineer must determine which items of work need these records and how much detail will be necessary. Records of this kind are also required for costs when the quantity of certain contract items runs over 125 percent or under 75 percent of the estimated quantity.

Caltrans personnel must not instruct the contractor's employees in equipment operation. The resident engineer must be very careful in this area because the contractor may interpret suggestions as the engineer's direct orders. Caltrans personnel must also not adjust the contractor's equipment or ride on equipment other than that designed for personnel transportation or as required to inspect specific features of the work.

3-510 Alternative Equipment

3-510 Alternative Equipment

In lieu of specified equipment, Section 5-1.11, "Alternative Equipment," of the *Standard Specifications,* provides for the use of new or improved equipment subject to satisfactory performance as determined by the engineer.

Contract change orders must cover all modifications under Section 5-1.11. Do not adjust cost for such changes.

3-511 Differing Site Conditions

3-511 Differing Site Conditions

When a differing site condition occurs, Section 5-1.116, "Differing Site Conditions," of the *Standard Specifications,* provides recourse for Caltrans and the contractor. When a differing site condition arises, the resident engineer or structure representative should contact the district materials unit or Geotechnical Services at:

http://www.dot.ca.gov/hq/esc/geotech/

The following presents the two types of differing site conditions that exist, followed by the procedure to recover damages or savings for a differing site condition claim:

<u>3-511A Type 1</u>
Type 1 consists of actual subsurface or latent physical conditions materially different from those indicated in any of the following:

- The contract
- The log of test borings
- Other records of geotechnical data obtained by Caltrans' investigation of subsurface conditions
- The "materials information"
- Other records of data to the extent they were available to the contractor prior to the opening of the bids
- Or an examination of site conditions above ground

<u>3-511B Type 2</u>
Type 2 consists of unknown physical conditions of an unusual nature that are materially different from those ordinarily encountered and generally recognized as inherent in the work provided for in the contract.

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

Fifteen days before implementing proposed vertical and horizontal clearance changes, the resident engineer must notify the Transportation Permits Branch by fax of the proposed changes and their duration. (Note: Whenever the operation will reduce clearances available to public traffic, the specifications require the contractor to notify the resident engineer at least 15 days before the anticipated start of each falsework and girder erection operation.) If the clearance change is on a local jurisdiction roadway, notify the affected agency in writing at the same time.

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

3-706 Preservation of Property

The contract makes the contractor responsible for the preservation of all property involved in the project, including that which is not in sight. It is in the best interests of all parties for the engineer to be diligent in determining and pointing out the existence of all such property of which Caltrans has knowledge, 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. The resident engineer must ensure the contractor is aware of all plant life to be saved.

The resident engineer must also ensure the contractor does all that is required under the contract to protect and preserve property. However, the contractor's responsibility includes only that which 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

3-707 Indemnification and Insurance

The following are guidelines for enforcing and administering the requirements in the *Standard Specifications* for contractors' insurance and for railroad insurance as required by the special provisions.

<u>3-707A Evidence of Insurance</u>

At or before the preconstruction conference, the contractor must provide the resident engineer with evidence of insurance, as required by Section 7-1.12B, "Insurance," of the *Standard Specifications*. The resident engineer must do the following:

- Ensure the evidence of insurance conforms to the specified requirements.
- Ensure the contractor's required insurance does not lapse during the life of the project.

- If the contractor fails to maintain insurance coverage, request the contractor to immediately obtain the necessary coverage. If the contractor fails to do so, the resident engineer may consider contacting the insurance carrier to make arrangements to maintain the required coverage and charge the expense to the contractor.
- If the above procedures do not result in obtaining coverage, contact the Division of Construction for guidance.

3-707B Railroad 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, "Railroad Relations and Insurance Requirements," of the special provisions defines the relationships between Caltrans, the contractor, and the railroad.

When work must be performed on or near a railroad's operating properties, the contractor must provide insurance to ensure the financial ability to meet legal liability for damage, and to cover the losses that a railroad might sustain because of the contractor's operations.

Although contract specifications regarding railroad insurance have been standardized, occasional changes occur because of special situations. Requirements for railroad protective liability insurance vary depending on the railroad company involved. In Section 13 of the special provisions, the Engineering Services, Railroad Agreements Branch will normally issue special instructions for irregular situations.

3-707B (1) Insurance Approvals

Deliver all railroad insurance policies and copies provided to cover the prime contractor in accordance with Section 13 of the special provisions. Allow a minimum of four weeks for the railroad's notice of approval of the insurance. In cases of emergencies, you can obtain verbal release and authority to start work after the railroad has received all the documents.

3-707B (2) Responsibility

The resident engineer must ensure the specified insurance is in force at all times when work is being performed that requires such insurance.

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

- The railroad or the Engineering Services, Railroad Agreements Branch, has advised the resident engineer that the contractor, subcontractor, or both, have furnished the specified insurance.
- The resident engineer has a copy of the certificate of insurance.

3-707B (3) Insurance Renewal

Approximately four weeks before the expiration date of an insurance certificate furnished by either a contractor or subcontractor, the resident engineer must notify the contractor, by letter, of the expiration date. If work is to continue on railroad property, request the contractor to obtain renewal insurance. At that time, determine whether work on the railroad property has been completed.

Renewals may be accomplished by endorsing the extension of existing certificates or by issuing new certificates.

Allow sufficient time for railroad approval after the submission of a new railroad protective policy.

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, the resident engineer should provide the contractor with a copy of the model agreement titled, "Agreement for the Authorization between a contrator working on State Facilities and a Real Property Owner for the placement of construction related material outside of the State Right-of-Way." The contractor may use this sample agreement or provide an equivalent agreement.

After the contractor and property owner complete an agreement and obtain all the necessary permits, licenses, and environmental clearances, the contractor must submit the signed agreement to the resident engineer for approval. The resident engineer must 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 that were submitted. A sample written approval and a sample agreement are located at the end of this section of the manual and at the following web site:

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

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, the resident engineer should access the California Water Resources Control Board or Department of Toxic Substances Control web sites at:

http://www.swrcb.ca.gov/cwphome/land/walist.html

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 only for 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 0.5 km 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 0.5 km sections that contain 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 Specifications*. 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 2000 mm in 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 work that is completed. Therefore, any recommendations for this action on work for other public agencies or owners also require the concurrence of these agencies and owners. 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

3-710 Acceptance of Contract

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 make use of 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, has been 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 prohibition against use, of nonoperating right-of-way by the contractor. On those occasions 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 of the normal provisions requiring insurance and parcel protection will be enforced.

AGREEMENT 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

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_____ _____ (such as 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") that has been 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.

- 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)

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 (916) 653-4086

Flex your power!
Be energy efficient!

Date

Address

Attn:

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

Dear _____,

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 _____ cubic yards of _____ (type of material) ("Material") to (property owner's) property. Pursuant to the submitted agreement, (contractor) and (property owner) have represented all necessary permits, licenses, and clearances were obtained and submitted prior to the disposal of the Material and have released the Department of Transportation (Department) of 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 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) 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 of or in connection with _____ _____ (contractor's) performance of this contract.

Sincerely,

Resident Engineer

c:

bc:

Record the date the contractor begins work on Form CEM-2701 in the resident engineer's daily report, and on the original or supplemental Form CEM-6003, "Progress Pay Estimate, Project Initiation or Update." For more information, see Section 5-103B (1), "Completing Form CEM-6003, Project Pay-Estimate Project Initiation or Update," of this manual.

Adequately record the district's actions toward encouraging the contractor to begin work. Notes of discussions from the preconstruction conference or other conversations with the contractor provide the necessary records. If a contractor fails to begin work by the specified time, remind the contractor of this failure under "Remarks" on Form CEM-2701. Send a separate letter with an additional reminder.

When the district decides that failure to begin work will result in unsatisfactory progress, discuss the situation with the construction field coordinator.

3-802A Work Before Contract Approval

After the contractor has executed and returned the contract to Caltrans, the contractor, after submitting the specified notice, may enter the site and begin operations.

When a contractor wants to start work before contract approval, call the Office of Office Engineer, contract documents unit, to determine whether Caltrans has received the executed contract documents. If the office has received the documents, proceed as set forth in Section 8-1.03, "Beginning of Work," of the *Standard Specifications*.

If a contractor wants to begin work before contract documents have been delivered to Caltrans, the contractor must obtain an encroachment permit from the district. The permit must incorporate the same terms stated in Section 8-1.03 that apply after the contractor has returned the executed contract documents to Caltrans but before the time of the contract's approval. In addition the permit must include the following:

- A statement that the contractor is responsible and liable for any personal injury or property damage resulting from the work.
- The requirements for cooperation contained in the special provisions and in Section 7-1.14, "Cooperation," of the *Standard Specifications*. The terms of the permit should include notice that the contractor may be working on the site concurrently with others performing utility relocation, right-of-way clearance work, or other construction operations and that the work of the others will take precedence over the contractor's operations.
- When obvious conflicts are apparent, a permit should not be issued.
- The limits of the area in which work will be performed.
- The operation or operations to be performed.
- A statement that the contractor will comply with the requirements of the contract plans, *Standard Specifications*, and the project's special provisions and that the contractor will comply with any order of work specified in these documents.
- A statement that the contractor's operations will not deprive property owners of access.
- A requirement to provide an adequate bond (or cash deposit) to cover the work contemplated before starting any work. The amount should be the same as for other types of work, as covered in the *Manual for Encroachment Permits on California State Highways*.
- A reference to the contract's water pollution control requirements.

When extra work must be a first order of work, it should be performed under a "prior authorization," as covered in Section 5-3, "Contract Change Orders," of this manual. After the executed contract documents have been delivered as specified, contract change orders may be approved in the normal manner.

The district must not process requests for relief from maintenance or for contract acceptance until after the contract's approval.

3-803 Progress Schedule

3-803 Progress Schedule

When the special provisions require a progress schedule, the resident engineer must make every effort to obtain a reasonable schedule at the beginning of the contract. Any communication regarding the progress schedule must be recorded in the daily report. Notify the contractor in advance if a progress payment will be withheld for failure to submit a satisfactory schedule.

Schedules should do the following to satisfy general specification requirements:

- Separate the major items into activities that are likely to become the controlling operation or operations.
- Accurately show progress of the work, determine controlling items of work, and analyze time impacts from contract changes or work delays.
- Be consistent with contract time requirements.
- Display milestones such as placing traffic on detours or new pavement and beginning new phases of the work in staged construction.

The resident engineer must require an updated or revised progress schedule regularly or when significant changes occur in the project.

The special provisions may require a progress schedule using the critical path method (CPM). The special provisions will contain all the requirements for such a schedule. Resident engineers should also refer to the CPM training publications, *Introduction to Construction Scheduling Manual* and the *Advanced Construction Scheduling Manual* located on the Division of Construction's Intranet web site on the contract administration page:

http://pd.dot.ca.gov/construction/contractmanagement/cmpage.htm

3-804 Temporary Suspension of Work

3-804 Temporary Suspension of Work

Temporary suspension of work, as covered under Section 8-1.05, "Temporary Suspension of Work," of the *Standard Specifications*, falls into two general categories:

1. This category relates to the contractor's failure to carry out orders or to perform any provision of the contract. Any letter ordering such a suspension must include references to applicable sections of the specifications and, if possible, state the conditions under which work may be resumed. Such action is taken only after careful consideration of all aspects of the problem.
2. This category relates to unsuitable weather or conditions unfavorable for the suitable prosecution of the work. This type of suspension may result from anticipated heavy traffic due to a holiday or a special event.

   a. Suspension of an Item or Operation

A suspension that affects an item or several items may be ordered. Usually this suspension is used when either the work or the public will be affected adversely by continued operation.

Although this type of suspension is an option available only to the engineer, consider the contractor's opinion on such a suspension.

b. Suspension of the Entire Project

In areas subject to severe weather, it is permissible to suspend an entire project if this action is considered to be in the best interest of Caltrans. However, the engineer's authority to suspend is limited to the reasons stated in Section 8-1.05, "Temporary Suspension of Work," of the *Standard Specifications*. When an entire project is suspended for reasons that do not fall under the scope of Section 8-1.05, the suspension must have the contractor's concurrence.

During any suspension, advise the contractor of the conditions under which maintenance will be performed.

During a suspension, preferably use the contractor to perform the necessary work to provide for public convenience or public safety. If Caltrans must perform such work, the district will request a director's order, financed from the contract allotment. This order allows the district to hire a contractor to perform the work at force account.

When the reason for a suspension no longer exists, or when favorable conditions are expected soon for resuming work, the resident engineer must notify the contractor in writing. The letter must state the date when working days are expected to be resumed and must allow sufficient time to permit the contractor to remobilize the necessary labor and equipment. Generally speaking, 10 working days are considered a reasonable time.

The district construction office must forward to the Division of Construction copies of the letters notifying the contractor of suspension and resumption of work.

Because of an ordered suspension of work, the contractor may be due additional compensation, contract time, or both, that was not provided for elsewhere in the specifications. The specification allowing such compensation applies only to situations where the work is suspended for an unreasonable period. A one-day suspension because of traffic generated by a planned major event is not unreasonable. However, a suspension resulting from an unplanned major incident could be reason for granting additional compensation, time, or both.

3-805 Time of Completion

3-805 Time of Completion

This section discusses the method of tracking contract time and uses the terms "days," "working days," and "controlling operation." Section 1, "Definitions and Terms," of the *Standard Specifications,* defines "days." Section 8-1.06, "Time of Completion," of the *Standard Specifications,* defines "working days" and "controlling operation." However, the contract's special provisions may modify the definition of working days.

The total time allowed for completion of a contract is a specified number of working days. The "computed date for completion" of a contract is the date of the last working day. On most projects situations arise that extend the date for completion beyond the "computed date for completion." This extension is called the "extended date for completion."

The “computed date for completion” can be extended in two ways:

1. A day that normally would be charged as a working day is not charged. The number of working days remains the same. The result of this situation is that the “computed date for completion” is extended by one working day. This method of extending the date for completion is used when work is suspended or when working days are not charged for the reasons given in paragraphs (b) and (c) in Section 8-1.06, “Time of Completion,” of the *Standard Specifications*.

2. The number of working days in the contract is increased, resulting in an extension of the date for completion. However, the actual working day, or days, on which an event occurred that resulted in an extension of time are charged as working days. This method of extending the date for completion is called a time extension. Reasons for time extensions are specified in Section 8-1.07, “Liquidated Damages,” Section 8-1.09, “Right of Way Delays,” and Section 8-1.10, “Utility and Non-Highway Facilities,” of the *Standard Specifications*.

3-805A Weekly Statement of Working Days

The resident engineer must use Form CEM-2701, “Weekly Statement of Working Days,” to report the status of contract time to the contractor.

As soon as possible and no later than the middle of the following week, forward the original statement to the contractor. For review, send one copy to the district construction office, and file another copy with the project records. When working days are not being charged because of a work suspension, the weekly statement need not be submitted until working days are charged again. The first weekly statement after resumption of work will show the total suspension days to date.

Form CEM-2701 consists of three basic sections:

3-805A (1) The Record Section (Upper Block)

This section is used to record all working days, nonworking days as defined in Section 8-1.06, “Time of Completion,” of the *Standard Specifications*, and working days on which no productive work was performed on the controlling operation. In this section, tabulate every elapsed working and nonworking day during the life of the project.

Each day, the resident engineer must determine whether or not to charge a working day, and if necessary, discuss the decision with the contractor. The “current controlling operation” is the basis of this determination; therefore, the resident engineer must base the decision on conditions effective on the day under consideration. The resident engineer will note on Form CEM-2701 the operation that, in the resident engineer’s opinion, is currently controlling. If the contractor does not concur, the entry will give the contractor an opportunity to protest formally, in accordance with Section 8-1.06, “Time of Completion,” of the *Standard Specifications*.

If the controlling operation is a nonweather dependent activity, such as concrete curing or an embankment settlement period, a working day must be charged during inclement weather.

2. Sign Structures. Structural steel that is used in overhead sign structures as described in Section 56, "Signs," of the *Standard Specifications* may be considered acceptable as raw material. However, pay for such material as raw material only, until shop fabrication of a usable member (such as a sign frame or other member) is 100 percent complete. After shop fabrication is complete, pay for the estimated fabricated value, subject to other specified restrictions and administrative guidelines.

- Verify proper storage of materials listed on Form CEM-5101 in accordance with the following procedures:

3-907D (1) Materials at the Project

For all valid requests for material located at or near the project, determine whether the materials are stored in conformance with the contract. To conform to this requirement, the contractor may have to store materials in fenced areas with locked gates, in locked warehouses or in areas where it is improbable that materials would be lost from any cause. In addition to having controlled storage, the contractor is required by the *Standard Specifications* to provide proper storage and handling so that the materials do not become damaged. Call any indication of improper storage to the contractor's attention. Withhold payment for materials on hand until the materials are properly stored.

Do not pay for material accepted on the basis of certificates of compliance until such certificates have been received.

The resident engineer or an assistant resident engineer must review Form CEM-5101 to verify that the request is acceptable.

3-907D (2) Materials Not at the Project

For materials not delivered to the jobsite, obtain evidence and establish the fact of purchase, proper storage, acceptability, accessibility and other factors. The Office of Materials Engineering and Testing Services (METS) maintains representatives in the major industrial areas and provides inspection in all other areas for this purpose. The following is the procedure:

- If it is not practical for the resident engineer or assistant resident engineers to verify quantity, quality, location and proper storage, send the duplicate copy of the Form CEM-5101 to METS.

- Upon receipt of Form CEM-5101, METS will notify the appropriate inspection office or offices immediately. The METS representative will notify the resident engineer directly by use of Form TL-0649, "Inspector's Report of Material on Hand," or TL-6037, "Fabrication Progress Report," that the material has been inspected and that it is in acceptable condition and properly stored. METS will use Form TL-6037, for structural steel, precast prestressed concrete members, or sign structures. For other products, METS will use Form TL-0649.

METS may also indicate on its correspondence, the percent complete of shop fabrication on various structural components. This figure is given for the purpose of reporting progress on the affected items. Do not use it to increase payment for materials on hand during fabrication.

- Upon receipt of the CEM-5101 and the above verification, the resident engineer can approve the partial payment. The contractor must submit a new CEM-5101

for each estimate, and the above procedure must be followed. However, it is possible METS may not be able to respond in time for payment on the estimate. METS gives priority to new or changed requests. Therefore, for requests that have not changed since a previous submittal, resident engineers may approve subsequent payments in the absence of any METS reports to the contrary.

On the monthly progress pay estimate, enter the total value of acceptable material as material on site regardless of storage location.

The maximum payment for materials on hand should be such that, when the estimated placing and other remaining costs of the work are added, the contract price is not exceeded. The purpose of this is to prevent payment of more than the contract price for the materials and to leave sufficient funds in the item to complete the work.

3-908 Deductions

3-908 Deductions

Deductions (as opposed to retentions) are those amounts held back for specific purposes. The resident engineer must identify, initiate, and control all deductions.

Make a deduction from payment to the contractor as soon as the liability for the event requiring a deduction has been determined. It is preferable to base deductions on known amounts resulting from agreements or actual billings, but, if necessary, they can be estimated.

Resident engineers must keep source documents and summary sheets in the appropriate contract records to cover all deductions. In the absence of any information to the contrary, the Contract Administrative System (CAS) will carry deductions forward from the previous month.

Whenever the contractor's progress is unsatisfactory, and the project has progressed to a point where a reasonably accurate estimate of possible liquidated damages can be made, the resident engineer must deduct an amount sufficient to cover probable liquidated damages. Make the deduction in lieu of any retention for unsatisfactory progress. To prevent the retention, check "Override Unsatisfactory Progress" on the CEM-6001. Enter the amount and description of deductions on Form CEM-6001, "Project Record-Estimate Request."

3-909 Retentions

3-909 Retentions

Retentions are made in accordance with the terms of the contract. For contracts without any federal funding, the Contract Administrative System (CAS) will calculate and withhold the retention, including any retention for unsatisfactory progress, without any specific action by construction personnel. On any estimate that shows satisfactory progress, the system will release all retentions previously made for unsatisfactory progress.

On federal aid contracts, retention will not be withheld by Caltrans except for unsatisfactory progress under very limited conditions. Federal rules also prohibit prime contractors from withholding retention from subcontractors.

Occasionally a contract will contain a nonstandard format for contract time or other circumstance resulting in satisfactory progress even though it is mathematically unsatisfactory. When this situation occurs, the resident engineer must waive the retention for unsatisfactory progress and document the reason for doing so. To waive the retention, check "Override Unsatisfactory Progress" on Form CEM-6001, "Project Record-Estimate Request."

In general, the retention for unsatisfactory progress should be waived only for landscape projects or on other projects only after a corrected entry has been made for "percent time elapsed" as covered below.

If the contractor requests a reduction of retention after 95 percent of the work has been completed, forward the written request to the disbursing officer in the Division of Accounting. CAS will reduce the retention when all the requirements specified in Section 9-1.06, "Partial Payments," of the *Standard Specifications*, have been met.

3-909A Calculating Progress - Projects with Single Time

Retentions are usually determined by unsatisfactory progress. On projects without any federal funding, progress is determined by comparing the contractor's actual progress with the curve on Form CEM-2601, "Construction Progress Chart." This requires calculation of the percent of work completed and the percent of time elapsed. If the plot of these percentages falls on or above the curve on Form CEM-2601, progress is considered satisfactory. Otherwise, it is considered unsatisfactory except under extenuating circumstances. The calculation of both the percent of work complete and the percent of time elapsed for contracts with federal funding is stated in the special provisions.

For contracts with federal funding, unsatisfactory progress is determined as follows.

- Progress is considered unsatisfactory when the following occurs:

  1. The number of working days charged to the contract exceeds 75 percent of the working days in the current time of completion, and

  2. The percent of working days elapsed exceeds the percent of work completed by more than 15 percentage points.

When both conditions are met, CAS will withhold 10 percent of the amount due on the current monthly estimate.

The percent of work completed (except on landscape projects with Type 1 plant establishment) is determined by dividing the amount on the line entitled "Total Work Completed" on the "Project Record Estimate" by the "Authorized Final Cost" on the "Project Status." CAS calculates this percentage (except on projects with Type 1 plant establishment).

CAS computes the percent of contract time elapsed by dividing the number of working days elapsed to the date of the progress estimate, by the original working days specified in the contract plus "Total time extension days approved to date (contract change order plus other)," on Form CEM-2701, "Weekly Statement of Working Days."

Occasionally the resident engineer has information indicating that the percent of time elapsed is different from that which CAS will calculate. The usual reason for this is that pending time extensions have not yet been approved and entered into the system. The percent of time elapsed can be calculated using the anticipated time extension in the formula in the preceding paragraph. The resident engineer must document the calculated percent of time elapsed as well as the reasons therefore. Enter the calculated percent of time elapsed in the appropriate place on Form CEM-6001, "Project Record-Estimate Request." CAS will calculate satisfactory or unsatisfactory progress based on this figure.

3-909B Calculating Progress for Landscape Projects

See Section 20-4.08, "Plant Establishment Work," of the *Standard Specifications*, and Section 4-2003C (8), "Plant Establishment Work," of the *Construction Manual*, for specifications and administrative guidelines for plant establishment time requirements. For projects with Type 2 plant establishment, the percent of time elapsed and percent of work completed is determined in the normal manner as described above. For projects with Type 1 plant establishment, compute the percent of time elapsed and the percent of work completed as follows for the periods prior to the start of plant establishment.

Determine the percent of work completed by dividing the value of work accomplished by the authorized contract amount minus the authorized plant establishment work.

$$\% \text{ Complete} = \frac{\$ \text{ Value Completed Work}}{(\$ \text{ Total Auth. Contract Amt.} - \$ \text{ Plant Estab. Work})}$$

Determine the percent of time elapsed by dividing the number of working days elapsed to the time of the estimate on Form CEM-2701 by the total contract time limit plus "Total time extension days approved to date (contract change order plus other)" on Form CEM-2701 and minus the length of the plant establishment period.

$$\% \text{ Time} = \frac{\text{Working Days Elapsed}}{(\text{Orig. Cont. Time} + \text{Time Ext. to date} - \text{Plant Estab. Period})}$$

On projects without federal funding, compare these two percentages to the curve on Form CEM-2601, "Construction Progress Chart." On projects with federal funding, compare these two percentages to the requirements specified in the special provisions. If progress is satisfactory, check the "Override Unsatisfactory Progress" on Form CEM-6001, "Project Record-Estimate Request."

After the start of Type 1 plant establishment, the resident engineer will decide if the progress is satisfactory. In general, consider progress considered satisfactory if the contractor entered the plant establishment period on time and carries out plant-establishment work on time. Progress will be considered unsatisfactory if there will be an overrun in contract time due to a delayed start of Type 1 plant establishment.

3-910 Payment After Acceptance

3-910 Payment After Acceptance

Caltrans makes final payment as soon as possible after the contract is accepted and the contractor submits the required documents requested by the resident engineer. Any estimate covering a payment after contract acceptance is identified either as "after acceptance," "semifinal," or "final." Section 5-4, "Disputes," of the *Construction Manual* lists the timeline for completing payment steps after the acceptance process.

3-910A Negative Estimates

Negative estimates reflect an overpayment made to the contractor, and should be avoided whenever possible. To reduce the processing time associated with negative estimates; contact the Division of Construction's progress pay coordinator to begin the process of generating a negative estimate.

The resident engineer is responsible for the accuracy of all payment estimates, including progress payment, after acceptance, semifinal, and final estimates. Verify the correctness of the contract item quantities and ensure the data submitted conforms to Caltrans policies. The district progress pay coordinator should hold the negative

payment estimate for processing until approved by the deputy district director of construction, or delegate, and the Division of Construction field coordinator. The Division of Construction field coordinator discusses and resolves negative payment estimates with district construction to determine the best course of action. The Division of Construction progress pay coordinator processes only those negative estimates approved by the Division of Construction field coordinator.

When a negative payment estimate is approved for processing, the Division of Accounting creates an accounts receivable and directly bills the contractor for the amount due. The Division of Accounting provides a monthly listing of all pending accounts receivable and their status to the progress pay coordinators and expects that further action is taken as directed by district construction and the Division of Construction. Accounts receivable debts are automatically sent to collections after 90 calendar days. A collection fee is charged to the district's capital outlay support in either a phase 3 project expenditure authorization (EA), or an overhead EA. If the bill is not collectable, the nonrecoverable debt is charged against the district's capital funding allocation (phase 4) EA. If, for any reason, you believe that the accounts receivable should not go to collections, notify the district progress pay coordinator and the Division of Construction's progress pay coordinator. Once notified, the Division of Construction's progress pay coordinator, with the Division of Construction field coordinator's concurrence, will notify the Division of Accounting to hold the accounts receivable from going to collections.

Section 3-910B, "Payment Offset," describes another method available to the resident engineer and the Division of Accounting to resolve overpayment to the contractor.

3-910B Payment Offset

A payment offset is a levy against future monies due to the contractor on other contracts Caltrans has awarded to the contractor. Offsets may be taken to retain adequate funds for stop notices, labor compliance violations, claim settlements, and determinations made by an arbitrator. The offset process is outlined in the flowchart later on in this section, and should be completed within 90 calendar days of contract acceptance.

Send a "Notice of Opportunity for Offset Hearing" pursuant to Government Code Section 12419.5 (see Example 8) to the contractor, offset resident engineer, bonding company, and offset bonding company. The contractor has 20 calendar days to inform the resident engineer that an offset hearing was requested. If an offset hearing is requested, the hearing officer should conduct the offset hearing within 10 calendar days of receipt of the request. The hearing officer should examine the facts of the specific case, and validate the offset process. The hearing officer is the district director or designee. The designee must be at least a supervising transportation engineer or career executive appointment one manager. A summary of the facts of the account receivable, minutes of the offset hearing, and final determination report are prepared by the resident engineer. Notify the contractor, offset resident engineer, and bonding companies of the final determination of the hearing, including the date and amount of the offset. If the hearing officer determines the offset is warranted, or if the contractor does not request a hearing, request that the Division of Construction execute an offset. If the hearing officer determines that offset is not warranted, process a progress payment to clear the accounts receivable in the Construction Administration System. In the case of an arbitration settlement, the Division of Construction will recommend the district execute an offset. The Division of Accounting executes only those offsets authorized by the Division of Construction.

A payment offset may affect not only the contractor, but also multiple resident engineers, districts, and bonding companies.When choosing a contract to offset against, the following criteria, in preferential order should be considered:

1. Active contract with adequate retention to cover the offset.
2. Both contracts are bonded by the same bonding company.
3. Both contracts are administrated by the same resident engineer in the same district.

The bonding companies from both contracts and the contractor are given the opportunity to request an offset hearing. Any legal arguments presented by the contractor or its bonding companies should be referred to the Legal Division for review and advice to the hearing officer

During the offset hearing, the contractor should provide convincing factual evidence to refute the account receivable. The hearing officer should consider the size of the offset, progress of the work, percent complete and financial health of the contractor.

When justified by evidence of financial hardship, contractor proposed repayment plans to clear the account receivable may be coordinated with the Division of Accounting. The status of claims and disputes should not have an influence on the decision to execute an offset.

Section 37 Bituminous Seals

Section 37
Bituminous Seals

4-3701 General

4-3701
General

Section 37, "Bituminous Seals," of the *Standard Specifications* covers seal coats and slurry seals.

Seal coats are either fog seals, an application of asphaltic emulsion with added water, or asphaltic emulsion and screenings (commonly known as "chip seals").

Slurry seal is a mixture of graded fine aggregate, asphaltic emulsion, water, and set-control additives.

In addition to the bituminous seals provided for in the *Standard Specifications*, the special provisions may provide for hot-applied seal coat (polymer-modified asphalt), asphalt-rubber seal coat, parking lot seal coat, or asphalt rejuvenating agent. This section will discuss the duties of resident engineers and assistant resident engineers regarding seal coats and slurry seals.

For the most part, bituminous seals are used to maintain existing asphalt concrete pavement. Bituminous seals on new work are generally limited to fog seal on asphalt concrete dikes, miscellaneous areas, and shoulders.

Refer to "Tack Coats for Bituminous Seals," in the *Tack Coat Guidelines* at the following web site:

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

4-3702 Seal Coats

4-3702
Seal Coats

The following covers the duties required throughout each phase of the project for seal coats.

4-3702A Before Work Begins

Before work begins, take the following steps:

- Review the contract to determine the type of bituminous seal required. Note the particular type of bituminous binder to be used, the requirements for aggregates, and any special details. Special details may include local agency requirements with regard to air quality and other environmental restrictions. Decide whether any conditions have changed from those upon which the design engineer based the requirements, and make any necessary changes.
- Verify the receipt and proper distribution of Form CEM-3101, "Notice of Materials to Be Used," which lists seal coat materials.
- In accord with the State Contract Act, ensure the aggregate comes from a permitted source site that complies with the Surface Mining and Reclamation Act of 1975 (SMARA). Mining operations determined to be in compliance are listed on the AB 3098 SMARA Eligible List. You can obtain this list from the Division of Construction or the Department of Conservation's web site at:

http://www.consrv.ca.gov/omr/reclamation

Also, see Section 7-103D, "Protection of Environmental Resources," of the *Construction Manual* to determine if the proposed materials site is exempt from SMARA.

- Obtain initial samples of screenings and test them for all of the specified attributes. Advise the contractor of the test results, with particular reference to any deficiencies that must be corrected.
- Examine the surface to be sealed. Prepare a contract change order to provide for any necessary corrective action, such as sealing cracks and repairing failed areas. At this stage, a joint review with the maintenance region manager or area superintendent would be helpful.
- Review the project to ascertain all requirements for handling traffic. Review with the contractor the required traffic control system and traffic control devices.
- Decide on and advise the contractor of the exact application rates of screenings and bituminous binder that will be used.
- For fog seal, decide on the water amount to be added to asphaltic emulsion. The quantity to be added must be based on the judgement and experience of field personnel. Take into account the permeability of the surface to be sealed, climatic conditions anticipated at the time of application, traffic, and desired spread rate. Unless circumstances dictate less, use the maximum amount permitted. This approach makes it easier to obtain a correct and uniform spread, especially when lighter spread rates are used.
- Determine temperatures, and ensure that bituminous seals are not placed when the applicable atmospheric or pavement temperatures are below the minimums specified.
- Be prepared to receive the latest weather reports, and have a means established for making contact with the contractor's authorized representative before 4:00 p.m. on the day before the intended workday. Note that the specification for notification of anticipated unsuitable weather conditions applies to both fog seals and chip seals. Prepare a contract change order, if it becomes necessary, to pay for standby time.
- Determine whether the surface to be sealed is clean and dry. Ensure the contractor cleans the surface to remove all loose particles of pavement, dirt, and other extraneous material.
- Examine distributor trucks, chip spreaders, rollers, and other equipment to ensure that specifications are met.

4-3702B During the Course of Work

Once work begins, take the following steps:

- Obtain the required test report for each truckload of asphaltic emulsion. Compare the report with the specifications. Do not permit the emulsion to be used before testing unless a Certificate of Compliance accompanies it.
- Obtain samples of the asphaltic emulsion in accordance with the frequency tables in Section 6-1, "Sample Types and Frequencies," of the *Construction Manual* (manual). For emulsion used in fog seals, it is preferable to take samples of the emulsion before adding water. If this approach is impractical, note on the sample form the amount of added water (that is, how many parts of water to how many parts of emulsion).
- From the delivered material, obtain samples and test them for sieve analysis and cleanness value in accordance with the frequency tables in Section 6-1 of this manual.

4-3703 Slurry Seal

The following covers the duties required throughout each phase of the project for slurry seal.

4-3703A Before Work Begins

Before work begins, take the following steps:

- Verify the receipt and proper distribution of Form CEM-3101, "Notice of Materials to Be Used," which lists slurry seal materials.
- Receive and review the mix design and laboratory tests from the contractor. After determining that the design and test results conform to the requirements in Section 37-2.03, "Mix Design," of the *Standard Specifications*, approve the mix design in a timely manner. Determine the percentage of asphalt binder to be used and notify the contractor.
- In accord with the State Contract Act, ensure the aggregate comes from a permitted site that complies with the Surface Mining and Reclamation Act of 1975 (SMARA). Mining operations determined to be in compliance are listed on the AB 3098 SMARA Eligible List. You can obtain this list from the Division of Construction or the Department of Conservation's web site at:

  http://www.consrv.ca.gov/omr/reclamation

Also, see Section 7-103D, "Protection of Environmental Resources," to determine if the proposed materials site is exempt from SMARA.

- Obtain initial samples of the aggregate, and test the samples for the specified attributes. Advise the contractor of the test results.
- Examine the surface to be sealed. Prepare a contract change order to provide for any necessary corrective action, such as sealing cracks and repairing failed areas. At this stage, a joint review with the maintenance region manager or area superintendent would be helpful.
- Examine the proposed mixing equipment to ensure compliance with the specifications. Mixer-spreader trucks must be calibrated for each material source in accordance with California Test 109, "Test for Weighing and Measuring Devices." Request assistance from the district weights and measures coordinator for calibrating and checking the accuracy of weighing and metering devices.
- Discuss with the contractor the proposed operation, and determine the method for measuring the weight of aggregate and asphaltic emulsion.
- Determine whether the surface to be sealed is clean and dry. Ensure the contractor cleans the surface to remove all loose particles of pavement, dirt, and other extraneous material.
- Review the project to ascertain all requirements for handling traffic. Review with the contractor the required traffic control system and traffic control devices.
- Advise the contractor of the exact spread rate to be used.

4-3703B During the Course of Work

Once work begins, take the following steps:

- If required under the contract, ensure the pavement surface to be treated has been coated with the specified asphaltic emulsion. Advise the contractor of the exact application rate and water amount to be added.

- Obtain the required test report for each truckload of asphaltic emulsion. Compare the report with the specifications. Do not permit the emulsion to be used before testing unless a Certificate of Compliance accompanies it.
- Before mixing, take samples of the aggregate for testing.
- If the results of grading or sand equivalent tests fail to meet the specifications, order the removal of the slurry seal represented by the failing tests. When the contractor requests in writing that the material remain in place, decide whether to reject the represented material or to allow it to remain in place. If you allow the material to remain in place, your decision must be based on the results of a physical examination of the slurry seal. Look for evidence of bleeding, raveling, stripping, or other deficiencies. Notify the contractor in writing of your decision. Also, if you allow the material to remain in place, calculate the amount of material represented, and deduct the amount from future progress payments.
- Observe the mixing operation to ensure the ordered proportions are being used.
- To determine the bitumen ratio and uniformity of mixing, submit samples of the completed mix to the district laboratory. Place samples in tightly closed containers to prevent moisture loss before testing.
- Make the necessary measurements and calculations to ensure the contractor spreads the slurry seal at the ordered rate.
- Review the completed slurry seal to determine if it meets the requirements of Section 37-2.04, "Proportioning," of the *Standard Specifications*.
- As specified, order the contractor to protect fresh slurry seal from traffic damage. To protect the fresh slurry seal, sand may be applied to the surface at intersections and driveways as specified.

4-3703C Measurement and Payment

For measurement and payment, do the following:

- The quantity of slurry seal to be paid for is the combined quantity of asphaltic emulsion and aggregate. Because of the type of equipment used and the nature of the slurry seal operation, it is usually impossible to weigh both components together. Separately determine the mass of asphaltic emulsion and aggregate, and add the two results together to determine the pay quantity.
- As necessary to determine pay quantities, collect weight tickets for aggregate and asphaltic emulsion. You may use properly sealed and calibrated metering devices to determine pay quantities. When converting volume measurements of asphaltic emulsion to mass, make the appropriate corrections for temperature.
- When slurry seal is allowed to remain in place even though it failed the grading or sand equivalent tests, make the appropriate administrative deduction.

Section 39 Asphalt Concrete

Section 39
Asphalt Concrete

4-3901 General

4-3901
General

Producing a specified asphalt concrete pavement is complex, normally requiring various Caltrans employees working as a team to accomplish the desired result. The resident engineer must clearly communicate assignments of responsibility (and commensurate authority) for all personnel and also ensure adequate communication among personnel at the job site and personnel at the plant.

At the mixing plant, plant inspection specialists and acceptance testers who are not directly assigned to the resident engineer usually perform inspection and testing duties. However, the resident engineer is as responsible for enforcing the specifications at the plant as at the job site. Thus, the resident engineer must ensure contract compliance at the mixing plant as well as on-site. Good communication is essential between plant inspection specialists and assistant resident engineers. The resident engineer must be kept informed of test results in a timely manner.

The *Quality Control and Quality Assurance Manual for Asphalt Concrete Production and Placement* covers quality control quality assurance (QCQA) projects. Before these projects begin, the resident engineer should contact the district or the headquarters QCQA coordinator.

