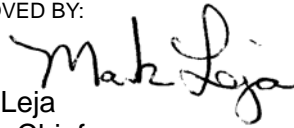




MANUAL CHANGE TRANSMITTAL		NO. 07-1
TITLE: Department of Transportation <i>Construction Manual</i>	APPROVED BY:  Mark Leja Acting Chief, Division of Construction	DATE ISSUED: 09/28/07
SUBJECT AREA Index and other areas of the <i>Construction Manual</i>	ISSUING UNIT Division of Construction	
SUPERSEDES CPB 07-3, CPD 06-10 and CPD 07-3	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: Chapter 1, Section 103D, "Construction Engineer," and Section 105B, "Resident Engineer," to include new requirements from CPB 07-3.	1-1.3 thru 1-1.6	1-1.3 thru 1-1.6
Update: Chapter 1, Section 205, "Relations With Property Owners," to include policy on temporary relocation.	1-2.3 thru 1-2.4	1-2.3 thru 1-2.4
Update: Chapter 1, Section 304, "Individual Duties," for documenting training on the Learning Management System.	1-3.1 thru 1-3.2	1-3.1 thru 1-3.2

Update: Chapter 3, Section 203, “Bid Opening,” dollar amount increase for minor B. Update: Chapter 3, Sections 205, “Disclosure of Construction Estimates,” and Section 206, “Names of Prospective Bidders,” text, phone numbers, and web sites.	3-2.1 thru 3-2.3	3-2.1 thru 3-2.3
Update: Chapter 3, Section 507, “Inspection,” to include the cost for inspections.	3-5.3 thru 3-5.8	3-5.3 thru 3-5.8
Correction: Chapter 3, Section 607B, “Public Interest Determination,” web site for SMARA.	3-6.7 thru 3-6.8	3-6.7 thru 3-6.8
Update: Chapter 3, Section 707B, “Railroad Insurance,” responsibility for Railroad Agreements. Section 708, “Disposal of Material Outside the Highway Right-of-Way,” converted web links to hyperlinks.	3-7.9 thru 3-7.10	3-7.9 thru 3-7.10
Update: Chapter 4, Section 2002D (4), “Sample Preparation, Preservation and Packaging,” for additional documentation included in CPD 07-3 and to convert web link to hyperlink.	4-20.5 thru 4-20.6	4-20.5 thru 4-20.6
Corrections: Chapter 4, Sections 2802, “Before Work Begins,” Section 4-3701, “General,” 4-3702A, 4-3703A, and Section 4-4002, “Before Work Begins,” Section 4-5203, “During the Course of Work,” web site. Section 4-9002A, “Materials,” and Section 4-9002C, “Admixture,” web site for SMARA.	4-28.1 thru 4-28.4 4-37.1 thru 4-37.2 4-37.5 thru 4-37.6 4-40.1 thru 4-40.2 4-52.3 4-90.1 thru 4-90.4	4-28.1 thru 4-28.4 4-37.1 thru 4-37.2 4-37.5 thru 4-37.6 4-40.1 thru 4-40.2 4-52.3 4-90.1 thru 4-90.4

Correction: Chapter 5, Section 101B, “Construction Forms,” Form CEM-1201, “Subcontracting Request,” reference for Chapter 3-8 and the web sites for CEFS.	5-1.1 thru 5-1.2	5-1.1 thru 5-1.2
Update: Chapter 5, Example 5-4.11, “District Director Determination of Claims,” is updated for CPD 06-10.	5-4.67 thru 5-4.68	5-4.67 thru 5-4.68
Correction: Chapter 6, Section 202A, “The Contractor,” and Section 305D(3), “Identification of Test Cylinders,” web site for SMARA.	6-2.1 thru 6-2.2 6-3.5 thru 6-3.6	6-2.1 thru 6-2.2 6-3.5 thru 6-3.6
Update: Chapter 7, Section 103D, “Disposal, Staging and Borrow Sites,” corrections for web sites. Section 7-105B, “Fish and Game Code Sections 1601 and 5650,” correction for section number in the <i>Highway Design Manual</i> .	7-1.3 thru 7-1.6 7-1.11 thru 7-1.12	7-1.3 thru 7-1.6 7-1.11 thru 7-1.12

- Ensuring adequate training for those assigned personnel who are or may be assigned as resident engineers, encouraging diligent pursuit of their Caltrans Resident Engineer Certificate.
- Ensuring that materials and completed work comply with plans, specifications, and design criteria.
- Approving or not approving a resident engineer's recommendation for contract change orders and time extensions.
- Ensuring that the maintenance of project records complies with this manual.
- Ensuring the performance of all safety-related activities.
- Ensuring compliance with regulations and specifications related to labor and civil rights.
- Collaborating with the district's project development unit on constructability reviews and providing expert assistance on construction matters for design and traffic engineers.
- Ensuring that the practice of civil engineering on assigned contracts complies with the Professional Engineer's Act.

1-104 Office of Structure Construction Organization

The Office of Structure Construction is responsible for the technical control of structure work. Engineers from the Office of Structure Construction are assigned to all districts to provide field engineering for structures. The district may request that the assigned structure representative act as the resident engineer where structure work predominates.

The Office of Structure Construction has the ultimate responsibility and authority for decisions relating to the structural adequacy of contract work on structures.

1-104A Office of Structure Construction, Chief

For construction contracts, the Office of Structure Construction, chief, must uniformly execute statewide structure construction services to the districts. The duties of the position include the following:

- Planning and directing the activities of the statewide division.
- Budgeting for structure construction personnel and other resources, as necessary, to administer contracts.
- Obtaining and providing training for all engineering activities for structure construction.
- Ensuring that statewide structure construction complies with regulations, Caltrans policies, and program objectives.
- Coordinating the activities of structure construction statewide with all district functions and with other Engineering Services functions.
- Recommending to the Division of Construction chief, revisions in the Division of Construction's policies and objectives.
- Producing and distributing policies and procedures for inspecting and administering structure construction work.

1-104

Division of Structure Construction Organization

1-104B Area Structure Construction Manager

The area structure construction manager is responsible for the structure construction staff within a designated area of the state. The area may include one or more districts or a portion of a metropolitan area or district. The duties of the position include the following:

- Assigning structure construction staff within the manager's assigned area, including approving requests to assign structure engineers to act as resident engineers on projects.
- Obtaining and providing adequate training for all structure construction staff within a designated area.
- Advising and assisting the district about contract change orders and claims involving structure work.
- Providing the structure construction headquarters in Sacramento with status information on all contracts within the manager's area.
- Informing the district managers of structure construction activities within their areas.