4-3902 Before Work Begins

4-3902
Before Work Begins

The following guidelines apply to non-QCQA projects. (For QCQA projects, refer to the *Quality Control and Quality Assurance Manual for Asphalt Concrete Production and Placement.*)

4-3902A General

Perform the following before work begins:

- Verify the receipt and proper distribution of Form CEM-3101, “Notice of Materials to Be Used,” which covers materials to be used for asphalt concrete paving.
- Determine if the contractor intends to use an optional tapered notched wedge device to install a tapered longitudinal joint between traffic lanes. (Refer to Sheet P70 of the *Standard Plans* for the use requirements).
- Contact the Office of Materials Engineering and Testing Services (METS) for technical support if the tapered notched wedge device is used.
- To determine the required type of asphalt concrete or asphalt concrete base, review the plans, special provisions, and *Standard Specifications*. Pay particular attention to any special requirements and to the type of asphalt binder specified.
- Decide whether field conditions (such as climate or types or sources of material) require any changes in the specified materials. In making such decisions, consider issues such as the designer’s intent as well as items such as preliminary test reports or previous experience with local sources.

- For information on the uses of various asphalts and the design and production of asphalt concrete, refer to *Principles of Construction of Hot-Mix Asphalt Pavements*, published by the Asphalt Institute. Personnel responsible for asphalt concrete must familiarize themselves with the information in this manual.
- If changes in the contract are necessary, determine these changes as far in advance of the operation as possible to avoid inconvenience and extra expense. Such changes must be covered by a contract change order.
- Determine whether automatic batching will be required for the contract in question. Automatic batching is required for most asphalt concrete projects and is always required for QCQA projects.
- Review the contract's measurement and payment clauses, and decide what records must be kept.
- With plant inspection staff and assistant resident engineers, review Form CEM-3501, "AC Production/Placement Checklist," and determine how often the form will be used.
- In the interest of economy, determine whether the plants from which the asphalt will be obtained are presently producing material under the same specifications for another Caltrans project. If so, decide whether you can waive initial sampling and testing. Note such a decision in the daily report, and notify the contractor in writing.

4-3902B Initial Sampling and Testing

Before work begins, take the following steps related to initial sampling and testing:

- For mix design and to determine other specified attributes, obtain samples of aggregates. The sizes of the samples are shown in the tables in Section 6-1, "Sample Types and Frequencies," of the *Construction Manual (manual)*.
- The contractor must furnish the aggregate gradation for each mix to be used on the project. Also, the contractor must furnish samples of processed aggregates, which will undergo testing to ensure compliance with specifications and to permit completion of the mix design. If the contractor changes the source of aggregate, new samples, gradings, and proportions must be furnished. When asphalt concrete will be produced from established sources, the resident engineer may allow the contractor to use the same source, gradings, and proportions as those approved for, and used on, another project. In this case samples are not required.
- Ship the samples to the district materials laboratory, where they will be processed according to the instructions you must include on Form TL-0101, "Sample Identification Card." Your objective is to ensure the laboratory specifies the asphalt content percent that will be maintained during asphalt production.
- When you propose to use an asphalt binder other than the one specified, advise the district materials laboratory so that the laboratory will base the design on the binder to be used.

4-3902C Design of Mixes

Before work begins, take the following steps related to the design of mixes:

- The district materials laboratory designs asphalt concrete mixes based on initial samples. As the sampler, you must advise laboratory personnel (usually through

your notes on Form TL-101, "Sample Identification Card") of exactly what a sample must undergo. In addition, your notes will help to inform construction personnel what the laboratory did to evaluate an initial mix design for the asphalt concrete.

- Without specific instructions, the district materials laboratory will design a mix based on a smooth grading curve located near the center of the grading envelope. In completing the mix design, request the laboratory to use the combined grading furnished by the contractor.
- For details about mix design, refer to *Principles of Construction of Hot-Mix Asphalt Pavements*.

4-3902D Plant Operations

Before production, check the following specified attributes of the asphalt plant:

- Ensure that storage meets specifications by observing the aggregate storage areas and facilities. When specifications require that the various aggregate sizes be stored separately, require physical separation, either by space between stockpiles or by some type of wall that will provide positive separation.
- Determine whether the stockpiled aggregate is similar to material upon which the design was based.
- Check that weighing equipment on the plant meets specifications. Ensure scales and meters are sealed or tested as required. For additional details, see Section 3-90E, "Weighing and Metering Procedures," in this manual. Particularly note the responsibilities of assistant resident engineers (plant inspectors) and the district weights and measures coordinator.
- The district materials laboratory must test and, if appropriate, approve all scales, interlocks, and meters in accordance with California Test 109, "Test for Weighing and Measuring Devices."
- Determine whether the plant has a temperature-sensing device on the drier. The temperature-sensing device will be a recording pyrometer. Temperatures are recorded on paper in graph form or as electronic data.
- The sensing element of the temperature-sensing device should protrude into the main stream of aggregate or the completed mix in the continuous mixing plants. The device should be located where it is not affected by wind, heat reflected from the burner, or other sources of heat.
- To check the accuracy of the temperature-sensing device, insert the device, along with an accurate thermometer, in an asphalt bath that is heated slowly above the temperature range expected of the dried aggregate. Compare the readings of the two instruments. The two readings should match very closely if the temperature-sensing device is to work within the specified tolerance under less than ideal conditions.
- The district weights and measures coordinator will have a standardized thermometer. Check the plant inspector's thermometer against the standardized one.
- Ensure the plant has a functional dust-collection system.
- When the plant uses supplemental fine aggregate or dust collected in baghouses, ensure the plant can store and proportion such material in the specified manner.

- Ensure provisions exist for safely obtaining representative bin samples of the aggregates, including a means to lower the samples from the sample deck.
- Ensure the asphalt storage tanks are calibrated to meet specifications.
- Ensure asphalt binder is stored in a way that prevents different grades of asphalt from intermingling.
- To maintain the asphalt at the required temperature, ensure all storage tanks, transfer lines, and pumps have heating coils or are jacketed and heated.
- As specified, ensure a sampling outlet valve is installed in the feed line (not in the return line). The valve should be insulated and heated, if necessary, to prevent plugging the valve with cold asphalt.
- Ensure the required asphalt temperature-sensing device is installed in the asphalt feed line as specified.
- Determine if the batch plants have the following additional specified attributes:
  1. Provisions for the binder to be introduced uniformly at the specified location.
  2. A timing device that indicates by an audible or visual signal the end of the mixing period. Ensure the system is in working order and accurate to the specified degree.
- Ask the district weights and measures coordinator or plant specialist for a detailed preproduction inspection and calibration of continuous mix and batch asphalt concrete plants.
- Based on initial samples and tests, provide the contractor with the amount of asphalt binder to be used.

4-3902E Street Operations

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

- Review "Placing Hot-Mix Asphalt" in the *Principles of Construction of Hot-Mix Asphalt Pavements manual*. This manual covers the many aspects of good paving practice.
- Ensure that subgrade has been prepared as specified. Decide whether asphalt concrete is to be spread over an existing surface to level irregularities. Advise the contractor if leveling is required and also of the method of payment.
- Discuss with the contractor the tack coat that must be used, including the number of applications, the exact application rate, and how far in advance of the surfacing operation the coat may be placed as designated in the contract special provisions. Refer to the *Tack Coat Guidelines* for complete instructions on the applications for all surfaces. The guidelines are available at the following address:

  http://www.dot.ca.gov/hq/construc/
- Consider atmospheric conditions in selecting the tack coat material to be applied. Refer to the discussions of and tack coat in "Placing Hot-Mix Asphalt" in *Principles of Construction of Hot-Mix Asphalt Pavements*.

- Ensure asphalt distributor trucks have the specified attributes. For tack coat placement guidelines, see Section 4-92, "Asphalts," Section 4-93, "Liquid Asphalts," and Section 4-94, "Asphaltic Emulsions," of this manual.
- Ensure the spreading equipment has the specified attributes. Pay particular attention to pavers that are variable in width, to ensure that spreading and compacting components (roller, tamper, or other suitable devices) extend for the full width of the traffic lane to be paved. Permit wings, or other spreading devices, only for areas not requiring an asphalt paver, and then only for such widths (usually less than 1.5 m) as will not adversely affect the surfacing on the traffic lane.
- Ensure rollers have the specified attributes. Ensure the specified number of rollers will be used, unless other compaction requirements are noted in the special provisions.
- If the contractor intends to use equipment other than the specified rollers to compact asphalt concrete, contact the district construction office to determine whether this equipment has been evaluated in accordance with California Test 113, "Evaluating the Capabilities of Asphalt Concrete Compactors." The district construction office maintains a listing of all compaction equipment that has been evaluated in accordance with the test. The Division of Construction notifies each district construction office of changes or additions. The listing also includes the operating conditions under which the equipment qualified. The contractor may use qualified equipment in the work without further testing provided the contractor adheres to the operating conditions set forth. If the proposed equipment is not listed, request the flexible pavement unit of the Office of Materials Engineering and Testing Services (METS) to evaluate the equipment.
- When compaction specifications for asphalt concrete are in effect, ensure that properly calibrated nuclear density gauges are available for the necessary compaction tests.
- Determine the atmospheric temperature, and prohibit the placing of asphalt concrete when applicable temperatures are below the minimum. Before placement, closely monitor local weather forecasts and conditions. Even a light drizzle can adversely affect the final product.
- For procedures to follow when resurfacing under structures that will result in reduced clearances, refer to Section 3-705B, "Clearance and Bridge Permit Rating Changes (Permanent)," of this manual.
- Before they take mat samples, ensure field engineers involved in asphalt concrete paving are certified through 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

The following guidelines apply to non-QCQA projects. (For QCQA projects, refer to the *Quality Control and Quality Assurance Manual for Asphalt Concrete Production.*)

4-3903A Plant Operations

During the course of work, take the following steps related to plant operations:

- For the asphalt concrete plant, maintain a daily record with the information

required in Section 39, "Asphalt Concrete," of the *Standard Specifications*. File a copy of this information under Category 35, "Asphalt Concrete," in the project records.

- Ensure that production rates in continuous mix plants do not exceed those rates established during the aggregate weigh belt and asphalt meter calibration (California Test 109).
- Ensure that the proportioning equipment is interlocked as specified. For details on checking the interlock, refer to Section 4-9003A, "Proportioning and Mixing Operations," of this manual. This procedure is the same for asphalt concrete plants as it is for portland cement concrete plants.
- Observe the overall plant operation to ensure the contractor controls dust or smoke as specified. Request the contractor to correct any obvious violation and to cease any operation that is causing damage to adjacent property or to the asphalt concrete mixture.
- For each truckload of paving asphalt or liquid asphalt, obtain the required test report. Compare the report with the specifications. Shipments may be used before Caltrans samples and tests them if certificates of compliance accompany the shipments.
- Obtain a sample of asphalt binder and ship it to METS for testing as detailed in Section 6-2, "Acceptance of Manufactured Material and Sampling Methods," of this manual.
- Ensure aggregate is stored separately, according to the specified sizes. If any segregation, degradation, or intermingling occurs, require the contractor to empty the storage facility and to waste or rescreen the material.
- Ensure supplemental fine aggregate remains dry and is stored separately as specified.
- Before mixing with asphalt, obtain samples of the aggregate in accordance with the frequency shown in Section 6-1, "Sample Types and Frequencies," of this manual. Do not use aggregate samplers that do not safely produce a manageable-sized sample.
- When grading test or sand equivalent results exceed the limits for contract compliance, determine whether the asphalt concrete represented by the test is to remain in place or be removed. Note the decision in the daily report.
- Keep adequate records for removed material or material that remains in place but exceeds the grading limits for contract compliance. Do not make payment for material removed from the work. Also, ensure the specified deduction is taken for material that is allowed to remain in place even though it exceeds the grading limits for contract compliance.
- Ensure the temperature of the asphalt binder, aggregate, and completed mix are within the specified ranges.
- Ensure the batch size and feed rates do not exceed the mixing capacity.
- After calculating and selecting batch weights for batch-type asphalt concrete plants, inspect scale settings. Follow this inspection with daily checks. The scale settings control the amount of material from each bin; one erroneous scale setting can throw the entire batch out of specification.

- To ensure the aggregate is stored in the specified sizes, compare the material from each bin with the specifications. Order any necessary corrective action.
- Compare the gradings by plotting the actual grading curve against the design curve. Plot the gradings periodically because plotting provides a better indication than numbers alone.
- The contractor may adjust the proportions of primary sizes of aggregates. However, any such adjustment must meet specified grading limits and should result in a stable mix. When adjustments vary significantly from the initial design's grading, request a new asphalt content calculation from the district materials laboratory based on the grading to be used.
- Sample and test aggregate and asphalt binder in accordance with the frequencies shown in Section 6-1, of this manual.
- Obtain samples of the completed mix, and in accordance with California tests 310, "Determination of Asphalt and Moisture Contents of Bituminous Mixtures," or 370, "Determining Moisture Content of Asphalt Mixtures or Mineral Aggregates," for moisture. You may also quickly check moisture content (based on your experience with a particular aggregate source) using the following method for batch plants:
  1. 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, knife 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 of any necessary adjustments to dry the aggregate.
- Perform California Tests 310 or 370 "as necessary for control." For the exact frequency of the tests, refer to Section 6-1, "Sample Types and Frequencies," of this manual. Early in production, take sufficient tests to determine factors such as the drier's heat versus the production rate versus the aggregate's moisture.
- Observe production at the batch plant to ensure the mixing time and sequence of withdrawal from the bins produce the specified homogeneous mixture. For batch mixing, do not approve a shorter mixing time than specified. The length of mixing time in a continuous-flow mixer is a function of the length of the mixing area and the rate of drop in the drier drum mixing. The most efficient pugmill mixing results when the material level remains at the top of the paddles throughout the length of the mixer. For best results, feeding must be continuous and uniform.
- Ensure that the temperature of the asphalt stays within the specified limits.
- When the contractor uses automatic batch mixing, ensure the automatic equipment functions within specifications.
- When the contractor uses any continuous mixing plant (drier drum or drier drum pugmill), ensure that the vibrating unit on the fine bins operates. Also, ensure that the low-level and no-flow interlock systems for the aggregate feeder bins and the asphalt storage function.

- Observe the operation of all weighing systems. Whenever scales and meters seem inaccurate, contact the district weights and measures coordinator for further assistance.
- In the batching process, consider the weight of the material falling from the bin gates to the weighing hopper after the gates are closed. Ensure 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 does not occur, 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 scales frequently to ensure the following:
  1. They can mark zero.
  2. The scale levers and knife edges move freely.
  3. No bind or drag exists on the lever system.
- When plants are used exclusively for one job, you can check the accuracy of meter-driven devices that proportion asphalt. To do so, compare meter totalizer readings with asphalt tank stabbings and also (in conjunction with an onsite vehicle scale) with the combined aggregate totalizer readings.
- Some plants are equipped with storage silos for asphalt concrete. Ensure this form of storage does the following:
  1. Prevents obvious segregation
  2. Maintains specified temperatures
  3. Maintains the minimum silo level as specified
  4. Does not exceed the maximum storage time
- Before the contractor loads the truck beds, ensure the absence of an excessive amount of parting agent or other contaminating material. Such material is excessive when it forms pools absorbed by the mix. Diesel or other petroleum-based products are prohibited.
- Ensure that all continuous mixing plants have a functional automatic blending computer. Prohibit the plant from producing material for Caltrans unless this automatic aggregate-asphalt proportioning system operates in good working condition.

4-3903B Street Operations

During the course of work, take the following steps related to street operations:

- For guidelines for inspecting prime coat and tack coat, refer to Sections 4-93, “Liquid Asphalts,” and Section 4-94, “Asphaltic Emulsions,” of this manual.
- From the mat behind the paving machine, obtain a sample of the completed mixture (using California Test 125, “Methods for Sampling Highway Materials and Products Used in Roadway Structural Sections”). Test the sample for extraction, moisture, and sieve analysis. Occasionally run stability tests. For the frequency and location of such testing, refer to Section 6-1, “Sample Types and Frequencies,” of this manual.

- Identify the samples to indicate both the stationing from which they were taken and also the approximate area they represent. Mark all acceptance samples for priority testing. Complete Form TL-0101, "Sample Identification Card," adhering to the instructions printed in the book containing the forms and information in Section 6-105, "Field Tested Material Sample Identification," of this manual. It is essential that you record the type of mix, grade, and source of asphalt and also the ordered percent of asphalt in the mixture. Remember to note whether the sample is for acceptance or special testing.
- As early as possible, analyze the test data. The best results come from obtaining test results on the day of sampling. If possible, samples representing drier-drum or continuous mixing should be tested in the field so the contractor can immediately correct any deviations.
- Ensure that placement occurs within the specified temperature range by taking sufficient measurements of air and asphalt concrete temperatures. Record these temperatures in the daily report, and on Form CEM-3501, "AC Production/ Placement Checklist."
- Along with atmospheric conditions, closely observe the queuing of asphalt concrete trucks. To prevent the cooling of the asphalt concrete mix to below the specified windrow temperature, ensure that extensive windrowing does not occur. To determine whether crusting has occurred and appropriate action should be taken, check the surface of the asphalt concrete mix in the truck or windrow.
- Ensure the specified equipment performs the spreading at the required thickness and with the required number of layers. Compare the spread rate against the theoretical rate, and if necessary, order adjustments. Note such observations in the daily report.
- Because of the high dollar value of the asphalt concrete and the necessity for an assistant resident engineer to know the weight of loads for spread calculations, load slips are required for asphalt concrete.
- For placing material, ensure the specified equipment performs the rolling in the specified order, for the required number of coverages, with the mixture's temperature above specified minimums. If the contractor uses a vibratory roller for compaction, ensure the use is in accordance with the operating conditions for which the roller was qualified. For these conditions, refer to the Vibratory Roller Qualification List. To check vibratory roller frequencies, use a vibratory reed tachometer.
- When compaction specifications are in use, test all areas in accordance with California tests 304, "Preparation of Bituminous Mixtures for Testing," and 375, "Determining the In-Place Density and Relative Compaction of AC Pavement."
- Ensure that longitudinal joints are offset as specified and that the joints on top courses correspond to the edges of traffic lanes.
- Before placing an adjacent top layer, ensure the contractor has trimmed the cold-transverse construction joints to a vertical face and to a neat line.
- Before placing an adjacent lane, decide whether longitudinal joints should be trimmed.
- Use a straightedge to determine whether the finished surface and transverse joints comply with specified tolerances. Note such measurements in the daily report.

- If using a tapered notch wedge device, ensure that the specical provisions allow the contractor to use a tapered notched wedge device to install a tapered logitudinal joint between traffic lanes.
- Ensure the contractor tests the notched wedge device for relative compaction.
- After acceptance of the contract, a compaction and core information spreadsheet must be submitted to the Office of Flexible Pavement, Material Engineering and Testing Services.
- Ensure the contractor surfaces miscellaneous areas as the plans and specifications require.
- Examine asphalt surfaces, and decide whether fog seal should be applied to shoulders. Fog seal must be applied to all asphalt concrete dikes and miscellaneous areas. For details about seal coats, refer to Section 4-37, "Bituminous Seals," of this manual.
- Prohibit the contractor from applying fog seal to open-graded asphalt concrete or any traveled way.

4-3904 Measurement and Payment

4-3904 Measurement and Payment

For details of measurement and payment, review contract specifications. Make necessary measurements and counts.

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

For asphalt concrete that is allowed to remain in place, yet the aggregate gradings for this asphalt concrete do not meet contract compliance, make the appropriate deductions as specified.

For guidelines on how to weigh asphalt concrete, refer to Section 3-9, "Measurement and Payment," of this manual.

Section 42 Groove and Grind Pavement

Section 42
Groove and Grind
Pavement

4-4201 General

4-4201
General

Groove and grind strategies for rehabilitation of existing rigid pavements is discussed in the *Rigid Pavement Preservation and Rehabilitation Guidelines* at the following web site:

http://www.dot.ca.gov/hq/oppd/pavement/

Grooving is usually performed on:

- existing pavements to improve drainage of water at the pavement surface, and
- on new and existing pavements to improve skid resistance.

Grinding is usually performed to improve the ride quality of new or existing pavements.

4-4202 Before Work Begins

4-4202
Before Work Begins

Review the contract plans and specifications. Also, take the following steps:

- Discuss traffic handling with the contractor and review the contractor's plan for lane closures. For a discussion of traffic handling devices and lane closure procedures, see Section 4-12, "Construction Area Traffic Control Devices," and Section 2-2, "Traffic," of the *Construction Manual* (manual).
- Ensure the contractor's equipment meets specified requirements.
- Before the grooving or grinding operation, inspect and locate any existing detector loops on either new or existing pavement to prevent damage to the detector loops' sealant. If detector loops are not visible, consult with the district traffic unit.
- Check local noise ordinances and review specified noise requirements.
- In areas to be grooved and ground, verify that yellow stripe and pvaement markings do not contain lead. For instructions regarding this issue, see Section 4-15, "Existing Highway Facilities," of this manual.
- Verify that the required water pollution control plan is approved and in place.
- The contract or materials information handout may identify locations within the right-of-way for final disposal of portland cement concrete grinding and grooving residue. The resident engineer must verify that a Regional Water Quality Control Board (RWQCB) permit or approvals is included in the materials information handout" or resident engineer file. If a RWQCB permit or approval has not been included, contact your environmental-construction liaison for assistance in obtaining these documents. Refer to the contract special provisions to obtain information about off-site disposal facilitites for portland cement concrete grooving and grinding residue.

- When the contract documents do not allow final disposal of grooving and grinding residue within the right-of-way; obtain from the contractor, the name and location of the disposal facility that will receive the portland cement concrete grooving and grinding residues, in accordance with Section 7-1.13, "Disposal of Materials Outside of the Highway Right of Way," of the *Standard Specifications* and Section 7-103, "Protection of Environmental Resources," of this manual.

  1. Verify that the disposal facility is permitted to accept portland cement concrete residue, by the California Environmental Protection Agency (Cal EPA). Verbal confirmation from the facility operator and documentation in the resident engineer's daily report is sufficient verification of permit status of commercial disposal facilities on this list.

  2. When the contractor chooses to use a noncommercial off-site disposal facility, the contractor must provide a copy of the CalEPA permit for disposal of the liquid portland cement concrete liquid residue.

  3. When the contractor chooses a disposal site that is located outside of California, the contractor must provide a copy of the permit issued by the state agency having jurisdiction over the site to the resident engineer. The permit must be provided before disposal.

4-4203 During the Course of Work

4-4203 During the Course of Work

4-4203A The following applies to both grooving and grinding operations

- Observe the operation to ensure that equipment and noise levels comply with specifications.
- Ensure that the handling of residue and dust from the operation meets specifications.
- Ensure that the grooved or ground widths meet specifications.
- Ensure the portland cement concrete is picked up by means of a vacumn device and not allowed to flow across the pavement or enter the storm drain inlets.
- For projects that temporarily store portland cement concrete residue in washout facilities, make sure that the plastic liner seams are installed in accordance with manufacturer requirements. Regularly inspect plastic liners during installation and operations to ensure that they are free of holes, tears or other defects that will compromise the impermeability of the liner. Inspect washout facilities to ensure that adequate holding capacity and minimum freeboard are maintained.
- When the operation is complete, and off-site disposal is specified, obtain from the contractor final proof of delivery of the residue to the off-site disposal facility.

4-4203B When grooving is specified

- At the beginning of the work shift, check behind the grooving machine to ensure that all the blades are cutting grooves to the specified depth.
- Record the locations of omitted grooves. When specified, require the cutting of omitted grooves.

4-4203C When grinding is specified

- As work progresses, check the ground pavements with the specified straightedge.
- Determine if any abnormally depressed areas must be excluded from testing with the profilograph and the 3.6 m straightedge. Measure these areas to ensure they do not exceed the specified percentage of the total ground area.
- In accordance with California Test 526, "Operation of California Profilograph and Evaluation of Profiles," measure ground portland cement concrete pavements for a profile index.
- Ensure ground areas on structures, approach slabs, and 15 m of approach pavement meet the smoothness and cover requirements in Section 51-1.17, "Finishing Bridge Decks," of the *Standard Specifications.*
- In accordance with California Test 342, "Surface Skid Resistance with the California Portable Skid Test," determine the coefficient of friction for surfaces that have been ground.

4-4204 Measurement and Payment

Measure both grooving and grinding by the area grooved or ground. As the work progresses, make transverse measurements to ensure the grooved or ground areas meet the widths specified. You may compute lengths by measuring the distance to start and stop locations from known stations and by computing the length grooved or ground from the stationing. Include curve corrections in the calculations.

4-4204 Measurement and Payment

Section 56 Signs

Section 56
Signs

4-5601 General

4-5601
General

Signs and sign structures are of various types, from simple roadside signs to complicated sign bridges containing changeable message signs. The resident engineer must apply the correct inspection to ensure the contractor installs signs and sign structures to function properly.

The Office of Structure Construction, Division of Engineering Services is responsible for reviewing and approving all overhead sign structure shop plans on contracts administered by Caltrans. District construction engineers will contact the local structure construction area manager or senior bridge engineer before the preconstruction meeting to arrange for the review of the overhead sign structure shop plans submitted by the contractor. Structure construction personnel review shop plans for standard overhead sign structures and coordinate, when needed, with the appropriate structure design engineer for review of shop plans for non-standard overhead sign structures.

The Division of Engineering Services provides technical support to structure construction personnel upon request. Send a copy of the shop plans to Structure Design Services & Earthquake Engineering if technical assistance is needed. The *Overhead Sign Structure Manual* provides guidance for reviewing shop plans and is available on the Intranet at:

http://onramp.dot.ca.gov/hq/oscnet/

4-5602 Before Work Begins

4-5602
Before Work Begins

Before work begins, take the following steps:

- Review the plans and specifications to determine the types of signs to be installed and any special requirements included in the contract.
- Verify the receipt and proper distribution of Form CEM-3101, “Notice of Materials to Be Used,” which covers signs.
- If required, before the manufacturers furnish the materials, obtain from the Office of Materials Engineering and Testing Services (METS) an approval of foreign manufacturers. (Refer to Section 6-1.08, “Foreign Materials,” of the *Standard Specifications*, which covers the use of foreign materials.)
- Refer to the contract specifications and Section 3-605, “Certificates of Compliance,” of the *Construction Manual* (manual) regarding provisions of the Buy America requirements.
- Obtain working drawings, including, but not limited to, anchor bolt layouts, shop details, erection plans, and equipment lists for sign structures as required by the contract. With the assistance of the structure representative, review these working drawings and approve them if they comply with the contract. To review

the working drawings of changeable message signs, refer to Section 168-3.1, "Shop Plan Review for Changeable Message Sign (CMS) Structures," of Volume II of the *Bridge Construction Records and Procedures Manual*. After review (and correction if necessary), return one set of the working drawings to the contractor with the following statement: "The plans are approved pursuant to Section 5-1.02 of the *Standard Specifications*."

- Do a field review of all sign locations, and check for possible conflicts with other structures, electrical and irrigation lines, and underground and overhead utilities. Ensure adequate horizontal and vertical sight distance. Trees or other landscape features may need to be trimmed to obtain adequate sight distance. Advise the contractor of any changes, and if necessary, prepare contract change orders. In addition, because relocating signs can impair or nullify their effectiveness, consult with the district traffic unit whenever changes must be made or the effectiveness of any signage is questionable.
- After control stakes have been placed, ensure the markings have the following:
  1. The correct span lengths
  2. The correct elevation of footing pedestals (usually 75 mm above the finished grade or the top of curbs)
  3. The minimum vertical clearance shown on the plans
  4. The required cover over the tops of footings
- To ensure incorporation into the work during shop fabrication, verify that the structure representative has given the source inspector any changes that revise materials, specifications, or structural design. Normally, METS is notified of any changes through the receipt of a copy of the contract change order. However, allow sufficient lead time for the normal distribution of contract change orders. If changes are under way based on a "prior authorization," the resident engineer (through the structure representative) may need to send the revised specifications or drawings directly to METS in advance of the approved contract change order. Resident engineers should call METS to confirm receipt of the changes.
- Review the contract for any requirements for state-furnished material. Resident engineers must ensure that state-furnished sign materials have been ordered and will be ready for timely delivery. Make a physical inspection and inventory to confirm that all state-furnished sign materials are delivered in good condition. After delivery, the contractor is responsible for any damage to state-furnished materials.

4-5603 During the Course of Work

4-5603 During the Course of Work

Inspect both overhead sign structures and roadside signs.

4-5603A Overhead Sign Structures

Sign structures often involve many details that are critical to the structures' permanence. Although maintaining sign structures is expensive, attention to detail during construction can mitigate future problems.

The resident engineer has final responsibility for ensuring that signs and sign structures are constructed in accordance with the contract. The resident engineer also has final responsibility for making any changes that are necessary to serve the

public as the designer intended. To perform the required duties properly, the resident engineer must obtain the relevant technical data. For overhead signs and bridge-mounted signs, copies of Section 168-1.0, "Bolted Connections for Overhead Sign Structures," and Section 170, "Structural Steel," of Volume II of the *Bridge Construction Records and Procedures Manual* will provide the information.

Construction inspectors should check the following items or perform the following duties:

- Upon delivery, check the materials' identification marks or inspection tags (using Form TL-0624, "Inspection Release Tag,") and match these marks and tags against those listed in Form TL-0029, "Report of Inspection of Material." (See Section 6-2, "Acceptance of Manufactured Material and Sampling Methods," of this manual for more explanation.) METS will check items for compliance with specifications. These items can also be checked at the source during fabrication. This check will include determining the adequacy of workmanship for activities such as welding, painting and galvanizing and also ensuring the use of the proper materials. For portable changeable message signs, METS will also ensure that all control components are connected and operating properly before release to the job site.
- Require the repair of any minor damage to galvanizing or coatings, as specified in Section 75-1.05, "Galvanizing," of the *Standard Specifications.*
- Determine that METS has inspected and approved anchorage devices for bridge-mounted signs. Ensure that anchorage devices are installed as recommended by the manufacturer, as shown on the plans, and as specified. For more information on anchorage devices, refer to Section 135, "Miscellaneous Construction Materials," Volume II of the *Bridge Construction Records and Procedures Manual.*
- Ensure the proper type of bolts in field connections. Observe the installation of high-strength bolts to ensure the correct method and sequence for tightening. Refer to Section 170, "Structural Steel," Volume II of the *Bridge Construction Records and Procedures Manual* for the specifications of the American Society for Testing and Materials for high-strength bolts.
- METS inspects welding at the fabrication plant. If welding will be performed at the job site, contact METS for assistance. Also, at the job site, visually check for any obvious defects. During sign erection, ensure a proper fit between the post and the sign frame. Also, verify the provision of the proper minimum clearances.
- Ensure that the surface finishes of all metal parts of sign structures meet specifications. Inspect portions of the work completed in the field.
- Ensure through observation that sign panels and fastening hardware comply with specifications. Ensure that exposed portions of fastening hardware on the panel faces have been finished as specified.
- Ensure that the construction of footing pedestals complies with specifications. It is particularly critical that the contractor correctly position and align anchor bolts for sign bridges.
- To ensure the minimum horizontal and vertical clearances, verify that the location and elevation of the footing pedestals are correct.

- Ensure the contractor performs electrical work according to the specifications.
- Ensure the contractor performs field painting, including touch-up, according to the specifications.
- Examine sign panels for compliance with specified workmanship.
- Whenever an installation exceeds the scope of knowledge of available personnel, request assistance from, or consult with, other units. For instance, you may call upon mechanical and electrical engineers from the Office of Structure Design for assistance with changeable message signs.
- Ensure sign panels over lanes and lane arrows are correctly centered over the appropriate lanes.
- Report any temporary or permanent changes to horizontal and vertical clearances to the Transportation Permits Branch in accordance with Section 3-705A, "Clearance and Bridge Permit Rating Changes (Temporary)," of the *manual.*
- Ensure adherence to the public safety requirements of the special provisions regarding permanent obstacles that are temporarily unprotected.

4-5603B Roadside Signs

Do the following for these types of signs:

- Upon delivery, check the materials' identification marks or inspection tags (using Form TL-0624, "Inspection Release Tag") and match these marks and tags against those listed in Form TL-0029, "Report of Inspection of Material." (See Section 6-2, "Acceptance of Manufactured Material and Sampling Methods," of this manual for more explanation.) METS will check items for compliance with specifications. These items can also be checked at the source during fabrication. Note the type of preservative used to treat wood posts.
- Ensure postholes are located so that the signs will have the correct horizontal clearance and will not be obstructed by other objects. Also, verify that holes are excavated to the full depth and backfilled as specified.
- Ensure the provision of minimum vertical clearances to the bottom of the sign panels, as required by the specifications.
- If posts are cut or drilled in the field, ensure the contractor treats exposed areas as specified.
- Ensure that the attaching of signs to posts complies with requirements.
- You may request the assistance of the district traffic unit. Such assistance may include an actual in-the-field review of sign staking and also day and night observation of completed signage. Include in the daily report notes on assistance received and changes made.

4-5604 Measurement and Payment

4-5604 Measurement and Payment

For details of measurement and payment, review contract specifications. Make necessary measurements and counts.

Section 90 Portland Cement Concrete

Section 90 Portland Cement Concrete

4-9001 General

4-9001 General

This section covers portland cement concrete. The *Standard Specifications* designates concrete with the following descriptions:

- Class
- Cement content
- Compressive strength
- Minor concrete

This section does not cover specialty concrete such as polyester concrete and fast-setting hydraulic cement concrete. The resident engineer should contact the Division of Construction, the Office of Materials Engineering and Testing Services (METS), and the district materials engineer for guidance on specialty concrete.

For a complete discussion on various items using concrete, refer to Section 40, "Portland Cement Concrete Pavement," Section 50, "Prestressing Concrete," Section 51, "Concrete Structures," Section 72, "Slope Protection," and Section 73, "Concrete Curbs and Sidewalks," among other sections of the *Standard Specifications*. Also refer to the corresponding Section 4-40, Section 4-51, Section 4-72, and Section 4-73 of the *Construction Manual* (manual). You can also obtain additional information on portland cement concrete from the Office of Structure Construction's *Concrete Technology Manual* and the *Bridge Construction Records and Procedures Manual*.

4-9002 Before Work Begins

4-9002 Before Work Begins

The *Standard Specifications* requires the contractor to determine the mix proportions for all concrete except for pavement concrete. To determine the various types of concrete that will be required, review the contract provisions. Pay particular attention to concrete designations such as "class," "cement content," "compressive strength," or "minor concrete." Also, note the type of cement to be used and any special requirements for the aggregate and use of admixtures. Make a list of the various mix designs the contractor will need to submit and a note of the concrete that needs to be prequalified before use. For your review, encourage the contractor to submit the mix designs early in the project.

Review the mix designs for compliance with the special provisions, *Standard Specifications*, and contract plans, or forward the mix designs to the district materials unit for review. Before the contractor places any concrete, the district materials unit will need an approved copy of the mix design for unit's plant inspectors. If the concrete is designated by compressive strength, obtain certified test data or trial batch test results in advance of the concrete's use to avoid delays. Review the data and results for contract compliance.

Review the current certifications of Caltrans field staff who will perform the acceptance testing of the concrete. Staff must be certified in the following:

- California Test 125, "Sampling Highway Materials and Products Used in the Roadway Structural Section"
- California Test 518, "Unit Weight of Fresh Concrete"
- California Test 523, "Flexural Strength of Concrete (Using Simple Beam with Center-Point Loading)"
- California Test 533, "Test for Ball Penetration in Fresh Portland Cement Concrete"
- California Test 540, "Making, Handling, and Storing Concrete Compressive Test Specimens in the Field"
- American Society for Testing and Materials (ASTM) C172, "Standard Practice for Sampling Freshly Mixed Concrete"

4-9002A Materials

Before work begins, do the following for materials:

- Verify the receipt and proper distribution of Form CEM-3101, "Notice of Materials to Be Used," which lists concrete materials such as cement, fly ash, and aggregate.
- Cement is normally accepted on the basis of a Certificate of Compliance; therefore, initial samples are not taken. If special requirements exist for the cement or if it is obtained from an unusual source, consider initial testing. For more details about cement sampling and testing, see Chapter 6, "Sampling and Testing," of this manual.
- In accord with the State Contract Act, verify that the aggregate source complies with the Surface Mining and Reclamation Act of 1975 (SMARA). Mining operations determined to be in compliance are listed on the AB 3098 SMARA Eligible List. This list can be obtained from the Division of Construction or at the Department of Conservation's web site at:

  http://www.consrv.ca.gov/omr/reclamation

  Also, see Section 7-103D (2), "Surface Mining and Reclamation Act," to determine if the proposed materials site is exempt from SMARA.
- Verify with the district materials unit that current tests have been performed on aggregates as listed in Section 6-1, "Sample Types and Frequencies," of this manual.
- You may omit initial sampling and testing if the specified aggregate is currently being used on another Caltrans contract with acceptable testing results. In the daily report, record any reasons for not taking initial samples.
- If current tests have not been performed, obtain initial samples of aggregate to be used and have them tested for all specified attributes. For reference, see the table in Section 6-1 of this manual. You can prevent unnecessary expense and delay if you send samples that can be made to conform to the specification grading. Indicate whether oversized material will be crushed or if any special blends are contemplated.

4-9002B Aggregate Gradings

From the contractor, obtain in writing the primary aggregate nominal sizes to be furnished. The Office of Structure Construction's *Concrete Technology Manual* has examples on how to check the contractor's proposed gradings. In addition, the Office of Structure Construction's web site has a spreadsheet available to assist in this review. When the requirement for furnishing the proposed gradation is unnecessary for the type or amount of concrete work, advise the contractor and note such a decision in the daily report.

4-9002C Admixtures

Before work begins, do the following for admixtures:

- Admixtures must be of a type allowed by the *Standard Specifications* or special provisions. In addition, they must be on the approved list of admixtures maintained by METS. You can access this list through the Division of Engineering Services web site at:

  http://www.dot.ca.gov/hq/esc/approved_products_list/.

  Admixtures do not require initial tests if they are currently approved and a Certificate of Compliance is furnished.

- If you choose to test admixtures before using them, obtain samples of liquid admixtures and place them in clean liter cans or plastic bottles. Sample powdered admixtures in dry form (not after mixing with water on the job). Friction top cans or plastic bags similar to those used to sample cement are satisfactory.

- Send a completed Form TL-0101, "Sample Identification Card," with the sample. Include the manufacturer's lot number represented by the sample and the name of the product, including any prefix or suffix. Also, show the class of work for which the sample will be used, such as concrete pavement or prestressed concrete. The laboratory needs this information to determine the suitability and amount of admixture for use. For sampling admixtures, refer to California Test 125, "Sampling Highway Materials and Products Used in the Roadway Structural Sections."

- Air-entraining agents need not be sampled initially if the contractor presents evidence that the product meets specifications.

- Even when a contract specifically allows or requires admixtures, determine the rate of such use through consultation with METS for each specific product other than air-entraining agents.

- Section 100, "Concrete Materials and Mixing," of the *Bridge Construction Records and Procedures Manual* contains detailed information under Memo 100-4.0, "Admixtures for Portland Cement Concrete." Before making a final decision on the use of admixtures, review this data.

4-9002D Proportioning

The following is primarily a guide for the Caltrans plant inspector, but anyone who needs to verify that plant operations are contract compliant can also use this guide:

- Ensure that storage is as specified in the aggregate storage areas. When various sizes are to be stored separately, require physical separation, either by space between stockpiles or some type of wall that will provide positive separation. Pay particular attention to the method used to prevent contamination of the aggregate. In general, a hard surface, as specified in Section 90-5.01, "Storage of Aggregates," of the *Standard Specifications*, is required for storage of the aggregate stockpile.

- Determine whether the stockpiled aggregate is similar to material upon which the design was based.
- As a part of California Test 109, "Test for Weighing and Measuring Devices," the district weights and measures coordinator will have completed a safety inspection of the plant facilities frequented by the Caltrans plant inspector for the plant in question. Review the sampling facilities to ensure they will deliver a sample in a safe manner that accurately represents the material. For sampling requirements, refer to California Test 125, "Sampling Highway Materials and Products Used in the Roadway Structural Sections."
- Before use for Caltrans projects, the plant scales and meters must have a current Form CEM-4204, "California Test 109 Sticker." The district weights and measures coordinator administers this test. Examine the plant to determine whether weighing equipment matches the testing results. Ensure that scales and meters have been sealed or tested as required. Request from the district weights and measures coordinator the material plant approval report. For additional details, see Section 3-903E, "Weighing and Metering Procedures," of this manual.

  The county sealer of weights and measures tests and seals weighing and metering devices at commercial plants. During the sealing of these plants, the county sealer does not test the interlocks. Therefore, even though the county sealer has sealed the scales and meters, the interlocks must be tested and approved as for noncommercial plants in accordance with California Test 109, "Test for Weighing and Measuring Devices."
- Ensure that cement can be kept separate from the aggregate until discharged into the mixer.
- Ensure the plant or mixer has the specified automatic timing device. When automatic batching is used, the timing device must be interlocked with the mixer discharge mechanism as specified.
- Examine mixers to ensure that blades are not worn beyond specified tolerances. See that mixers are free of accumulations of hard concrete or mortar.
- Ensure truck mixers have the required metal plates containing the specified information. Also, check truck mixers to ensure they have the specified revolution counters.
- Ensure the contractor will not use equipment with aluminum or magnesium components if these components will contact plastic concrete.
- In addition to the above, check the following when the concrete to be produced is for portland cement concrete pavement:

  1. If specified, ensure the plant has a moisture meter. Be aware that any moisture determination is calculated "as a percent of the dry aggregate." Commonly used moisture meters measure the total moisture in the material being tested. However, specifications for moisture content in the fine aggregate and batch proportion calculations are based on the free moisture rather than the total moisture content. Therefore, ensure the moisture meter is calibrated for the absorption of the aggregate upon which it is to be used.
  2. Ensure the system contains the specified proportioning interlocks. Determine whether the proportioning system is capable of full automatic operation.
  3. Determine whether the equipment is capable of accepting changes in proportions or sequence of weighing individual sizes without delay.

Section 92 Asphalts

Section 92
Asphalts

4-9201 General

4-9201
General

Asphalt, as defined in Section 92, "Asphalts," of the *Standard Specifications*, is also referred to as paving asphalt. Asphalt is used in asphalt concrete, in asphalt-treated permeable base, and when specified, for tack coat. It is a solid at normal ambient temperatures and must be heated before it is mixed with aggregates or applied as tack coat.

In addition to the specifications for asphalts in Section 92 of the *Standard Specifications*, refer to the requirements for asphalts in other sections of the *Standard Specifications* covering work in which asphalts are used.

For more information, see the *Tack Coat Guidelines* at the following address:

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

4-9202 Before Work Begins

4-9202
Before Work Begins

Before work begins, take the following steps:

- Verify the receipt and proper distribution of Form CEM-3101, "Notice of Materials to Be Used," which covers asphalt.
- When asphalt is used for tack coat, examine the distributor truck and ensure it meets the specified requirements.
- When required, ensure the contractor properly equips delivery trucks, storage tanks, and spreading equipment with the specified devices for measuring asphalt volumes.

4-9203 During the Course of Work

4-9203
During the Course
of Work

During the work, take the following steps:

- If asphalt is used before sampling and testing, obtain a Certificate of Compliance containing the specified information.
- Check the temperature of the asphalt to ensure it is within the specified range when applied as tack coat at the job site or mixed with aggregate for asphalt concrete or asphalt-treated permeable base at the plant.
- Before paving asphalt is applied as tack coat, ensure the pavement is clean and dry.
- Check the application rate of asphalt used as tack coat to ensure the designated rate. After the first few hundred meters of application, check the initial spread rate. The frequency for checking the spread rate will depend on the accuracy and consistency of the first few checks. Record the spot-check results and the overall daily spread rate in the daily report.

- Ensure that asphalt is not sprayed outside designated areas and that bituminous material does not drip from distribution equipment.
- Sample asphalt in accordance with the table in Section 6-1, “Sample Types and Frequencies,” of the *Construction Manual* (manual) and with the manual’s instructions in Section 6-202E, “Materials Accepted on the Basis of a Certificate of Compliance.”

4-9204 Measurement and Payment

4-9204 Measurement and Payment

Section 92, ”Asphalts,” of the *Standard Specifications,* does not contain provisions for payment. Payment clauses for asphalts are found in the various sections covering work in which asphalts are used.

It is a good practice, before the asphalt is discharged, to measure the volume in the distributor truck and to make this volumetric measurement again 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.

When making volumetric measurements, measure the temperature, and apply the proper factors for converting volume to mass.

Section 94 Asphaltic Emulsions

Section 94 Asphaltic Emulsions

4-9401 General

4-9401 General

Asphaltic emulsions are described in Section 94, "Asphaltic Emulsions," of the *Standard Specifications*. They are used for bituminous seals and tack coat. Asphaltic emulsions are also used for other purposes, such as curing seals for lime stabilization and cement-treated base and for coating the surface of cement-treated permeable base to facilitate measuring the thickness of concrete pavement.

In addition to the specifications for asphaltic emulsions in Section 94, of the *Standard Specifications,* refer to the requirements for asphaltic emulsions in other sections of the *Standard Specifications* covering work in which asphaltic emulsions are used.

Refer to the *Tack Coat Guidelines* for more information at the following address:

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

4-9402 Before Work Begins

4-9402 Before Work Begins

Before work begins, take the following steps:

- Verify the receipt and proper distribution of Form CEM-3101, "Notice of Materials to Be Used," which covers asphaltic emulsion.
- Examine the distributor truck to ensure it meets the specified requirements.
- Ensure the contractor properly equips delivery trucks, storage tanks, and spreading equipment with specified devices for measuring volumes of asphaltic emulsion.

4-9403 During the Course of Work

4-9403 During the Course of Work

During the work, take the following steps:

- If asphaltic emulsion is used before sampling and testing, obtain a Certificate of Compliance containing the specified information.
- Check the temperature of the asphaltic emulsion to ensure it is within the specified range when applied.
- Before applying asphaltic emulsion, ensure the surface to be treated is clean and dry.
- Ensure that asphaltic emulsion is not sprayed outside designated areas and that bituminous material does not drip from distribution equipment.
- Check the application rate of asphaltic emulsion to ensure the designated rate. After the first few hundred meters of application, check the initial spread rate. The frequency for checking the spread rate will depend on the accuracy and consistency of the first few checks. Record the spot-check results and the overall daily spread rate in the daily report.

- Sample asphaltic emulsion in accordance with the table in Section 6-1, "Sample Types and Frequencies," of the *Construction Manual* (manual) and the manual's instructions in Section 6-202E, "Materials Accepted on the Basis of a Certificate of Compliance." If water has been added to the asphaltic emulsion, note on Form TL-0101, "Sample Identification Card," the ratio of added water to the total mixture.

4-9404 Measurement and Payment

4-9404 Measurement and Payment

Section 94, "Asphaltic Emulsions," of the *Standard Specifications,* does not contain provisions for payment. Payment clauses for asphaltic emulsions are in the various sections covering work in which asphaltic emulsions are used.

Obtain weight tickets for deliveries of asphaltic emulsion.

It is a good practice, before the asphaltic emulsion is discharged, to measure the volume in the distributor and to make this volumetric measurement again 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 asphaltic emulsion.

When the specifications provide for additional water to be mixed with asphaltic emulsion, it is necessary to determine the mass of asphaltic emulsion without the mass of the added water. Delivery weight tickets will show the mass of the emulsion before water was added and the total mass of asphaltic emulsion and added water.

When making volumetric measurements, measure the temperature, and apply the proper factors for converting volume to mass.

In a partial load using volumetric measurements, the procedure for determining the mass of asphaltic emulsion with added water is as follows:

1. Measure the volume and temperature of the mixture in the partial load. Calculate the volume of emulsion in the original load at the temperature of the partial load. Convert tonnes of added water in the original load to liters.
2. Based on the final temperature reading, calculate the ratio of the volume of asphaltic emulsion to the total volume in the original load.
3. Calculate the volume, at 15°C, of emulsion in the partial load.
4. Determine the mass of emulsion remaining in the partial load.

<u>Example:</u>
Assume the following:

- Weight ticket shows 10.00 t of emulsion and 5.00 t of added water. (Total = 15 t.) Temperature at time of weighing was 75°C.
- 2020 L of emulsion and added water remain in the partial load. At the time of measuring, the temperature of the mixture is 55°C.

Using these assumptions, calculate as follows:

1. Volume of emulsion (at 55°C) in the original load:

   10.00 t X 1002 L/t @ 15°C ÷ 0.98225 (see the conversion table, Section 94-1.07, "Measurement," of the *Standard Specifications*) = 10201 L

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-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, Notitfication of Completion of Construction (Desert Areas)
Form CEM-2025, Solid Waste Disposal and Recycling Report
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/Disabled Veteran Business Enterprise
Form CEM-2402(F), Final Report- Utilization of Disadvantaged Business Enterprises (DBE), First - Tier Subcontractors (Federally Funded Projects)
Form CEM-2402(S), Final Report - Utilization of Disabled Veteran Business Enterprises (DVBE) State Funded Projects
Form CEM-2403(F), Disadvantaged Business Enterprises (DBE) Certification Status Change
Form CEM-2404(F), Monthly DBE 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
Form CEM-2505, Owner - Operator Listing Statement of Compliance

Form CEM-2506, Labor Compliance – Wage Violation
Form CEM-2507, Labor Violation: Case Summary
Form CEM-2508, Contractor's Payroll Source Document Review
Form CEM-2509, Checklist – Source Document Review
Form CEM-2601, Construction Progress Chart
Form CEM-2701, Weekly Statement of Working Days
Form CEM-2702, Overrun in Contract Time
Form CEM-3101, Notice of Materials to be Used
Form CEM-3501, AC Production/Placement Checklist
Form CEM-3701, Test Result Summary
Form CEM-3702, Relative Compaction Summary
Form CEM-4101, Materials Release Summary
Form CEM-4102, Material Inspected and Released on Job
Form CEM-4202, Material Plant Safety Checklist
Form CEM-4204, California Test 109 Sticker
Form CEM-4501, Resident Engineer's Daily Report/Assistant Resident Engineer's Daily Report
Form CEM-4601, Assistant Resident Engineer's Daily Report
Form CEM-4701, Drainage System Summary
Form CEM-4801, Quantity Calculations
Form CEM-4900, Contract Change Order
Form CEM-4901, Contract Change Order Input
Form CEM-4902, Extra Work Bill (Short Form)
Form CEM 4902A, Extra Work Bill - Title Page
Form CEM-4902B, Extra Work Bill - Labor Charges
Form CEM-4902C, Extra Work Bill - Equipment Charges
Form CEM-4902D, Extra Work Bill - Material Charges
Form CEM-4903, Contract Change Order Memorandum
Form CEM-5101, Request for Payment for Materials on Hand
Form CEM-6001, Project Record - Estimate Request
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
Form CEM-6201, Notice of Potential Claim
Form CEM-6201A, Initial Notice of Potential Claim
Form CEM-6201B, Supplemental Notice of Potential Claim
Form CEM-6201C, Full and Final Documentation of Potential Claim
Form CEM-6202, Disputes Review Board (DRB) Establishment
Form CEM-6203, Dispute Review Board (DRB) Update Report
Form CEM-6204, Dispute Review Board (DRB) Issue Report
Form CEM-6205, Dispute Review Board (DRB) Completion Report
Form CEM-6301, Contract Acceptance
Form CEM-9001, Construction Manual Proposed Change

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 back 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 back 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-2025, Solid Waste Disposal and Recycling Report

The contractor completes and certifies the information reported on Form CEM-2025, "Solid Waste Disposal and Recycling Report." The resident engineer reviews all reports submitted by the contractor for accuracy. The resident engineer submits the approved form directly to the district recycling coordinator and a copy of the statewide recycle 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-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/ Disabled Veteran Business Enterprise

The contractor fills out Form CEM-2401, "Substitution Report for Disadvantaged Business Enterprise/Disabled Veteran Business Enterprise." The resident engineer uses the form to approve disadvantaged business enterprise (DBE) subcontractor substitutions. For more information on substituting subcontractors refer to Sections 3-8, "Prosecution and Progress," and 8-3, "Disadvantaged Business," of this manual.

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

The contractor fills out and certifies Form CEM-2402(F), "Final Report- Utilization of Disadvantaged Business Enterprises (DBE), First - Tier Subcontractors (Federally Funded Projects)." 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-2402(S), Final Report - Utilization of Disabled Veteran Business Enterprises (DVBE) State Funded Projects

The contractor fills out and certifies Form CEM-2402(S), "Final Report - Utilization of Disabled Veteran Business Enterprises (DVBE) State Funded Projects." The resident engineer verifies the form. It describes work performed and materials provided by disabled veteran business enterprise subcontractors on state funded projects. 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 Trucking Verification

The contractor must submit Form CEM-2404(F), "Monthly DBE 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 utilized each month on the project. Instructions for filling out this form are on the back 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.

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 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
In this category, file the outputs for "Project Record Item Sheets." Subcategories of this category are estimate numbers in numerical order. The subcategories contain documents resulting from the computerized contract administration system (CAS). These CAS reports are cumulative. Only the most current results need to be retained. Possible subcategories are:

- Project Record Item Sheets
- Form CEM-6003, " Progress Pay - Estimate Project Initiation or Update"
- Estimate Verification Form.
- Form CEM-6001, "Project Record - Estimate Request"
- Form CEM-6004, "Contract Transactions Input"

- Status of Contract Items
- Status of Contract Change Orders
- Contract Change Order Master Listing
- Daily Extra Work Report Edit Messages
- Form CEM-6002, “Contract Administration System (CAS) - Report Requests”

If desired, some of the above project documents (other than the “Project Record Item Sheets”) may be filed in extra category numbers.

Category 61, Estimate and Project Status

In this category, file monthly Project Record - Estimate Request documents.

The suggested subcategories of this category are:

- Progress Payment Voucher
- Project Record-Estimate and Project Status
- Estimate Processing Results

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 FHWA-47M, “Statement of Materials and Labor Used by Contractors On Highway Construction Involving Federal Funds”
- 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	Asphalt Concrete
36	Portland Cement Concrete (other than structure items)
37	Initial Tests and Acceptance Tests
38	Quality Control Quality Assurance
39	Materials Testing Certification 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	(Extra category number)
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
55-58	(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
Asphalt Concrete	35
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, 38, 56, 57, 58
Field Laboratory Assistant Reports to Resident Engineer	40
General Correspondence	5
Hazardous Waste and Hazardous Materials	19
Information Furnished at Start of Project	11
Initial Tests and Acceptance Tests	37
Labor Compliance and Equal Employment Opportunity	25
Materials on Hand	51

Material Plants 42
Materials Information and Preliminary Tests 29
Materials Testing Certification of Employees 39
Notice of Materials to be Furnished (Form TL-0608) 33
Notice of Materials to be Inspected (Form TL-0028) 32
Notice of Materials to Be Used (Form CEM-3101) 31
Photograph Records 14
Portland Cement Concrete (other than structure items) 36
Progress Schedule 26
Project Completion Documents 63
Project Office Equipment and Supplies 2
Project Personnel 1
Public Relations 7
Quality Control Quality Assurance 38
Report of Inspection of Material (TL-0029) 41
Resident Engineer's Daily Reports 45
Safety 6
Service Contracts 4
Signs and Striping 13
Traffic Management Information 22
Utility Agreements 16
Utility Work Performed 17
Water Pollution Control Plan or Storm Water Pollution Prevention Plan 20
Weekly Newsletter 28
Weekly Statement of Working Days (Form CEM-2701) 27
Welding 9

5-103 The Contract Administration System (CAS)

5-103A General

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

CAS is one of three subsystems of the Project Information System and Analysis (PISA). The three 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 CAS relates to the other components of the Caltrans computer system used for tracking and paying contract capital costs.

CAS is also composed of separate modules, each of which accomplishes a distinct function. The following are the most common of CAS's 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

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-6001) 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) CCO 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.

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Section 3 Contract Change Orders

Section 3 Contract Change Orders

5-301 General

5-301 General

A contract change order is a legally binding document used to make changes to the contract. Form CEM-4900, "Contract Change Order," is used for contract change orders. Form CEM-4903, "Contract Change Order Memorandum," must be prepared for each contract change order. This section describes the use of forms CEM-4900 and CEM-4903, describes Caltrans policies for contract change orders, and provides guidelines for writing contract change orders and memorandums.

5-302 Contract Change Order Policy

5-302 Contract Change Order Policy

The authority for Caltrans to make changes to a contract is located in Section 3-403, "Changes" of the *Construction Manual* (manual). Work that is outside the scope of an existing contract should be done in a separate contract. However, in special situations it may be added to an existing contract if:

- A director's order has been approved for the new work in accordance with Deputy Directive 26, dated May 1, 1999,
- The Division of Construction chief concurs with adding new work to the existing contract by co-signing the director's order,
- On all federal-aid projects, the FHWA engineer approves the change as outlined in Section 5-308, "Federal Highway Administration Contract Change Order Requirements," of this manual,
- On locally funded state highway projects, the contributing agency agrees to the change as outlined in Section 5-310, "Locally Funded State Highway Projects," of the manual and
- The contractor agrees to the contract change.

District construction personnel should consider the following in determining if the proposed change is within the scope of the original contract. Answering "yes" to any of the following questions indicates that the new work may be outside the scope of the original contract:

- Is the type of work for the proposed change significantly different from other types of work within the original contract?
- Is it necessary for the prime contractor or subcontractors to mobilize specialized forces and equipment to perform the work of the proposed change?
- Will the estimated cost of the proposed work, when combined with all other contract changes, be outside the approved contract allotment?
- Does the proposed change represent a significant deletion to the original contract?
- Does the proposed change significantly delay completion of the contract when compared to the number of original contract working days?

- Is the proposed change outside the original contract limits?
- Can the project be completed as contemplated at the time of bid without the proposed change?

Answering the previous questions assists in determining if a proposal is within the scope of the existing contract. However a complete analysis of all the facts and circumstances surrounding the proposed change or new work is required to make a final determination. When district construction is uncertain if the new work is within the scope of the original contract, the district construction deputy director must consult the appropriate Division of Construction field coordinator for determination.

When new work resulting from the director's order may be accomplished best by adding to an existing contract, the district submits a request to the Division of Construction chief to co-sign the order. After the director's order is approved, district personnel may process a change order incorporating the new work, in accordance with the procedures described in Section 5-311, "Contract Change Order Approval," of this manual.

5-302A Contract Change Order Payment

When writing a contract change order, the resident engineer often can choose the payment method for added or changed work. However, Caltrans has a policy of preference for the payment method. Always attempt to use the most preferred method. The following lists, in order of preference, the payment methods:

- Contract items at contract unit prices
- Contract items at contract prices with an adjustment in compensation
- Extra work at agreed unit price or lump sum
- Extra work at force account

When a contract item is changed in character, the resident engineer may delete the entire contract item, or the portion of it affected by the change, and pay for the entire work as extra work. A much better choice, though, is to determine a correct and equitable adjustment in compensation to the contract item unit price. An adjustment in compensation providing for increased or decreased costs due to the change in character allows the contract price to remain unchanged. Before resorting to force account payment, resident engineers must make every effort to make adjustments in compensation or negotiate agreed prices.

See Section 3-902, "Payment Methods," of this manual for methods of payment. Section 3-904, "Payment for Extra Work," describes how the various methods of payment are used in contract change orders.

5-303 Purpose of Contract Change Orders

5-303 Purpose of Contract Change Orders

Use contract change orders to change any part of the original contract. In addition, contract change orders are used for administrative and other purposes. The following are some of the reasons for writing contract change orders:

- To change contract plans, specifications, or both.
- To describe the work and method of payment for work stipulated in the contract to be paid as extra work.
- To authorize an increase in extra work funds necessary to complete a previously authorized change.

- To make adjustments in compensation.
- To implement a cost reduction proposal or a construction evaluated research proposal. See Section 3-5, "Control of Work," of this manual for a discussion of cost reduction proposals and Section 3-4, "Scope of Work," of this manual for a discussion of construction evaluated research.
- To clarify terms of the contract.
- To resolve disputes, potential claims, exceptions during the contract, after the proposed final estimate, and to pay for contract claim determinations. For the use of contract change orders in the dispute resolution process, see Section 5-4, "Disputes," of this manual.

5-304 Initiation of Contract Change Orders

5-304 Initiation of Contract Change Orders

The resident engineer usually determines the need for and initiates a contract change order. However, the contractor, other Caltrans units, or outside agencies or individuals may request changes. Other Caltrans units requesting a contract change order must clearly document the need for the change. They must provide information sufficient to demonstrate that the requested change meets Caltrans policy for making changes to the contract. For all changes requested by any person except the contractor, indicate "Change Requested by Engineer" on Form CEM-4900, "Contract Change Order."

5-305 Preliminary Considerations

5-305 Preliminary Considerations

When preparing to write a contract change order, consider the following:

- Is the proposed contract change order necessary to complete the work as contemplated at the time the plans and specifications were approved?
- What is the overall impact on the planned work?
- Are there sufficient unobligated contingency funds? If additional funds are required, can they be obtained soon enough to prevent delays? See Section 5-2, "Funds," of this manual for the procedure for obtaining additional funds.
- Will the contract time be affected?
- What are the impacts of extending contract time?
- When a project is nearing completion, give careful consideration to the effect the change will have on the time of completion. Changes near the end of a contract are more apt to extend the time of completion than changes made earlier. Late changes may adversely affect the contractor's schedule, delay public use of the facility, and disrupt the planned use of Caltrans personnel.
- If the adjustment of time of completion is deferred, how will the adjustment be determined?
- Will the proposed contract change order affect or change the contractor's planned method of performing the work?
- Is the proposed work already covered in the contract?
- Will the ordered change cause a change in character of the work?
- If an adjustment in compensation resulting from a change in character of the work is deferred, how will the adjustment be determined?

- Is timely coordination with other affected Caltrans units possible? Does the proposed change adhere to existing permit conditions, environmental mitigation requirements, local agency and utility obligations, and right-of-way agreements? Does the proposed change require new coordination, permits, or agreements?
- Will the contractor cooperate in providing timely cost estimates for the extra work at the agreed price and cost information for adjustments in compensation? Should you make your own cost estimates and determinations first and present them to the contractor?
- What methods of payment should be used?

To avoid misunderstanding and obtain full agreement, discuss with the contractor all elements of a change, including the method of compensation and the effect on time. Failure to identify elements requiring consideration may lead to protest.

5-306 Contract Change Order Content

5-306 Contract Change Order Content

The contract change order must be clear, concise, and explicit. When appropriate, it must include the following:

- What is to be done
- Location and limits of proposed work
- Any applicable specification changes and references to specifications
- The proposed contract change order's effect on time of completion
- Method and amount of compensation

5-306A Specifications

The specifications for contract item work already included in the contract will apply to added contract item work. You do not need to repeat or reference specifications for added work that is clearly shown to be contract item work.

In the contract change order, completely describe extra work. Include directly or by reference the specifications for extra work, whether paid for at agreed price or at force account. The contractor must complete this extra work exactly as it is specified in the contract change order.

Included in the contract will be some work specifically designated as extra work. For an example of this situation, see Section 12-2.01, "Flaggers," and Section 12-2.02, "Flagging Costs," of the *Standard Specifications*.

The contractor normally chooses the method of performing extra work, subject to the resident engineer's approval for labor, equipment, and materials for force account work. If, for any reason, the engineer wants to control the method of performing the work, the method must be specified in the contract change order.

5-306B Description of Work

The contract change order must clearly describe added work or other changes to the contract. Include appropriate references to special provisions, contract plans, *Standard Plans*, or *Standard Specifications*. Decide if a written statement clearly defines the proposed change or if plans or drawings need to be included.

On plans attached to a contract change order, show pertinent dimensions and the scale or label the plans "not to scale." Plainly mark reduced reproductions "Reduced Plans, Scales Reduced Accordingly." When using existing plan sheets, clearly show

the difference between new work, work already included in the contract, and changed or eliminated work. A simple sketch on a letter-sized sheet will more clearly depict the change than an obscure revision to an existing sheet of the original plans. An 8.5" x 11" attachment is always preferable to a full-size contract plan sheet.

Section 6735, "Preparation of Plans and Other Documents," of the Business and Professions Code, requires that a registered civil engineer signs and stamps or seals all civil engineering plans and specifications. Plans or specifications attached to a proposed contract change order must meet this requirement. A registered civil engineer does not need to sign revisions already covered by *Standard Plans*, *Standard Specifications*, standard special provisions, previously engineered drawings, or minor changes not requiring calculations or determinations by a registered engineer.

Show the Caltrans contract number, sheet number, and contract change order number on plans or other documents made a part of a contract change order. Include all attachments to each distributed copy of a contract change order.

5-306C Methods of Payment

This section provides guidelines for using the various methods of payment in contract change orders.

5-306C (1) Increases and Decreases in Contract Items at Contract Prices

Changes in planned work or adding or decreasing work will often result in increases or decreases in contract item quantities. Except for contract items designated in the engineer's estimate as final pay quantities, show changes in contract item quantities as estimates on a contract change order. Calculate the estimated increases or decreases that will result from the work as changed by the contract change order. The actual quantity paid for each contract item will be determined by the method specified for measuring each contract item quantity. For guidelines on measuring contract item quantities, see Section 3-9, "Measurement and Payment" of this manual.

Show changes in the quantity of contract items that are designated as final pay quantities as fixed amounts added to the quantity shown in the engineer's estimate. Calculate the increase or decrease in the final pay quantity by the method specified in Section 9-1.015 of the *Standard Specifications.* For a standard clause for revised final pay quantities, see "Contract Change Order Standard Clauses" later in this section.

For the method of indicating changes in contract item quantities, refer to "Contract Change Order Format" later in this section and see the example contract change orders, Example 5-3.7, Example 5-3.9, and Example 5-3.10, at the end of this section.

5-306C (2) ExtraWork

For the definition of extra work and guidelines for using extra work in contract change orders, see Section 3-4, "Scope of Work," of this manual. Before designating additional work as extra work, ensure that it cannot be paid for as a contract item, a combination of contract items, or a contract item with an adjustment in compensation.

5-306C (2a) Extra work at agreed prices

For guidelines for determining and paying for extra work at agreed price, see Section 3-9, "Measurement and Payment" of this manual.

File with the contract records any calculations made to determine extra work at agreed price. These calculations are subject to audit and must be in such a form that they clearly substantiate and justify the amount paid for extra work. In lieu of showing all the calculations necessary to substantiate extra work at agreed price in the change order memorandum, you can include a statement that such calculations are on file in the project records.

When a subcontractor is to perform extra work paid for by agreed price, include the subcontractor markup in the agreed price calculations. For subcontractor markup guidelines, see Section 3-9, "Measurement and Payment," of this manual.

Agreed prices may be unit prices or lump sum. Before an agreed price may be used to pay for extra work, the resident engineer and the contractor must agree on compensation. The contractor must execute the contract change order providing for extra work at agreed price.

After the extent of extra work has been determined, request the contractor to submit a proposed agreed price. Analyze the contractor's proposed price using the force account method. You may also initially determine a proposed agreed price based on a force account analysis and present it to the contractor. When you have reached an agreement, process the contract change order and retain in the project files the records fully justifying the agreed price.

Ensure that payments of agreed lump sum prices do not exceed the amount authorized on the change order. Agreed unit prices can be applied to an estimated number of units in the contract change order. Although the unit price remains fixed, the number of units paid for may vary from the estimated number.

When extra work consists entirely of work that neither the contractor nor any of the subcontractors would normally perform, the work is considered "specialty work," and the contractor may obtain three bids for the extra work. Determine the agreed price by taking the lowest bid and adding the markup, as described in Section 9-1.03B, "Work Performed by Special Forces or Other Special Services," of the *Standard Specifications*. When this method is used, ensure that the work is accurately and completely described when bids are solicited. The same description of the work must be used in the contract change order. If the contractor or a subcontractor includes a bid along with independent firms, you must make an analysis using the force account method. The contractor's or subcontractor's bid will be acceptable only if the analysis can justify it.

For examples of contract change orders with extra work at agreed price, see Example 5-3.2 and Example 5-3.10 at the end of this section.

<u>5-306C (2b) Extra work at force account</u>
Pay for extra work at force account under the following conditions:

- When the work cannot be estimated within reasonable limits of accuracy.
- When the resident engineer and the contractor are unable to agree on a unit or lump sum price for the work.

For guidelines for paying for extra work at force account, see Section 3-9, "Measurement and Payment," of this manual. For examples of contract change orders with extra work paid for on a force account basis, see Example 5-3.1 and Example 5-3.7 at the end of this section.

5-306C (3) Adjustment in Compensation
For definitions of adjustments in compensation, see Section 3-9 of this manual. Section 3-4, "Scope of Work," of this manual discusses adjustments in compensation for increased or decreased quantities and for changes in character of work.

Adjustments in compensation usually involve estimating the cost of work or determining the actual cost of work performed. The following explains how to estimate or determine such costs.

Verify the contractor's records of item cost by comparing labor and equipment charged to the item by the contractor to the labor and equipment shown on the daily reports. Charge equipment to the item cost in accordance with the force account method. Exclude down time, and apply the correct force account rental rates. Exclude any overhead costs and any items that should be charged to other work.

Sometimes a contractor may submit cost estimates based on the billing from a specialist plus a markup. When the work is of such a nature that it would qualify under Section 9-1.03B, "Work Performed by Special Forces or Other Special Services," of the *Standard Specifications*, you may calculate the adjustment on this basis. Ensure the specialist rate or billing is in line with the firm's usual charges.

For contract item overrun and underrun adjustments, when the contractor does not furnish sufficient and timely cost information, issue a unilaterally approved contract change order adjusting the item. Base the adjustment on your cost determination. This approved contract change order establishes the time allowed for protest and helps avoid problems and delays after contract completion.

Even though the contractor may have agreed to pay a fixed price to others for an element of work, you can still use a force account based adjustment of the item price. You must use a force account cost determination even when the work is subcontracted unless the element of work was performed by special forces, as defined in Section 9-1.03B, "Work Performed by Special Forces or Other Special Services," of the *Standard Specifications*.

For large and complex adjustments, request auditing assistance from the Division of Accounting Services through the Division of Construction.

5-306C (3a) Adjustments for increased or decreased quantities

As soon as it is known that a contract item quantity will vary from the engineer's estimate by more than 25 percent, consider the method of adjustment that will be used. Make daily reports for the item with the same degree of detail used in force account daily reports. Doing so will facilitate determining any necessary adjustment. When required, make adjustments in compensation for increased or decreased quantities as soon as the contractor completes work on a contract item.

You may calculate adjustments by analyzing the performance of a portion of an item, provided the portion is typical of the item as a whole.

You may verify a contractor's records by comparing them with Caltrans records. Where more extensive auditing is required, request the assistance of the Division of Accounting Services. When examining the contractor's records to determine the cost of equipment used, consider only the hours worked. Force account equipment rental rates must be used regardless of what rate the contractor may have used. When verifying contractor's records, eliminate supervision and overhead costs and any items of costs properly chargeable to other work.

When making adjustments, use Caltrans records to determine the amounts of labor, equipment, and materials. The verified contractor's records may supplement the Caltrans records, or in some instances, you may need to use only the verified contractor's records. The resident engineer must use good judgement when reconciling differences between the contractor's and the engineer's records to arrive at a reasonable and equitable adjustment.

An item that has been adjusted under the provisions of Section 4-1.03C, "Changes in Character of Work," of the *Standard Specifications*, may later become eligible for further adjustment under Section 4-1.03B, "Increased or Decreased Quantities," of the *Standard Specifications.*" In making the quantity adjustment, deduct or add payments made in making the change in character adjustment to determine the contractor's total cost of the work.

5-306C (3b) Adjustment calculations involving asphalt concrete dikes and miscellaneous areas

The contract item "asphalt concrete dike" is paid for by the tonne of asphalt concrete and by the meter for asphalt concrete dike. The contract item "asphalt concrete (miscellaneous areas)" is paid for by the tonne of asphalt concrete and by the square meter for asphalt concrete (miscellaneous areas). The specifications do not exactly separate the work covered under each contract item. This lack of separation causes a problem when it is necessary to adjust either the asphalt concrete dike contract item or the asphalt concrete (miscellaneous areas) contract item.

Although a change in character is not actually involved, the procedure is considered the most equitable to compute the adjustment somewhat in conformance with change in character methods.

The following is the recommended procedure to determine the proper costs for computing adjustments of asphalt concrete dike and asphalt concrete (miscellaneous areas):

- Subtract the estimated normal haul and laydown unit cost for asphalt concrete used in paving from the contract unit price to determine the cost of producing asphalt concrete. For commercial plants, you may use published price lists to determine the cost of producing asphalt concrete.
- To obtain the total cost of producing asphalt concrete used in dikes or miscellaneous areas, multiply the actual mass of asphalt concrete used for dikes or miscellaneous areas by the unit cost of asphalt concrete as determined above.
- To obtain the total force account cost of dikes or miscellaneous areas, add to the total cost of producing asphalt concrete the total force account haul and placing costs for asphalt concrete used in dikes or miscellaneous areas.
- Calculate the force account unit cost of the dike or miscellaneous area item and proceed as with any contract item increase or decrease adjustment.

To some extent, this procedure constitutes an adjustment in the asphalt concrete item as well as in the placing item. However, this statement is true only for the asphalt concrete used on that portion of the dike or miscellaneous areas in excess of 125 percent of the engineer's estimate. Also, an overrun or underrun in asphalt concrete dike or asphalt concrete (miscellaneous areas) will usually have little effect on the overall quantity of asphalt concrete.

5-306C (3c) Deferred contract item adjustments:

If adjustment was deferred on the original contract change order, you may write a supplemental contract change order to resolve the adjustment.

To simply indicate an item adjustment will not be made, you do not need to write a supplemental contract change order. In this case, a letter from the contractor is sufficient. File a copy of the contractor's letter with the original contract change order that deferred the adjustment.

Upon completion of the changed work, promptly resolve all deferred item adjustments.

5-306C (3d) Exemption from adjustment:
Unless requested in writing by the contractor, do not adjust a contract item when the total pay quantity is less than 75 percent of the engineer's estimate. You also do not need to adjust (unless requested in writing by the contractor) if the value based on the contract price for the units of work in excess of 125 percent is less than an amount shown in Section 4-1.03B(1), "Increases of More Than 25 percent," of the *Standard Specifications*. As soon as a final contract item quantity is known, decide whether to make the adjustment. Unless an obvious imbalance exists between the contract unit price and actual cost, do not make the adjustment. Inform the contractor in writing whether or not Caltrans will adjust the contract item price.

5-306C (3e) Adjustments for changes in character of work:
Section 3-403, "Changes in Character of Work," of this manual defines changes in character of work.

Adjustments in compensation for changes in character may be unit or lump sum adjustments. A lump sum adjustment is normally only applied to a lump sum contract item.

A change in character adjustment may require a force account determination of the cost of an entire item as changed and a force account estimate of the cost of the work as planned.

When the changed portion of the work can be separated from the unchanged portion, only a force account determination of the cost of the changed portion is necessary. You can make payment at the contract price plus a separate payment for the added work or credit for any deleted work. When added work is clearly separable from the planned item work, pay for it as a lump sum or unit adjustment in compensation. You may also pay clearly separable added work as extra work at agreed price or force account. For work deleted from the original item work, make an adjustment in compensation (credit) for the deleted portion.

Do not eliminate a contract item and pay for the work at agreed price or force account unless the change is so extensive that the original item no longer applies. If at all possible, never change a contract bid price. Instead, make an adjustment to the contract bid price.

Changes in character always result from an approved contract change order. At times, it will not be possible to come to an immediate agreement with the contractor regarding adjustment of compensation. You may need to complete the entire item before costs can be determined. In such cases, provide for payment at contract prices, and defer adjustment in the initial contract change order. Include an appropriate deferment clause.

5-306D Adjustments to Time of Completion
For a discussion of time of completion and extensions of contract time, see Section 3-805, "Time of Completion," of this manual.

A contract change order may specify a positive, negative, or zero adjustment to time of completion.

Whenever you can estimate an adjustment in contract time with reasonable accuracy, try to reach agreement with the contractor. Enter the amount of the adjustment on the change order (including zero adjustments). Regardless of the amount of time actually required, the agreed adjustment becomes binding on both parties. File with the contract records the calculations and other data used to determine adjustments of contract time.

If you cannot determine or agree on an adjustment of contract time in the initial contract change order, you may defer the adjustment. When doing so, write "deferred" on the time adjustment line and include a time adjustment deferred clause in the contract change order.

As soon as the contract change order work is completed, determine the appropriate contract time adjustment. If you cannot reach agreement with the contractor, issue a unilaterally approved supplemental contract change order adjusting contract time.

On contracts with internal time limits or multiple time limits, ensure any contract change order that includes a time extension contains a statement that identifies the time limit(s) to which the extension applies. If an internal milestone date will change, but total contract time remains unaffected, specify the new date in the contract change order and indicate a zero time adjustment.

Periodically during the progress of the contract change order work, resolve extensive deferred time extensions. Do so by issuing a supplemental contract change order covering time allowable to a given date, with the deferment continued for subsequent work. Your objective is to resolve deferred time extensions as soon possible. By doing so, the contractor can better schedule remaining work so as to complete the project within the contract time limits.

The resident engineer may not unilaterally decrease contract time unless this is permitted by the contract specifications. Otherwise, the contractor must agree to changes that reduce contract time. Without this agreement, you can do one of two things:

1. Do not recommend approval of the change if no benefit exists for Caltrans.
2. If substantial benefits exist for Caltrans, issue a unilaterally approved contract change order with no adjustment in contract time.