1-104C Structure Construction Engineer

The structure construction engineer must execute the structure portion of construction projects and is accountable for the performance of assigned structure construction employees. The duties of the position include the following:

- Supervising the activities of structure construction personnel.
- Ensuring adequate training for assigned structure construction personnel.
- Collaborating with Engineering Services and the district's design unit on constructability reviews, and providing expert assistance on structure construction methods.
- Ensuring structure materials and completed structure work generally comply with the contract plans, specifications, and design policies.
- Providing concurrence and advice to the district for contract change orders and time extensions on structure work items.
- Ensuring and verifying that the maintenance of project records complies with the manual.
- Ensuring the performance of all safety-related activities.
- Ensuring that the practice of civil engineering on contracts in the assigned area complies with the Professional Engineer's Act.

1-105 Construction Project Organization

1-105 Construction Project Organization

The number of state personnel required on a contract varies with the particular circumstances involved. A resident engineer may be assigned to a single contract or may be assigned as resident engineer over several contracts. Field office assistants, assistant resident engineers, and other support personnel are assigned as necessary.

The district must obtain maximum efficiency on the project with a minimum number of personnel. This expectation means that all personnel must have adequate training.

Depending on the project size, a full-time office assistant may be assigned for the clerical work.



In some instances, several smaller projects may be grouped together and administered from a single field office, making it possible to employ full-time clerical office assistants.

Personnel furnished by engineering consultants may be assigned to the project as assistant resident engineers. The resident engineer must be familiar with the terms of the engineering consultant contract. The resident engineer must also monitor the performance of the consultant personnel.

1-105A Using Personnel From the Office of Structure Construction

When structure work predominates, the districts may use structure construction personnel as resident engineers. Upon district request, the Office of Structure Construction will select staff acceptable to the district as resident engineers.

All resident engineers, whether from the Office of Structure Construction or district personnel, report and act through the district.

To ensure optimum use of combined district and structure construction personnel, the project personnel may be interchanged freely when conditions require, particularly when work load varies because of temporary overstaffing or understaffing. In such instances, the resident engineer and the structure representative will assign personnel through agreement with each other. In making their assignments, they will consider the responsibility of structure personnel for the technical control of structure work.

Because of the specialized training of structure and transportation personnel, prolonged use of either in the work of the other must be avoided.

1-105B Resident Engineer

Under the general direction of a construction engineer, the resident engineer is responsible for the contract administration and construction engineering of all assigned projects. As a Caltrans representative, the resident engineer acts within the authority of the following:

- The State Contract Act
- Section 5-1.01, "Authority of the Engineer," of the *Standard Specifications*
- The manual
- Any other applicable administrative instructions

The construction engineer is the resident engineer's counselor on the intent and application of any portion of the contract. On complex or sensitive construction issues, the resident engineer and construction engineer should consult with the construction field coordinator.

A registered professional engineer must be responsible for the engineering integrity of a construction project. The resident engineer, as the Caltrans person in responsible charge, must be a licensed professional engineer in the State of California, as defined by the Professional Engineer's Act.

Selecting a person to act as resident engineer is dependent upon the following:

- The work's magnitude and complexity
- The type of work
- The degree of independent control and direction to be exercised
- Pursuit or completion of the Caltrans Resident Engineer Certificate Program

Only the person best qualified for a specific project should be selected as the resident engineer.

The civil service classification of a resident engineer is related to the project's size and complexity as well as to the staff size required to properly administer the assigned contract or contracts. Normally, the person selected as resident engineer will be a registered professional engineer at the transportation engineer level. On complex projects (or a group of projects) that require a large staff to monitor the contractor's operations, a senior level engineer may be necessary. Complexity, rather than monetary value, governs the assignment of resident engineers.

The resident engineer must thoroughly study the assigned project, becoming familiar with all its facets. The resident engineer must analyze the plans, estimate, and preliminary quantity calculations, and determine if the estimated quantities cover all work items contemplated. If the resident engineer discovers any major discrepancies, the engineer must take appropriate action. The resident engineer must also thoroughly study the requirements of environmental commitments and permits, including pollution and erosion control plans.

If it becomes apparent at any time that the probable unobligated balance of funds, with due regard for the amount of work remaining, is not sufficient to complete the project, the resident engineer must bring the situation to the supervisor's attention. To permit contract expenditures to overrun allotted funds seriously reflects on the resident engineer's ability. For the procedure for obtaining additional funds, see Section 5-203, "Obtaining Additional Funds," of this manual.

Once assigned, the resident engineer should remain on the project until its completion, including the completion of all project documents and administrative matters.

1-105C Structure Representative

Under the general direction of a structure construction engineer, the structure representative must inspect, document, and field test materials for all structure work on a project. As a service to the resident engineer, the structure representative will also provide claim positions and draft contract change orders. As a representative of Engineering Services, the structure representative acts within the authority of the following:

- The State Contract Act
- The *Standard Specifications*
- The manual
- The *Bridge Construction Records and Procedures Manual*
- Other applicable administrative instructions

Under the general direction of a construction engineer and a structure construction engineer, the structure representative must administer all assigned contracts. When acting as a resident engineer, the structure representative has authority commensurate to this responsibility.

The structure representative acting as resident engineer should consult the construction engineer whenever the structure representative is unsure about the intent and application of any portion of the contract.

1-204 Relations With Utility Companies and Other Public Agencies

Good public relations with internal and external stakeholders will have a beneficial effect in completing a construction project within scope, schedule and budget. Preconstruction discussions that may affect Caltrans functional units or local agencies and communities should involve all stakeholders. The resident engineer should make early personal contact and establish a good working relationship with staff of affected utility companies and other agencies. Such agencies may include: local school districts, local transit agencies, permitting agencies, California Highway Patrol and local police organizations, local bicyclist and pedestrian advocacy groups, local community groups, and any other government agency or local group with interest in the project. Early personal contact with staff from these agencies and groups will acquaint them with upcoming construction operations and will enable them to have input and schedule their work or services to the best advantage of all concerned.

1-205 Relations With Property Owners

Another important part of public relations is courteously dealing with the property owners near the project. The owners are the ones most affected by construction operations.

By courteously listening to the property owner's problem, request, or question and by taking the time to explain or answer, the resident engineer can generate faith that Caltrans is not an impersonal organization running roughshod over the general public or the individual. Sometimes this human approach will reduce unreasonable demands and complaints by the property owner.

Construction operations (for example, temporary closures of streets and driveways and construction noise, especially at night) may have an adverse effect on nearby residents and businesses adjacent to the project. Informing business owners and residents near the project about the reason for, and the duration of, the activity will go a long way toward a higher degree of acceptance and tolerance. Timely notice is important. Also consider rescheduling construction activity around major business or public events.