5-306E Contract Change Order Standard Clauses

The following are examples of standard clauses for specific situations found in various types of contract change orders. Note that any items in brackets are not part of the clause, but are instructions to you in using the clause. In using any of these clauses, ensure that the clause states what is appropriate for your contract change order.

Situation 1: Adjustment Deferred for Increase in Quantities in Excess of 125 Percent of the engineer's estimate

Standard Clause for Situation 1:

Any adjustment due in accordance with Section 4-1.03B(1), "Increases of More Than 25 Percent", of the *Standard Specifications* for contract item(s) No. _____ is deferred.

Situation 2: Adjustment for Increase in Quantities in Excess of 125 Percent of the Engineer's Estimate

Standard Clause for Situation 2:

Adjustment in compensation in accordance with Section 4-1.03B(1), "Increases of More Than 25 Percent," of the *Standard Specifications*:

The following adjustment(s) will be made for units of work in excess of 125 percent of the engineer's estimate:

[List the contract item(s), unit adjustments, quantities, and total item adjustment(s).]

Or [for a single contract item]:

In accordance with Section 4-1.03B(1), "Increases of More Than 25 Percent," of the *Standard Specifications*, the adjustment of the contract unit price for the quantity in excess of 125 percent of the engineer's estimate for contract item No. _____ [item description] will be $____ per _____ increase [or decrease].

[When you know the total pay quantity, you may apply the unit adjustment to a fixed quantity for an exact total adjustment. When the total pay quantity has not yet been determined, you may apply the unit adjustment to an estimated quantity for an estimated total adjustment.]

Situation 3: Adjustment Deferred for Decrease of More Than 25 Percent

Standard Clause Situation 3:

Any adjustment due in accordance with Section 4-1.03B(2), "Decreases of More Than 25 Percent," of the *Standard Specifications* for contract item(s) No. _____, [item title] is deferred.

Situation 4: Adjustment for Decrease of More Than 25 Percent

Standard Clause for Situation 4:

Adjustment in accordance with Section 4-1.03B(2), "Decreases of More Than 25 Percent," of the *Standard Specifications*:

The following adjustments will be made for contract items that underran the engineer's estimate by more than 25 percent:

Or [for a single contract item]

In accordance with Section 4-1.03B(2), "Decreases of More Than 25 percent," of the *Standard Specifications*, the adjustment of the contract unit price for contract item No. _____ (item description) will be $_____ increase.

[Normally, in the case of an underrun, you must know the total pay quantity before determining the adjustment. It is usually more convenient to show the adjustment as a lump sum amount because of the specified limit of 75 percent of the engineer's estimate for total compensation.]

Situation 5: No Adjustment due to Increases or Decreases of More Than 25 Percent of the engineer's estimate

Standard Clause Situation 5:

No adjustment(s) to the contract unit price of item(s), No.____ [item title], will be made in accordance with Section 4-1.03B(1), "Increases of More Than 25 Percent," of the *Standard Specifications*. [Or for decreases, use Section 4-1.03B(2), "Decrease of More Than 25 Percent," of the *Standard Specifications*.]

Or [When waiving adjustments for both increases and decreases]

There will be no adjustment for items No. _____ and No. _____ [item titles] in accordance with Section 4-1.03B, "Increased or Decreased Quantities," of the *Standard Specifications* by reason of this contract change order.

[The contractor must be in agreement and execute the contract change order before adjustment in compensation for increased or decreased quantities is waived.]

Situation 6: Adjustment Deferred Due to Possible Change in Character

Standard Clause for Situation 6:

Any adjustment due in the contract unit price(s) of item(s) No. ___, [item title] in accordance with the provisions in Section 4-1.03C, "Change in Character of Work," of the *Standard Specifications*, is deferred.

Situation 7a: Eliminated Item, Adjustment Deferred

Standard Clause for Situation 7a:

Any adjustment due in accordance with Section 4-1.03B(3), "Eliminated Items," of the *Standard Specifications* of contract item No._____ will be deferred until all incurred or unavoidable costs can be determined.

Situation 7b: Eliminated Item, Adjustment Determined

Standard Clause for Situation 7b:

In accordance with Section 4-1.03B(3), "Eliminated Items," of the *Standard Specifications*, the adjustment due to the elimination of item(s) No. _____, [item title] is zero. [Or replace zero with whatever costs the contractor has incurred.]

Situation 8: Revised Final Pay Item Quantities

Standard Clause for Situation 8:

The quantity increase shown herein for item No. ____, [item title] when combined with the quantity shown in the engineer's estimate, and as modified by any previous change orders or revisions to dimensions made by the engineer, shall be the final quantity for which payment will be made.

Situation 9: Extra Work or Adjustment in Compensation at Agreed Unit Price

Standard Clause for Situation 9:

For this work, the contractor shall receive and accept $ __ per [unit] of [pipe, fence, among other items]. This sum constitutes full and complete compensation for furnishing all labor, material, equipment, tools, and incidentals including all markups by reason of this change.

Situation 10: Extra Work or Adjustment in Compensation at Agreed Lump Sum Price

Standard Clause for Situation 10:

For this work, the contractor will be paid the sum of $ ___. This sum constitutes full and complete compensation, including all markups for this change.

Or

For this work, the contractor shall receive and accept the agreed lump sum of $ ____. This sum constitutes full and complete compensation for providing all labor, material, equipment, tools and incidentals, including all markups by reason of this change.

Or

For this reduction, the contractor agrees to [or will] credit [or pay] the state a lump sum of $ ___. This sum constitutes full and complete compensation, including all markups for this change.

Or

The state will accept a lump sum payment of $ ___ as full compensation for this change.

Or

The contractor shall credit the state $ ___ for each [unit] of item(s) No. ____ [item title]. This sum constitutes full and complete compensation for this change.

Or

There shall be no cost or credit to the state by reason of this change.

Situation 11: Time Adjustment

Standard Clause for Situation 11:

Consideration of a time adjustment will be deferred until completion of the work specified in this contract change order. A determination of a time extension will be made in accordance with Section 8-1.07, "Liquidated Damages," of the *Standard Specifications*.

Or

A determination of the delay in completion of the contract due to the work specified by contract change order No. ____ has been made in accordance with the provisions of Section 8-1.07, "Liquidated Damages," of the *Standard Specifications*. [Add either of the following sentences to this clause]

Contract change order No. _____ was the controlling item of work for the following dates: [list dates—mm/dd/yy].

The contractor shall be granted [number] working days for the following dates: [list dates—mm/dd/yy].

Or

A determination of the delay in completion of the contract due to work specified by contract change order No. ___ for work performed from [mm/dd/yy] to [mm/dd/yy] [or on mm/dd/yy] has been made. Consideration of time extension for the remaining work continues to be deferred.

Situation 12: Deferred Adjustment for Right-of-Way Delay

Standard Clause for Situation 12:

Any adjustment in compensation due to possible delays to the work resulting from this change is deferred until completion of the work. The adjustment will be made in accordance with Section 8-1.09, "Right of Way Delays," of the *Standard Specifications*.

Situation 13: Adjustment in Compensation for Overhead Costs

Standard Clause for Situation 13:

In accordance with Section 9-1.08, "Adjustment of Overhead Costs," of the *Standard Specifications*, compensate the contractor the total sum of $ ___ to cover overhead costs.

Situation 14: Claim Settlement

Standard Clause for Situation 14:

Payment indicated in this contract change order provides for full settlement of all claims on this contract [or the contractor's claim No. ____.]

Or

Grant the contractor [number] working days, reducing the overrun in contract time by [number] calendar days, which provides for full settlement of all claims on this contract.

Or

This contract change order resolves notice of potential claim No. ____, dated [date].

5-306F Work Designated as Extra Work in the Specifications

The *Standard Specifications* and the special provisions describe certain work and specify that it is to be paid for as extra work. In some cases, supplemental funds are set aside to pay for this extra work. Make an independent cost estimate of the work for which the supplemental funds were provided. This estimate must be as accurate as possible.

Refer to the specific section of the specifications that identifies the extra work in the contract change order. Also, describe the exact work to be performed.

Traditionally, Contract Change Order No. 1 provides for extra work specified for public traffic and public convenience. This contract change order must be limited to the following:

- Work designated as extra work in the specifications
- Work related to the needs of public traffic or for public convenience

Refer to the example contract change order, Example 5-3.1, at the end of this section. This contract change order indicates the method for incorporating specified extra work into a contract change order. Note that the example contract change order is written as extra work at force account. You may also pay for specified extra work as extra work at agreed price if the extent of the work can be accurately determined. This approach is illustrated in the example contract change order, Example 5-3.2, which provides for payment for flaggers at an agreed unit price. Payment for flaggers at an agreed price may be written as a separate contract change order or combined with the other traffic related work paid for as extra work at force account.

5-306G Contract Change Order Format

The example contract change orders at the end of this section follow the generally accepted format for writing contract change orders. The following describes the format:

- Describe the work or the change that will cause increases and decreases to contract item quantities. Refer to any attached drawings or documents (sheets __ and _____ of _____). If the contract item work cannot be described separately from other work, describe the entire work at this stage. Describe work paid for by other methods in the appropriate sections of the contract change order. The intent is that the contract change order clearly specifies the work paid for by each payment method.
- Show the increases and decreases in contract item quantities. Include the percent of the engineer's estimate represented by this change. Also show the accumulated change to date from the original quantity in the engineer's estimate.
- Write clauses for situations resulting from increases or decreases in contract item quantities (deferred adjustments or actual adjustments in compensation for overruns or underruns).
- Write clauses for adjustments or deferred adjustments in compensation due to any cause. Describe the work or change causing the adjustment or deferred adjustment. Show the amounts of adjustments.
- Describe work to be paid for as extra work at agreed price. Show the price agreed. Agreed prices may be fixed unit prices and an estimated or actual number of units, or agreed prices may be fixed lump sums.
- Describe the work to be paid for as extra work at force account. Show the estimated cost of the extra work.
- Write time deferment or time extension clauses.

5-307 Contract Change Order Memorandum

5-307
Contract Change
Order Memorandum

Include with all contract change orders sufficient documentation to explain what the change does and why it is needed. For this purpose, use Form CEM-4903, "Contract Change Order Memorandum," with any necessary attachments. The memorandum is intended for interdepartmental use only. Do not send the memorandum to the contractor.

The memorandum must be sufficiently complete to enable a person unfamiliar with the details of the project to review the contract change order and determine the justification for the work, the reasonableness of the compensation, and the time extension provisions.

5-307A Contents of the Memorandum

Include the following in the memorandum:

- State what the contract change order provides. Supplemental contract change orders should also include a description of the original contract change order.
- Explain why the change is needed. When another Caltrans unit requests a change, the correspondence requesting the change should also justify the need for the change. Attach supporting letters to the memorandum.
- State why a particular method of payment was chosen. Include a complete cost analysis, or state that the cost analysis is on file with the project records. The statement should include the method used in making the cost analysis.
- Explain why the ordered change causes any change in the character of the work. To substantiate why any additional compensation is due, you may need to provide a summary of events leading up to the change.
- State the extent of coordination and concurrence. If agreement with any district unit cannot be obtained, then indicate specifically what was said and why it should or should not influence a decision for approval. See Section 5-307C, "Coordination and Concurrence by Others" in this section.
- If prior approval of the change order has been obtained, state the name of the person who granted prior approval and the date.
- Show the unobligated balance of funds available to finance the contract change order. The resident engineer must ensure the available funds are not exceeded. For obtaining additional funds, see Section 5-2, "Funds," of this manual.
- Show the total authorized funds to date, as well as the dollar amount of a supplemental contract change order.
- Indicate when funds for supplemental work shown in the detailed estimate of job cost are used in the contract change order.
- For major changes on federal "oversight" projects, indicate the name and date of discussion and concurrence, if any, by the Federal Highway Administration (FHWA) transportation engineer. For details relating to federal funding to be shown on the contract change order memorandum, see "Federal Requirements," "Federal Funding," and "Determining Federal Participation" in this section.
- For change orders involving participation by local agencies, identify the portion of the work that is applicable to the contributing agency.
- For a contract change order that is to be unilaterally approved, explain why the

contractor will not sign it or why the contractor's signature is not required. Attach a copy of any correspondence from the contractor regarding the contract change order.

- Include justification for a contract time adjustment. Describe the method used to determine time extensions. State what operation controlled time during the delay period. Whenever possible, and when resolving a previously deferred time adjustment with a time extension, indicate the specific calendar or working days represented by the time extension. By indicating the specific days, you ensure that other time extensions do not cover the same time period.

5-307B Contract Change Order Category Codes

The resident engineer is responsible for assigning a four-letter code to every contract change order to indicate the main reason for the change. Preferably, there should only be one issue per contract change order. For contract change orders with multiple distinct issues, assign the coding based on the one issue that has the greatest impact to the project. Assign the coding according to the reason for the change, not according to how the problem was corrected. The resident engineer should enter this code on Forms CEM-4903, "Contract Change Order Memorandum," and CEM-4901, "Contract Change Order Input."

The contract change order code will identify discrete pieces of information about the change:

1. The type of contract change order (first character),
2. The specification which authorizes the change, or the physical asset which is affected by the change (second character),
3. The source document that led to the need for a change (third and fourth characters), or
4. The disposition of a dispute resolution (third and fourth characters).

Administrative types of contract change orders (accelerations, and changes that are anticipated and authorized by existing administrative specifications) require only minimal coding information. Consequently, extra coding positions will be assigned a default character placeholder, the letter *Z*. Assign characters from left to right, as subsequent character code selection is dependent on the preceding characters.

- Character 1: Contract Change Order Type

Use the codes in Table 5-3.1, "Contract Change Order Type," to categorize the contract change order according to its general type (for example: administrative, dispute resolution and others). Coding for dispute resolution takes precedence over coding for any other potential scenario. After selecting the first character code, use the corresponding directions on Table 5-3.1 to complete the coding for the remaining three characters.

- Character 2: Specification, or Physical Asset

Next, based on your selection for the first character code, and using the directions within Table 5-3.2, "Specification, or Physical Asset," select the code that most accurately identifies the appropriate administrative specification, or the affected physical asset. Enter this code as the second character. In the case of a contract change order that is strictly for acceleration, with no physical change in the planned work (the first character code is a B), then the second character code is defaulted to a placeholder Z character.

- Characters 3 and 4:Source Document, or Dispute Disposition

If the contract change order is needed to bring about a plan or specification change (the first character code is *C* or *D*), use Table 5-3.3, "Source Document," to identify the pair of character codes that together best describe the original document that created the need for the contract change order. The reason for the change may be due to:

- Constructability issues, errors, conflicts, or inconsistencies,
- The introduction of improved products, means or methods, or
- For any other reason, provided that the change will affect some physical aspect of the planned work.

If the contract change order is for a dispute resolution (first character code from Table 5-3.1 is either *E, F, G,* or *H*), use Table 5-3.4, "Dispute Disposition," to assign the third and fourth characters. Begin by selecting the code for the third character that most closely identifies the time frame ***before*** the dispute was resolved, Table 5-3.4 The milestones for the third character are listed chronologically. For the fourth character, choose a code from Table 5-3.4 that most accurately explains how the dispute was resolved (entitlement, negotiated settlement, and arbitration award, full or partial resolution.)

If the contract change order type was administrative (first character code is either *A* or *B*), then the third and fourth character codes are defaulted to *Z*s.

General Examples:

Contract change orders that are strictly for constructive accelerations when there is no change to the final configuration of a planned permanent physical asset are all coded *"BZZZ."* No additional coding information is necessary.

When a contract change order resolves a dispute based on contract administration, and there was no change to the planned work on some permanent physical asset:

1. The first character will be either *E* or *G*, (see Table 5-3.1,),
2. The second character represents the disputed administrative specification. Choose this character from the upper portion of Table 5-3.2,
3. The third and fourth coding characters are selected depending on when and how the dispute was resolved. Choose these characters from Table 5-3.4, "Dispute Disposition."

When a contract change order is authorized by an administrative specification and there is no formalized dispute involved:

1. The first character will be *A*, (see Table 5-3.1).
2. Select the second character from the upper portion of Table 5-3.2, and
3. The third and fourth characters will both default to the placeholder letter *Z*. No other coding information is necessary in this particular example.

The "Contract Change Order Code Generator" is a tool that is used to categorize types of contract change orders. It is available on the Division of Construction's Intranet web site at:

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

Table 5-3.1: Contract Change Order Type (Character 1)

CCO Type		Code	Description
Administrative	Contract or Supplemental Work	A	Contract change order used to pay for work or adjustments already authorized by specifications (supplemental work, quantity adjustments, and other) (Use only the specification codes from the upper portion of **Table 5-3.2** for the second character, and *Z*s for the third and fourth characters)
	Acceleration	B	Contract change order used to accelerate certain planned work. Describe the reason for acceleration in the transmittal memo (public convenience, staging coordination, delay mitigation, and other) (Use only *Z*s for subsequent code characters 2, 3, and 4)
Plan or Specification Change	Non-CRIP	C	Contract change order needed to change plans or specifications for reasons unrelated to a cost reduction incentive proposal (CRIP). (Use only the Physical Asset codes from **Table 5-3.2** for the second character, and ***Table 3*** for the third and fourth characters)
	CRIP-related	D	Contract change order needed to change plans or specifications due to a CRIP (Use only the Physical Asset codes from **Table 5-3.2** for the second character, and **Table 5-3.3** for the third and fourth characters)
Dispute Resolution	Potential Claim	E	Contract change order either fully or partially resolves certain notices of potential claim (NOPCs) due to some dispute over contract administration. (Use the specification codes from the upper portion of **Table 5-3.2** for the second character, and **Table 5-3.4** for the third and fourth characters)
		F	Contract change order either fully or partially resolves certain NOPCs due to a dispute over an ordered change, which affected some physical asset. (Use either the Physical Asset codes from the lower portion of **Table 5-3.2** for the second character, and **Table 5-3.4** for the third and fourth characters)
	Claim	G	Contract change order either fully or partially resolves certain contract claims due to some dispute over contract administration. (Use the specification codes from the upper portion of **Table 5-3.2** for the second character, and **Table 5-3.4** for the third and fourth characters)
		H	Contract change order either fully or partially resolves certain contract claims due to a dispute over an ordered change, which affected some physical asset. (Use the Physical Asset codes from the lower portion of **Table 5-3.2** for the second character, and **Table 5-3.4** for the third and fourth characters)

Table 5-3.2:Specification, or Physical Asset (Character 2)

	Code	Specification (use this portion of **Table 5-3.2** only when the first character code is *A, E,* or *G*)	
Authorizing Specification *Standard Specifications* (No.) or Special Provision (SP)	A	4-1.03B(1 & 2):	Quantity adjustments
	B	4-1.04:	Detour repair
	C	5-1.116:	Differing site conditions
	D	7-1.01A(5):	Apprentice training
	E	7-1.08:	Public convenience
	F	8-1.07:	Miscellaneous time adjustments
	G	8-1.09:	Right-of-Way delay
	H	8-1.10:	Utility and non-highway facilities
	I	9-1.08:	Overhead cost adjustment
	J	12-2, 12-4:	Flagging and other temporary traffic control
	K	15-2.05:	Unsuitable reconstruction material
	L	19-1.04:	Buried man-made objects
	M	19-2.02:	Unsuitable earthwork material
	N	19-2.04:	Slides and slipouts
	O	20-4.03:	Planting area rock and debris removal, disposal
	P	20-5.025, 86-1.06:	Maintaining existing facilities
	Q	SP:	California Paving Asphalt Index price adjustment
	R	SP:	Dispute Review Board meetings
	S	SP:	Interest for late payments
	T	SP:	Value analysis meetings (Not CRIPs)
	U	SP:	Partnering meetings
	V	SP:	Quality control/assurance
	W	SP:	Other listed supplemental work (Describe in transmittal memo) (Use only if no other code describes this supplemental work)
	X	Other:	Other (Describe the "other" specification in transmittal memo)
	Z	Default:	(Use only when the first character is B)
Affected Permanent Physical Asset	**Code**	**Physical Asset** (use this portion of **Table 5-3.2** only when the first character code is *C, D, F,* or *H*)	
	A	Building (maintenance facilities, pump stations, etc.)	
	B	Electrical (signals, lighting, communications, electrical systems, etc.)	
	C	Drainage (culvert, subsurface, roadway drainage, gutters, lined ditches, etc.)	
	D	Earthwork (excavation, embankment, soil stabilization, slope protection, erosion control, etc.)	
	E	Landscaping (plants, irrigation, etc.)	
	F	Materials (borrow or disposal sites, surplus, salvage, etc.)	
	G	Property (fence, survey monument, easements, Right-of-Way obligations, etc.)	
	H	Structure (vehicle or pedestrian)	
	I	Base, subbase, shoulder backing	
	J	Surfacing (pavement, pavement reinforcing, shoulders, sidewalks)	
	K	Traffic control devices (barriers, railing, signing, delineation, etc.)	
	L	Utility	
	M	Wall (retaining, sound, aesthetic, etc.)	
	X	Other (Describe the "other" affected permanent physical asset in transmittal memo)	
	Z	Default (Use only when the first character is B)	

Table 5-3.3:Source Document (Characters 3 and 4)

(Use Table 5-3.3 only when the first character code is *C* or *D* from Table 5-3-1)

Character 3 (General)		Character 4 (Specific)	
Code	**Description**	**Code**	**Description**
A	Agreement	A	Cooperative
		B	Permit
		C	Right-of-Way obligation
C	Certificate	A	Environmental clearance
		B	Right-of-Way clearance
G	Survey	A	Data/Control
		B	Detailed cross-sections
M	Materials	A	Log of test borings
		B	Information handout, brochure
P	Plan	A	Construction detail
		B	Contour grading
		C	Electrical
		D	Elevation view
		E	Environmental mitigation
		F	Erosion control
		G	Foundation
		H	General cross-sections
		I	Irrigation
		J	Layout/Plan View
		K	Mechanical
		L	Pavement delineation
		M	Planting
		N	Profile
		O	Schedule of materials
		P	Signage
		Q	*Standard Plans*
		R	Substructure
		S	Superelevation
		T	Superstructure
		U	Typical section
		V	Utilities
S	Specification	A	Special Provision
		B	*Standard Specifications*
T	Temporary Plan	A	Construction area signs
		B	Construction easements
		C	Construction staging
		D	Electrical
		E	Erosion control
		F	Environmentally Sensitive Area (ESA)
		G	Lane closure chart
		H	*Standard Plans*
		I	Water Pollution Control/Prevention (WPCP or SWPPP)
		J	Traffic handling
		K	Traffic management plan
A,C,G,M, P,S,T	Any of above	X	Other specific document (Describe in transmittal memo)
X	Other	X	Other (Describe in transmittal memo)
Z	Default	Z	When the first character is either A or B

Table 5-3.4:Dispute Disposition (Characters 3 and 4)

(Use **Table 5-3.4** only when the first character code is *E*, *F*, *G*, or *H*, from **Table 5-3.1**, representing a Dispute Resolution)

Character 3 (Time Frame)		
Code		**Chronological Milestone**
Potential Claims (Use only when first character code from **Table 5-3.1** is *E* or *F*)	A	Prior to a "Differing Site Condition Management Review Committee" (DSC-MRC) hearing
	B	Prior to a "Dispute Review Board" (DRB) hearing
	C	Prior to the "Construction Contract Acceptance" (CCA) date
	D	Prior to the Proposed Final Estimate (PFE) date
Claims (Use only when first character code from **Table 5-3.1** is *G* or *H*)	E	Prior to a "Board of Review" (BOR) hearing
	F	Prior to an Arbitration Filing
	G	Prior to the Arbitration Hearing
	H	Prior to the Arbitrator's Decision
	I	After the Arbitrator's Decision

Character 4 (Resolution Authority)	
Code	**Description**
A	Entitlement, Partial Resolution (Describe unresolved issues in transmittal memo)
B	Entitlement, Full Resolution
C	Negotiated Settlement, Partial Resolution (Describe unresolved issues in transmittal memo)
D	Negotiated Settlement, Full Resolution
E	Arbitration Award, Partial Resolution (Describe unresolved issues in transmittal memo) (Use only with first character code from **Table 5-3.1** is *G* or *H*)
F	Arbitration Award, Full Resolution (Use only with first character code from **Table 5-3.1** is *G* or *H*)
X	Other (Describe in transmittal memo)

5-307C Coordination and Concurrence by Others

Secure recommendation or concurrence from affected functional units and other agencies. Concurrence is evidence of agreement with a change in the contract and does not constitute approval of a contract change order. Process all contract change orders for approval as described in Section 5-311, "Contract Change Order Approval."

Use procedures established in the district for circulating contract change orders for concurrence. If contacted parties are unresponsive, in the contract change order memorandum, state the facts and what was done instead to ensure the proposed change is appropriate. Obtaining concurrence is not intended to cause delay to the project.

The following lists some of the Caltrans functional units and reasons for seeking their concurrence.

5-307C (1) Project Development

The project engineer must concur with all design-related contract change orders, including plan or specification changes and cost reduction proposals. You may obtain design assistance from the project engineer on some of the more complex design changes. Remember that the project engineer is the engineer of record, and unless the project engineer is consulted the resident engineer may not know why some design decisions were made.

By coordinating with the project engineer on all design and specification contract change orders, a continuous "constructability review" process develops. Cooperation between design and construction personnel will result in better plans and specifications and fewer contract change orders. Cooperation will also reduce potential for construction delays, limit negative effects on the contractor, and lessen the potential for contract claims.

5-307C (2) Project Management

For contract change orders with the following conditions, obtain concurrence from the project manager:

- Potential for significant delays to the planned work.
- Unanticipated large project cost increases, including those requiring a request for additional funds.
- Changes that may be considered outside the scope or intent of the planned work.

The project manager's duties relating to contract change orders include the following:

- Monitoring project costs.
- Expediting decisions by functional units as needed, so as not to delay or otherwise adversely affect the contractor's operations.

5-307C (3) Structures

Where changes are to be made that involve structures, the Office of Structure Construction determines the need for the change, the intent or content of the change order, and any methods or restrictions in doing the work. The resident engineer is responsible for administration, including processing for approval of the contract change order. The structure construction engineer and personnel in Engineering Services may need to concur. For procedures for obtaining concurrence for structure contract change orders, see Section 7-00, "Contract Change Orders," of the *Bridge Construction Records and Procedures Manual*.

5-307C (4) Materials

The district materials engineer, as well as the project engineer, must concur with all

contract change orders that change or modify material specifications. Also, seek concurrence from the district materials engineer for proposed changes in structural section, slope rates, installation of subsurface drains, removal of unsuitable material, erosion control, and repair of slides and slipouts.

5-307C (5) Traffic

Obtain concurrence from the appropriate traffic engineer in the district for contract change orders affecting traffic management plans, hours of work, detours, signing, highway lighting, traffic signals, illuminated signs, guardrail, barriers, delineation, or any other traffic control device or facility. Clear any proposed special sign with the district traffic design engineer.

5-307C (6) Maintenance

Obtain concurrence from the appropriate maintenance region manager or engineer for changes affecting maintenance facilities, lands and buildings, and maintenance operations. Concurrence from the appropriate maintenance manager or engineer is required for all contract change orders affecting the use of maintenance funds.

5-307C (7) Right-of-Way

Obtain concurrence from the district right-of-way unit for any changes to right-of-way contracts or agreements, right-of-way fencing or alignment, or gates.

Contact the district right-of-way unit for assistance with any required rights-of-entry permits, easements, or agreements.

The district utility coordinator must concur with all changes involving utility work. The district utility coordinator must also make proposed revisions to Form RW 13-14, "Notice to Owner." For information about coordinating utility work, see Section 3-809, "Utility and Non-Highway Facilities," of this manual.

5-307C (8) Environmental

For environmental concerns and requirements, see Chapter 7, "Environmental," of this manual. Contact the district environmental unit for assistance and concurrence with any change affecting environmental considerations or requirements or affecting obligations or commitments to other agencies.

The environmental document on any project is valid only for the work described by the document and shown on the plans submitted for environmental approval. For any work proposed in addition to or as a deviation from the approved work, consult with the district environmental unit. Significant changes may require amended or additional environmental approval or permits. The types of changes that may require additional consultation and approval include the following:

- New materials sites
- New haul or access roads
- Previously unidentified clearing and grubbing and hazardous materials
- Increases in earthwork
- Utility relocation
- Diversion or extraction of water from a stream not covered by a Lake/Streambed Alteration Agreement, more commonly known as a "1601 permit," with the Department of Fish and Game
- Disposal sites
- Revision to allowable work windows

5-307C (9) Locally Funded Projects

For guidelines for processing contract change orders on locally funded projects, see Section 5-310, "Locally Funded State Highway Projects, " later in this section.

5-308 Federal Highway Administration Contract Change Order Requirements

5-308 Federal Highway Administration Contract Change Order Requirements

5-308A Full Oversight Projects

Projects with a suffix of "N" are subject to full FHWA oversight requirements. Early and frequent communication with the FHWA engineer is essential to ensure full compliance with all federal requirements.

5-308A(1) Federal Highway Administration Approval Requirements– Major Contract Change Orders

Major contract change orders require FHWA approval. The resident engineer must obtain approval before proceeding with a proposed change. The resident engineer may obtain same-day verbal approval by telephone upon furnishing the FHWA engineer with the information they request. Following the verbal approval, the FHWA egineer sends the written approval electronically (e-mail, fax, or both). The district sends a copy of the contract change order and contract change order memorandum to the FHWA engineer upon approval of the contract change order.

Written and signed FHWA approval is required for any of the following major contract change orders:

- Contract change order that would increase the cost greater than $200,000.
- Contract change order that would increase the cost of anticipated supplemental work item listed in the detail estimate greater than $200,000.
- Supplemental contract change orders above the $200,000 threshold.
- Changes in specifications (with the exception of lane requirements and hours of work charts).
- Changes in method of payment.
- Changes in material processing.
- Changes in type or quantity of materials furnished (with the exception of minor building materials).

  Example:

  The contract change order changes the individual aggregate base to an asphalt concrete material.
- Changes in proprietary or sole source materials for which specific or blanket approval has not been previously given.
- Waivers to the Buy America requirements, above the minimal amount that is allowed in Section 3-605, "Certificates of Compliance," of the *Construction Manual* and the project special provisions.
- Cost Reduction Proposal.
- Experimental Work Plan.
- Changes to federal environmental requirements such as:

1. Environmental mitigation. See Mitigation Monitoring Reporting Record, if available.
2. Permit conditions.
3. Agreements with federal resource agencies.

   Example:

   Revising sound walls – height, length, location, adding auxiliary lanes, and disturbing a site on or eligible for National Register of Historic Places

- Introduction of new social, environmental, or economic issues that need to be addressed under applicable federal laws
- Changes to, or requiring of, mandatory disposal or borrow sites, Public Interest Finding and National Environmental Policy Act (NEPA) clearance may be needed.
- Expansion of project limits beyond the limits set in the environmental document.
- Form of payment (not just a contract change order) to a contractor resulting from a claim, board of review, exception to proposed final estimate, district director determination or arbitration.
- Supplemental contract change orders to all of the above.
- Change resulting in a contract time extension of 20 or more working days. Additionally, if time is extended by more than 20 percent of the original contract working days, then that change and each subsequent contract change order to extend time.

5-308A(2) Federal Highway Administration Approval Requirements– Minor Contract Change Orders

Contract change orders other than those listed above are considered minor. Although approval may be granted retroactively, minor contract change orders require written and signed FHWA approval. These approvals occur during FHWA construction reviews, or occur with final approval of the project by FHWA.

5-308B State-Authorized Projects

Projects with a suffix of "E" are state-authorized, so resident engineers are not formally required to communicate with the FHWA engineer except for a few instances. Informal discussions for technical guidance are encouraged.

5-308B(1) Federal Highway Administration Involvement Requirements– Major Contract Change Orders

There are several events that may make FHWA involvement necessary. The FHWA engineer is contacted sufficiently in advance of the project event deemed necessary to allow their participation. In all other cases, contact the FHWA engineer as soon as practical to ensure federal concurrence and participation.

FHWA involvement is required for any of the following major contract change orders:

- Changes to federal environmental requirements:

  1. Environmental Mitigation. See Mitigation Monitoring Reporting Record, if available.

2. Permit conditions.
3. Agreements with federal resource agencies.

   Example:

   Revising sound walls – height, length, location, adding auxiliary lanes, and disturbing a site on or eligible for the National Register of Historic Places.

- Introduction of new social, environmental or economic issues that need to be addressed under applicable federal laws.
- Changes for mandatory disposal or borrow sites – Public Interest Finding and NEPA clearance may be needed.
- Waivers to the Buy America requirements, above the minimal amount that is allowed in Section 3-605, "Certificates of Compliance," of the *Construction Manual* and the project special provisions.
- Project limits expanding beyond the limits set in the environmental document.

5-308C All Federally Funded Projects

For each case listed in Section 5-308A(1) and 5-308B(1), the resident engineer contacts the Federal Highway Administration engineer and provides documents as necessary. In addition to the major and minor contract change orders listed above for "N" and "E" projects, there are several other issues or events that may invoke the involvement of the FHWA. See Section 5-007 "Federal Highway Administration Involvement in Contract Administration."

5-309 Fund Segregation Determination

5-309 Fund Segregation Determination

Funds for a project may come from more than one source, such as from state highway funds, local funds, and federal funds. For a contract change order, the resident engineer must segregate funds between the different fund sources. For more information on project funding, see Section 5-2, "Funds," of this manual. Show the proper distribution of contract change order funding on Form CEM-4903, "Contract Change Order Memorandum."

Each contract change order may have an effect upon each source of funds provided for a particular project. Segregation of these funds is only necessary if the funds differ from the pro-rata share as indicated in the federal detail estimate. If the contract change order funding is the same as that indicated in the detail estimate, simply mark the appropriate box on Form CEM-4903.

A contract change order may not be eligible for participation from one or more of the funding sources, depending upon the location and the work to be performed.

For example, a contract change order written for a project funded from both federal and other sources may not be eligible for federal participation. In this case, the cost of the contract change order must be distributed between the other funding sources. In the box in the lower right-hand corner of Form CEM-4903, show the percent of participation by each funding source.

At the beginning of the project, the resident engineer should receive the federal detail estimate with an estimate for each category of funds and the applicable limits of eligibility. If not, contact the project manager. In some cases the FHWA transportation engineer has a color-coded plan title sheet for more complex multiple-funded projects.

5-310 Locally Funded State Highway Projects

Generally, participation will be based on Caltrans' original agreement with the contributing agency.

Before making changes that affect work for contributing agencies, ensure that such changes are within the scope of the agreement. If not, take action (usually through the district local projects unit) to have the agreement modified.

In the margin of the headquarters and district copies of contract change orders covering the work, obtain the signature of an authorized representative of the affected agency.

Include in the contract change order memorandum sufficient information to identify the portion of the work that is applicable to the contributing agency. As soon as the contract change order and memorandum is approved, send the Division of Accounting Services, Accounts Receivable and Program Accounting section a copy.

5-311 Contract Change Order Approval

Caltrans must approve a contract change order, and whenever possible, the contractor should sign it. When the contractor signs a contract change order, it is referred to as "executed." If the contractor refuses to sign the contract change order, then Caltrans may approve it "unilaterally."

So that the contractor will execute the contract change order, make every effort possible to reach agreement. However, do not delay the work by waiting for the contractor to respond. If necessary, submit the contract change order for unilateral approval. Receipt by the contractor of an approved contract change order establishes a time for protest. If the contract change order is not protested within the specified time, it is considered an executed contract change order. Refer to Section 4-1.03A, "Procedure and Protest," of the *Standard Specifications* and Section 3-403, "Changes," in this manual.

You may routinely submit for approval without the contractor's signature any supplemental contract change orders written solely to increase force account funds. However, should the extent or type of work covered in the supplemental contract change order differ from that included in the original, submit the supplemental contract change order to the contractor for acceptance.

On sensitive or complex contract change orders, districts are encouraged to submit draft contract change orders to the Division of Construction for review and recommendation before preparing the final contract change order. In following this practice, however, discuss the work with the contractor in the usual manner.

5-311A Division of Construction Approval

The Division of Construction must approve the following types of contract change orders.

1. Any contract change order that does not provide for anticipated supplemental work that would increase the cost of the contract by more than $200,000.
2. Any contract change order that increases the cost of anticipated supplemental work listed in the detailed estimate by more than $200,000.
3. Once the $200,000 threshold is reached, each supplemental contract change order.
4. Any change in the following:

- Specifications (with the exception of "Lane Requirements and Hours of Work" charts)
- Method of payment
- Method of materials processing
- Type or quality of materials to be furnished (with the exception of minor building materials)
- Proprietary material for which specific or blanket approval has not been previously received.

5. Any change that results in a contract time extension of 20 or more working days. Additionally, if time is extended by more than 20 percent of the original contract working days, then that change and each subsequent contract change order to extend time.
6. Any work that is outside the scope of the existing contract, refer to Section 5-302, "Contract Change Order Policy," of this manual.

Projects with a suffix of "N" are subject to full FHWA oversight requirements. Major contract change orders require FHWA approval before commencing the work authorized by the contract change order. Refer to Section 5-308A(1) "Federal Highway Administration Approval Requirements – Major Contract Change Orders," in this manual. FHWA approval is required before requesting Division of Construction approval.

For a contract change order requiring Division of Construction approval, the Division of Construction will authorize the district to issue and approve the contract change order. Copies of contract change orders transmitted to headquarters for district authority to issue and approve must bear the resident engineer's signature, and the properly authorized person in the district must sign the "approval recommended" line. Follow the procedures described below under "Division of Construction Prior Authorization" and "District Prior Authorization" for prior approval of contract change orders.

5-311B District Approval

The district director may approve or delegate authority to approve contract change orders that do not fall under the requirements for Division of Construction approval.

District approval of contract change orders may not be delegated below the level of a construction engineer or senior-level resident engineer. Within this delegation, senior-level resident engineers or construction engineers may be given authority to approve contract change orders that increase the contract cost or approved supplemental work by up to $50,000.

Only the Division of Construction or district construction deputy director may approve contract change orders for cost reduction incentive proposals.

5-311C Division of Construction Prior Authorization

For those changes that require Division of Construction approval, request prior authorization from the Division of Construction. To send the information necessary to evaluate the change, use the procedure established between the district and the Division of Construction contract reviewer.

If sufficient information is included in the request for prior authorization, the Division of Construction will authorize the district to issue and approve the contract change order. Authority to issue and approve a contract change order allows the district to authorize the resident engineer to order the contractor to proceed with the work. The contract change order may then be approved in the district.

If the proposal appears to be satisfactory but more information is needed, the Division of Construction may authorize the district to proceed with the work. This allows the resident engineer to order the contractor to proceed with the work. However, follow district procedures to ensure that construction engineers are aware of and concur with the change. When the necessary information is received, the Division of Construction will authorize the district to issue and approve the contract change order.

If the proposed work seems inappropriate, or the submittal lacks sufficient justification to support the proposed change, the Division of Construction will request additional information or will not authorize the change.