The necessity for residential relocations should be considered during constructability reviews and if necessary discussed at project development team meetings. Details for temporary relocations appear in Section 10.10.05.01 of the *Right of Way Manual*.

If nighttime noise levels become an issue during construction and temporary relocation of residents is not addressed in the project files, contact the construction field coordinator for guidance.

Start public relations early. The fullest possible cooperation of the contractor's organization should be solicited to achieve good public relations most effectively. By calling on property owners together, the resident engineer and the superintendent can assure owners that inconvenience and the nuisance of noise and dust will be kept to a minimum. For some projects on metropolitan freeways, contractors have distributed their own informational folders to property owners. This practice should be encouraged.

1-204 Relations With Utility Companies and Other Public Agencies

1-205 Relations With Property Owners

**1-206
Relations With the
General Public**

1-206 Relations With the General Public

The main differences in public relations toward the property owners and the general public occur in the scope of coverage and the degree of personal contact. When highway construction information must be conveyed to large numbers of highway users (including those who commute regularly over a particular route and those who use the route only occasionally), contact the public information officer early in the project. The most satisfactory method is for the officer to make full use of the press, radio, internet, and television to publicize the upcoming work.

Another proven method of promoting good public relations is to use district personnel as speakers at meetings of the local chamber of commerce and service clubs. Resident engineers so inclined might consider joining a service organization. Frequent notices and progress reports in the local press are also very common and effective methods of keeping the public informed of changing project conditions.

On advice by the resident engineer, the district should also issue press releases. The district should contact members of the local press before the job starts, inform them how they can contact the proper person for information throughout the contract, and invite them to tour the project with the resident engineer. In special cases, the district may prepare and distribute pamphlets to motorists who are delayed as they pass through construction. If the traveling public outside of the district will be affected, the Caltrans information officer in Sacramento must be advised directly.

Project personnel should always keep in mind that they are representatives of Caltrans and the State of California. As such, they are expected to conduct themselves in a manner that will command respect and be a credit to the organization.

Section 3 Personnel Development

Section 3 Personnel Development

1-301 General

Personnel development is essential for successfully implementing Caltrans' strategic plan, goals, and objectives. Moreover, most construction employees want to learn new job skills. A comprehensive training and development program helps to recruit and retain new construction staff. It is in the best interests of Caltrans to train staff early in their careers, reinforce that training as time passes, and update staff job skills as changes in policy and technology affect the way Caltrans conducts business and serves its stakeholders.

Base staff development needs on Caltrans' fundamental goals and objectives. Design each training and development activity to produce construction personnel who are prepared to perform their essential job duties.

1-301 General

1-302 District Role

District construction will do the following:

- Identify training needs based on the following:
 1. The employee's current knowledge and skills
 2. Additional job skills necessary for the employee's success in the current job assignment
 3. Skills the employee will need for future job assignments
- Include training and development planning in each employee's yearly individual development plan.
- Provide each employee with adequate training and development opportunities that will facilitate the implementation of the employee's training and development plan.
- For each construction employee, maintain a historic record of completed training and development sufficient to enable a supervisor to evaluate the employee's construction knowledge and skill level.

1-302 District Role

1-303 Supervisor Role

Supervisors will do the following:

- Ensure that each employee under their direct supervision is capable of performing the assigned duties.
- Periodically review subordinates' qualifications and use that information when making decisions about new job assignments.

1-303 Supervisor Role

- When evaluating staffing needs and planning job assignments, carefully consider cross-training opportunities for all staff, provided collective bargaining agreements and memorandums of understanding allow such opportunities. A well cross-trained staff has the following abilities:
 1. More flexibility in completing a job
 2. More ability to collaborate
 3. Stronger ability to adjust to changing project conditions
- Establish a succession plan, indicating who will back up the supervisor and the employees when they are absent. Update the plan each year based on staff performance, and ensure the unit training and development plan supports the advancement of interested employees.
- Take immediate action to correct any known deficiency in an employee's capability to perform currently assigned tasks.
- Encourage the development of subordinates, and foster a working environment in which employees are encouraged to learn new job skills.
- Assist employees to participate in external training opportunities requested by the employees. Such training must benefit the employees' professional career development. Ensure the training schedule does not have a significant negative effect on the employees' work. This training must also conform to current departmental guidelines for career related training.

1-304 1-304 Individual Duties

Individual Duties

Each individual employee will do the following:

- As directed by the supervisor, attend training activities and learn the skills and acquire the knowledge necessary to meet the standards for satisfactorily completing job assignments.
- Attend a training class when scheduled to do so.
- Be responsible for evaluating their own ability to perform the essential job duties for each task they are asked to perform. If the individual does not feel properly trained or qualified to execute a specific job task, then that person must notify the supervisor.
- In the planning of activities for training and development, consider future promotional opportunities. Planning for training and development requires the employee to maintain a basic level of knowledge necessary to efficiently perform current job duties and also requires the employee to expand knowledge to include job duties for the next position on the individual's career path.
- Obtain prior approval from the supervisor to attend a training activity.
- Accurately report training expenditures, including filling out the "G" number column on the time reporting system. In addition, employees are to follow the procedures for requesting and documenting training detailed in the Learning Management System on Caltrans' intranet.

Section 2 Proposal Requirements and Conditions**Section 2
Proposal
Requirements
and Conditions****3-201 General**

Section 2, “Proposal Requirements and Conditions,” of the *Standard Specifications* covers proposal requirements and conditions that apply to a contractor bidding on a project. The Office of Office Engineer must adhere to this section’s requirements. District construction personnel must be familiar with this section, including the contractor’s responsibilities and options after bids have been opened.

**3-201
General****3-202 Advertisement**

Before the plans and specifications are made available to the public, California law requires the publication of contract information in the *State Contracts Register*. Before bid opening, Caltrans will then allow a minimum of three weeks (more if the project is complex) for contractors to purchase plans and specifications and prepare their bids. Emergency projects may have a shortened advertisement period.

**3-202
Advertisement****3-203 Bid Opening**

For projects in northern California (districts 1, 2, 3, 4, 5, 6, 9, and 10), bids open in Sacramento on Tuesdays and Wednesdays. For projects in southern California (districts 7, 8, 11, and 12), bids open on Thursdays in the District 12 headquarters in Irvine.

**3-203
Bid Opening**

The Division of Administrative Services administers projects estimated to be below \$131,000, which are designated as minor B. For minor B projects in Northern California bids are opened in Sacramento while minor B projects in Southern California bids are opened in Irvine.

3-204 Communication With Bidders

To protect the integrity of the bidding process, no bidder must be given a real or perceived advantage over any other bidder. Use the following guidelines to ensure that any information provided to one bidder is also provided to all other potential bidders for a particular project.