5-311D District Prior Authorization

Districts must establish procedures for issuing prior authorization of contract change orders. After receiving prior authorization, the resident engineer may order the contractor to proceed with the work. This order, as well as the prior authorization, must be dated and in writing. In the case of a contract change order requested by the contractor, the district must have written assurance before allowing work to proceed that the contractor will execute the contract change order.

Actively pursue preparation and final approval of contract change orders for work covered under a prior authorization. Prior authorization does not include the authority to make payments for the work.

5-312 Copy Distribution

5-312 Copy Distribution

For full oversight federal projects, send two copies, with all attachments, of each contract change order approved by the district to the Division of Construction contract reviewer. For all other projects, send one copy of contract change orders approved by the district to the Division of Construction contract reviewer.

5-313 Cost Reduction Proposals

5-313 Cost Reduction Proposals

For procedures for a cost reduction proposal, see Section 3-5, “Control of Work,” of this manual.

Prepare all cost reduction proposal contract change orders as a complete package, with no indeterminate or deferred time or cost considerations.

Give careful attention to the clauses in the contract change order covering payment. Cost reduction incentive change orders may involve any combination of contract item work, adjustments in compensation, and extra work at agreed price.

Contract item prices for the contract items possibly may not represent the costs of doing either the planned or changed work as computed on a force account basis. In this case, in addition to increases and decreases at contract prices, include adjustments in compensation to reflect the actual force account cost of increases and decreases in contract item quantities. Also, in the analysis of cost savings, you may have to consider adjustments based on a 25 percent overrun or underrun.

Cost reduction proposal contract change orders must include an adjustment in compensation that returns one half of the savings to the contractor. Determine the adjustment in the following manner:

- Determine the total decrease in construction cost. This decrease will be the sum of increases and decreases in contract items at contract unit prices, adjustments in compensation including change in character adjustments, and extra work at agreed price.
- Provide for an adjustment in compensation to pay the contractor one half of the total decrease.

5-314 Examples of Contract Change Orders

5-314 Examples of Contract Change Orders

The following are examples of contract change orders and contract change order memorandums. Use these "cookbook" examples and standard clauses cautiously. The examples are for guidance and general format only. For instance, the examples contain assumptions that may or may not fit actual project situations. Also, the *Standard Specifications* and special provisions in use at the time the examples were written are the basis for the example contract change orders. Do not assume that your project uses the same specifications. Base contract change orders on specifications included in the project for which the contract change order is written.

The following list provides brief descriptions of the example contract change orders and method of payment included in this section:

Example 5-3.1	Flagging and Traffic Control. Extra Work at Force Account.
Example 5-3.2	Flagging Only. Extra Work at Agreed Price.
Example 5-3.3	Resolution of a Notice of Potential Claim. Adjustment in Compensation.
Example 5-3.4	Compensation for Late Payment of Extra Work Bills. Adjustment in Compensation.
Example 5-3.5	Eliminate Portion of a Lump Sum Contract Item with a Specified "Cost Break-Down." Adjustment in Compensation. Clause for NoAdjustment Due to Eliminated Work.
Example 5-3.6	Change in Specified Material. Change in Character Adjustment in Compensation.
Example 5-3.7	Additional Work. Change Material Specifications. Increase in Contract Items. Change in Character Adjustment. Extra Work at Force Account.
Example 5-3.8	Compensation for Right-of-Way Delay. Adjustment in Compensation.
Example 5-3.9	Cost Reduction Incentive. Decrease Contract Item. Adjustment in Compensation.
Example 5-3.10	Additional Work. Increase Contract Items. Clause for Final PayItems. Extra Work at Agreed Price.
Example 5-3.11	Adjustment for Asphalt Price Fluctuation. Adjustment in Compensation.

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

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CONTRACT CHANGE ORDER MEMORANDUM

CEM-4903 CT# 7541-3544-0

DATE

TO	FILE E. A. CO-RTE-PM FED NO.
FROM Resident Engineer	
CCO NO. 1 / SUPPLEMENT NO. / CATEGORY CODE	CONTINGENCY BALANCE (including this change): $ 230,000.00
$ 20,000 ☒ INCR ☐ DECR	HEADQUARTERS APPROVAL REQUIRED? ☐ YES ☒ NO
SUPPLEMENTAL FUNDS PROVIDED $ 20,000 for flagging and traffic control	IS THIS REQUEST IN ACCORDANCE WITH ENVIRONMENTAL DOCUMENTS? ☒ YES ☐ NO

This change order provides for

Flagging and traffic control work specified in the *Standard Specifications*.

The *Standard Specifications* and *Special Provisions* specify certain work to be performed to expedite the safe and convenient passage of public traffic around and through the work. Such work is specified to be paid for as extra work. This contract change order provides for payment as extra work at force account of all such traffic-related work to be performed on this project.

This contract change order will not affect contract time and, therefore, provides for no adjustment in time of completion.

CONCURRED BY:		ESTIMATE OF COST		
CONSTRUCTION ENGINEER/BRIDGE ENGINEER	DATE		THIS REQUEST	TOTAL TO DATE
		ITEMS	$ 0.00	$ 0.00
PROJECT ENGINEER	DATE	FORCE ACCOUNT	$ 20,000.00	$ 20,000.00
		AGREED PRICE	$ 0.00	$ 0.00
PROJECT MANAGER	DATE	ADJUSTMENT	$ 0.00	$ 0.00
		TOTAL	**$ 20,000.00**	**$ 20,000.00**
FHWA REP.	DATE	**FEDERAL PARTICIPATION**		
		☒ PARTICIPATING ☐ PARTICIPATING IN PART ☐ NONE		
ENVIRONMENTAL	DATE	☐ NONPARTICIPATING (Maintenance) ☐ NONPARTICIPATING		
OTHER (SPECIFY)	DATE	**FEDERAL SEGREGATION (If more than one funding source or P.I.P. type)**		
	DATE	☐ CCO FUNDED PER CONTRACT ☐ CCO FUNDED AS FOLLOWS		
HQ OR DISTRICT PRIOR APPROVAL BY	DATE	FEDERAL FUNDING SOURCE		PERCENT
RESIDENT ENGINEER SIGNATURE	DATE			

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION **Sheet** 1 **of** 2

CONTRACT CHANGE ORDER

CEM-4900 CT# 7541-3501-0 Change Requested by: ☒ Engineer ☐ Contractor

CCO NUMBER	SUPPL. NUMBER	CONTRACT NO.	ROAD	FEDERAL NUMBER(S)
1				

TO Contractor

You are directed to make the following changes from the plans and specifications or do the following described work not included in the plans and specifications for this contract. ***NOTE: This change order is not effective until approved by the Engineer.***

Description of work to be done, estimate of quantities and prices to be paid. (Segregate between additional work at contract price, agreed price, and force account.) Unless otherwise stated, rates for rental of equipment cover only such time as equipment is actually used and no allowance will be made for idle time. The last percentage shown is the net accumulated increase or decrease from the original quantity in the Engineer's Estimate

Extra Work at Force Account:

Furnish flaggers in accordance with Section 7-1.08,"Public Convenience," and Section 7-1.09, "Public Safety," of the *Standard Specifications*. Furnishing flaggers will be paid for as specified in Section 12-2.02, "Flagging Costs," of the *Standard Specifications*.

Repair damage to detours caused by public traffic in accordance with Section 4-1.04, "Detours," of the *Standard Specifications*.

In accordance with Section 7-1.08, "Public Convenience" of the *Standard Specifications*:

Except as otherwise provided for construction area signs in Section 12, "Construction Area Traffic Control Devices," of the *Standard Specifications*, furnish, install, and remove sign covers.

Furnish a pilot car and driver for the purpose of expediting the passage of public traffic through the work under one-way controls.

In order to expedite the passage of public traffic through or around the work and where ordered by the engineer, furnish and install signs, lights, flares, temporary railing (Type K), barricades, and other facilities, not to be paid for as separate contract items.

Perform work ordered by the engineer for the accommodation of public traffic after the roadbed has been brought to a smooth and even condition and prior to commencing subgrade operations.

Shape shoulders and reshape subgrade as necessary for the passage of public traffic thereon during subgrade preparation on paving operations.

Apply water for the purpose of controlling dust caused by public traffic only in accordance with Section 10-1.04, "Payment," of the *Standard Specifications*.

In accordance with Section 12-4.01, "Measurement and Payment," of the *Standard Specifications, do the following*:

After initial placement of barricades, and if ordered by the engineer, move barricades from location to location.

Move temporary railing (Type K) laterally when ordered by the engineer and when such repositioning is not shown on the plans.

Furnish, erect, maintain, move, and remove additional construction area signs when ordered by the engineer.

In accordance with Section 10-1.xx, "Temporary Crash Cushion Module," of the *Special Provisions*

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION **Sheet** 2 **of** 2

CONTRACT CHANGE ORDER

CEM-4900 CT# 7541-3501-0 Change Requested by: ☒ Engineer ☐ Contractor

CCO NUMBER	SUPPL. NUMBER	CONTRACT NO.	ROAD	FEDERAL NUMBER(S)
1				

Repair crash cushion modules damaged by public traffic.

When ordered by the engineer, reposition crash cushion modules when such repositioning is not shown on the plans.

In accordance with Section 10-1.xx, "Traffic Plastic Drums," of the *Special Provisions*, after initial placement move plastic traffic drums from location to location when ordered by the engineer.

Estimate of extra work = $20,000.00

Estimated Cost: : ☐ Decrease ☒ Increase $ 20,000.00

By reason of this order, the time of completion will be adjusted as follows: **No Adjustment**

SUBMITTED BY		
SIGNATURE	(PRINT NAME & TITLE)	DATE
APPROVAL RECOMMENDED BY		
SIGNATURE	(PRINT NAME & TITLE)	DATE
ENGINEER APPROVAL BY		
SIGNATURE	(PRINT NAME & TITLE)	DATE

We, the undersigned contractor, have given careful consideration to the change proposed and agree, if this proposal is approved, that we will provide all equipment, furnish the materials, except as may otherwise be noted above, and perform all services necessary for the work above specified, and will accept as full payment, therefore, the prices shown above. **NOTE: If you, the contractor, do not sign acceptance of this order, your attention is directed to the requirements of the specification as to proceeding with the ordered work and filing a written protest within the time therein specified.**

CONTRACTOR ACCEPTANCE BY		
SIGNATURE	(PRINT NAME & TITLE)	DATE

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

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CONTRACT CHANGE ORDER MEMORANDUM

CEM-4903 (OLD HC-39 REV. 6/93) CT# 7541-3544-0

DATE

TO	FILE E. A. CO-RTE-PM FED NO.
FROM Resident Engineer	
CCO NO. 2 / SUPPLEMENT NO. / CATEGORY CODE	CONTINGENCY BALANCE (including this change): $ 230,000.00
$ 48,302.80 ☒ INCR ☐ DECR	HEADQUARTERS APPROVAL REQUIRED? ☐ YES ☒ NO
SUPPLEMENTAL FUNDS PROVIDED $ 60,000 for flagging and traffic control	IS THIS REQUEST IN ACCORDANCE WITH ENVIRONMENTAL DOCUMENTS? ☒ YES ☐ NO

This change order provides for

Flagging in accordance with Section 12-2.02, "Flagging Costs," of the *Standard Specifications*. Payment for flaggers and furnishing flaggers as extra work under this contract change order will be made at agreed unit (hourly) prices. Hourly costs, based on prevailing wage rates with force account markups applied have been determined for laborers and for the contractor's foremen.

The straight time and overtime rates for foremen include the cost of a pickup truck at the specified equipment rental rate.

The *Standard Specifications* provide that an additional 5 percent markup is added to the cost of extra work at force account performed by a subcontractor. The hourly rates shown in the contract change order for the subcontractor's employees include the additional 5 percent markup.

In case there is a change in prevailing wages or labor surcharge rates affecting the cost of flaggers and furnishing flaggers, a supplemental contract change order will be written to revise the hourly agreed prices.

Calculations used to determine the agreed prices are on file with the project records.

This contract change order will not affect contract time and no adjustment in contract time is provided for.

CONCURRED BY:

CONSTRUCTION ENGINEER/BRIDGE ENGINEER	DATE
PROJECT ENGINEER	DATE
PROJECT MANAGER	DATE
FHWA REP.	DATE
ENVIRONMENTAL	DATE
OTHER (SPECIFY)	DATE
	DATE
HQ OR DISTRICT PRIOR APPROVAL BY	DATE
RESIDENT ENGINEER SIGNATURE	DATE

ESTIMATE OF COST

ITEMS	THIS REQUEST	TOTAL TO DATE
FORCE ACCOUNT		
AGREED PRICE	$48,302.80	$48,302.80
ADJUSTMENT		
TOTAL	$48,302.80	$48,302.80

FEDERAL PARTICIPATION

☐ PARTICIPATING ☐ PARTICIPATING IN PART ☐ NONE

☐ NONPARTICIPATING (Maintenance) ☐ NONPARTICIPATING

FEDERAL SEGREGATION **(If more than one funding source or P.I.P. type)**

☐ CCO FUNDED PER CONTRACT ☐ CCO FUNDED AS FOLLOWS

FEDERAL FUNDING SOURCE	PERCENT

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION **Sheet** 1 **of** 2

CONTRACT CHANGE ORDER

CEM-4900 CT# 7541-3501-0 Change Requested by: ☒ Engineer ☐ Contractor

CCO NUMBER	SUPPL. NUMBER	CONTRACT NO.	ROAD	FEDERAL NUMBER(S)
2				

TO Contractor

You are directed to make the following changes from the plans and specifications or do the following described work not included in the plans and specifications for this contract. ***NOTE: This change order is not effective until approved by the Engineer.***

Description of work to be done, estimate of quantities, and prices to be paid. (Segregate between additional work at contract price, agreed price, and force account.) Unless otherwise stated, rates for rental of equipment cover only such time as equipment is actually used and no allowance will be made for idle time. The last percentage shown is the net accumulated increase or decrease from the original quantity in the Engineer's Estimate

Extra Work at Agreed Unit Price:

Furnish flaggers in accordance with Section 7-1.08, "Public Convenience," and Section, 7-1.09, "Public Safety," of the *Standard Specifications*. Furnishing flaggers will be paid for as specified in Section 12-2.02, "Flagging Costs," of the *Standard Specifications* and as follows:

The following agreed hourly prices are determined in conformance with the provisions in Section 9-1.03, "Force Account Payment," of the *Standard Specifications* and represent the state's 50 percent share of flagging costs. The contractor must maintain a daily log of flagging labor by individual. The copy of the log and a signed extra work bill must be submitted to the resident engineer before the 15th day of each month for payment. These agreed prices are subject to revision due to any changes in prevailing wage rates or labor surcharge rates.

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION **Sheet** 2 **of** 2

CONTRACT CHANGE ORDER

CEM-4900 CT# 7541-3501-0 Change Requested by: ☒ Engineer ☐ Contractor

CCO NUMBER	SUPPL. NUMBER	CONTRACT NO.	ROAD	FEDERAL NUMBER(S)
2				

Flaggers (contractor's employees) 1000 hours straight time @ $21.41/hr = $ 21,410.00
Flaggers (contractor's employees) 200 hours overtime @ $28.71/hr = $ 5,742.00
Foreman and pickup truck (contractor's employee)
20 hours straight time @ $41.90/hr = $ 838.00
Foreman and pickup truck (contractor's employee)
20 hours overtime @ $52.75/hr = $ 1055.00
Flaggers (subcontractor's employees) 500 hours straight time @ $22.48/hr = $11,240.00
Flaggers (subcontractor's employees) 200 hours overtime @ $30.15/hr = $ 6,030.00
Foreman and pickup truck (subcontractor's employee)
20 hours straight time @ $44.00/hr = $ 880.00
Foreman and pickup truck (subcontractor's employee)
20 hours overtime @ $55.39/hr = $ 1,107.80

Estimate of extra work = $ 48,302.80

Estimated Cost: : ☐ Decrease ☒ Increase $ 48,302.80.00

By reason of this order, the time of completion will be adjusted as follows: **No Adjustment**

SUBMITTED BY		
SIGNATURE	(PRINT NAME & TITLE)	DATE
APPROVAL RECOMMENDED BY		
SIGNATURE	(PRINT NAME & TITLE)	DATE
ENGINEER APPROVAL BY		
SIGNATURE	(PRINT NAME & TITLE)	DATE

We, the undersigned contractor, have given careful consideration to the change proposed and agree, if this proposal is approved, that we will provide all equipment, furnish the materials, except as may otherwise be noted above, and perform all services necessary for the work above specified, and will accept as full payment, therefore, the prices shown above. **NOTE: If you, the contractor, do not sign acceptance of this order, your attention is directed to the requirements of the specification as to proceeding with the ordered work and filing a written protest within the time therein specified.**

CONTRACTOR ACCEPTANCE BY		
SIGNATURE	(PRINT NAME & TITLE)	DATE

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

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CONTRACT CHANGE ORDER MEMORANDUM

CEM-4903 CT# 7541-3544-0

DATE

TO	FILE E. A. CO-RTE-KP FED NO.
FROM Resident Engineer	
CCO NO. 3 / SUPPLEMENT NO. / CATEGORY CODE	CONTINGENCY BALANCE (including this change): $ 127,127.12
$ 23,000.00 ☒ INCR ☐ DECR	HEADQUARTERS APPROVAL REQUIRED? ☐ YES ☒ NO
SUPPLEMENTAL FUNDS PROVIDED $	IS THIS REQUEST IN ACCORDANCE WITH ENVIRONMENTAL DOCUMENTS? ☒ YES ☐ NO

This change order provides for

Settlement of Notice of Potential Claim No. 2 dated June 1, 2000.

This contract change order compensates the contractor for additional costs incurred in the construction of retaining wall No. 3. The contract plans showed an existing 36-inch drainage culvert to be 6 meters in back of the top of the retaining wall. It was found to be much closer. The contractor was required to install special shoring to protect the culvert and submitted Notice of Potential Claim No. 2 for reimbursement of the protective work. Records of the protective work were kept during construction of the retaining wall. The resident engineer determined that, due to the plan error, the contractor is entitled to be reimbursed for the cost of protecting the culvert.

The adjustment in compensation at agreed lump sum, provided for in the contract change order, is based on the force account cost of protecting the culvert. Records and calculations used to determine the adjustment in compensation are on file in the project records.

This change was discussed with the construction engineer and she agrees that the contractor should receive additional compensation for protecting the culvert.

There will be no time adjustment by reason of this contract change order since the work involved did not affect the controlling operation.

CONCURRED BY:

CONSTRUCTION ENGINEER/BRIDGE ENGINEER	DATE
PROJECT ENGINEER	DATE
PROJECT MANAGER	DATE
FHWA REP.	DATE
ENVIRONMENTAL	DATE
OTHER (SPECIFY)	DATE
	DATE
HQ OR DISTRICT PRIOR APPROVAL BY	DATE
RESIDENT ENGINEER SIGNATURE	DATE

ESTIMATE OF COST

ITEMS	THIS REQUEST	TOTAL TO DATE
	$ 0.00	$ 0.00
FORCE ACCOUNT	$ 0.00	$ 0.00
AGREED PRICE	$ 0.00	$ 0.00
ADJUSTMENT	$ 23,000.00	$ 23,000.00
TOTAL	**$ 23,000.00**	**$ 23,000.00**

FEDERAL PARTICIPATION

☒ PARTICIPATING ☐ PARTICIPATING IN PART ☐ NONE

☐ NON-PARTICIPATING (Maintenance) ☐ NON-PARTICIPATING

FEDERAL SEGREGATION **(If more than one funding source or P.I.P. type)**

☐ CCO FUNDED PER CONTRACT ☐ CCO FUNDED AS FOLLOWS

FEDERAL FUNDING SOURCE	PERCENT

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION **Sheet** 1 **of** 1

CONTRACT CHANGE ORDER

CEM-4900 CT# 7541-3501-0 Change Requested by: ☒ Engineer ☐ Contractor

CCO NUMBER	SUPPL. NUMBER	CONTRACT NO.	ROAD	FEDERAL NUMBER(S)

TO Contractor

You are directed to make the following changes from the plans and specifications or do the following described work not included in the plans and specifications for this contract. ***NOTE: This change order is not effective until approved by the Engineer.***

Description of work to be done, estimate of quantities, and prices to be paid. (Segregate between additional work at contract price, agreed price, and force account.) Unless otherwise stated, rates for rental of equipment cover only such time as equipment is actually used and no allowance will be made for idle time. The last percentage shown is the net accumulated increase or decrease from the original quantity in the Engineer's Estimate

Adjustment in Compensation at Agreed Lump Sum:

Compensate the contractor for additional costs incurred in the construction of Retaining Wall 3.

The contractor will receive and agrees to accept the lump sum of $23,000.00 for this change. This contract change order resolves Notice of Potential Claim No. 2, dated June 1, 2000.

Adjustment in compensation = $23,000.00

Estimated Cost: : ☐ Decrease ☒ Increase $ 23,000.00

By reason of this order, the time of completion will be adjusted as follows: **No Adjustment**

SUBMITTED BY		
SIGNATURE	(PRINT NAME & TITLE)	DATE
APPROVAL RECOMMENDED BY		
SIGNATURE	(PRINT NAME & TITLE)	DATE
ENGINEER APPROVAL BY		
SIGNATURE	(PRINT NAME & TITLE)	DATE

We, the undersigned contractor, have given careful consideration to the change proposed and agree, if this proposal is approved, that we will provide all equipment, furnish the materials, except as may otherwise be noted above, and perform all services necessary for the work above specified, and will accept as full payment, therefore, the prices shown above. **NOTE: If you, the contractor, do not sign acceptance of this order, your attention is directed to the requirements of the specification as to proceeding with the ordered work and filing a written protest within the time therein specified.**

CONTRACTOR ACCEPTANCE BY		
SIGNATURE	(PRINT NAME & TITLE)	DATE

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Page 1 of 1

CONTRACT CHANGE ORDER MEMORANDUM

CEM-4903 CT# 7541-3544-0

DATE

TO	FILE E. A. CO-RTE-KP FED NO.
FROM Resident Engineer	
CCO NO. 4 / SUPPLEMENT NO. / CATEGORY CODE	CONTINGENCY BALANCE (including this change): $ 127,127.12
$ 843.84 ☒ INCR ☐ DECR	HEADQUARTERS APPROVAL REQUIRED? ☐ YES ☒ NO
SUPPLEMENTAL FUNDS PROVIDED $	IS THIS REQUEST IN ACCORDANCE WITH ENVIRONMENTAL DOCUMENTS? ☒ YES ☐ NO

This change order provides for

Payment of interest for late payment of undisputed extra work bills.

The contractor submitted acceptable extra work bills in the amount of $40,000 on September 8, 2000, for work performed on Contract Change Order 2 and Contract Change Order 3. However, because of filing errors in the resident engineer's office, these bills were not paid within the time limits specified in Section 5-xx , "Interest on Payments," of the *Special Provisions*. The bills were paid on the estimate for the period ending December 20, 2000, and the check including payment for these bills was issued January 6, 2001.

The interest paid by this contract change order is calculated for the 77-day period beginning October 20, 2000, and ending January 5, 2001.

CONCURRED BY:

CONSTRUCTION ENGINEER/BRIDGE ENGINEER	DATE
PROJECT ENGINEER	DATE
PROJECT MANAGER	DATE
FHWA REP.	DATE
ENVIRONMENTAL	DATE
OTHER (SPECIFY)	DATE
	DATE
HQ OR DISTRICT PRIOR APPROVAL BY	DATE
RESIDENT ENGINEER SIGNATURE	DATE

ESTIMATE OF COST

ITEMS	THIS REQUEST	TOTAL TO DATE
	$ 0.00	$ 0.00
FORCE ACCOUNT	$ 0.00	$ 0.00
AGREED PRICE	$ 0.00	$ 0.00
ADJUSTMENT	$ 843.84	$ 843.84
TOTAL	**$ 843.84**	**$ 843.84**

FEDERAL PARTICIPATION

☐ PARTICIPATING ☐ PARTICIPATING IN PART ☐ NONE

☐ NONPARTICIPATING (Maintenance) ☒ NONPARTICIPATING

FEDERAL SEGREGATION **(If more than one funding source or P.I.P. type)**

☐ CCO FUNDED PER CONTRACT ☐ CCO FUNDED AS FOLLOWS

FEDERAL FUNDING SOURCE	PERCENT

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION **Sheet** 1 **of** 1

CONTRACT CHANGE ORDER

CEM-4900 CT# 7541-3501-0 Change Requested by: ☒ Engineer ☐ Contractor

CCO NUMBER	SUPPL. NUMBER	CONTRACT NO.	ROAD	FEDERAL NUMBER(S)
4				

TO Contractor

You are directed to make the following changes from the plans and specifications or do the following described work not included in the plans and specifications for this contract. ***NOTE: This change order is not effective until approved by the Engineer.***

Description of work to be done, estimate of quantities, and prices to be paid. (Segregate between additional work at contract price, agreed price, and force account.) Unless otherwise stated, rates for rental of equipment cover only such time as equipment is actually used and no allowance will be made for idle time. The last percentage shown is the net accumulated increase or decrease from the original quantity in the Engineer's Estimate.

Adjustment in Compensation at Agreed Lump Sum:

In accordance with Section 5.xx , "Interest on Payments," of the *Special Provisions*, provide payment of interest for the following extra work bills:

CCO No. 2, Daily Extra Work Reports 28, 29, 30, and 32.
CCO No. 3, Daily Extra Work Report 1, 2, 5, 7, and 8.

Interest = $40,000 X (0.10/365) X 77 days = $843.84.

Total adjustment = $843.84.

Estimated Cost: : ☐ Decrease ☒ Increase $ 843.84

By reason of this order, the time of completion will be adjusted as follows: **No Adjustment**

SUBMITTED BY		
SIGNATURE	(PRINT NAME & TITLE)	DATE
APPROVAL RECOMMENDED BY		
SIGNATURE	(PRINT NAME & TITLE)	DATE
ENGINEER APPROVAL BY		
SIGNATURE	(PRINT NAME & TITLE)	DATE

We, the undersigned contractor, have given careful consideration to the change proposed and agree, if this proposal is approved, that we will provide all equipment, furnish the materials, except as may otherwise be noted above, and perform all services necessary for the work above specified, and will accept as full payment, therefore, the prices shown above. **NOTE: If you, the contractor, do not sign acceptance of this order, your attention is directed to the requirements of the specification as to proceeding with the ordered work and filing a written protest within the time therein specified.**

CONTRACTOR ACCEPTANCE BY		
SIGNATURE	(PRINT NAME & TITLE)	DATE

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Page 1 of 1

CONTRACT CHANGE ORDER MEMORANDUM

CEM-4903 CT# 7541-3544-0

DATE

TO	FILE E. A. CO-RTE-KP FED NO.
FROM Resident Engineer	
CCO NO. 5 / SUPPLEMENT NO. / CATEGORY CODE	CONTINGENCY BALANCE (including this change): $ 127,127.12
$ 3,600.00 ☐ INCR ☒ DECR	HEADQUARTERS APPROVAL REQUIRED? ☐ YES ☒ NO
SUPPLEMENTAL FUNDS PROVIDED $	IS THIS REQUEST IN ACCORDANCE WITH ENVIRONMENTAL DOCUMENTS? ☒ YES ☐ NO

This contract change order provides for

Eliminating the foliage protectors shown on the plant list, in the remarks column (Sheet HP-1).

The district landscape architect has determined that foliage protectors are not needed on this project. Attached is a letter from the district landscape architect requesting this change.
As required in Section 10-2.01A, Cost Breakdown," of the *Special Provisions*, the contractor submitted a cost breakdown for highway planting. The price for foliage protectors included in the cost breakdown submittal is $1.50 each. The contract change order provides for an adjustment in compensation, based on the submitted price and the special provision.

The deleted portion of the lump sum contract item, highway planting, is subject to Section 4-1.03B(3), "Eliminated Items," of the *Standard Specifications*. The contractor purchased no material and did no work on foliage protectors. Therefore, the contract change order provides that no adjustment in compensation is made in accordance with Section 4-1.03B(3).

CONCURRED BY:		ESTIMATE OF COST		
CONSTRUCTION ENGINEER/BRIDGE ENGINEER	DATE		THIS REQUEST	TOTAL TO DATE
		ITEMS	$ 0.00	$ 0.00
PROJECT ENGINEER	DATE	FORCE ACCOUNT	$ 0.00	$ 0.00
		AGREED PRICE	$ 0.00	$ 0.00
PROJECT MANAGER	DATE	ADJUSTMENT	($ 3,600.00)	($ 3,600.00)
		TOTAL	**($ 3,600.00)**	**($ 3,600.00)**
FHWA REP.	DATE	**FEDERAL PARTICIPATION**		
		☒ PARTICIPATING	☐ PARTICIPATING IN PART	☐ NONE
ENVIRONMENTAL	DATE	☐ NONPARTICIPATING (Maintenance)	☐ NONPARTICIPATING	
OTHER (SPECIFY)	DATE	**FEDERAL SEGREGATION** (If more than one funding source or P.I.P. type)		
		☐ CCO FUNDED PER CONTRACT	☐ CCO FUNDED AS FOLLOWS	
	DATE	FEDERAL FUNDING SOURCE	PERCENT	
HQ OR DISTRICT PRIOR APPROVAL BY	DATE			
RESIDENT ENGINEER SIGNATURE	DATE			

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION **Sheet** 1 **of** 1

CONTRACT CHANGE ORDER

CEM-4900 CT# 7541-3501-0 Change Requested by: ☒ Engineer ☐ Contractor

CCO NUMBER	SUPPL. NUMBER	CONTRACT NO.	ROAD	FEDERAL NUMBER(S)
5				

TO

Contractor

You are directed to make the following changes from the plans and specifications or do the following described work not included in the plans and specifications for this contract. ***NOTE: This change order is not effective until approved by the engineer.***

Description of work to be done, estimate of quantities, and prices to be paid. (Segregate between additional work at contract price, agreed price, and force account.) Unless otherwise stated, rates for rental of equipment cover only such time as equipment is actually used and no allowance will be made for idle time. The last percentage shown is the net accumulated increase or decrease from the original quantity in the Engineer's Estimate

Delete foliage protectors shown under remarks on the plant list of Contract Plan Sheet HP-1 and shown on the highway planting cost breakdown submitted by the contractor in accordance with Section 10-2.01A, "Cost Breakdown," of the *Special Provisions*.

Adjustment in Compensation at Agreed Unit Price:

In accordance with Section 10-2.01A, "Cost Break-Down," of the *Special Provisions*, an adjustment in compensation (decrease) will be made to Contract Item 36 (Lump Sum), Highway Planting.

Item 36 – Highway Planting (Foliage Protector Unit)
Decrease 2400 EA Foliage Protectors (-100 %) @ $1.50 Ea……$3,600 (-6 %)

In accordance with Section 4-1.03B(3), "Eliminated Items," of the *Standard Specifications* and Section 10-2.01A, "Cost Break-down," of the *Special Provisions,* the adjustment due to eliminating foliage protectors is zero.

Estimated Cost: : ☒ Decrease ☐ Increase $ 3,600.00

By reason of this order, the time of completion will be adjusted as follows: **No Adjustment**

SUBMITTED BY		
SIGNATURE	(PRINT NAME & TITLE)	DATE
APPROVAL RECOMMENDED BY		
SIGNATURE	(PRINT NAME & TITLE)	DATE
ENGINEER APPROVAL BY		
SIGNATURE	(PRINT NAME & TITLE)	DATE

We, the undersigned contractor, have given careful consideration to the change proposed and agree, if this proposal is approved, that we will provide all equipment, furnish the materials, except as may otherwise be noted above, and perform all services necessary for the work above specified, and will accept as full payment, therefore, the prices shown above. **NOTE: If you, the contractor, do not sign acceptance of this order, your attention is directed to the requirements of the specification as to proceeding with the ordered work and filing a written protest within the time therein specified.**

CONTRACTOR ACCEPTANCE BY		
SIGNATURE	(PRINT NAME & TITLE)	DATE

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Page 1 of 1

CONTRACT CHANGE ORDER MEMORANDUM

CEM-4903) CT# 7541-3544-0

DATE

TO	FILE E. A. CO-RTE-KP FED NO.
FROM Resident Engineer	
CCO NO. 6 / SUPPLEMENT NO. / CATEGORY CODE	CONTINGENCY BALANCE (including this change): $ 127,127.12
$ 922.32 ☒ INCR ☐ DECR	HEADQUARTERS APPROVAL REQUIRED? ☒ YES ☐ NO
SUPPLEMENTAL FUNDS PROVIDED $	IS THIS REQUEST IN ACCORDANCE WITH ENVIRONMENTAL DOCUMENTS? ☒ YES ☐ NO

This change order provides for

Furnishing 3.51 mm thick pipe in lieu of 2.77 mm thick pipe for the 1800 mm diameter corrugated metal pipe at station “N” 375+00.

The district materials engineer requested this change because of new information obtained regarding the abrasiveness of the streambed load at this location. The letter requesting the change is attached.

This change constitutes a change in character for the contract item for 1800 mm diameter corrugated metal pipe. A unit price adjustment of $25.62 per meter will be paid for the increased pipe thickness. The adjustment is based on price quotes for the two pipe sizes from the supplier. A 15 percent material markup was added to the difference in the two quotes to arrive at the unit adjustment. Records supporting this adjustment are on file in the project records.

No adjustment in contract time is warranted. This change does not affect contract time.

CONCURRED BY:

CONSTRUCTION ENGINEER/BRIDGE ENGINEER	DATE
PROJECT ENGINEER	DATE
PROJECT MANAGER	DATE
FHWA REP.	DATE
ENVIRONMENTAL	DATE
OTHER (SPECIFY)	DATE
MATERIALS ENGINEER	DATE
HQ OR DISTRICT PRIOR APPROVAL BY	DATE
RESIDENT ENGINEER SIGNATURE	DATE

ESTIMATE OF COST

ITEMS	THIS REQUEST	TOTAL TO DATE
	$ 0.00	$ 0.00
FORCE ACCOUNT	$ 0.00	$ 0.00
AGREED PRICE	$ 0.00	$ 0.00
ADJUSTMENT	$ 922.32	$ 922.32
TOTAL	**$ 922.32**	**$ 922.32**

FEDERAL PARTICIPATION

☒ PARTICIPATING ☐ PARTICIPATING IN PART ☐ NONE

☐ NONPARTICIPATING (Maintenance) ☐ NONPARTICIPATING

FEDERAL SEGREGATION **(If more than one funding source or P.I.P. type)**

☐ CCO FUNDED PER CONTRACT ☐ CCO FUNDED AS FOLLOWS

FEDERAL FUNDING SOURCE	PERCENT

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION **Sheet** 1 **of** 1

CONTRACT CHANGE ORDER

CEM-4900 CT# 7541-3501-0 Change Requested by: ☒ Engineer ☐ Contractor

CCO NUMBER	SUPPL. NUMBER	CONTRACT NO.	ROAD	FEDERAL NUMBER(S)
6				

TO

Contractor

You are directed to make the following changes from the plans and specifications or do the following described work not included in the plans and specifications for this contract. ***NOTE: This change order is not effective until approved by the Engineer.***

Description of work to be done, estimate of quantities, and prices to be paid. (Segregate between additional work at contract price, agreed price, and force account.) Unless otherwise stated, rates for rental of equipment cover only such time as equipment is actually used and no allowance will be made for idle time. The last percentage shown is the net accumulated increase or decrease from the original quantity in the Engineer's Estimate

Adjustment in Compensation at Agreed Unit Price:

Furnish 3.51 mm thick pipe in lieu of the specified 2.77 mm thick pipe for the 1800 mm diameter corrugated metal pipe culvert at station “N” 375+00.

In accordance with Section 4-1.03C, “Changes in Character of Work,” of the *Standard Specifications*, a unit price adjustment of $25.62 per meter of 1800 mm diameter corrugated metal pipe will be paid for furnishing 3.51 mm thick pipe in lieu of 2.77 mm thick pipe. This adjustment constitutes full compensation, including all markups, for this change.

Estimated cost: 36 m @ $25.62 / m = $922.32

Estimated Cost: : ☐ Decrease ☒ Increase $ 922.32

By reason of this order, the time of completion will be adjusted as follows: **No Adjustment**

SUBMITTED BY		
SIGNATURE	(PRINT NAME & TITLE)	DATE
APPROVAL RECOMMENDED BY		
SIGNATURE	(PRINT NAME & TITLE)	DATE
ENGINEER APPROVAL BY		
SIGNATURE	(PRINT NAME & TITLE)	DATE

We, the undersigned contractor, have given careful consideration to the change proposed and agree, if this proposal is approved, that we will provide all equipment, furnish the materials, except as may otherwise be noted above, and perform all services necessary for the work above specified, and will accept as full payment, therefore, the prices shown above. **NOTE: If you, the contractor, do not sign acceptance of this order, your attention is directed to the requirements of the specification as to proceeding with the ordered work and filing a written protest within the time therein specified.**

CONTRACTOR ACCEPTANCE BY		
SIGNATURE	(PRINT NAME & TITLE)	DATE

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Page 1 of 2

CONTRACT CHANGE ORDER MEMORANDUM

CEM-4903 CT# 7541-3544-0

DATE

TO	FILE E. A. CO-RTE-KP FED NO.
FROM Resident Engineer	
CCO NO. 7 / SUPPLEMENT NO. / CATEGORY CODE	CONTINGENCY BALANCE (including this change): $ 260,000.00
$ 404,210.00 ☒ INCR ☐ DECR	HEADQUARTERS APPROVAL REQUIRED? ☒ YES ☐ NO
SUPPLEMENTAL FUNDS PROVIDED $	IS THIS REQUEST IN ACCORDANCE WITH ENVIRONMENTAL DOCUMENTS? ☒ YES ☐ NO

This change order provides for

1. Adding an additional area of permeable blanket and underdrain system.
2. Furnishing Class 1 permeable material in lieu of the specified Class 3 permeable material.
3. Removing and replacing permeable material already placed.

The Class 3 permeable material specified in the *Special Provisions* did not function properly. The district materials engineer recommended that Class 1 permeable material be used instead for permeable blankets. Unanticipated ground water was encountered throughout the entire cut between Stations “A” 725 + 00 and “A” 737 + 00. The district materials engineer recommended that the planned permeable blanket and underdrain system between Stations “A” 722 + 50 and “A” 725 + 00 be extended to Station “A” 737 + 00. The district materials engineer’s letter, recommending these changes, is attached.

This contract change order increases quantities of Contract Item 6, “Roadway Excavation,” and Contract Item 48, “Permeable Material (Blanket).”

We have provided a change in character adjustment in compensation for the permeable material contract item. The adjustment, based on the contractor’s force account analysis and verified by the engineer, represents the increased cost in processing the permeable material. Calculations supporting the adjustment are on file with the project records.