**3-204
Communication
With Bidders**

- Only the designated district construction personnel must answer bidder inquiries. The design engineer, construction field personnel, or other nondesignated Caltrans personnel must never respond directly to bidder inquiries.
- Thoroughly investigate bidder inquiries, and provide timely and conclusive responses.
- Distribute or post written responses to all plan holders via fax, the Internet, or other similar means.
- Number the responses to facilitate bidder comments and follow-up questions to responses. Specify the date responses are posted.

- Include the following language with all responses published or posted:

Responses to bidder inquiries, unless incorporated into formal addenda to the contract, are not a part of the contract, and are provided for the bidder's convenience only. In some instances, the question and answer may represent a summary of the matters discussed rather than a word-for-word recitation. The availability or use of information provided in the responses to bidder inquiries is not to be construed in any way as a waiver of the provisions of Section 2-1.03, "Examination of Plans, Specifications, Contract, and Site of Work," of the *Standard Specifications* or any other provision of the contract, the plans, *Standard Specifications*, or special provisions, nor to excuse the contractor from full compliance with those contract requirements. Bidders are cautioned that subsequent responses or contract addenda may affect or vary a response previously given.

- Refer directly to the plans, specifications, and other provisions of the contract. Quote specific sections of the *Standard Specifications* and special provisions, as well as specific sheet numbers and details on the plans and *Standard Plans*.
- Ensure conclusive responses. If an inquiry cannot be answered conclusively by directly referring to the contract provisions and requires some measure of amplification, confirm the statewide interpretation by consulting with the district construction office, the Division of Construction, the Division of Engineering Services, or other program with the necessary knowledge. In such cases, give special emphasis to assessing the need for an addendum. Before giving a response that involves inquiries regarding construction methods, obtain direction from the district construction office. Routinely route inquiries and proposed responses through appropriate support and construction functions. Before bid opening, route all inquiries and responses to the resident or construction engineer responsible for administering the project.
- If an inquiry indicates the contract should be modified, issue an addendum. Before publicly posting any referrals to the addendum, issue it. When an addendum is issued in response to an inquiry, post "Per Addendum No.--, dated ---" as the inquiry response. The district office engineer must notify the Office of Office Engineer as soon as possible of addenda proposed or under consideration. Responses to inquiries, whether made verbally or in writing, do not become part of nor change the contract. However, they may be used in defending Caltrans or the contractor's position in a dispute when the industry has been given related knowledge before bidding.
- Rarely respond with "Bid it as you see it." However, such responses may be appropriate, depending on the scope of the particular issue, the timing of the bidder inquiry, and other factors.
- It may be impractical to post responses to certain inquiries that are submitted too close to the bid opening date. Although you should aggressively pursue the investigation of all bidder inquiries, Caltrans may, considering the particular circumstances, waive posting a response, if warranted.
- Post all responses, including "Bid it as you see it" responses.
- Consider written bidder inquiries only when a completed "Bidder Inquiry" form is submitted when the contract requires this form.

- Even if the contract does not require written bidder inquiries, Caltrans strongly encourages the form's use to the extent practical because the form helps manage bidder inquiries and responses. You can obtain a sample of this form from the Office of Office Engineer.

3-205 Disclosure of Construction Estimates

Until bids are opened, the engineer's estimate of the cost of each contract item, supplemental fund allocation, contingency fund allocation, state furnished materials allocation, and any other portion of the project estimate are not public information.

Before bid opening, bidders may know only the total allocated funds available on a specific project. This information is available for minor A and major projects and is provided by the weekly advertisement for bid listing either in hardcopy form or on the Internet at the following address:

<http://www.dot.ca.gov/hq/esc/>

Minor B project funds allocation information is available by calling the Sacramento office at (916) 227-6075, or by sending a fax request to (916) 227-1950, or from the Internet at the following address:

<http://www.caltrans-opac.ca.gov/refguide.pdf>

3-206 Names of Prospective Bidders

For all projects except minor B construction projects the names of prospective bidders can be obtained by requesting in writing or by fax a "Plan Holders List" from the Caltrans' plans counter in Sacramento, Fax (916) 654-7028, or from the Internet at the following address:

<http://www.dot.ca.gov/hq/esc/>

3-205

Disclosure of Construction Estimates

3-206

Names of Prospective Bidders

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

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.

Standard Specifications Section 5-1.08, “Inspection,” allows the resident engineer access to work for inspection pertaining to contract items or work included on approved contract change orders. The access must be safe, and the resident engineer must take full advantage of this access.

Cal/OSHA establishes standards for safe access to work, and Caltrans enforces them under Section 7-1.06, “Safety and Health Provisions,” of the *Standard Specifications*. When the contract specifies that the cost for access is included in various items of work, no separate payment is allowed.

Approved contract change orders do not include the cost of providing access for inspection related to extra work or other changed work. The contractor’s costs for inspection on extra work or other changed work may be billed as separate compensation on extra work bills. Costs should be billed to the nearest tenth of an hour. When contractors bill inspection costs for access on changed work with other extra work, they should only bill the increased cost of providing inspection and not all of the inspection access costs under the original item work.

The resident engineer and assistant resident engineer must never operate the contractor’s equipment. The contractor’s own equipment operators should operate equipment during inspections.

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

3-506

Lines and Grades

3-507

Inspection

3-508

Removal of Rejected and Unauthorized Work

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:

3-511A Type 1

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

3-511B Type 2

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.

3-511C Procedure

For the contractor to recover damages for a differing site condition claim, the following things must be done:

- Before the bid, the contractor must investigate the site and carefully examine the following items:
 1. Plans
 2. Specifications
 3. "Materials information"
 4. Log of test borings
 5. Other records of geotechnical data (cores and other physical data) obtained by Caltrans' investigation of subsurface conditions
 6. Other records of data to the extent they were available to the contractor.

This investigation is required by Section 2-1.03, "Examination of Plans, Specifications, Contract, and Site of Work," of the *Standard Specifications*.

- The conditions encountered must either be materially different from those represented by the bid documents, other records of data available to the contractors prior to bid, and a site investigation, or be materially different from those normally encountered or inherent in the industry.
- Before disturbing the conditions, the contractor must provide to the resident engineer written notice of them.
- The resident engineer must then investigate the conditions and determine if they differ materially and cause an increase or decrease in the cost or time to do the work.

The resident engineer must remain alert to the possibility that a differing site condition may result in a credit to the state. If such a condition is encountered, the resident engineer must promptly notify the contractor in writing.

The specifications for differing site conditions do not apply to those situations covered in the *Standard Specifications* under Section 8-1.09, "Right of Way Delay," Section 8-1.10, "Utilities and Non-Highway Facilities," or Section 19-1.04, "Removal and Disposal of Man-Made Objects."

Differing site conditions are not considered “changes in character” because the conditions do not result from ordered changes. However, determine and give compensation or credit due to differing site conditions in the same manner as you would for changes in character. For how compensation is made for changes in character and for a sample contract change order, see Section 5-3, “Contract Change Orders,” of this manual.

3-512 Character of Workers

3-512 Character of Workers

Section 5-1.12, “Character of Workers,” of the *Standard Specifications*, covers the issue of character of workers. In addition, Caltrans policy calls for a work environment with zero tolerance for violence, threats, harassment, and intimidation. This policy also applies to any subcontractor or employee of a contractor in their dealings with Caltrans personnel. Caltrans may discharge a worker from the project for engaging in any of the above mentioned activities.

Discuss the decision to remove a worker with the worker’s supervisor prior to issuing the directive. The contractor may request reinstatement of the worker. If requested, the resident engineer’s supervisor conducts a meeting with the resident engineer, the contractor’s authorized representative, and, at the contractor’s discretion, the affected worker. The reason for removal and the contractor’s request for reinstatement are discussed at the meeting.

None of these procedures affects the authority of the resident engineer to direct the removal of a worker from the project.

3-513 Final Inspection

3-513 Final Inspection

As a project’s completion approaches, the resident engineer must schedule appropriate reviews with maintenance, traffic, and safety personnel.

To resolve any potential problems on interstate projects, request a field engineer from the Federal Highway Administration to review the project before the day of final inspection. Your objective is to prevent last-minute delays in contract acceptance.

According to Section 5-1.13, “Final Inspection,” of the *Standard Specifications*, the engineer must do a final observation of the contract work during the final inspection. The district director or an engineer from the district construction, such as the district construction deputy director, construction engineer, structure construction engineer, or resident engineer, must make the final inspection.

Maintain a record of the final inspection in the resident engineer’s daily report. The record should state something along the following lines:

“I made a final inspection of the project today and determined that all contract work has been completed.”

Or,

“(Name) made the final inspection today and concurred that all contract work has been completed.”

Time the final inspection so that the recommendation for contract acceptance will not be delayed pending the inspection. Before the final inspection, give the contractor a written list of items needing attention.

3-513A Work for Other Agencies or Owners

When any work performed under the contract is for other agencies or owners, as a courtesy ask for the concurrence of these entities in the acceptability of the work. Include the concurrence of others such as local agencies, other state agencies, utility companies, and school districts.

Also ask for concurrence from another party or agency if it finances a state highway project or a portion of the project. The district must arrange a joint field inspection with the owner or agency. In writing and in advance (usually 30 days), notify the owner or agency when the facility will be ready for final inspection. Time the inspection so that concurrence for acceptance is available at the time of recommending to the director the acceptance of the contract or relief from responsibility for maintenance. However, do not withhold recommendations for acceptance or relief merely because an outside agency will not concur.

The letter notifying the owner or agency of readiness for inspection should include the following:

- A reference to the agreement.
- A statement that the inspection is to determine whether work is in compliance with plans, the agreement, or both.
- The date of the inspection.
- A request that when an inspection reveals no deficiencies, the agency's authorized representative responsible for performing the inspection will confirm in writing that the agency agrees to accept the work.
- A statement that failure by the agency to inspect or confirm acceptance in writing will be deemed acceptance of the work as constructed.

If the size or complexity of the work warrants such an action, an agency representative and the resident engineer should make a preliminary joint inspection to correct minor deficiencies before the final inspection described above.

The resident engineer must record in writing preliminary and final joint field inspections, noting what actions were necessary to complete the work to the satisfaction of the agency representative. If the agency representative is satisfied with the completeness but declines concurrence in writing, record this situation.

3-514 Cost Reduction Incentive

Caltrans encourages contractors to develop and implement innovative approaches to construction projects. When new approaches result in construction cost savings, Caltrans and the contractor may share the savings in construction cost. Section 5-1.14, "Cost Reduction Incentive," of the *Standard Specifications*, specifies the method and procedure for sharing construction cost savings. A contractor's proposal made in accordance with Section 5-1.14 is called a cost reduction proposal.

The special provisions may allow for the contractor and engineer to organize and participate in a "value analysis" workshop. The workshop's purpose is to identify value-enhancing opportunities that would reduce the total project cost, time of construction, or traffic congestion. Items identified in the workshop could be developed into cost reduction proposals.

3-514 Cost Reduction Incentive

Section 5-1.14 applies only to the actual cost of construction. Savings in construction engineering, maintenance, operations, safety, and traffic services, among other items, are not eligible for sharing with the contractor.

3-514A Procedure

Handle cost reduction proposals as follows:

- After discussing the merits of a potential cost reduction proposal with the resident engineer, the contractor may submit a written proposal for approval. The initial written proposal may be preliminary in nature, but for Caltrans to evaluate the anticipated cost savings or other value enhancement, the proposal must provide enough of the information required by Section 5-1.14, “Cost Reduction Incentive,” of the *Standard Specifications*. Thus, the proposal must include information regarding the following:
 1. Any construction effects related to staging, right-of-way, or environment
 2. Any required permits or permit modifications
 3. Maintenance or enhancement of essential functions or characteristics of the project such as service life, reliability, economy of operation, ease of maintenance, desired appearance, conformity to design, safety and other applicable standards, and the time within which the engineer must make a decision on the proposal.
- With assistance from the resident engineer, the construction engineer must coordinate Caltrans’ evaluation of the written proposal by the date requested by the contractor.
- Consider the following factors in determining whether or not a proposal is acceptable. (Do not include any cost benefit resulting from these factors in the actual computation of net savings in construction costs.)
 1. Any engineering, environmental, legal or administrative considerations making the proposal impractical or unacceptable.
 2. The relationship of net savings to the cost of evaluating and implementing the proposal
 3. Any total benefit to the public including construction savings or reduced engineering costs
 4. Improved operations
 5. Reduced maintenance
 6. Improved safety and traffic service or other values that clearly favor the proposal
- Compute a cost reduction proposal’s net savings due to the changed work in accordance with the methods detailed in Section 4-1.03C, “Changes in Character of Work,” of the *Standard Specifications*. The net savings must result from the difference in the actual cost of doing the work in accordance with the contract plans and specifications as originally planned and the actual cost of doing the work based on designs, methods, labor, equipment and materials as changed by the proposal. In determining the net savings, exclude from consideration the contractor’s engineering and other costs incurred in preparing the proposal. Also exclude Caltrans’ cost of evaluating the proposal, including any portion of this effort for which the contractor paid.

In accordance with the State Contract Act, aggregate sources must comply with the Surface Mining and Reclamation Act of 1975 (SMARA). Refer to Chapter 7, “Environmental,” of this manual for further information on SMARA requirements.