Adjustment in compensation due to the overrun in Contract Item 48, “Permeable Material (Blanket),” is deferred until the completion of the item.

Removing and disposing of the Class 3 permeable material previously placed will be paid for as extra work at force account. There is no contract item that would be applicable to this work.

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Page 2 of 2

CONTRACT CHANGE ORDER MEMORANDUM

CEM-4903 CT# 7541-3544-0

DATE

The contractor requested an adjustment in contract time of an additional eight working days. Placing the additional permeable material will delay structural section work (the controlling item), and time will be required to begin producing the Class 1 permeable material. The engineer's analysis, on file with the contract records, verifies that an eight-day extension of contract time is reasonable.

CONCURRED BY:	
CONSTRUCTION ENGINEER/BRIDGE ENGINEER	DATE
PROJECT ENGINEER	DATE
PROJECT MANAGER	DATE
FHWA REP.	DATE
ENVIRONMENTAL	DATE
OTHER (SPECIFY)	DATE
	DATE
HQ OR DISTRICT PRIOR APPROVAL BY	DATE
RESIDENT ENGINEER SIGNATURE	DATE

ESTIMATE OF COST

ITEMS	THIS REQUEST	TOTAL TO DATE
	$ 268,810.00	$ 268,810.00
FORCE ACCOUNT	$ 17,000.00	$ 17,000.00
AGREED PRICE	$ 0.00	$ 0.00
ADJUSTMENT	$ 118,400.00	$ 118,400.00
TOTAL	$ 404,210.00	$ 404,210.00

FEDERAL PARTICIPATION

☒ PARTICIPATING ☐ PARTICIPATING IN PART ☐ NONE

☐ NONPARTICIPATING (Maintenance) ☐ NONPARTICIPATING

FEDERAL SEGREGATION **(If more than one funding source or P.I.P. type)**

☒ CCO FUNDED PER CONTRACT ☐ CCO FUNDED AS FOLLOWS

FEDERAL FUNDING SOURCE	PERCENT

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION **Sheet** 1 **of** 4

CONTRACT CHANGE ORDER

CEM-4900 CT# 7541-3501-0 Change Requested by: ☒ Engineer ☐ Contractor

CCO NUMBER	SUPPL. NUMBER	CONTRACT NO.	ROAD	FEDERAL NUMBER(S)
7				

TO Contractor

You are directed to make the following changes from the plans and specifications or do the following described work not included in the plans and specifications for this contract. ***NOTE: This change order is not effective until approved by the Engineer.***

Description of work to be done, estimate of quantities, and prices to be paid. (Segregate between additional work at contract price, agreed price, and force account.) Unless otherwise stated, rates for rental of equipment cover only such time as equipment is actually used and no allowance will be made for idle time. The last percentage shown is the net accumulated increase or decrease from the original quantity in the Engineer's Estimate.

As shown on sheets 3 and 4 of this contract change order, place a permeable blanket and underdrain system between stations "A" 725 + 00 and "A" 737 + 00. Place permeable material (blanket) between station "A" 722 + 50 and "A" 725 + 00.

Estimate of Increases in Contract Items at Contract Unit Prices:

Item 6 roadway excavation	5,000 m^3 (1 %) @ \$1.25/ m^3 =	\$ 6,250.00 (+ 8 %)
Item 48 permeable material (blanket)	17,760 tonnes (27 %) @ \$6.00	\$ 106,560.00(+27%)
Item 46 200 mm perforated plastic pipe underdrain	2,600 m (23 %) @ \$60.00	\$ 156,000.00 (+23%)
Estimated increase		\$ 268,810.00

Any adjustment due in accordance with Section 4-1.03B(1), "Increases of More Than 25 Percent," of the *Standard Specifications*, for Contract Item 48 is deferred.

Adjustment in Compensation at Agreed Price:

In lieu of Class 3 permeable material, as specified in the *Special Provisions*, use Class 1 permeable material for all permeable blankets. In accordance with Section 4-1.03C, "Changes in Character of Work," of the *Standard Specifications*, the contractor will accept and receive \$1.48 per tonne of permeable material (blanket). This sum constitutes full payment, including all markups, for this change.

Estimated adjustment 80,000 tonnes @ \$1.48 \$ 118,400.00

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION **Sheet** 2 **of** 4

CONTRACT CHANGE ORDER

CEM-4900 CT# 7541-3501-0 Change Requested by: ☒ Engineer ☐ Contractor

CCO NUMBER	SUPPL. NUMBER	CONTRACT NO.	ROAD	FEDERAL NUMBER(S)
7				

Extra Work at Force Account:

Remove the Class 3 permeable material (blanket) from the roadbed between station "A" 722 + 50 and "A" 725 + 00 and place it in the embankment at station "A" 715 + 00.

Estimate of extra work $ 17,000.00

Estimated Cost: : ☐ Decrease ☒ Increase $ 404,210.00

By reason of this order, the time of completion will be adjusted as follows: **8 Working Days Extension**

SUBMITTED BY		
SIGNATURE	(PRINT NAME & TITLE)	DATE
APPROVAL RECOMMENDED BY		
SIGNATURE	(PRINT NAME & TITLE)	DATE
ENGINEER APPROVAL BY		
SIGNATURE	(PRINT NAME & TITLE)	DATE

We, the undersigned contractor, have given careful consideration to the change proposed and agree, if this proposal is approved, that we will provide all equipment, furnish the materials, except as may otherwise be noted above, and perform all services necessary for the work above specified, and will accept as full payment, therefore, the prices shown above. **NOTE: If you, the contractor, do not sign acceptance of this order, your attention is directed to the requirements of the specification as to proceeding with the ordered work and filing a written protest within the time therein specified.**

CONTRACTOR ACCEPTANCE BY		
SIGNATURE	(PRINT NAME & TITLE)	DATE

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Page 1 of 2

CONTRACT CHANGE ORDER MEMORANDUM

CEM-4903 CT# 7541-3544-0

DATE

TO	FILE E. A. CO-RTE-KP FED NO.
FROM Resident Engineer	
CCO NO. 8 / SUPPLEMENT NO. / CATEGORY CODE	CONTINGENCY BALANCE (including this change): $ 68,500.00
$ 9,203.00 ☒ INCR ☐ DECR	HEADQUARTERS APPROVAL REQUIRED? ☐ YES ☒ NO
SUPPLEMENTAL FUNDS PROVIDED $	IS THIS REQUEST IN ACCORDANCE WITH ENVIRONMENTAL DOCUMENTS? ☒ YES ☐ NO

This change order provides for

Compensating the contractor for a right-of-way delay.

A 300 mm waterline, crossing the right-of-way at station “A” 453 + 45 was lowered and placed in a steel conduit before construction began on the project. During roadway excavation operations, a check was made on the elevation of the waterline, and it was discovered that an error of approximately 2 meters had been made in establishing the relocated elevation. The line was critical for water service in the area and could be taken out of service for only short time periods. Roadway excavation had to be suspended from September 29, 2000, through October 12, 2000, while city water crews lowered the line below planned subgrade.

Some of the roadway excavation equipment was sent to other work, and the remainder of the equipment that was made idle by the delay remained at the job site. The adjustment in compensation provided for in the contract change order represents the cost of idle equipment calculated as specified in Section 8-1.09, “Right of Way Delays,” of the *Standard Specifications.* Records were kept of equipment moved off the site to other work and moved back in when roadway excavation resumed. Cost of move-out and move-in are paid for as extra work at agreed price. The contract change order does not include payments for the idle time of workers. A full day of work was completed on September 28, 2000, before the work was suspended.

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Page 2 of 2

CONTRACT CHANGE ORDER MEMORANDUM

CEM-4903 CT# 7541-3544-0

DATE

Records and cost calculations for the adjustment in compensation and for the extra work at agreed price are on file with the project records.

The contract change order provides for an increase in contract time of 10 working days. Earthwork was the controlling operation, and it was delayed for the period between September 29, 2000, and October 12, 2000, inclusive.

CONCURRED BY:		ESTIMATE OF COST		
CONSTRUCTION ENGINEER/BRIDGE ENGINEER	DATE	ITEMS	THIS REQUEST	TOTAL TO DATE
			$ 0.00	$ 0.00
PROJECT ENGINEER	DATE	FORCE ACCOUNT	$ 0.00	$ 0.00
		AGREED PRICE	$ 2,350.00	$ 2,350.00
PROJECT MANAGER	DATE	ADJUSTMENT	$ 6,853.00	$ 6,853.00
		TOTAL	**$ 9,203.00**	**$ 9,203.00**
FHWA REP.	DATE	**FEDERAL PARTICIPATION**		
		☒ PARTICIPATING	☐ PARTICIPATING IN PART	☐ NONE
ENVIRONMENTAL	DATE	☐ NONPARTICIPATING (Maintenance)	☐ NONPARTICIPATING	
OTHER (SPECIFY)	DATE	**FEDERAL SEGREGATION** (If more than one funding source or P.I.P. type)		
		☐ CCO FUNDED PER CONTRACT	☐ CCO FUNDED AS FOLLOWS	
	DATE	FEDERAL FUNDING SOURCE	PERCENT	
HQ OR DISTRICT PRIOR APPROVAL BY	DATE			
RESIDENT ENGINEER SIGNATURE	DATE			

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION **Sheet** 1 **of** 1

CONTRACT CHANGE ORDER

CEM-4900 CT# 7541-3501-0 Change Requested by: ☒ Engineer ☐ Contractor

CCO NUMBER	SUPPL. NUMBER	CONTRACT NO.	ROAD	FEDERAL NUMBER(S)
8				

TO Contractor

You are directed to make the following changes from the plans and specifications or do the following described work not included in the plans and specifications for this contract. ***NOTE: This change order is not effective until approved by the Engineer.***

Description of work to be done, estimate of quantities, and prices to be paid. (Segregate between additional work at contract price, agreed price, and force account.) Unless otherwise stated, rates for rental of equipment cover only such time as equipment is actually used and no allowance will be made for idle time. The last percentage shown is the net accumulated increase or decrease from the original quantity in the Engineer's Estimate.

Adjustment in Compensation at Agreed Lump Sum:

In accordance with Section 8-1.09, "Right of Way Delay," of the *Standard Specifications*, the contractor agrees to accept the sum of $6,853.00 as full compensation for idle equipment due to suspension of roadway excavation from September 29, 2000, through October 12, 2000.
Adjustment of compensation…… $ 6,853.00 increase

Extra Work at Agreed Price

The contractor agrees to accept and receive the sum of $2,350.00 as full compensation for the extra cost of moving equipment made necessary by the suspension of roadway excavation from September 29, 2000, through October 12, 2000.

Extra work……. $ 2,350.00 increase

A determination of the delay in completion of the contract due to the right-of-way delay caused by the suspension of the earthwork from September 29, 2000, through October 12, 2000, has been made in accordance with the provisions of Section 8-1.07, "Liquidated Damages," of the *Standard Specifications*.

The contractor shall be granted 10 working days for the following dates: August 29, 2000, through September 12, 2000.

Estimated Cost: : ☐ Decrease ☒ Increase $ 9,203.00

By reason of this order, the time of completion will be adjusted as follows: **10 Working Days**

SUBMITTED BY		
SIGNATURE	(PRINT NAME & TITLE)	DATE
APPROVAL RECOMMENDED BY		
SIGNATURE	(PRINT NAME & TITLE)	DATE
ENGINEER APPROVAL BY		
SIGNATURE	(PRINT NAME & TITLE)	DATE

We, the undersigned contractor, have given careful consideration to the change proposed and agree, if this proposal is approved, that we will provide all equipment, furnish the materials, except as may otherwise be noted above, and perform all services necessary for the work above specified, and will accept as full payment, therefore, the prices shown above. **NOTE: If you, the contractor, do not sign acceptance of this order, your attention is directed to the requirements of the specification as to proceeding with the ordered work and filing a written protest within the time therein specified.**

CONTRACTOR ACCEPTANCE BY		
SIGNATURE	(PRINT NAME & TITLE)	DATE

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Page 1 of 2

CONTRACT CHANGE ORDER MEMORANDUM

CEM-4903 CT# 7541-3544-0

DATE

TO	FILE E. A. CO-RTE-KP FED NO.
FROM Resident engineer	
CCO NO. 9 / SUPPLEMENT NO. / CATEGORY CODE	CONTINGENCY BALANCE (including this change): $ 75,000.00
$ 2,945.30 ☐ INCR ☒ DECR	HEADQUARTERS APPROVAL REQUIRED? ☐ YES ☒ NO
SUPPLEMENTAL FUNDS PROVIDED $	IS THIS REQUEST IN ACCORDANCE WITH ENVIRONMENTAL DOCUMENTS? ☒ YES ☐ NO

This change order provides for

A cost reduction incentive to eliminate the falsework opening at the Brighton Overhead (Br. No. 24-289 R/L).

The contractor negotiated an agreement with Ms. Mary Smith, owner of the property served by the driveway passing under the Brighton Overhead. A copy of the agreement is attached. As a result of the agreement, the temporary falsework opening at the Brighton Overhead can be eliminated. The contractor submitted a cost reduction incentive proposal providing for elimination of the opening. The Division of Structure Construction has approved revised falsework plans.

The estimated net savings in construction costs resulting from this contract change order are $5,890.60. The net decrease is based on the following:

1. A decrease in Contract Item 3, “Temporary Railing (Type K),” at the contract price of $4,312.00. A cost analysis, on file with the project records, verifies that the contract price of this item is reasonably close to the actual cost of the work determined by the force account method.
2. A decrease in the cost of constructing the Brighton Overhead falsework of $1578.60. This decrease is based on the contractor’s submitted force account analysis verified by the engineer. Cost information and analysis are on file with the project records.

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Page 2 of 2

CONTRACT CHANGE ORDER MEMORANDUM

CEM-4903 CT# 7541-3544-0

DATE

On half of the construction cost savings, $2,945.30 is returned to the contractor as an adjustment in compensation in accordance with the cost reduction incentive specification.

This change had no effect on contract time, and no adjustment in contract time is made in the contract change order.

CONCURRED BY:		ESTIMATE OF COST		
CONSTRUCTION ENGINEER/BRIDGE ENGINEER	DATE	ITEMS	THIS REQUEST	TOTAL TO DATE
			($ 4,312.00)	($ 4,312.00)
PROJECT ENGINEER	DATE	FORCE ACCOUNT	$ 0.00	$ 0.00
		AGREED PRICE	$ 0.00	$ 0.00
PROJECT MANAGER	DATE	ADJUSTMENT	$ 1,366.70	$ 1,366.70
		TOTAL	($ 2,945.30)	($ 2,945.30)
FHWA REP.	DATE	**FEDERAL PARTICIPATION**		
		☒ PARTICIPATING	☐ PARTICIPATING IN PART	☐ NONE
ENVIRONMENTAL	DATE	☐ NONPARTICIPATING (Maintenance)	☐ NONPARTICIPATING	
OTHER (SPECIFY)	DATE	**FEDERAL SEGREGATION** (If more than one funding source or P.I.P. type)		
		☐ CCO FUNDED PER CONTRACT	☐ CCO FUNDED AS FOLLOWS	
	DATE	FEDERAL FUNDING SOURCE	PERCENT	
HQ OR DISTRICT PRIOR APPROVAL BY	DATE			
RESIDENT ENGINEER SIGNATURE	DATE			

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION **Sheet** 1 **of** 1

CONTRACT CHANGE ORDER

CEM-4900 CT# 7541-3501-0 Change Requested by: ☐ Engineer ☒ Contractor

CCO NUMBER	SUPPL. NUMBER	CONTRACT NO.	ROAD	FEDERAL NUMBER(S)
9				

TO

Contractor

You are directed to make the following changes from the plans and specifications or do the following described work not included in the plans and specifications for this contract. ***NOTE: This change order is not effective until approved by the Engineer.***

Description of work to be done, estimate of quantities, and prices to be paid. (Segregate between additional work at contract price, agreed price, and force account.) Unless otherwise stated, rates for rental of equipment cover only such time as equipment is actually used and no allowance will be made for idle time. The last percentage shown is the net accumulated increase or decrease from the original quantity in the Engineer's Estimate.

In accordance with Section 5-1.14, "Cost Reduction Incentive," of the *Standard Specifications*, eliminate the falsework opening at the Brighton Overhead (Br. No. 24-289 R/L).

Decrease Contract Item at Contract Item Price:

Item No. 3, "Temporary Railing (Type K)," 392 m (7 %) @ $11.00/m = $ 4,312.00 (-7 %)

Adjustment in Compensation:

In accordance with Section 4-1.03C, "Changes in Character of Work," of the *Standard Specifications,"* the state will receive a credit of $1,578.60 by eliminating the falsework opening at the Brighton Overhead.

Adjustment in compensation (decrease) = $ 1,578.60

Adjustment in Compensation

In accordance with Section 5-1.14, "Cost Reduction Incentive," of the *Standard Specifications*, the contractor agrees to accept the above decrease in contract payments and a lump sum payment of $2,945.30 as full compensation for this change.

Adjustment in compensation (increase) = $ 2,945.30

Estimated Cost: : ☒ Decrease ☐ Increase $2,945.30

By reason of this order, the time of completion will be adjusted as follows: **No Adjustment**

SUBMITTED BY		
SIGNATURE	(PRINT NAME & TITLE)	DATE
APPROVAL RECOMMENDED BY		
SIGNATURE	(PRINT NAME & TITLE)	DATE
ENGINEER APPROVAL BY		
SIGNATURE	(PRINT NAME & TITLE)	DATE

We, the undersigned contractor, have given careful consideration to the change proposed and agree, if this proposal is approved, that we will provide all equipment, furnish the materials, except as may otherwise be noted above, and perform all services necessary for the work above specified, and will accept as full payment, therefore, the prices shown above. **NOTE: If you, the contractor, do not sign acceptance of this order, your attention is directed to the requirements of the specification as to proceeding with the ordered work and filing a written protest within the time therein specified.**

CONTRACTOR ACCEPTANCE BY		
SIGNATURE	(PRINT NAME & TITLE)	DATE

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Page 1 of 1

CONTRACT CHANGE ORDER MEMORANDUM

CEM-4903 CT# 7541-3544-0

DATE

TO	FILE E. A. CO-RTE-KP FED NO.
FROM Resident Engineer	
CCO NO. 10 / SUPPLEMENT NO. / CATEGORY CODE	CONTINGENCY BALANCE (including this change): $ 269,000.00
$ $43,807.10 ☒ INCR ☐ DECR	HEADQUARTERS APPROVAL REQUIRED? ☐ YES ☒ NO
SUPPLEMENTAL FUNDS PROVIDED $	IS THIS REQUEST IN ACCORDANCE WITH ENVIRONMENTAL DOCUMENTS? ☒ YES ☐ NO

This contract change order provides for

Constructing a reinforced concrete box culvert at Station 782 + 32, to serve as a cattle pass.

Before the project was advertised, the district right-of-way agents were unable to close negotiations with the abutting property owner adjacent to Station 782 + 32. An Order of Immediate Possession was obtained so that construction could begin. Before the start of construction, negotiations were finally closed. The major item of agreement was the construction of a 2440 mm x 2440 mm reinforced concrete box culvert, located at Station 782 + 32, to serve as a cattle pass from one portion of the property to the other. There are no applicable contract items for constructing the reinforced concrete box culvert. The contractor quoted a price of $216.00 per cubic meter of concrete, in-place, for the reinforced concrete box culvert. The resident engineer verified this cost as reasonable by performing an independent force account analysis. The cost submittal and independent analysis are filed in the job records. Structure excavation and structure backfill will be measured and paid for by contract item.

The project engineer and the construction engineer agreed with this change.

Construction of the reinforced concrete box culvert will not affect contract time. No adjustment of contract time is provided for in the contract change order.

CONCURRED BY:		ESTIMATE OF COST		
CONSTRUCTION ENGINEER/BRIDGE ENGINEER	DATE		THIS REQUEST	TOTAL TO DATE
		ITEMS	$ 6,655.10	$ 6,655.10
PROJECT ENGINEER	DATE	FORCE ACCOUNT	$ 0.00	$ 0.00
		AGREED PRICE	$ 37,152.00	$ 37,152.00
PROJECT MANAGER	DATE	ADJUSTMENT	$ 0.00	$ 0.00
		TOTAL	**$ 43,807.10**	**$ 43,807.10**
FHWA REP.	DATE	**FEDERAL PARTICIPATION**		
		☒ PARTICIPATING	☐ PARTICIPATING IN PART	☐ NONE
ENVIRONMENTAL	DATE	☐ NONPARTICIPATING (Maintenance)	☐ NONPARTICIPATING	
OTHER (SPECIFY)	DATE	**FEDERAL SEGREGATION** (If more than one funding source or P.I.P. type)		
	DATE	☐ CCO FUNDED PER CONTRACT	☐ CCO FUNDED AS FOLLOWS	
HQ OR DISTRICT PRIOR APPROVAL BY	DATE	FEDERAL FUNDING SOURCE	PERCENT	
RESIDENT ENGINEER SIGNATURE	DATE			

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION **Sheet** 1 **of** 3

CONTRACT CHANGE ORDER

CEM-4900 CT# 7541-3501-0 Change Requested by: ☒ Engineer ☐ Contractor

CCO NUMBER	SUPPL. NUMBER	CONTRACT NO.	ROAD	FEDERAL NUMBER(S)
10				

TO

Contractor

You are directed to make the following changes from the plans and specifications or do the following described work not included in the plans and specifications for this contract. ***NOTE: This change order is not effective until approved by the Engineer.***

Description of work to be done, estimate of quantities, and prices to be paid. (Segregate between additional work at contract price, agreed price, and force account.) Unless otherwise stated, rates for rental of equipment cover only such time as equipment is actually used and no allowance will be made for idle time. The last percentage shown is the net accumulated increase or decrease from the original quantity in the Engineer's Estimate.

Increases in Contract Items at Contract Prices:

Perform excavation and backfill for the reinforced concrete box culvert shown on sheet 3 of 3 of this contract change order.

Item No. 43 (F) – Structure Excavation
220 m^3 (7 %) @ \$8.83/ m^3 = \$ 1,942.60 (+18 %)
Item No. 44 (F) – Structure Backfill
250 m^3 (3%) @ \$18.85/ m^3 = ... \$ 4,712.50 (+11 %)

Total increase in contract items =\$ 6,655.10

The quantity increase shown here for Contract Items 43 and Contract Item 44, when combined with quantities shown in the engineer's estimate, and as modified by any previous change orders or revisions to dimensions made by the engineer, will be the final quantities for which payment will be made for each contract item.

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION **Sheet** 1 **of** 3

CONTRACT CHANGE ORDER

CEM-4900 CT# 7541-3501-0 Change Requested by: ☒ Engineer ☐ Contractor

Extra Work at Agreed Unit Price:

Construct a reinforced concrete box culvert at station 782 + 32 as shown on sheet 3 of 3 of this contract change order and *Standard Plans* D80, D82, and D83. Perform all work in accordance with Section 51, "Concrete Structures," and Section 52, "Reinforcement," of the *Standard Specifications*.

A payment of $216.00 per cubic meter of concrete, measured in accordance with the *Standard Specifications*, will constitute full compensation, including all markups, for constructing the reinforced concrete box culvert, complete in-place, including all reinforcing steel and incidentals.

Estimate of extra work = 172 M3 @ $216.00 = $37,152.00 increase

Estimated Cost: : ☐ Decrease ☒ Increase $ 43,807.10

By reason of this order, the time of completion will be adjusted as follows: **No adjustment**

SUBMITTED BY		
SIGNATURE	(PRINT NAME & TITLE)	DATE
APPROVAL RECOMMENDED BY		
SIGNATURE	(PRINT NAME & TITLE)	DATE
ENGINEER APPROVAL BY		
SIGNATURE	(PRINT NAME & TITLE)	DATE

We, the undersigned contractor, have given careful consideration to the change proposed and agree, if this proposal is approved, that we will provide all equipment, furnish the materials, except as may otherwise be noted above, and perform all services necessary for the work above specified, and will accept as full payment, therefore, the prices shown above. **NOTE: If you, the contractor, do not sign acceptance of this order, your attention is directed to the requirements of the specification as to proceeding with the ordered work and filing a written protest within the time therein specified.**

CONTRACTOR ACCEPTANCE BY		
SIGNATURE	(PRINT NAME & TITLE)	DATE

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Page 1 of 1

CONTRACT CHANGE ORDER MEMORANDUM

CEM-4903 CT# 7541-3544-0

DATE

TO	FILE E. A. CO-RTE-KP FED NO.
FROM Resident Engineer	
CCO NO. 11 / SUPPLEMENT NO. / CATEGORY CODE	CONTINGENCY BALANCE (including this change): $ 115,000.00
$ 120,000.00 ☒ INCR ☐ DECR	HEADQUARTERS APPROVAL REQUIRED? ☐ YES ☒ NO
SUPPLEMENTAL FUNDS PROVIDED $ 120,000.00 for price index fluctuations.	IS THIS REQUEST IN ACCORDANCE WITH ENVIRONMENTAL DOCUMENTS? ☒ YES ☐ NO

This change order provides for

Adjustments of compensation for fluctuations in the California Statewide Paving Asphalt Price Index.

This change is made in accordance with the requirements of Section 5-xx, “Compensation Adjustment for Price Index Fluctuations,” of the *Special Provisions*. Contract Item 20, “Asphalt Concrete,” and Contract Item 22, “Asphalt Concrete Base,” are subject to the adjustment. The contract change order authorizes the maximum amount allowed by the special provision.

CONCURRED BY:

CONSTRUCTION ENGINEER/BRIDGE ENGINEER	DATE
PROJECT ENGINEER	DATE
PROJECT MANAGER	DATE
FHWA REP.	DATE
ENVIRONMENTAL	DATE
OTHER (SPECIFY)	DATE
	DATE
HQ OR DISTRICT PRIOR APPROVAL BY	DATE
RESIDENT ENGINEER SIGNATURE	DATE

ESTIMATE OF COST

ITEMS	THIS REQUEST	TOTAL TO DATE
	$ 0.00	$ 0.00
FORCE ACCOUNT	$ 0.00	$ 0.00
AGREED PRICE	$ 0.00	$ 0.00
ADJUSTMENT	$ 120,000.00	$ 120,000.00
TOTAL	**$ 120,000.00**	**$ 120,000.00**

FEDERAL PARTICIPATION

☒ PARTICIPATING ☐ PARTICIPATING IN PART ☐ NONE

☐ NONPARTICIPATING (Maintenance) ☐ NONPARTICIPATING

FEDERAL SEGREGATION (If more than one funding source or P.I.P. type)

☐ CCO FUNDED PER CONTRACT ☐ CCO FUNDED AS FOLLOWS

FEDERAL FUNDING SOURCE	PERCENT

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION Sheet 1 of 1

CONTRACT CHANGE ORDER

CEM-4900 (OLD HC-5 REV. 9/97) CT# 7541-3501-0 Change Requested by: ☒ Engineer ☐ Contractor

CCO NUMBER	SUPPL. NUMBER	CONTRACT NO.	ROAD	FEDERAL NUMBER(S)
11				

TO

Contractor

You are directed to make the following changes from the plans and specifications or do the following described work not included in the plans and specifications for this contract. ***NOTE: This change order is not effective until approved by the Engineer.***

Description of work to be done, estimate of quantities, and prices to be paid. (Segregate between additional work at contract price, agreed price, and force account.) Unless otherwise stated, rates for rental of equipment cover only such time as equipment is actually used and no allowance will be made for idle time. The last percentage shown is the net accumulated increase or decrease from the original quantity in the Engineer's Estimate.

Adjustment in Compensation at Unit Price:

Adjust the contract unit prices of the contract items listed below in accordance with Section 5.1xx, "Compensation Adjustments for Price Index Fluctuations," of the *Special Provisions*.

Item 20, Asphalt Concrete
Item 22, Asphalt Concrete Base

Estimated cost increase = $ 120,000.00

Estimated Cost: : ☐ Decrease ☒ Increase $ 120,000.00

By reason of this order, the time of completion will be adjusted as follows: **No Adjustment**

SUBMITTED BY		
SIGNATURE	(PRINT NAME & TITLE)	DATE
APPROVAL RECOMMENDED BY		
SIGNATURE	(PRINT NAME & TITLE)	DATE
ENGINEER APPROVAL BY		
SIGNATURE	(PRINT NAME & TITLE)	DATE

We, the undersigned contractor, have given careful consideration to the change proposed and agree, if this proposal is approved, that we will provide all equipment, furnish the materials, except as may otherwise be noted above, and perform all services necessary for the work above specified, and will accept as full payment, therefore, the prices shown above. **NOTE: If you, the contractor, do not sign acceptance of this order, your attention is directed to the requirements of the specification as to proceeding with the ordered work and filing a written protest within the time therein specified.**

CONTRACTOR ACCEPTANCE BY		
SIGNATURE	(PRINT NAME & TITLE)	DATE

- Contract award date
- Contract approval date
- First working day (date and working day number)
- Date contractor began work
- Working days specified (number of days)
- Computed completion date (date and working day number)
- Contract change order time adjustment (number of days)
- Nonworking days (number of days)
- Suspension days (number of days)
- Working days not worked on controlling operation (number of days)
- Extended date for completion (date and working day number)
- Project completion date
- Contract acceptance date
- Overrun in contract time (number of working and calendar days)

5-412A (4) General Information

The general information section should be presented in a narrative format, and include the following:

- Description of the work
- Contractor's bid amount
- Proposed final estimate amount
- Date the proposed final estimate was sent to the contractor
- Date the contractor returned the proposed final estimate with claims
- Total number and amount of claims submitted

5-412A (5) Summary of Claims

Provide the following information:

- Identification numbers and titles
- Claimed amounts
- Recommended payments
- Remaining amounts

5-412A (6) Claim Categories

Show the segregation of claims into the following categories:

- Administrative claims
- Claims heard by board of review
- Claims not heard by board of review

5-412A (7) Claim Number, Title, and Claim Amount

A boldfaced, underlined title bar will be used for each claim. In the left-hand column, place the claim number. In the middle column, position the claim title. In the right-hand column locate the claim amount, including days claimed.

5-412A (8) Description of the Claim

Provide the following information:

- An explanation of what caused the claim
- Pertinent statements of facts related to the issue, not beliefs or opinions
- A reference to the applicable specifications relating to the claim. You may include a separate section entitled "Applicable Specifications," listing the section numbers and excerpts.
- The circumstances leading to each claim. Use facts supported with exhibits that include daily reports or letters.
- Relevant dates if the claim includes time considerations.
- A statement of actions and responses made by Caltrans and the contractor.
- The method and time of notification of the claim.

5-412A (9) Contractor's Position

Quote directly from the contractor's protest, notice, notice of potential claim, or written statement of claims. Add any other pertinent information provided in other documentation. Do not interpret the contractor's position. If the contractor has not stated the basis for the claim, note that the basis was not stated. State whether a cost analysis was stated.

Provide the information in the following order:

- Full and final documentation of potential claim
- Supplemental notice of potential claim
- Initial notice of potential claim
- Written notice or protest if applicable
- Contractor's initial written correspondence pertaining to the claim
- Reference table to contractor's supporting exhibits

5-412A (10) District's Position

The district's position must be compiled from the responses to potential claim submittals, and supported by exhibits including related correspondence. Additional arguments supporting the district's position are not required. If the contractor provides reasons for changing the amount of requested additional compensation from that stated in the full and final documentation, additional opposing statements may be included.

Provide the information in the following order:

- Resident engineer's response to the full and final documentation of potential claim
- Resident engineer's response to the supplemental notice of potential claim
- Resident engineer's initial written correspondence pertaining to the claim
- A list of exhibits including contract change orders for partial resolution of the potential claim, photographs, critical path method analysis, cost analysis, correspondence, and diaries.

Include a separate section stating deficiencies if the contractor has failed to comply with Section 9-1.07B, "Final Payment of Claims," of the *Standard Specifications*.

5-412A (11) Findings and Recommendations

State the district's conclusions on the merit of the claim in bullets, following the format of the board of review report.

Briefly state the reason for the conclusions based on the information provided. Recommend denial if there is no merit, but do not deny the claim. Only the district director has the authority to deny the claim.

5-412A (12) Tabular reference to supporting information

5-412A (13) Summary of resolved claims in tabular format for all claims

5-412A (14) Deputy district director of construction signature block

5-412A (15) Exhibits

Include the following exhibits as appropriate:

- Copy of the contractor's written statement of claims
- Correspondence
- Cost data
- Notices, protests, or notices of potential claims
- Detailed chronology of correspondence, other documents, or events
- Critical path method schedule or time impact analysis
- Photographs

5-412B Helpful Hints

When preparing the construction claim findings, the following hints may be helpful:

- Identify specific references in the following manner: "Section xx of the special provisions requires..."
- Quote all excerpts. Avoid paraphrasing them.
- Include all pertinent correspondence.
- Include pertinent photographs.
- Provide a response to every relevant contention that the contractor makes.
- Use exact dates and numbers.
- State whether days are working or calendar.
- When referring to days, when applicable, include the month, day number, and year.

5-412C Things to Avoid

When preparing the construction claim findings, avoid the following:

- Using the words "denied," "rejected," or "determined." Only the district director can use these terms in the district director determination of claims.
- Including a copy of Sections 1 through 9 of the *Standard Specifications*.
- Making the background section of the district's position a chronology of letters or events. Write the background as a narrative, referencing any relevant letters or events, if appropriate.
- Including correspondence, photographs, or other exhibits that have no direct bearing on the claim.

5-413 District Director Determination of Claims Preparation and Guidelines

5-413 District Director Determination of Claims Preparation and Guidelines

The district director makes the final determination of claims in consideration of the construction claim findings and supporting documents. The district director determination of claims is a stand-alone document and does not reference the board of review report, or construction claim findings. The district director determination is presented in a bulleted format, listing the construction claim findings.

For a sample district director determination of claims see Example 5-4.11, "Sample District Director Determination of Claims," of the *Construction Manual*.

Once the district director determination of claims is completed, send it to the contractor by hand delivery or deposit in the U.S. Mail. Issue the final estimate in writing. If the contractor is due any monies, pay the entire sum within 30 days.

Once the district director determination of claims is submitted to the contractor, there should be no further contact or discussion concerning merits of claims. If the contractor pursues unresolved claims in arbitration, the Caltrans' Legal Division coordinates any necessary responses.

Example 5-4.10 - SampleConstruction Claim Findings (5 of 10)

PROJECT CHRONOLOGY

EVENT	DATE	WORKING DAY NO.	NO. OF DAYS
Advertisement date	03/20/02		
Bid opening date	05/15/02		
Contract award date	06/11/02		
Contract approval date	06/24/02		
First working day	07/09/02	342	
Begin work	07/10/02		
Working days specified			300
Computed completion date	09/22/03	641	
Contract change order time adjustment			8
Non-working days			6
Suspension days			14
Working days that contractor did not work on the controlling operation			11
Extended date for completion	10/31/03	669	
Date work completed	10/22/03	662	
Contract acceptance date	10/22/03	662	
Overrun in contract time		0 working days (= 0 calendar days)	

GENERAL INFORMATION

This project consisted of constructing a cast-in-place, prestressed, concrete box girder bridge supported on cast-in-drilled-hole concrete piling. Also, existing highway 88 was realigned with portland cement concrete pavement over aggregate base over imported borrow.

The bid amount was $12,654,308.00. The proposed final estimate was $13,013,459.85.

The proposed final estimate was mailed to the contractor on December 9, 2003, and was returned with five (5) exceptions on December 31, 2003. The total amount of the exceptions is $48,302.62.

SUMMARY OF CLAIMS

Claim ID No./Title	Claimed Amount	Recommended Payment	Remaining Amount
1 (ID #46) PCC Pavement Grinding Claim	$ 25,209.00	$ 0.00	$ 25,209.00
2 (ID #34) Differing Site Condition Claim	$ 18,482.00	$ 0.00	$ 18,482.00
3 Item 27 Reconstruct Fence – 11.6M	$ 2,030.00	$ 0.00	$ 2,030.00
4 Item 124 Rock Slope Protection – 10M3	$ 1,925.00	$ 1,925.00	$ 0.00
5 CCO #11 – DEWR's 6 and 8	$ 656.62	$ 314.67	$ 341.95
Total Claim Amounts	$ 48,302.62	$ 2,239.67	$ 46,062.95

NON-ADMINISTRATIVE CLAIMS:

CLAIM #1 PCC PAVEMENT GRINDING CLAIM (ID #46) $25,209.00

Background (Utilize background from resident engineer's response to full and final documentation of potential claim in conjunction with guidelines in Section 5-412A (8), "Description of the Claim," of the *Construction Manual*)

Section 10-1.01, "Order of Work," of the special provisions and Sheet SC-1 of the project plans require the contractor to construct this project in multiple stages and describe PCC pavement of variable widths and orientations relative to the lane lines.

On March 10, 2003, the contractor completed profilographing the PCC pavement surface from stationing 10+240 to 12+010 and found that multiple areas exceeded the profile index requirements of Section 40-1.10, "Final Finishing," of the *Standard Specifications*. The contractor proposed that a contract change order be executed to modify the profile index requirements (see Exhibit 1). The resident engineer required the contractor to remedy the deficient areas to conform to the final finishing requirements (see Exhibit 2). The contractor submitted an initial notice of potential claim on March 21, 2003 (see Exhibit 3)

followed by a supplemental notice of potential claim (see Exhibit 4). The resident engineer provided a response to the supplemental notice of potential claim finding no merit in the contractor's potential claim (see Exhibit 5).

The contractor referred this dispute issue to the dispute review board. The dispute review board heard the subject of this claim and issued a unanimous recommendation on June 10, 2003 in Caltrans' favor (see Exhibit 10).

This issue was not heard by a board of review.

Applicable Specifications

Special provisions:	Section 10-1.01, "Order of Work" (see Exhibit 13)
Standard Specifications:	Section 40-1.10, "Final Finishing" Section 40-1.14, "Payment" (see Exhibit 13)

Notification of Claim

Date of Event:	March 18, 2003 (see Exhibit 2)
Initial Notice of Potential Claim:	March 21, 2003 (see Exhibit 3)
Supplemental Notice of Potential Claim:	April 2, 2003 (see Exhibit 4)
Full and Final Documentation of Potential Claim:	May 2, 2003 (see Exhibit 6)
Notification was timely?:	Yes

Contractor's Position (Utilize the contractor's potential claim submittals in conjunction with guidelines in Section 5-412A (9), "Contractor's Position," of the *Construction Manual*)

Exhibits 1, 3, 4, 6, 8, and 11 are documents in which the contractor has stated their position on this dispute. These exhibits provide the contractor's consistent basis for claim in this matter. The contractor's detailed position in this matter is taken verbatim from their supplemental notice of potential claim dated April 2, 2003:

Example 5-4.10 - Sample Construction Claim Findings (8 of 10)

"We should be compensated for the additional cost of grinding the PCC pavement between stationing 10+240 and 12+010. Due to the staging requirements that provide necessary traffic handling throughout the contract's duration, we were required to utilize a variety of construction methods in constructing the PCC pavement that consisted of variable widths and orientations. This non-standard construction has caused numerous irregularities in the finished surface of the PCC pavement. It is obvious that the profile index requirements of Section 40-1.10, "Final Finishing," of the *Standard Specifications* did not contemplate such constraints as experienced on this contract. It is therefore unreasonable for us to absorb the grinding costs in obtaining the profile index demanded by the State."