If the contract change order directs the contractor to obtain material from Caltrans’ chosen source, the Federal Highway Administration (FHWA) considers the source mandatory. The FHWA then requires written approval of a public interest determination before approval of the contract change order.

At a minimum, the public interest determination, written by the resident engineer, must include the following:

- The reason the chosen source is the most economical. If the determination is not based on economy, other reasons such as public safety or convenience must be included.
- The alternatives considered.
- The effect on the value of the material site.

All such sites are subject to compliance with 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:

http://www.consrv.ca.gov/OMR/ab_3098_list/index.htm

Also, see Section 7-103D, “Surface Mining and Reclamation Act,” to determine if the proposed materials site is exempt from SMARA.

The FHWA must then approve the resident engineer’s determination. One method of submitting a public interest determination for approval is to include the required statements on Form CEM-4903, “CCO Memorandum.” The Division of Construction will pursue approval of the public interest determination before approval of the contract change order. To expedite approval of the contract change order, the resident engineer should, whenever possible, send the public interest determination to the Division of Construction before submission of the contract change order.

The above requirements do not apply to “local borrow,” as defined in Section 19-7, “Borrow Excavation,” of the *Standard Specifications*.

3-607C Disposal of Material

Section 7-1.13, “Disposal of Material Outside the Highway Right of Way,” of the *Standard Specifications*, and Section 7-103D, “Environmental Rules and Requirements,” of this manual, cover the requirements for the contractor’s disposal of materials (unless modified by special provisions). When required to execute documents related to disposal sites, the contractor should use agreements similar to those shown earlier in this section for material sites, with the wording modified to indicate disposal sites instead.

3-608 Testing

The *Standard Specifications* contain references to the standards and tests of the American Association of State Highway and Transportation Officials (AASHTO) and the American Society for Testing and Materials (ASTM). These standards and tests may, or may not, be readily available to the resident engineer. Note any references to these tests well in advance of need, and obtain any necessary copies of them from the district materials engineer. It is not practical to supply each resident engineer with complete AASHTO and ASTM standard test procedures.

3-608 Testing

Whenever samples are taken from materials sites, the resident engineer must ensure the samples are representative of material being used. Degradation and segregation may occur in aggregates between the processing operation and their incorporation in the work. The resident engineer cannot assume that material satisfactorily tested at the source or at the processing plant is still satisfactory at the job site. To ensure specification compliance, test at the frequencies shown in the specifications as the material is being incorporated into the work.

3-608A Operating Range and Contract Compliance

Section 25, “Aggregate Subbases,” Section 26, “Aggregate Bases,” Section 27, “Cement-treated Bases,” Section 28, “Lean Concrete Base,” Section 39, “Asphalt Concrete,” and Section 90, “Portland Cement Concrete,” of the *Standard Specifications*, all contain provisions for an acceptable range of test results and unacceptable results for aggregate gradation tests. If a test result fails to meet the requirements of the operating range but meets contract compliance, the contractor usually needs to make some change in operations to ensure subsequent test results meet the “Operating Range” requirements. The resident engineer should document the contractor’s actions and any off-site testing done before the next day’s work.

If a test result fails to meet the specified value for contract compliance, the result should be treated just like any other failing test result. However, if the contractor writes a request, the resident engineer may consider leaving the material in place and applying the specified deduction, if the specifications allow. The contractor’s written request, along with documentation for reasons for leaving the material in place and the contractor’s actions, is sufficient for the contract records. A contract change order accepting out-of-specification material is not required in this case because the specifications provide the procedure for acceptance.

The resident engineer must inform the contractor promptly of test results that indicate unacceptable or borderline work. The contractor must be advised that all test results are available for the contractor’s inspection. Accordingly, test results must remain in the project files for ready accessibility.

3-609 Testing by Contractor

Testing by Contractor

The contractor must be satisfied at all times that the quality of materials entering the work and the work performed, regardless of who supplies the materials or performs the work, will meet the contract requirements. For acceptance of materials or work, resident engineers must not use as documentation any tests the contractor performs to control the work. Perform and record acceptance tests as required by Section 6-1, “Sample Types and Frequencies,” of this manual.

3-610 Suspected Fraudulent Test and Inspection Reports

Suspected Fraudulent Test and Inspection Reports

When fraudulent tests or inspection reports are suspected, discuss the situation with the Division of Construction field coordinator. Contact the Office of Materials Engineering and Testing Services for assistance in evaluating the reports. Retest the material represented by suspect tests, as appropriate. If after investigating, fraud is still suspected, the deputy district director provides the facts in writing to the Division of Construction field coordinator.

- 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 Division of Right of Way and Land Surveys, 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 Division of Right of Way and Land Surveys, 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 contractor 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.



- Observe the amounts and proportions of materials spread or entered into the hydroseeder. You may use sack counts and weights to determine the weights of seed, stabilizing emulsion, fiber, and commercial fertilizer.
- Compute and record the spread rates of the various materials applied. For each day of operation, compute and record the spread rates at least once.

4-2002D Seed Sampling

Use the following guidelines for obtaining samples for testing.

4-2002D (1) Scope

The purpose of seed testing is to get quality assurance data regarding the purity and viability (germination) of seed. For accurate laboratory test results, seed must be collected and handled to get representative samples. Samples submitted to the laboratory that are not representative can result in inaccurate or erroneous test results.

4-2002D (2) Size of Sample

For each seed lot greater than 1kg, take a seed sample of approximately 30 grams.

4-2002D (3) Procedure for Sampling

Before handling the seed sample, observe the following requirements:

- Do not touch or sample fungicide dyed seed, such as, dyed red or green, or mercury treated seed or seed labeled, "Treated Seed."
- Use protective gloves when sampling seed.
- Use clean gloves to avoid affecting the purity of the seed samples.
- Avoid inhaling any dust.

When taking the seed sample:

- Take a seed sample from a newly opened seed bag.
- Do not mix samples from different seed species or seed lots.
- Sample the seed by thrusting your gloved hand into the bag and withdrawing representative portions.
- Take at least seven equal portions of seed from various parts of the bag.
- Place each portion in a clean container and visually examine the seed for uniformity.
- When the portions appear to be uniform, combine them in a glassine lined bag provided by the contractor.

4-2002D (4) Sample Preparation, Preservation and Packaging

Sample preservation maintains the integrity of the sample from the time of collection until the tests is performed.

- Keep the samples in a suitable and shaded location. Avoid placing samples in a hot or a damp location.

- Identify the contents of each sample by placing the vendor's original seed label in each bag. Place a custody seal over the bag opening.
- Protect the seed from damage. Package samples in a cardboard box with bubble wrap or insulating peanuts. No additional preservation is necessary.
- Include the following documentation:
 1. Completed Form TL-0101, "Identification Card."
 2. Copy of the seed requirements from the project special provisions.
 3. Seed vendor's seed lot test results.
 4. Copy of the vendor's original seed label.

Send (within 24 hours) the sample and documentation via express mail to the Caltrans contracted seed clearinghouse. The clearinghouse information can be located at:

<http://pd.dot.ca.gov/design/landscape/>

4-2002E Quality Assurance Seed Testing Results

Consider the following areas when making determinations about seed.

4-2002E (1) Results

Quality assurance testing results will be provided through Caltrans contracted seed clearinghouse.

The clearing house will contact the resident engineer by letter with the results of the quality assurance testing in conformance with the specifications. Some potential issues are:

- Species of seed on the seed label does not match the species in the special provisions.
- The percent total viability of the seed is lower than what is specified in the special provisions.
- The percent total weed identified on the vendor seed label is greater than what is specified in the special provisions.
- The presence of California prohibited noxious weeds is identified on the vendor seed label or test results.

4-2002E (2) Nonconformance Procedures

If the contractor fails to comply with the contract specifications for seed, enforce the appropriate contract provisions to ensure compliance based on the nature and severity of the situation. Refer to Section 6-1.04, "Defective Materials," in the *Standard Specifications*.

4-2002F Measurement and Payment

From the weight shown on the certified scale sheets, deduct any leftover straw not used in the work. If a "weigh back" certified weight is not available, you may use bale counts and average bale weights for this purpose.

To determine pay quantities, you may use sack counts and sack weights. Make accurate counts, and record them in the project records.

Determine the pay quantity of live seed using the germination and purity rates of the bulk seed.

Section 28 Lean Concrete Base

Section 28 Lean Concrete Base

4-2801 General

4-2801 General

Lean concrete base is normally used under portland cement concrete pavement and is more rigid and less erodible than cement-treated base. The quality of aggregates for both bases is similar. However, lean concrete base is proportioned, mixed, and placed in a manner similar to portland cement concrete pavement while cement-treated base is not.

The contractor must proportion the aggregate so that it meets the specified grading requirements. The engineer determines the cement content to be used. For design considerations for lean concrete base, see Chapter 600 of the *Highway Design Manual*.

Resident engineers need to plan carefully to fully meet the requirements for inspecting and testing materials. When planning for the inspection of lean concrete base, consider the following:

- The production of lean concrete base
- The placing, finishing, and curing of the base
- The subgrade, specified equipment, and construction of joints for the base

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.

This section focuses on the resident engineer's on-site inspection duties. For information on producing and transporting lean concrete base, see Section 4-90, "Portland Cement Concrete," of the *Construction Manual* (manual).

4-2802 Before Work Begins

4-2802 Before Work Begins

Before work begins, take the following steps:

- For general requirements, review the *Standard Specifications* and plans. For any special requirements, review the special provisions.
- Review the engineer's estimate of quantities to verify accuracy.
- Verify the receipt and proper distribution of Form CEM-3101, "Notice of Materials to Be Used," which lists the aggregate, cement, and curing compound for lean concrete base.
- Section 28-1.01, "Description," of the *Standard Specifications*, specifies the cement content for lean concrete base. After testing the contractor's proposed

aggregate supply, the cement content may be increased. To test the proposed aggregates in accordance with Section 28-1.02, “Materials,” of the *Standard Specifications*, take the following steps:

1. Obtain in writing the contractor’s proposed grading and source of aggregate.
2. In accord with the State Contract Act, check to ensure the aggregate’s source site is permitted and 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:

http://www.consrv.ca.gov/OMR/ab_3098_list/index.htm

Also, see Section 7-103D, “Surface Mining and Reclamation Act,” to determine if the proposed materials site is exempt from SMARA.

3. Well in advance of the 45-day requirement for making aggregates available for sampling, contact the Office of Engineering Materials and Testing Services (METS) to determine whether METS is reviewing the cement content for the base. It is the resident engineer’s responsibility to ensure this process has begun. The district materials engineer may be a good initial contact.
 4. METS may perform the required testing to determine cement content or it may establish the cement content based on previous aggregate testing from the same source.
 5. If METS has received Form CEM 3101, “Notice of Materials to Be Used,” it will probably have initiated action to determine the cement content. If METS needs aggregate testing samples, the resident engineer will be advised. Either district materials laboratory personnel or project personnel may obtain the samples.
 6. METS will notify the resident engineer of the cement content to be used. In accordance with Section 28-1.10, “Payment,” of the *Standard Specifications*, if the amount to be used is greater than the specified content, prepare a contract change order to provide an adjustment in compensation.
- Should the contractor change the supply source, repeat the procedure for determining cement content.
 - Examine equipment or tools to be used for placement following the steps listed below. When obvious inadequacies exist, advise the contractor and enter the details in the daily report.
 1. For sideform construction:
 - a. Examine the forms to ensure they have the specified attributes for items such as composition, weight, dimensions, and rigidity. Before each use, ensure the forms are cleaned and oiled.
 - b. Ensure the installation of the forms complies with specifications. Before the placement of concrete, order any necessary corrective work.
 - c. Ensure the paving equipment complies with specifications.
 2. For slipform construction, ensure the paver has the specified attributes. Require the specified demonstration of satisfactory operation and note such activity in the daily report.

3. To ensure the contractor meets the requirements for protecting the base, examine all equipment that will travel on the completed base.
- Just before the start of paving check the accuracy of the final grade stakes.
 - Inspect the subgrade to ensure it conforms to the tolerances specified for compaction and elevations. Ensure that any low areas are identified and will be filled with additional base and that any high areas are trimmed as specified. Additional thickness is paid for as part of the lower layer and must not be included when calculating base thickness.
 - When slipform pavers are used, inspect the grade upon which the paver will ride to determine if it is smooth enough to prevent abrupt vertical changes in the finished surface. When the paver controls the grade and alignment by a wire, sight along the wire for any obvious variations, and order necessary corrections. Ensure the wire is tensioned sufficiently so no measurable sag occurs between the supporting stakes. Advise the contractor if you anticipate any problems. Keep in mind that the contractor is responsible for compliance with thickness and grade requirements.
 - Check the facilities proposed for producing and transporting lean concrete base. Section 4-90, "Portland Cement Concrete," of this manual covers the items involved.
 - Ascertain the curing methods and type of material the contractor proposes to use. Discuss with the contractor the requirements for labeling and packaging the curing compound.
 - The material specified for curing depends on whether the overlying surface will be portland cement concrete pavement or asphalt concrete pavement. When the overlying surface is portland cement concrete, the specifications require a much higher percentage of paraffin wax in the curing compound than that required for an overlying surface of asphalt concrete.
 - The curing compound for an overlying surface of portland cement concrete serves a dual purpose. It both cures the lean concrete base and also, after the pavement is placed, provides a bond-breaking membrane between the pavement and base. The bond breaker is very important if cracks and the longitudinal weakened plane joint in the lean concrete base are to be prevented from reflecting through the pavement.
 - Examine the equipment to be used for applying the curing compound to determine whether it meets specifications.
 - Before paving begins, ensure equipment for constructing longitudinal weakened plane joints is onsite and conforms to specifications.
 - Confirm placement dates with the contractor and arrange Caltrans personnel for plant inspection and testing.
 - If paving or finishing operations will extend beyond daylight hours, ensure the project has adequate lighting before the contractor begins placing the lean concrete base.
 - When the project requires long hauls, review the contractor's proposed placement method to ensure adequate time.
 - Before placing the lean concrete base, ensure the subgrade is uniformly moist.