District's Position (Utilize the resident engineer's responses in conjunction with guidelines in Section 5-412A (10), "District's Position," of the *Construction Manual*)

The district's position in this matter is stated in exhibits 2, 5, 7, and 9. The following compilation provides the district's position on this issue:

The contractor's claim for additional compensation associated with grinding of PCC pavement to meet the profile index requirements of Section 40-1.10, "Final Finishing," is without merit. The contractor has stated that the staging requirements of the contract in conjunction with construction of PCC pavement in variable widths and orientations created the non-compliant profile index of the finished surfaces in question. District maintains that the primary cause leading to the remedial grinding of PCC pavement was due to the contractor's lack of quality control in placing PCC pavement.

The contract specified the staging requirements within Section 10-1.01, "Order of Work," of the special provisions and on the Sheet SC-1 of the Project Plans. While the staging requirements of this contract may have influenced the contractor's means and methods utilized in constructing the PCC pavement, these constraints were not unknown at time of bid and were not changed during the course of the contract. In addition, the contractor's own profilographs show many areas where PCC pavement surfaces were produced within the profile index requirements and that many of these areas involved pavement of variable widths along multiple orientations. These results along with satisfactory results from other contracts with similar constraints and construction methods verify that profile index requirements can be met without remedial grinding if proper care is taken during the placement operations. The contractor was informed of these facts by the resident engineer on multiple occasions as evidenced in exhibits 2, 5, and 7.

Profile index requirements on finished PCC pavement surfaces are contractually defined in Section 40-1.10, "Final Finishing," of the *Standard Specifications*. The contractor's argument that these requirements should not be applied to the PCC pavement for this contract is without merit. The department has consistently utilized the profile index requirements on finished PCC pavement surfaces constructed in stages. The only exception to this practice is when portions of the existing pavement are to remain in the finished contract. In such cases, the department will contractually exclude those areas and related transitions from the profile index requirements. On this contract there is no existing PCC pavement that remained in the final PCC pavement from stationing 10+240 to 12+010.

Example 5-4.10 - Sample Construction Claim Findings (9 of 10)

In summary, the remedial grinding of PCC pavement performed by the contractor to meet the contractual profile index requirements is due to the contractor's own means and methods utilized in constructing said pavement. Had the contractor exercised additional quality control during placement of the PCC pavement, the need for remedial grinding would have been significantly reduced or eliminated in its entirety. The contract payments made per cubic meter for PCC pavement constitute full payment for pavement meeting all contract requirements including profile index requirements. The contractor's claim in this matter is without merit.

Findings and Recommendations

- That the contract details the PCC pavement work to be performed including staging requirements shown on project plan sheet SC-1 and as specified in Section 10-1.01, "Order of Work," of the special provisions.
- That the contractor constructed PCC pavement between stationing 10+240 and 12+010 between the dates of September 17, 2002 and March 5, 2003.
- That this PCC pavement was constructed in multiple stages of variable widths and multiple orientations relative to the lane lines.
- That the contractor profilographed the completed PCC pavement surfaces on March 10, 2003.
- That the contractor's profiling results showed that multiple finished surface areas of PCC pavement exceeded the profile index requirements in Section 40-1.10, "Final Finishing," of the *Standard Specifications*.
- That the contractor requested a contract change order on March 12, 2003 to modify profile index requirements for the PCC pavement.
- That on March 18, 2003 the resident engineer denied the contractor's request for a contract change order to modify the profile index requirements for the PCC pavement and requested the contractor provide details for how the non-compliant areas of the PCC pavement would be remedied.
- That on March 21, 2003 the contractor submitted an initial notice of potential claim for grinding PCC pavement along with a proposal for remedial work.
- That on March 24, 2003 the resident engineer accepted the contractor's proposal for correcting the non-compliant PCC pavement.
- That the grinding of PCC pavement areas to meet profile index requirements occurred between the dates of April 2, 2003 and April 4, 2003.
- That the contractor submitted each potential claim document in conformance with timeframes specified in the contract.
- That the contractor submitted this dispute as an exception to the proposed final estimate within the contractual timeframe specified in the contract.
- That the contractor requested $25,209.00 for this claim issue which corresponds to the full and final documentation of potential claim.
- That the resident engineer's letter dated March 18, 2003 and resident engineer's responses to the supplemental notice of potential claim and full and final documentation of potential claim correctly reference the contract requirements with respect to final finishing surface requirements (profile index) of the PCC pavement (Section 40-1.10 of the *Standard Specifications*).

Example 5-4.10 - Sample Construction Claim Findings (10 of 10)

- That Section 40-1.14, "Payment," of the *Standard Specifications* provides the payment provisions for PCC pavement, which includes full compensation for doing all the work involved in constructing the PCC pavement, complete in place, as shown on the plans, and as specified in the specifications.
- That the contractor's means and methods utilized in constructing the PCC pavement were the cause for the non-compliant finished surfaces of PCC pavement.
- That the contractor was capable of meeting the required finish surface requirements as demonstrated at other locations with similar geometric constraints that met the required profile index.
- That additional quality control on the contractor's part would have reduced or eliminated the need for remedial grinding of PCC pavement surfaces.
- That remedial costs associated with grinding PCC pavement surfaces to meet required profile index requirements specified in the contract are to be borne by the contractor in their entirety.
- That the contractor has been properly paid through bid item payments and no further compensation is due.
- That it is recommended the claim be denied.

SUMMARY OF RESOLVED CLAIMS

Claim No.	Title	Amount Claimed	Recommended Payment
1 (ID #46)	PCC Pavement Grinding Claim	$25,209.00	Unresolved
2 (ID #34)	Differing Site Condition Claim	$18,482.00	Unresolved
3	Item 27 Reconstruct Fence – 11.6M	$ 2,030.00	$ 0.00
4	Item 124 Rock Slope Protection – 10M3	$ 1,925.00	$ 1,925.00
5	CCO #11 – DEWR's 6 & 8	$ 656.62	$ 314.67

SIGNATURES

Respectfully Submitted,

_____

DISTRICT CONSTRUCTION CLAIMS ENGINEER'S NAME
Claims Engineer

Findings Approved,

_____

DEPUTY DISTRICT DIRECTOR OF CONSTRUCTION'S NAME
Deputy District Director, Construction

Section 5 Emergency Contract Administration

Section 5 Emergency Contract Administration

5-501 General

5-501 General

An emergency contract is authorized by a director's order. A director's order is a document that approves the use of special authority, delegated by state law, to set aside normal contracting procedures so that Caltrans can quickly initiate and complete emergency work sooner than can be done under normal processes. The district maintenance unit has the responsibility to obtain a director's order for emergency work. Director's orders may also be obtained to prevent the imminent threat of catastrophic damage.

The Public Contract Code, Section 1102, defines an emergency as "a sudden unexpected occurrence that poses clear and imminent danger, requiring immediate action to prevent or mitigate the loss or impairment of life, health, property, or essential public services."

Currently, a district director can approve emergency contracts costing up to $117,000. For emergency work exceeding this threshold amount, the director or delegated deputy director has approval authority.

For guidelines on director's orders, go to the Caltrans Division of Maintenance Intranet site at the following address:

http://onramp.dot.ca.gov/hq/maint/orway/ha23/index.htm

Deputy Directive 26, "Use of Director's Orders," also covers director's orders.

A number of different types of emergency contracts exist. District construction division is usually involved in emergency force account contracts and emergency informal bid contracts. Emergency informal bid contracts occur once the initial disaster response is accomplished. The district design unit will prepare plans and specifications for this type of contract. For contract administration, follow the normal procedures outlined in the *Construction Manual* (manual).

This section provides guidelines to assist resident engineers in administering emergency force account contracts.

5-502 Emergency Force Account Contracts

5-502 Emergency Force Account Contracts

When time is of the essence to reopen a roadway or facility, or the need to prevent imminent failure exists, a "no-bid" (sole-source) emergency contract is allowed when covered by a director's order. The Office of Procurement and Contracts of the Division of Administrative Services typically prepares and executes these service contracts. The resident engineer becomes the contract manager on a force account contract once work begins.

Form ADM-0366, "Confirmation of Verbal Agreement Other than for Equipment Rental," is the document that allows the contractor to begin work with verbal approval, and the form obligates the contractor to enter into a service contract with Caltrans.

When using the form, which is limited to the highest level of emergency, the work should begin within a day. For written prior approval, the emergency work should begin within a few days of written approval. Do not permit the contractor to begin work until the proper approvals have been obtained.

5-503 Specifications

5-503 Specifications

In the description portion of Form ADM-0366, "Confirmation of Verbal Agreement Other Than for Equipment Rental," add the following:

- A brief description of the work and estimated total cost.
- The location and limits of the work.
- The business enterprise participation goals, if required.
- The statement: "All work will be paid for in accordance with Section 9-1.03, "Force Account Payment," of the Caltrans *Standard Specifications* dated (year) as amended by the attached provisions."

For the current provisions for force account emergency contracts, see the end of this section.

5-504 Selection of Resident Engineer and Support Staff

5-504 Selection of Resident Engineer and Support Staff

The construction engineer must establish adequate staffing levels to ensure control of work, testing, and documentation and to ensure current contract files and fund expenditures. To put an individual in responsible charge at the site, the construction engineer must also expeditiously assign a resident engineer.

When structure work is necessary, use personnel from the Office of Structure Construction.

5-505 Contractor Selection and Notification

5-505 Contractor Selection and Notification

District construction should appoint a construction engineer as "contractor selection coordinator." The district maintenance unit, contractor selection coordinator, and the construction engineer should coordinate their efforts to select a contractor for an emergency contract. The unit that selects, contacts, and notifies the contractor varies in each district. Generally, Caltrans prefers that district construction handle these duties because these divisions are most aware of local contractors' varying capabilities. The Division of Maintenance maintains a registry of contractors available for emergency contracts.

When selecting a contractor for an emergency contract, consider factors such as the following:

- Availability of resources
- Mobilization response time
- Proven management abilities
- Current contractor's license
- Corporate cooperation

Some local contractors can be as responsive and effective as a larger firm, so for quick emergency response, if the smaller firm is available and selecting that firm would prevent delaying other ongoing Caltrans work, consider the smaller firm.

Section 2 Acceptance of Manufactured Material and Sampling Methods

Section 2 Acceptance of Manufactured Material and Sampling Methods

6-201 General

6-201 General

This section describes Caltrans procedures for acceptance of manufactured material. This section also describes the types of materials that are considered "manufactured material" and the guidelines for sampling these materials.

6-202 Responsibilities and Procedures for Acceptance of Materials

6-202 Responsibilities and Procedures for Acceptance of Materials

The following describes the responsibilities and procedures for acceptance of materials:

6-202A The Contractor

The contractor must provide sufficient advance notification to the resident engineer on source and location of materials to be tested so that the work will not be delayed. As required in Section 6, "Control of Materials," of the *Standard Specifications,* the contractor must list all sources of materials and the location at which these materials are available for inspection on Form CEM-3101, "Notice of Materials to Be Used," prior to being used on the project.

Before use for Caltrans projects, plant scales and meters must have a current certification. For additional details, see Section 3-903E, "Weighing and Metering Procedures," of the *Construction Manual* (manual).

Aggregate sources must comply with the Surface Mining and Reclamation Act of 1975 (SMARA). Mining operations determined to be in compliance are listed on the AB 3098 SMARA Eligible List. This list can be obtained from the Division of Construction or at the Department of Conservation's web site at:

http://www.consrv.ca.gov/omr/reclamation

Refer to Chapter 7, "Environmental," of this manual for further information on SMARA requirements.

Specifications for welded products usually require the fabricator to have an acceptable welding quality control plan prior to manufacturing any products for Caltrans. For details on welding quality control plans refer to the Section 180, "Welding," of the *Bridge Construction Records and Procedures Manual,* Volume II.

Contractors must submit working drawings for overhead sign structures. The working drawings must include both shop details and erection plans. For more information on submittal and approval of shop details and erection plans, refer to the Division of Engineering Services, *Overhead Sign Structures Manual.* Also, refer to Section 4-56, "Signs," of the *Construction Manual* for more information.

6-202B Office of Materials Engineering and Testing Services

The Office of Materials Engineering and Testing Services (METS) assigns personnel for inspection of materials at the source of supply. This includes all materials listed in Table 6-2.1, "Materials Accepted by Resident Engineer" at the end of this section.

METS assigns the responsibility for making the inspection based on information contained on Form CEM-3101. Offices in Sacramento, the San Francisco Bay Area, or Los Angeles conduct most of the inspections. However, METS may assign the inspection to the district materials engineer, the resident engineer, or a commercial laboratory.

6-202B (1) Source Inspection

METS must receive all necessary information for source inspection. Forward all copies of approved shop drawings without established distributions (for example, buildings or other small structures) as well as notification of approvals (such as paint color) or changes in the work (such as design changes or contract change orders) to METS. METS should receive copies of all correspondence with contractors or suppliers that may affect fabrication or manufacture.

Inspection by METS includes sampling and testing as necessary to ensure compliance with test requirements and dimensional requirements. Complex fabrication, as in the case of precast, prestressed concrete members and structural steel, also require inspection during fabrication. Inspected materials meeting specifications are identified with a lot number. The METS inspector enters the lot number, a description and the quantities of materials inspected on Form TL-0029, "Report of Inspection of Material."

6-202B (2) Assignment to a Unit of METS or a District Materials Laboratory

After receiving the Form CEM-3101 from the resident engineer, METS indicates on the Form CEM-3101 the items in need of inspection and assigns the inspection to the appropriate inspection office. The responsible inspection office then prepares Form TL-0608, "Notice of Materials to be Furnished," and sends it to the contractor or supplier and the resident engineer.

Subsequently, the inspection office inspects the material, and if acceptable, identifies it with Form TL-0624, "Inspection Release Tag." If the material does not comply, METS or the district materials laboratory will send a "non-conformance report" to the resident engineer.

For acceptable material, a completed copy of Form TL-0029 is sent to the resident engineer.

The resident engineer does not normally receive this report until after the materials have arrived at the job site, but it should be checked against the identifying information that was attached to, or marked on, the materials.

The resident engineer must inform the assigned inspection office if the Form TL-0029 is not received within 15 days after receipt of materials or if there are discrepancies so the necessary investigation can be made.

6-202B (3) Form TL-0624, "Inspection Release Tag."

Materials covered by a Form TL-0624, "Inspection Release Tag," should arrive at the job site properly identified. Form TL-0624 shows the identifying lot number, the inspector's initials, and the date of inspection. If the item is one that does not lend itself to the attaching of tags, such as reinforced concrete pipe, the inspector marks the lot number on each separate piece. In some instances, when there is a possibility of losing tags, the inspector both attaches tags and marks a lot number on the pieces. Timber products typically are stamped with a brand on each piece, usually at the end where it can be seen. (Caltrans inspectors use a stamp with the letters CHC or CT. Commercial laboratories use their own identifying initials or symbols.)

Laboratory inspectors will not necessarily tag every bundle or piece in a shipment (with the exception of timber and reinforced concrete pipe). However, the inspector must attach enough tags on a load to give reasonable assurance that the tags represent the entire shipment.

When manufactured products arrive on the project, the attached Forms TL-0624 authorize the resident engineer to permit use of the materials. However, inspect the materials for damage during shipping or storage, general workmanship, and conformance to planned shape or dimensions.

The METS inspector (or the district laboratory inspector) collects the required certificates of compliance for materials inspected at the source.

6-202B (4) Assignment to a Commercial Laboratory

Commercial laboratories perform most out-of-state inspections. This requires an agreement between METS and the commercial laboratory.

METS authorizes out-of-state inspections only for critical fabricated and manufactured materials and where, in the opinion of the resident engineer and METS, it is in Caltrans' best interest to do so. METS assigns inspection to commercial laboratories.

The assigned laboratory inspects, identifies and tags the material. A commercial laboratory does not use Form TL-0029. They do make a report, usually in letter form, and submit this to METS. METS forwards a copy to the resident engineer.

Materials covered by a letter from a commercial laboratory must arrive at the job site properly identified.

6-202B (5) Assignment to the Resident Engineer.

METS may assign inspection of products for which they normally have responsibility back to the resident engineer. The resident engineer will release these materials at the jobsite using Form CEM-4102, "Material Inspected and Released on Job." See Section 6-3, "Field Tests," of this manual for details. METS assigns inspection responsibility to the resident engineer using Form TL-0028, "Notice of Materials to be Inspected."

After being assigned inspection responsibility, the resident engineer may accept material on the basis of required certificates of compliance or sampling and testing and visual inspection.

When material will be accepted and released at the job site by use of a Certificate of Compliance, the required certificates of compliance should accompany the material to the job site and be retained in the project files. Sampling of material is in accordance with the data shown in the tables at the end of section 6-1, "Sample Types and Frequencies," of this manual.

The resident engineer should inform the contractor that the material will be sampled and inspected on the job and that sufficient time must be allowed to complete any necessary testing before the material can be used.

6-202C The District

The responsibility for training and certifying materials testers rests with the district materials engineer.

6-202D The Resident Engineer

The resident engineer must ensure that only sampled, tested and inspected materials meeting the contract requirements enter the work. The resident engineer must also ensure

production facilities, such as asphalt plants and concrete plants, meet specifications. Request the assistance of the district weights and measure coordinator for inspecting asphalt concrete and portland cement concrete plants as required by the specifications and California Test 109, "Method for Testing of Weighing and Measuring Devices."

The resident engineer must ensure that the contractor submits a Form CEM-3101, "Notice of Materials to Be Used" for all materials that require inspection. If the contractor does not submit a Form CEM-3101 before the preconstruction conference, provide a list of materials that may require listing on the CEM-3101 to the contractor during this conference. If the sources of all material are not known, the contractor may submit a partial list and submit supplements as soon as other sources are known.

A timely, accurate, and complete Form CEM-3101 can prevent future delays and conflicts. The following data must be included:

- The Caltrans contract number and the contract item or items for which the material will be used. If the contractor uses a project number (different from the Caltrans number) it helps to also include this number.
- The name, address and telephone number of the supplier or manufacturer where the material can be inspected.
- If the source of material is out-of-state also include the name, address and telephone number of the contractor or subcontractor placing the order and the order number.

Check the form for the required information. If the Form CEM-3101 is incomplete, require that it is corrected or supplemented before distributing the copies. Send METS a copy promptly. METS will make the required assignments for inspection as noted above under " Office of Materials Engineering and Testing Services." Distribute other copies as required by the district.

On the basis of information contained on the Form CEM-3101, the resident engineer will identify (based on district policy) the appropriate samplers, testers and inspectors. The following is a partial list of those who may need to be notified:

- District or METS staff who will be obtaining samples and performing tests on each material
- District or METS staff who will be obtaining samples for each material accepted on the basis of a Certificate of Compliance (Normally tested by METS)
- Office of Structures Construction to review and approve shop plans for overhead sign structures
- The district weights and measures coordinator to inspect or witness California Test 109. The district weights and measures coordinator maintains a list of material plants currently in compliance with California Test 109.

6-202D (1) Inspection Verification

If the material delivered to the job site lacks proper identification, or the report of inspection is unconfirmed, or the acceptability of the material is questionable, do not allow materials to be incorporated in the work until they have been found to comply with the specifications. Contact the assigned inspection unit to verify testing or submit samples for new acceptance tests. The exception is sampling of paint. Paint must be sampled at the job site even if there is evidence of previous inspection.

6-202D (2) Source Inspection

The resident engineer and METS share the responsibility for inspection of materials at the source. However, the resident engineer has the sole responsibility for acceptance of material. For example:

- The material may be damaged in shipment or installation.
- It is not always practical for METS to make a 100 percent piece-by-piece inspection. The inspection is usually random sampling. The resident engineer or assistant resident engineer should check for visually detectable defects or damage.
- There are other situations over which the METS inspector has little control. For example:

  1. A given size of metal culvert pipe may vary in required thickness at various locations with different fill heights. METS inspectors cannot guarantee that a given piece of pipe will be placed at the proper location. They can only check the pipe for specified markings and determine that the measurement is within tolerance for the indicated thickness.
  2. Fit of band couplers should also be checked at the job site.
  3. Some contracts require special wall thickness of reinforced concrete pipe at certain locations, the pipe may be furnished from several plants, and the METS inspector would not know the specific job site location of that particular pipe. The inspector can only determine that it fits one of the types specified.
  4. Another situation not controllable by inspection at the source is the transfer of materials from one contract to another. The inspector can confirm (by a copy of the original inspection report) that a given amount of material with a given lot number was inspected for the first contract. Identifying the material as that received on the first job under the original inspection report and monitoring its transfer from one job to another are responsibilities of the resident engineers involved.

     Such transfers should not be allowed unless the material is positively identified or is of a type (such as fencing or reinforcing steel) that can be resampled and retested in the event identification is lost or is questionable.

- The specifications may be difficult to interpret or the inspector is not aware of a contract change order.

The tables at the end of this section list products that are usually inspected at the site of manufacture or fabrication and indicate items that are checked by the inspector at the source and those which must be checked or rechecked at the job site. The table does not cover every item but provides typical examples.

<u>6-202E Materials Accepted on the Basis of a "Certificate of Compliance"</u>

In accordance with Section 6-1.07, "Certificates of Compliance," of the *Standard Specifications*, the engineer may permit the use of certain materials before sampling and testing if accompanied by a Certificate of Compliance.

Certificates of compliance are used for products for which the industry has demonstrated a high degree of reliability in meeting specifications. METS is responsible for monitoring these industries. METS notifies districts when material from any producer is not acceptable on the basis of a Certificate of Compliance.

The district must notify affected contractors. Certificates of compliance must contain the following information:

- Name of mill and company.
- Date of shipment.
- Quantity shipped.
- Serial number traceable to a specific silo, bin or lot.
- A statement naming the applicable type and brand, and that the materials meet the requirements of the *Standard Specifications,* the special provisions, or both.
- Contract number.
- Signature of responsible officer of the company.

When material delivered with a Certificate of Compliance is improperly certified, or any part of it is found not to comply with specifications, reject the entire shipment and notify METS immediately. Procedures for sampling and testing materials accepted by certification vary depending on the material. Following are some details covering the sampling of materials that are accepted by certification.

6-202E (1) Bituminous Materials

When asphalt arrives at the job site or at the plant accompanied by a Certificate of Compliance, the resident engineer to may accept the shipment for use before sampling and testing.

All samples of asphalt, along with the necessary forms and tickets, are sent to Engineering Services, Office of Materials Engineering and Testing Services, 5900 Folsom Boulevard, Sacramento, California 95819. Ship sample cans, two at a time, in the cardboard cartons used for shipping samples of the completed mix. Take samples in the amount and frequency show in the tables in Section 6-1, "Sample Types and Frequencies," of this manual.

Sample asphalts in accordance with California Test 125, "Methods for Sampling Highway Materials and Products Used in the Roadway Structural Sections." Review the safety and health portion of California Test 125 before sampling asphalts.

After obtaining a sample from a plant storage tank, write the shipment number on Form TL-0101, "Sample Identification Card."

METS sends test results to the district materials engineer and to the resident engineer.

6-202E (2) Asphalt Rubber Latex Joint Filler

Submit samples in one-liter friction top cans. Sample after the contents of the drum have been stirred thoroughly and brought to a uniform consistency and before the setting powder has been added.

Note the batch number and the shipment number on Form TL-0101.

6-202E (3) Two-component Joint Sealing Compounds

This material is usually in 10-liter pails. Each pail requires a manufacturer's lot number. Before sampling, stir thoroughly. Samples should be taken in the amount and frequency show in the tables in Section 6-1, "Sample Types and Frequencies," of this manual.

6-202E (4) Portland Cement

For cement delivered directly to the work by the manufacturer, require one Certificate of Compliance for each shipment.

Section 1 Environmental Rules and Requirements

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Section 1 Environmental Rules and Requirements

Section 1 Environmental Rules and Requirements

7-101 General

7-101 General

This section provides information and guidelines for administering the various environmental requirements for Caltrans contracts.

The district construction deputy director is responsible for ensuring that environmental and permit requirements are enforced. To meet legal requirements, district construction staff must receive appropriate training, possess appropriate skills, and understand their role in successfully carrying out environmental measures. Within the district construction division, appropriate environmental-construction liaison and storm water coordinators must be appointed.

7-102 Environmental Commitments Record

7-102 Environmental Commitments Record

Caltrans has established the Environmental Commitments Record or Mitigation Monitoring and Reporting Record to ensure that Caltrans meets it environmental commitments by:

- recording each environmental mitigation, compensation, and enhancement commitment made for an individual project;
- specififying how each commitment will be met;
- documenting the completion of each commitment.

The Environmental Commitments Record contains all relevant environmental compliance information. It aids in preparing the resident engineer pending file, monitoring environmental compliance, and preparing the Certificate of Environmental Compliance.

Each district establishes their own format for the Environmental Commitments Record. The Environmental Commitments Record must contain basic project information; each environmental commitment, person or branch responsible for completing the commitment, how and when the commitment will be implemented, the commitment location, a commitment reference document, and other commitment requirements.

The resident engineer should review the Environmental Commitments Record with the environmental-construction liaison or district environmental unit during the preconstruction meeting with Caltrans personnel before meeting with the contractor. The environmental-construction liaison or district environmental unit can assist the resident engineer in discussing the requirements at the contractor's preconstruction conference. The resident engineer should ensure that all environmental commitments are implemented and then monitor the progress of their implementation on a quarterly or more frequent basis.

7-103 Protection of Environmental Resources

The following are guidelines for fulfilling the responsibility for protecting and preserving various environmental resources during construction as required by law.

7-103A Archeological and Historical Resources

Mitigating a project's impact on historical and archaeological sites during construction may require the recovery of artifacts. Mitigation may also require Native Americans, archeologists, architects, and historians to monitor and coordinate the recovery process. Normally, archaeological work is done in advance of construction, but occasionally, finds are made during construction. If human remains or previously unknown historic and archaeological artifacts are unearthed, suspend work in the vicinity until the find can be evaluated and properly treated. Procedures and responsibilities are detailed in the *Caltrans Environmental Handbook*.

7-103B Endangered Species

Both state and federal laws are designed to protect designated plant and animal species along with their respective habitats. As a result, often very strict prohibitions exist on certain types of work, work during certain times of the year, or work at specific locations. Even inadvertently impacting protected species can result in fines or jail sentences. The contract will specify the necessary measures and restrictions, and the plans will show environmentally sensitive areas. However, during construction, project crews may discover protected species that were not anticipated in the contract. If such a discovery occurs, suspend work in the area and immediately notify the district environmental - construction liaison or district environmental unit.

7-103C Migratory Bird Act

The Migratory Bird Treaty Act (MBTA) makes it illegal to harm migratory birds or their occupied nests. Activities which are most likely to encounter migratory birds and their nests include clearing and grubbing or bridge demolition, maintenance and retrofit work.

The environmental - construction liaison should attend the preconstruction meeting to discuss the requirements of MBTA and necessary preventive measures to ensure compliance and limit project impacts. When occupied nests are found within the project area, the resident engineer should evaluate whether or not work in the area can continue or if suspension of work is necessary. The resident engineer should immediately contact the district environmental - construction liaison or district environmental unit for assistance in this evaluation.

7-103D Disposal, Staging and Borrow Sites

The instruction contained in this section pertain to all contractor disposal, staging and borrow sites.

Caltrans construction projects often require contractors to make use of either state owned or private off-site lands and facilities for the disposal of excess materials, the acquisition of necessary borrow materials, and to stage equipment, store supplies, and to house their offices. Contract documents generally require the contractor to show that construction activities on these sites comply with all local, state and federal environmental and permitted use regulations. However, recent history has shown that in some geographic locations there have been issues regarding final compliance responsibility. To resolve these issues and to foster better cooperation with regulatory agencies, the option of designating disposal, staging and borrow (DSB) sites has been facilitated.

Those construction projects that cannot accommodate the disposal, staging, or borrow material needs of the project within the right-of-way may have designated sites for these purposes located outside the project limits. However even when such sites are made available, the contractor will continue to have the flexibility to use alternative sites. Alternative sites selected by the contractor require the contractor to prepare and submit a to the engineer for approval a DSB site submittal. Requirements for this submittal are outlined below under Section 7-103D(1), "Caltrans and Contractor Designated Disposal, Staging and Borrow Sites," of this chapter.

The need for identifying and clearing a designated DSB will generally have been made by the project engineer on a case by case basis, considering historical and geographical issues and practices, project design requirements, environmental concerns, economic factors, and other aspects specific to projects and their locale. During project development, the project engineer should have considered and identified sites readily available for use by the contractor. These sites would have included, but not be limited to, commercial dumpsites, recycling plants, private property and other local sites. If it was determined necessary that one or more DSB sites needed to be designated, then the project engineer would have proposed sites evaluated during the environmental review process, and as necessary, included them in the environmental compliance documentation. To ensure their availability to the contractor, right-of-way agreements would have been obtained for private sites selected as designated DSB sites. Any necessary permits for selected DSB sites would have been included among those obtained during the Plans Specifications and Estimate development. Information or documents regarding arrangements made by Caltrans to ensure the availability of designated sites are provided to prospective bidders or contractors in a materials information handout.

Contractors use of designated sites is not mandatory unless stated in the special provisions. If the contractor chooses to use an alternate site, a DSB site submittal must be made by the contractor and approved by the resident engineer. The contractor can obtain the DSB Site Submittal information at:

http://www.dot.ca.gov/hq/oppd/design/m121201.pdf

Summaries are provided below for the minimum items expected in a: 1) DSB site submittal for a site designated by Caltrans; and 2) a summary of the minimum items expected in a DSB site submittal for a contractor to get approval for the use of an alternate site. The submittal and support documents are then filed under Category 18 (Borrow and Disposal Agreements and Permits).

7-103D (1) Caltrans & Contractor Designated Disposal, Staging and Borrow Sites

For Caltrans designated disposal, staging and borrow (DSB) sites

- Caltrans will:
  1. Provide a general site plan, including site limits and access roads,
  2. Obtain temporary property owner agreements as necessary to "reserve" property,
  3. Prepare California Environmental Quality Act or National Environmental Policy Act documentation as needed,
  4. Verify the existence of or obtain the necessary permits, licenses, and agreements to satisfy regulatory agencies and ensure site availability, and
  5. Review and approve contractor's submittal.

- The contractor will:
    1. Prepare a final grading plan in conformance with the *Standard Specifications*,
    2. Provde a release of liability,
    3. Provide final property owner agreements (See Section 3-607, "Local Materials"), and
    4. Submit Water Pollution Control Plan.

For alternative sites (outside the right-of-way) selected by the contractor,

- Caltrans will review and approve contractor's submittal
- The contractor will:
    1. For borrow sites, demonstrate that the site is exempt or in compliance with Surface Mining and Reclamation Act (SMARA), (that is listed on the AB 3098 SMARA eligible list); and
    2. For all DSB sites,

       Provide a site plan, including site limits and access roads,

       Obtain property owner agreements (see Section 3-607, "Local Materials")

       Provide release of liability,

       Provide final property owner agreements,

       Provide environmental documentation prepared by appropriately qualified environmental specialists,

       Obtain or update all necessary permits, licenses, and agreements

       Determine final grading plan in conformance with *Standard Specifications, and*

       Submit Water Pollution Pollution Control Plan.

7-103D (2) Surface Mining and Reclamation Act

The State Contract Act prohibits Caltrans from buying aggregate or any other mined materials from sources not exempt or not compliant with the Surface Mining and Reclamation Act of 1975 (SMARA). Mining operations determined to be in compliance are listed on the AB 3098 SMARA eligible list. You can obtain this list from the Division of Construction or the Department of Conservation's web site at:

http://www.consrv.ca.gov/omr/SMARA/

Generally, Caltrans cannot accept material from unlisted sites. However, the State Mining and Geology Board may grant one-time exceptions. To comply with SMARA and the State Contract Act, imported materials from the following sources must be listed on the AB 3098 list:

- Materials from mined sources,
- Materials from commercial vendors and suppliers,
- Materials from federally owned lands where an agreement exists between the federal landholding agency and the California Department of Conservation that SMARA applies, and

- Materials from Native American reservations, where an agreement exists between the reservation and the Department of Conservation that SMARA applies or a nontribal mine operator is present.

In addition to the specific exemptions listed in SMARA (that is, less than 1,000 cubic yards, and others), Caltrans has determined that imported material from the following types of sources comply with SMARA and do not require inclusion on the AB 3098 list:

- Imported material from a development or other nonmining source where the material is a byproduct of construction and this source has approval in a local agency plan and through the California Environmental Quality Act.
- Excess material generated from a Caltrans project whose environmental approval appropriately considered the construction phase and met approval requirements for reclamation of the site.
- Materials from failures of natural or man-made slopes within Caltrans' right-of-way as a result of storm slides, or slipouts.
- Materials from outside the State of California.
- Materials originating from Native American reservations where no agreement exists between the reservation and the Department of Conservation that SMARA applies and a tribal mine operator is present.
- Materials from federal land when no agreement exists between the federal landholding agency and the Department of Conservation that SMARA applies.

For assistance with resolution, refer any challenges to the acceptance of materials to the Division of Construction field coordinator.

7-103D (3) Other Contractor Uses of the State Right of Way

The contractor's use of Caltrans owned parcels that are not designated on the plans will be contingent upon successful approval by the resident engineer based on: 1) the DSB site submittal; 2) the execution of a fair market rental agreement with Caltrans; and 3) the execution of an encroachment permit by the district permit engineer. The resident engineer should consult with the project engineer and environmental - construction liaison or district environmental unit before approving the DSB site submittal.

- The contractor may arrange for temporary storage of equipment and materials on Caltrans property with the resident engineer.
- The contractor uses authorized work areas and other approved Caltrans owned property at the contractor's own risk; the contractor can not hold Caltrans liable for damage to or loss of materials or equipment located within such areas.
- The contractor must maintain areas designated for contractor's use in a neat and presentable condition. Adequate measures must be in place to protect soil, groundwater, noise, and air contamination.
- Before final inspection of the work, the contractor must remove equipment, materials, and rubbish from the work areas and other Caltrans owned property that the contractor occupies. The contractor must leave the areas in a neat and presentable condition in conformance with the provisions in Section 4-1.02, "Final Cleaning Up," of the *Standard Specifications*.

During the development of the project, the project engineer may identify areas on the right-of-way for the disposal of portland cement concrete grinding and grooving residue. The project engineer may identify these areas in the materials information handout or in the contract. If a RWQCB permit or approval has not been included, contact your environmental - construction liaison for assistance in obtaining the documents. Refer to the contract special provisions to obtain information about off-site disposal facilities for portland cement concrete grinding and grooving residue.

7-103D (4) Contractor Use of Areas Outside of the State Right of Way

If sufficient area is not available to the contractor within the contract limits or at the Caltrans owned sites outside the contract limits designated on the plans, the contractor must secure, at the contractor's own expense, areas required for plant sites, storage of equipment or materials, or other purposes. The contractor must complete the Disposal, Staging and Borrow (DSB) Site Submittal and obtain the resident engineer's approval.

The contractor's use of parcels outside of the Caltrans right-of-way and that are not designated on the plans will be contingent upon successful approval by the resident engineer of the DSB site submittal.

7-104 Air, Water, and Noise Pollution Control

7-104 Air, Water, and Noise Pollution Control

This section contains guidelines for administering the contract's air, water, and noise requirements.

7-104A Air Quality

All Caltrans projects must comply with the Clean Air Act. Permits are issued by local air quality management districts and require that the project create no smoke, offensive odors, or visible dust. Contractors must take appropriate measures to ensure their equipment is properly maintained and to apply water and other dust palliatives as frequently as necessary. Violations can result in fines and sanctions against the contractor and Caltrans.

In areas where naturally occurring asbestos has been identified, the specifications will set forth additional requirements to protect workers and the public. In this case, the resident engineer should include consideration of asbestos in the project code of safe practices.

7-104B Water Pollution Control

To ensure the control of pollutants in discharges of storm water runoff, Caltrans projects may be subject to federal law under the Clean Water Act and state law under the Water Code. The regulations require a National Pollutant Discharge Elimination System Permit (storm water permit), issued by the State Water Resources Control Board (SWRCB). The specifications require the contractor to conform to the permit's requirements.

For each construction project, the contractor must prepare a water pollution control program (WPCP) in accordance with Section 7-1.01G, "Water Pollution," of the *Standard Specifications*, *Caltrans Storm Water Quality Handbooks*, and the contract's special provisions. These documents describe the measures the contractor must implement to ensure that construction activities do not pollute the waters of the state. The resident engineer must approve all such preventive measures, and then the contractor's forces must implement and maintain the measures.

Successfully protecting from pollution the state's water resources (rivers, lakes, and streams) is critical to the project's success. These waters must be protected from chemical pollutants and from sediment in storm water runoff. Chemical pollutants include petroleum products, paint residues, and curing compounds. The Division of Environmental Analysis, in conjunction with the Division of Construction, has organized a task force (known as the "storm water task force"), consisting of construction environmental specialists. This task force visits the projects, reviews the contractor's WPCP, and acts as technical advisors to the resident engineer.

7-104B (1) District Construction Storm Water Coordinator Responsibilities

District construction must have a designated construction storm water coordinator who will carry out necessary administrative functions to prevent water pollution. The coordinator will work with other functional areas in the district, assist resident engineers to ensure compliance, and ensure that field construction personnel are appropriately trained.

7-104B (2) Resident Engineer Responsibilities

The resident engineer must use all available assistance and expertise in preventing water pollution. This assistance may come from the construction storm water coordinator, other functional areas in the district (such as the environmental and hydraulics units), or the storm water task force.

Before work begins, the resident engineer must do the following:

- Designate appropriate staff as storm water inspectors to assist in preventing storm water pollution.
- Review the construction contract and the resident engineer's file for instructions and commitments.
- Ensure that all proper forms have been filed with the Regional Water Quality Control Board (RWQCB).
- Meet with the appropriate environmental and engineering experts in the district to ensure a full understanding of the contract requirements for water pollution prevention.
- Conduct a preconstruction meeting with the contractor to discuss all required storm water measures and requirements. Depending on the project's size and complexity, this preconstruction conference may be used exclusively for discussing water pollution prevention or the topic may be included in a general preconstruction conference.
- Provide the contractor with a copy of the conceptual storm water pollution prevention plan (SWPPP) if one has been prepared, by the district design unit, for the project.
- Review and approve the contractor's SWPPP or WPCP as required by the specifications. The construction storm water coordinator and the storm water task force may assist in the review. Note that before the resident engineer has accepted the plan, the specifications prohibit any work that has the potential to cause water pollution.
- Before any earthwork begins, direct the contractor to deploy any storm water "best management practices" (BMPs) called for in the SWPPP or WPCP.

During the course of work, the resident engineer must do the following:

- In compliance with the storm water permit, maintain a copy of the SWPPP or WPCP on the project site.

- Inspect the contractor's operations for compliance with the specifications and the approved SWPPP or WPCP, including deployment of BMPs.
- Ensure the contractor adheres to the inspection schedule set forth in the SWPPP or WPCP and provides written reports of these inspections.
- Ensure the contractor maintains BMPs so that they will function as planned.
- Ensure the contractor has the necessary materials on hand to deploy any necessary additional BMPs in the event of a storm.
- Ensure the contractor uses appropriate measures to stabilize slopes at the times specified.
- In accordance with the specifications, ensure the contractor submits an implementation schedule for soil stabilization and sediment control for disturbed soil areas.
- Ensure the contractor complies with the provisions that restrict the size of the contractor's disturbed soil area.
- Ensure the contractor notifies the resident engineer and obtains the resident engineer's approval in advance for each first-time nonstorm water discharge, excluding exempted discharges.
- Monitor the contractor's active and nonactive disturbed soil areas. Ensure the contractor conducts soil stabilizing activities as specified.
- Ensure the contractor deploys storm water and nonstorm water BMPs whenever associated construction activities are taking place.
- Direct the contractor to correct any deficiencies in compliance efforts identified as a result of reviewing the contractor's or compliance task force's written reports.
- If any pollutants are discharged into the waters of the state, notify the construction storm water coordinator immediately. Review the storm water permit to determine the appropriate reporting timeframe, and provide a draft report of noncompliance to the construction storm water coordinator. The construction storm water coordinator will then forward the report to the RWQCB.
- Report to the construction storm water coordinator any illegal discharges or connections. Require the contractor to prepare a notice of discharge as specified in the SWPPP.
- If noncompliance occurs, take appropriate contractual sanctions against the contractor based on the nature and severity of the situation. Such sanctions include the following:

    1. Withholding funds from contract payment as specified in the contract.
    2. Suspending any work that would exacerbate the noncompliance or interfere with or prevent the contractor's efforts to correct the deficiency. For example, earthwork operations may be suspended until the contractor controls sediment or stabilizes soil as specified. Other work performed by a crew might be suspended if that crew is needed to install BMPs.
    3. Bringing in a separate contractor to complete the work and billing the contractor or the contractor's bonding company for all costs.

- Meet with personnel from regulatory agencies, such as the United States Environmental Protection Agency (EPA) and the RWQCB, and the storm water task force to discuss storm water issues and measures.
- Ensure the contractor submits an annual certification of compliance as specified. Sign, date, and file this certification in the project records.

Before accepting the contract, the resident engineer must do the following:

- As required by the contract, determine that all slopes are stabilized.
- Require the contractor to remove temporary BMPs such as silt fences or other measures that are not a part of permanent erosion control or that the district maintenance unit has not requested to be left in place.
- Conduct a final walk-through of the project area with the maintenance superintendent or region manager.

Upon acceptance of the contract, file Form CEM-2003, "Notification of Completion of Construction," with the RWQCB.

7-104B (3) Storm Water Inspector's Responsibilities

The resident engineer may assign an assistant resident engineer as the storm water inspector. The storm water inspector will assist the resident engineer in carrying out any or all of the inspection tasks and other work described above, as determined by the resident engineer. Typically, the storm water inspector will do the following:

- Review and become familiar with the *Standard Specifications* and special provisions pertaining to water pollution control.
- Review and become familiar with the approved WPCP or SWPPP.
- Conduct site inspections. Verify that BMPs are properly installed and meet the requirements in the *Caltrans Storm Water Quality Handbooks* and the contract specifications. Look for areas that may require BMPs that are not deployed or not addressed in the WPCP or SWPPP. Observe and identify any discharges, illicit connections, and illegal discharges. Take photographs of all areas.
- Prepare special daily reports on storm water pollution prevention. Record all storm water management activities, or inactivity, and conversations with the contractor regarding storm water pollution prevention. Record site visits from regulatory agencies, such as the (SWRCB), the RWQCB, or EPA, and any inspections the agencies perform.
- Monitor the weather reports of the National Weather Service for rainfall predictions. If rainfall is predicted, direct the contractor to deploy appropriate BMPs as identified in the SWPPP or the WPCP.
- Inform the resident engineer immediately of any problems with BMPs during the implementation of the WPCP or SWPPP and any observed discharges.
- Identify changes in construction that may require amendments to the WPCP or SWPPP, and notify the resident engineer of these findings.
- For sites covered by permits, ensure site access and the safety of representatives of regulatory agencies and local agencies when they are on site for any reason.

7-104B (4) Contractor's Inspections

The special provisions for water pollution control require the contractor to regularly inspect the construction site for the proper implementation, performance, and maintenance of BMPs identified in the WPCP or SWPPP. The contractor must follow the site inspection procedure specified in the *Storm Water Pollution Prevention Plan (SWPPP) and Water Pollution Control Program Preparation (WPCP) Manual* (plan preparation manual). Trained personnel must conduct the site inspections, using the site inspection checklist, a copy of which must be provided to the resident engineer.

The contractor must notify the resident engineer whenever the SWPPP, WPCP, or BMPs may not reduce or have not reduced the discharge of sediment or other pollutants into a waterway. The contractor must follow the verbal notification with a written report. The contractor's report must conform to the provisions of Section 600.2, "Discharge Reporting," of the plan preparation manual.

If the situation constitutes noncompliance with the permit, the resident engineer must conduct a verification inspection, and if a noncompliance condition exists, report it to the construction storm water coordinator. The construction storm water coordinator will report it to the appropriate RWQCB. The resident engineer must require the contractor to amend the WPCP or the SWPPP, if necessary, to install additional BMPs.

7-104B (5) Amendment Review and Processing

During construction, conditions may occur that affect the ability of the contractor to implement the WPCP or SWPPP as initially approved or the ability of the approved WPCP or SWPPP to meet the objectives for water pollution control. A change in construction operations or site conditions may result in the discharge of significant quantities of pollutants to surface waters or municipal storm drain systems. These changes can include construction staging or schedule changes, staging area modifications, unanticipated offsite drainage impacts, and failures of BMPs. The contractor must amend the WPCP or SWPPP if either of these plan's effectiveness is diminished by any such changed condition. The SWPPP must also be amended if it violates any condition of the permit.

Upon the resident engineer's approval, the contractor must incorporate all WPCP or SWPPP amendments into the on-site documents. The contractor must prepare WPCP amendments in the format prescribed in Section 40, "Amendments," in Section 3 of the plan preparation manual. The contractor must prepare SWPPP amendments in the format prescribed in Section 200, "SWPPP Amendments," in Section 2 of the plan preparation manual. In addition, SWPPP amendments must be entered into an amendment log, as shown in Section 200.2,"Amendment Log," in Section 2 of the plan preparation manual.

The resident engineer must review the contractor's proposed WPCP or SWPPP amendment for completeness and conformance with the revised conditions, and give written approval to the contractor if the amendments are acceptable.

7-104B (6) Project Files

The resident engineer must keep copies of all documents related to storm water pollution prevention in category 20, "Water Pollution Control Plan or Storm Water Pollution Prevention Plan," of the project files. Retain all the required documents for at least three years after contract completion. These documents include the following:

- SWPPP or WPCP and all amendments.
- Daily reports and photographs related to the prevention of storm water pollution.

- The contractor's site-inspection checklists.
- The contractor's reports of discharge.
- All correspondence related to storm water pollution prevention, including notices of noncompliance.
- Inspection reports from the storm water compliance task force.
- Inspection reports from the resident engineer and assistant resident engineer.
- Copies of the certifications required by the specifications, and
- Form CEM-2003, "Notification of Completion of Construction."

7-104B (7) Contractor's Files

The specifications require the contractor to keep at the project site copies of the SWPPP or WPCP and all approved amendments.

7-104C Noise Control

Construction and traffic noise is often a sensitive issue in neighborhoods and communities adjacent to state highways. Major funding often has to be provided to pay for highway noise reduction through the construction of sound walls and other noise attenuation. Construction contractors are required to have appropriate noise attenuators in good working condition on all equipment. Special restrictions may be employed on night work in sensitive areas, such as residential neighborhoods, schools, or hospitals near the project site.

7-105 Permits

7-105 Permits

This section covers environmental related permits issued by regulatory agencies.

7-105A Special Use Permits

The U.S. Forest Service, Bureau of Land Management, and other federal agencies issue special use permits to Caltrans to construct and operate highway facilities across lands under their jurisdictions. Special use permits often require Caltrans to construct facilities in certain ways to protect the environment.

7-105B Fish and Game Code Sections 1601 and 5650

Section 1601 of the Fish and Game Code requires that public agencies such as Caltrans reach an agreement with the California Department of Fish and Game if the proposed work affects a waterway. The agreement required by this section of the code is known as the "Lake/Streambed Alteration Agreement," also known as the 1601 agreement. Blue lines on an U.S. Geological Survey (USGS) map are considered a waterway. The California Department of Fish and Game may also designate other areas as protected waterways, such as roadside ditches or ephemeral streams. When in doubt, consult with your representative from the California Department of Fish and Game. The 1601 agreement specifically prohibits polluting the waters of the state and may specifically prohibit certain activities at certain times of the year, such as work in the river during spawning season. The agreement may also require the contractor to undertake specific measures, such as installing fish ladders. Violations of the agreement are punishable by fine, imprisonment, or both.

Section 5650 of the Fish and Game Code prohibits the placement of specified materials in the waters of the state. Violations can result in major fines or even jail. Examples of violations include the following:

- Causing dirt and sediment to enter the waters of the state.
- Using creosoted timbers in the waters of the state.
- Placing petroleum products, such as asphalt or diesel, into, or where they can get into, the waters of the state.

Placing asphalt concrete grindings, chunks, and pieces in areas where they can pass into the waters of the state is also a violation of Section 5650 of the Fish and Game Code. A memorandum of understanding exists between the California Department of Fish and Game and Caltrans regarding the placement of asphalt concrete pavement grindings as shoulder backing and the placement of asphalt concrete pieces and chunks in embankments. For a discussion of reusing asphalt concrete as fill material and shoulder backing and a summary of the memorandum of understanding, refer to Section 611.11, "Conservation of Materials and Energy," of the *Highway Design Manual*. If a question exists as to whether asphalt concrete grindings or chunks may get into the waters of the state, consult with your California Department of Fish and Game representative.

7-105C List of Potential Permits

The first table below may be used as a guideline for when permits or approval of contract plans may be required from state or local governmental agencies. The left-hand column lists the activity or a resource affected by construction activity. The second column lists the agency or agencies that may have jurisdiction in the area shown in the first column. The third column indicates the type of permit or plan approval that may be required by the agency or agencies. Most required permits and plan approvals should be obtained during the project's design phase. However, the table may be used as a reminder of the types of permits and plan approvals that may be required when making changes to the original plans.

The second table below lists federal environmental statutes and regulations. The first column lists resources or activities. The second column shows the federal agency having jurisdiction in the area, and the third column lists the statute or regulation that applies to the resource or activity.

Table 7-1.1 State and Local Agency Permits (1 of 3)

Resource or Activity	Agency	Permit or Approval
Commercial, industrial, and residential development	Local agency (county or city)	Land use, general plans, specific plan, conditional use, or subdivision
Conversion of timberland to nonforest uses through timber operations and immediate timberland production zone rezoning	California Department of Forestry	Timberland conversion permit
Power transmission lines, pipelines, and railroad crossings	Public Utilities Commission	Review of plans and approval
Solid waste disposal	California Integrated Waste Management Board	Disposal requirements
Sewage disposal	County health department	Disposal requirements
Waste discharge	State Water Resources Control Board; Regional Water Quality Control Board	Discharge requirements
Storing, treating, or disposing of hazardous waste	Department of Toxic Substances Control State Water Resources Control Board; Regional Water Quality Control Board; local agency	Hazardous Waste Facilities Permit Hazardous waste discharge requirements; Underground Storage of Hazardous Substances Permit
Right-of-way across state parkland	California Department of Parks and Recreation	Right of-way permit, license, easement, joint agreement, or lease
Encroachment on or across a local street or highway	Local agency (county or city)	Encroachment permit
Encroachment on 100-year floodplain, intermittent streams, and desert washes	California Department of Fish and Game	Lake/Streambed Alteration Agreement (1601 agreement)
Encroachment on or across cove, bay, or inlet	Department of Boating and Waterways	Review of plans
Air quality	Air Resources Board or local air pollution control district	Authority to construct and permit to operate for activities emitting stationary source pollutants to the atmosphere
Fish and wildlife habitat	California Department of Fish and Game	Lake/Streambed Alteration Agreement for activities in lakes, streams, and channels and crossings

Table 7-1.1 State and Local Agency Permits (2 of 3)

Water	California State Lands Commission	Land use lease (for encroachments, crossings on tidelands, submerged lands, and so forth.)
	State Water Resources Control Board; Regional Water Quality Control Board	National Pollutant Discharge Elimination System Permit for storm water discharges to surface water; Waste discharge requirements for nonstorm discharges to surface water or groundwater to the waters of the state
	Department of Health Services, Division of Drinking Water and Environmental Management; or local health office	Permit to Operate a Public Water System
Dredging	California Department of Fish and Game State Lands Commission	Standard or special suction dredging permit dredging permit
Surface (material borrow sites, and so forth)	Local agency (county or city)	Surface Mining and Reclamation Act (SMARA) permit
Burning	Local air pollution control district; California Department of Forestry; local fire control agency	Burn permit
Grading	Local agency (county or city)	Grading permit
Entering private property ? to gather information ? for temporary use	Caltrans district right-of-way unit Caltrans district right-of-way unit Property owner right of entry approval	Property owner approval for temporary encroachment
Entering surface waters to gather information or for construction	Regional water quality control board	Water quality certification or waiver
All activities involving dams or reservoirs	California Department of Water Resources, Division of Safety of Dams	Approval of plans

Table 7-1.1 State and Local Agency Permits (3 of 3)

Resource or Activity	Agency	Federal Statute, Regulation or Executive Order
Water	US Army Corps of Engineers ; United States Environmental Protection Agency (EPA); Bureau of Reclamation; U.S. Fish and Wildlife Service; National Marine Fisheries Service	Federal Clean Water Act (Section 404) Regulations concerning the National Pollutant Discharge Elimination System (40 CFR)
Air	United States Environmental Protection Agency	Clean Air Act, Title 42, sections 7401 through 7414
Fish and Wildlife Habitat	U.S. Fish and Wildlife Service; U.S. Forest Service; The National Park Service; National Marine Fisheries Service	Endangered Species Act (Section 7)
Navigable Waters	US Army Corps of Engineers; U.S. Coast Guard	Rivers & Harbor Act
Federal Lands	U.S. Forest Service; Bureau of Land Management; National Park Service	
Historic Properties	Advisory Council on Historic Preservation	National Historic Preservation Act (Section 106)
Coastal Zone	US Army Corps of Engineers; U.S. Fish and Wildlife Service; National Oceanic and Atmospheric Administration	
Wild and Scenic Rivers	National Park Service	Code of Federal Regulations: 36 CFR 297; 43 CFR 8350
Wetlands	US Army Corps of Engineers; United States Environmental Protection Agency	Executive Order 11990 (Protection of Wetlands)
Floodplains	Federal Emergency Management Agency	Executive Order 11988 (Floodplains Management)
Dredging	US Army Corps of Engineers; U.S. Coast Guard	
Airport Airspace	Federal Aviation Administration	Federal Aviation Regulations, Part 77
Farmland	National Resources Conservation Service	Farmland Protection Policy Act

7-106 Environmental Hazards and Safety Procedures

This section contains guidelines for handling and dealing with hazardous materials, hazardous waste, and hazardous spills on construction projects. See Table 7-1.1, "Unknown Hazards Procedures," at the end of this section for properly handling underground tanks, gases, odors, and uncontained spills.

7-106A Hazardous Materials

Many hazardous materials are used in the construction of highway facilities. Employees must take appropriate precautions to minimize their exposure and use protective clothing and equipment. Contractors must submit material safety data sheets and obtain permission from the resident engineer before bringing any hazardous material onto the job site. For instructions, guidelines, and requirements for handling hazardous materials to ensure employee safety, see Chapter 16, "Hazardous Materials Communication Program," of the *Caltrans Safety Manual*. For guidelines for the use of pesticides, see Section 4-20, "Erosion Control and Highway Planting," of the *Construction Manual* (manual).

Some special permits are required for dealing with hazardous materials during construction. Demolishing a bridge, whether new, old, or temporary, requires an asbestos survey and a permit from the local air quality management district. Reusing soils contaminated with aerially deposited lead at concentrations exceeding regulatory thresholds is generally prohibited by state hazardous waste laws and regulations. For low levels of lead contamination, Caltrans has a variance issued by the Department of Toxic Substances Control (DTSC), which exempts Caltrans from certain hazardous waste regulations and allows reuse of soils as long as specific requirements are met. This variance is not automatic. To invoke the variance, you must notify DTSC at least five days before construction of the project begins. The appropriate Reginonal Water Quality Control Board must also be notified.

For guidance regarding special permit and variance requirements and procedures, contact the district environmental- construction liaison or district environmental unit.

7-106B Hazardous Waste

District construction division must have a designated district hazardous waste coordinator who will carry out necessary administrative functions for hazardous waste. The coordinator will work with other functional areas in the district and headquarters to do the following:

- Identify hazardous waste training needs.
- Ensure the proper notifications if unidentified waste is found during construction.
- Provide field personnel with procedures and other information so that the personnel may safely deal with known and unknown waste.

Caltrans construction employees must follow safe practices and minimize their exposure when dealing with hazardous wastes. Minimize potential risks during project construction by having all construction personnel follow the general procedures below:

- After unknown and potentially hazardous wastes (including underground tanks) are discovered, cease construction work in that area.
- Secure the vicinity of the find by cordoning off the area with barriers or fences, and evacuate the vicinity if the resident engineer deems such an action necessary.
- Prohibit construction personnel from any exploratory or investigative work that would result in further personal exposure. Such personnel are prohibited from taking samples or testing potentially hazardous waste. This prohibition includes activities such as the following:

  1. Touching, smelling, or ingesting suspected materials.

2. Climbing into trenches or enclosed areas where contamination is suspected.

3. Reaching, looking, or placing a foreign object (such as a stick to probe or a rock to test depth or to determine the presence of a liquid) into exposed or leaking tanks or other enclosed spaces.

- For any necessary exploratory, investigative, or cleanup work, use specialized consultants or safety workers who are fully trained, licensed, and qualified for hazardous waste work in accordance with state and federal regulations.
- Because of potentially catastrophic health effects, the Code of Federal Regulations, Title 29, Part 1910.120 (29 CFR1910.120) requires that no one enter the designated exclusion zones until the establishment of a complete and effective "hazardous waste worker protection program" or until the consultant has determined no exposure danger exists. (The designated exclusion zones are delineated in the consultant prepared hazardous waste site safety plans.)

7-106B (1) Hazardous Waste Disposal Contracts

When dealing with the identification, assessment, and mitigation of hazardous material or waste, the resident engineer must obtain technical assistance. This assistance is available from the district hazardous waste coordinator and staff in the Division of Environmental Analysis'Environmental Engineering Processes (EEP) Office. The EEP is responsible for providing construction hazardous waste emergency contracts and providing procedural direction. Procedures for using this contract are on the Division of Environmental Analysis' web site: http://www.dot.ca.gov/hq/env/

When using construction hazardous waste emergency contracts, the resident engineer must request all services and act as the contract manager. The resident engineer may not delegate the overall responsibility for the hazardous waste portion of the project. The resident engineer reports all expenditures for hazardous waste to the construction hazardous waste coordinator in the district construction office.

The resident engineer must also coordinate activities under the contract with other Caltrans functional units. When hazardous waste or underground tanks are found, the resident engineer notifies both the district and the Division of Construction. The resident engineer also notifies the district Proposition 65 coordinator and the EEP in Sacramento.

As contract manager, the resident engineer must do the following:

- Provide funds for the work from project contingency funds or from supplemental funds obtained through a funds request.
- Request services under the contract.
- Prepare the work request.
- Process the work request authorization through the Division of Environmental Analysis.
- Authorize the contractor to begin work.
- Ensure work is performed as stipulated in the work request and according to the contract terms.
- Review and approve invoices for payment.
- Review reports.
- Maintain project records in regard to the hazardous waste work.
- Evaluate contractor performance when work is not performed satisfactorily.

- Sign manifests for hazardous waste disposal.
- Pay manifest fees.
- Obtain a temporary United States Environmental Protection Agency identification number.

7-106B (2) Removal of Yellow Traffic Stripe and Pavement Markings

Follow the procedures below when assessing, removing, and disposing of yellow traffic stripe and pavement marking materials on all projects.

7-106B (2a) Construction contract review:

The resident engineer must review the construction contract to determine whether yellow traffic stripe and pavement marking material must be removed. If so, the resident engineer must also determine whether special handling as a hazardous waste is specified. The project may proceed as planned if one of the following situations exist:

- All yellow traffic stripe and pavement marking material to be removed has been previously assessed and found to be free of lead.
- Yellow traffic stripe or pavement marking material to be removed has been tested and found to contain lead, and its removal and disposal as a regulated or hazardous waste is specified.
- If yellow traffic stripe and pavement markings are to be removed and the removal has not been addressed in the contract, the resident engineer must consult with the district hazardous waste coordinator and have lead testing done.

7-106B (2b) Testing and removal requirements:

If identified in the special provisions, the resident engineer may order the prime contractor to test the striping and marking materials for lead. This testing should be paid for as extra work. Depending on the result of testing, proceed as follows:

- *Nonregulated levels of lead found*: If no lead is detected by the initial testing or is detected at levels less than 350 ppm total lead and less than 5 ppm soluble, no additional testing or collection of residues is required. The contractor can dispose of the residue as with any other construction debris.
- *Nonhazardous regulated levels of lead found*: When lead levels detected by testing are less than 5 ppm soluble and less than 1,000 ppm total but more than 350 ppm total, an employee safety and health plan does not have to be prepared. Measures to suppress dust and follow good personal hygiene are still required. All residue resulting from yellow traffic stripe and pavement marking removal, including any removal agent, must be collected and stored in sealed drums. The material must be retested and disposed of appropriately as set forth in "Retesting and Disposal," later in this section.
- *Hazardous levels of lead found*: Should the lead levels detected by this initial testing be greater than 1,000 ppm total lead or greater than 5 ppm soluble lead, treat removal as lead abatement work. Even when not contemplated in the contract, the abatement of lead contained in striping by the construction contractor is allowable under Section 25914.2 of the Health and Safety Code and Section 7058.7(d) of the Business and Professions Code. The contractor must test the striping material when directed but may refuse to do the abatement work when it was not included in the original contract. If the contractor refuses

the lead abatement work, one of the construction hazardous waste emergency contractors will perform the work. Proceed as follows when lead abatement is required.

- *Training*: The contractor responsible for lead abatement must provide a safety training program that meets the requirements in Section 1532.1, "Lead," of the *Construction Safety Orders*. Before performing any yellow traffic stripe and pavement marking removal, personnel (including Caltrans employees) who have had no prior lead training must complete the safety training program.

- *Lead abatement program*: Work practices and worker health and safety must conform to Section 1532.1, "Lead," of the *Construction Safety Orders*. The contractor must submit the written compliance programs required in Subsection (e)(2), "Compliance Program," of Section 1532.1, to the engineer before starting to remove yellow traffic stripes and pavement markings and at such times when revisions to the programs are required. An industrial hygienist certified by the American Board of Industrial Hygiene must prepare the compliance programs. A competent person who is capable of taking corrective action must monitor the programs. Require that copies of all inspection reports made in accordance with Section 1532.1 are given to the resident engineer.

- *Storage of residue*: The contractor must store the residue from traffic stripe and pavement marking removal as follows:

  1. While waiting for any test results required by the disposal facility, store the collected residue in properly labeled containers approved for the transport of hazardous waste by the U.S. Department of Transportation.

  2. Cover and handle the containers in such a manner that no spillage will occur.

  3. Enclose the stored containers with temporary fencing at a location within the project limits approved by the resident engineer. Fencing must not be plastic.

  4. Begin disposing of the contained residue no more than 90 days after accumulating 100 kg of residue.

- *Retesting and disposal*: Before disposal, retest the residue collected in the containers. The level of lead waste contained in the removed material will be diluted by pavement debris that has also been removed. Depending on the test results, dispose of the stored material as follows:

  1. The contractor can dispose of the stored material in the same manner as any other construction debris when the stored material's lead content is detected at levels less than 350 ppm and less than 5 ppm soluble.

  2. The abatement contractor must take the stored residue to a Class 1 disposal site or a specially permitted Class II disposal site when its lead content is detected at levels greater than 350 ppm but less than 1,000 ppm total lead and less than 5 ppm soluble. However, in this case, the stored residue does not require hazardous waste manifesting or handling by a registered hauler. In the project files, retain the records of the testing and the amounts of residue tested and disposed.

  3. Treat the stored residue as hazardous waste when its lead content is

detected to be at levels greater than 1,000 ppm total lead or greater than 5 ppm soluble. Keep records in accordance with current requirements for hazardous waste handling and disposal, and file them in the project files. The abatement contractor must dispose of all residues resulting from yellow traffic stripe and pavement marking removal at an approved Class 1 disposal facility in accordance with the requirements of the disposal facility operator. A transporter currently registered with the Department of Toxic Substances Control using correct manifesting procedures must haul the yellow traffic stripe and pavement marking residue.

The abatement contractor must make all arrangements with the operator of the disposal facility and perform any testing of the yellow traffic stripe and pavement marking debris required by the operator. The abatement contractor must submit the name and location of the disposal facility along with the testing requirements to the engineer before starting removal of yellow traffic stripe and pavement markings on the project. The resident engineer must obtain the United States Environmental Protection Agency identification number and sign all manifests as the generator. The resident engineer must also pay the manifest fees.

4. Unless the lead removal work was already contemplated in the construction contract, pay as extra work all work performed for testing, additional removal costs, retesting, and additional disposal.

7-106C Aerial Deposited Lead

In areas where aerial deposited lead (ADL) has impacted soils, the contract specifications will set forth required procedures for worker protection, handling and reuse or disposal. Reuse of ADL soils with lead concentrations exceeding regulatory thresholds is allowed when the Department of Toxic Substances Control (DTSC) ADL variance requirements are met and the variance is properly invoked through notification of DTSC and the appropriate RWQCB.

The resident engineer must verify that the resident engineers file or the materials information handout include a copy of the project variance submittal sent to DTSC. If the DTSC submittal is not with the file or the materials information handout, the resident engineer must contact the project engineer to determine if the submittal was sent to the DTSC. If the submittal was not sent to DTSC, the resident engineer must contact the district environmental – construction liaison or hazardous waste coordinator for assistance in preparing and sending the submittal which must be received by DTSC at least five days before the start of construction.

7-107 Hazardous Spills

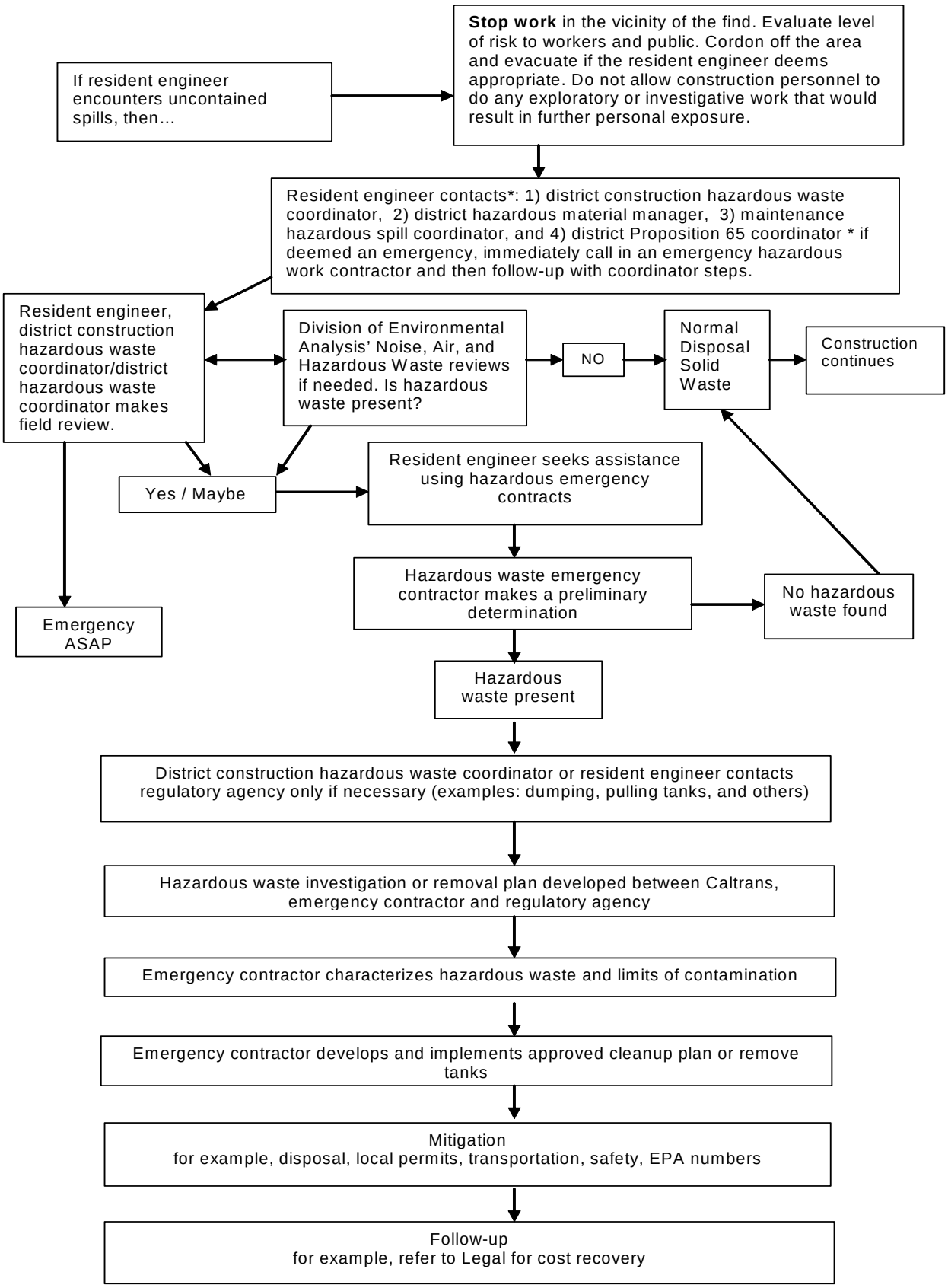
7-107 Hazardous Spills

Each district has a hazardous material manager and other personnel trained in handling highway spills. When an unknown substance is deposited or spilled from a vehicle on a roadway caused by the traveling public, contact the district hazardous material manager for assistance in containment, identification, and cleanup within the Caltrans Right-of-Way. For instructions on reporting hazardous highway spills, see Section 2-3, “Major Construction Incidents,” of this manual. If the contractor spills hazardous materials, the contractor must comply with applicable laws and regulations as well as cleanup and disposal.

If an unidentified spill is expanding and threatening adjacent sensitive areas, begin containment immediately if it can be done without personal exposure.

Conventional methods for containment include interception with dikes or ditches at sufficient distance downstream to avoid contact with the material. Prevent employees, workers, or the public from being exposed to any unknown spilled material.

Table 7-1.1 Unknown Hazards Procedures



7-108 Certification of Environmental Compliance

7-108 Certification of Environmental Compliance

A Certificate of Environmental Compliance (CEC) is prepared at the end of the project to document the mitigation monitoring and reporting program required under the California Environmental Quality Act for every construction project unless no mitigation measures were identified or undertaken. This requirement is shown in Section 270.50 of the *Guide to Caltrans Capital Work Breakdown Structure*. The basic purpose of the CEC is to certify that the mitigation measures were implemented in accordance with the contract.

The resident engineer is responsible for ensuring that the CEC is prepared and distributed. The CEC lists all mitigation measures for the project and includes a discussion of:

- The effectiveness of the constructed mitigation measures;
- Whether the mitigation measures were met and, if not, what measures were implemented;
- How well the contract specifications satisfied all environmental commitments and concerns; and
- Additional mitigation measures required as a result of project changes along with their outcomes.

The Environmental Commitments Record can serve as the basis for the CEC documentation.

The CEC will be signed by all responsible parties including the environmental - construction liaison, environmental generalist, the project manager, and the resident engineer.

The CEC must be sent to the State Office of Planning and Research (1400 Tenth Street, Sacramento 95814) for review and filing. Provide copies of the CEC to all of the district or regional organizational units responsible for the project including the Divisions of Environmental, Design, Project Management and Construction.

Discuss the CEC fully at the project close out meeting. It identifies the lessons learned on the project and areas in environmental compliance that may need improvement.

7-109 Solid Waste Disposal and Recycling Reporting

7-109 Solid Waste Disposal and Recycling Reporting

Contracts containing special provisions for solid waste disposal and recycling reports require the contractor to chronicle landfill disposal and material recycling activity performed through the duration of the contract. The contractor reports this information via the Division of Construction Form CEM-2025, “Solid Waste Disposal and Recycling Report.”

The contractor submits the annual report to the resident engineer by the 15th day of January, and five days following contract acceptance. If no work was conducted during the reporting period, the report states no work was performed during that period.

Contract special provisions require that all reports be received from the contractor in good order before the contract can be finalized. Review all reports submitted by the contractor for accuracy. Compare the Solid Waste Disposal and Recyclying Reports total volumes of materials taken to, and diverted from landfills with the approximate volume of work requiring the removal of materials. Before approving each report, resolve any discrepancies in material type or volume with the contractor. Reports submitted by the contractor that are delinquent or grossly inaccurate are subject to a deduction of $10,000 (ten thousand dollars) for non-compliance.

Submit approved Solid Waste Disposal and Recycling Reports directly to the district recycling coordinator and send a copy to the statewide recycle coordinator in the Division of Design. Contact information about district and statewide recycling coordinators is available via the following Internet address:

http://www.dot.ca.gov/hq/oppd/ab75/coordinators.htm

STATE OF CALIFORNIA • DEPARTMENT OF TRANSPORTATION

NOTIFICATION OF CONSTRUCTION (DESERT AREAS)

(APPLIES TO PROJECTS BELOW ELEVATION 1200 METERS IN RWQCB 6 & 7 JURISDICTION)

CEM-2004 (REV 8/2005)

ADA Notice

For individuals with sensory disabilities, this document is available in alternate formats. For information call (916) 654-6410 or TDD (916) 654-3880 or write Records and Forms Management, 1120 N Street, MS-89, Sacramento, CA

IN COMPLIANCE WITH CALTRANS STATEWIDE NPDES STORM WATER PERMIT Order No. 99-06 DWQ, NPDES No. CAS000003

I. IDENTIFICATION - Attach Vicinity Map, ½ size copy of Title Sheet

PROJECT	NOC SUBMITTAL (Check One) ☐ First Submittal or ☐ Amendment No. ___	CONTRACT NUMBER EA	DATE MM/DD/YYYY
CITY (if applicable)	COUNTY	TENTATIVE START DATE	TENTATIVE END DATE
ROUTE	POST MILE	KILOMETER POST	TENTATIVE DATE SWPPP AVAILABLE

II. CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARDS

☐ REGION 6, LAHONTAN RWQCB South VICTORVILLE OFICE 14440 Civic Drive, Ste 200 Victorville, CA 92392 Ph: (760-241-6583 FAX: (760) 241-7308	☐ REGION 7, COLORADO RIVER BASIN RWQCB 73-720 Fred Waring Drive, Ste. 100 Palm Desert, CA 92260 Ph. (760) 346-7491 FAX: (760-341-6820

III. CALTRANS DISTRICT

NAME/NUMBER	PROJECT CONTACT
ADDRESS	POSITION TITLE
CITY	PHONE

IV. CONSTRUCTION OFFICE - Attach location Map

STREET ADDRESS		CONSTRUCTION CONTACT	
PHYSICAL LOCATION IF DIFFERENT THAN ADDRESS ABOVE		POSITION TITLE	
CITY	STATE	ZIP	PHONE

V. CONSTRUCTION SITE INFORMATION

DESCRIPTION AND TYPE OF WORK:

BMPS TO BE IMPLEMENTED (CHECK BOXES THAT APPLY OR ATTACH SWPPP)

Temporary Soil Stabilization BMPs:

- ☐ SS-1 Scheduling
- ☐ SS-2 Pres. of Existing Vegetation
- ☐ SS-3 Hydraulic Mulch
- ☐ SS-4 Hydroseeding
- ☐ SS-5 Soil Binders
- ☐ SS-6 Straw Mulch
- ☐ SS-7 Geotextiles, Plastic Covers & Erosion Control
- ☐ SS-8 Wood Mulching
- ☐ SS-9 Earth Dikes/Drainage Swales & Lined Ditches
- ☐ SS-10 Outlet Protection & Velocity Dissipation Devices
- ☐ SS-11 Slope Drains
- ☐ SS-12 Stream Bank Stabilization

Temporary Sediment Control BMPs:

- ☐ SC-1 Silt Fence
- ☐ SC-2 Desilting Basin
- ☐ SC-3 Sediment Trap
- ☐ SC-4 Check Dam
- ☐ SC-5 Fiber Rolls
- ☐ SC-6 Gravel Bag Berm
- ☐ SC-7 Street Sweeping & Vacuuming
- ☐ SC-8 Sandbag Barrier
- ☐ SC-9 Straw Bale Barrier
- ☐ SC-10 Storm Drain Inlet Protection

☐ Wind Erosion Control BMPs ☐ Tracking Control BMPs ☐ Non-Storm Water Management BMPs ☐ Waste Mgmt. & Materials Pollution Control BMPs

ADDITIONAL RELATED REQUIRED APPROVALS: ☐ DTSC Variance ☐ CWA 404/401 ☐ DFG 1601 ☐ NPDES/WDRS ☐ OTHER

DESCRIBE:

USGS COORDINATES:	NORTHING:	EASTING:	
TOTAL CONSTRUCTION AREA:	ACRES HECTARES	TOTAL DISTURBED AREA:	ACRES HECTARES
RECEIVING WATER NEAREST PROJECT SITE:		APPROXIMATE CLOSEST DISTANCE TO RECEIVING WATER?	
PROJECT DISCHARGES TO? ☐ GROUNDWATER INFILTRATION	BASIN LOCATION	MUNICIPAL/OTHER SYSTEM NAME	

VI. CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or to those persons directly responsible for gathering the information, the information submitted is true, accurate and belief. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment of knowing violations.

SIGNATURE	DATE
PRINT/TYPE NAME	TITLE