4-2803
During the Course
of Work

4-2803 During the Course of Work

Once work begins, take the following steps:

- Before mixing, obtain samples of the aggregate. Also, in accordance with the frequency shown in Section 6-1, "Sample Types and Frequencies," of this manual, test for the specified attributes. Initially, and in the case of borderline material, take and save additional samples. In case the first samples tested do not meet the requirements for contract acceptance, the extra samples may be tested to determine the extent of the failing material.
- When the results of grading or sand equivalent tests, or both, are outside the limits for contract compliance, determine whether the lean concrete base represented by the tests is structurally adequate. When lean concrete base is left in place even though it does not comply with the contract, the specified payment by the contractor must be made by administrative deduction. Document the reasons for leaving the concrete in place, and notify the contractor of your decision and the deduction amount.
- For placing lean concrete base and applying curing compound, ensure the subgrade is not frozen and the ambient temperature is above the minimums required.
- As it is placed, observe the lean concrete base for any improper proportions or inadequate mixing. In the daily report, record the reasons for rejecting any lean concrete base and the approximate amount rejected.
- Ensure the contractor furnishes the required tachometer. Also, check to ensure that frequencies are as specified. Immediately replace inoperative vibrators.
- To ensure the correction of any problems related to mixing or hauling, maintain good communication with the engineers who inspect operations at the mixing plant. For more detailed information about transporting concrete and receiving load tickets at the delivery point, see Section 4-90, "Portland Cement Concrete," of this manual.
- Obtain samples of the plastic concrete, and perform penetration and air content tests in accordance with the frequencies shown in Section 6-1 of this manual.
- Compressive strength tests of the lean concrete base are only necessary to confirm design assumptions. For information, it is recommended that you test compressive strength near the start of placing lean concrete base.
- Ensure the material for longitudinal weakened plane joints is placed to the dimensions specified. Also, ensure the contractor vibrates the lean concrete base to cause an even flow of material about the joint.
- Ensure the construction of a contact joint whenever an interval exists that is greater than the specifications allow between the placement of any two successive loads of lean concrete base.
- When the contractor uses side form construction, ensure screeding and tamping conforms to the specifications. Where the hand-float method is permissible, ensure the contractor uses the specified floats and methods.
- Ensure the surface of the lean concrete base is textured as specified. Lean concrete base to be surfaced with asphalt concrete must have a rough texture to prevent

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:

http://www.consrv.ca.gov/OMR/ab_3098_list/index.htm

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.

4-3703 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:

http://www.consrv.ca.gov/OMR/ab_3098_list/index.htm

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 40 Portland Cement Concrete Pavement

Section 40 Portland Cement Concrete Pavement

4-4001 General

4-4001 General

This section covers portland cement concrete pavement. A concrete paving operation includes the following:

- The production of the portland cement concrete
- The placing, finishing, and curing of the concrete pavement
- The concrete pavement subgrade
- The specified equipment
- The construction of joints
- The protection of the pavement

Plant inspection specialists and acceptance testers not directly assigned to the resident engineer usually perform inspection and testing duties at the concrete batch plant. However, in addition to on-site inspection, mix design and plant inspection are part of the resident engineer's responsibility. Good communication is essential between plant and inspection specialists and assistant resident engineers. The resident engineer must be kept informed of test results in a timely manner.

This section will mostly cover on-site inspection duties. For information on producing and transporting portland cement concrete, see Section 4-90, "Portland Cement Concrete," of the *Construction Manual* (manual).

4-4002 Before Work Begins

4-4002 Before work begins

Before work begins, do the following:

- Review the plans and specifications to determine the requirements for portland cement concrete pavement, including thickness requirements, joint and tie bar details, and cement content requirements.
- Verify the receipt and proper distribution of Form CEM-3101, "Notice of Materials to Be Used," which lists materials for portland cement concrete pavement.
- In accord with the State Contract Act, check to ensure the aggregate source is a permitted site in compliance 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:

http://www.consrv.ca.gov/OMR/ab_3098_list/index.htm

Also, see Section 7-103D, "Surface Mining and Reclamation Act," to determine if the proposed materials site is exempt from SMARA.

- The specified cement content is based on the best information available to the project design engineer. The procedure to determine the actual cement content that will be used is as follows:
 1. To determine whether the cement content for the pavement is being reviewed, contact the Office of Materials Engineering and Testing Services (METS) at least 70 days before paving begins. The resident engineer must ensure the process has started. The district materials engineer may be a good initial contact.
 2. METS may perform the required testing to determine cement content or may establish cement content based on previous testing of aggregates from the same source. If METS has received Form CEM 3101, "Notice of Materials to Be Used," action will probably have been initiated to determine the cement content. If METS needs samples of aggregate for testing, the resident engineer will be advised. Either district materials laboratory personnel or project personnel may obtain the samples.
 3. The resident engineer will be advised of the recommended cement content. If the recommended cement content and the specified cement content are different, prepare a contract change order to provide an adjustment in compensation in accordance with Section 40-1.015, "Cement Content," of the *Standard Specifications*.
- Obtain initial samples and design the mix as covered in Section 4-90, "Portland Cement Concrete," of this manual. For assistance with the mix design process when needed, contact the district materials engineer or responsible unit.
- Well before paving begins, contact the district materials engineer to make arrangements for measuring pavement thickness. Personnel from the district materials laboratory or METS may take core samples for thickness measurements or you may need to initiate a service contract for taking core samples.
- Decide whether crossings will be necessary for the convenience of public traffic and whether Type III portland cement should be used for such crossings. Advise the contractor accordingly.
- Examine the equipment or tools to be used. When obvious inadequacies exist, advise the contractor and enter the details in the daily report. More specifically, do the following in examining equipment or tools:
 1. For side-form construction:
 - a. Examine the forms to ensure the specified attributes, including those for composition, weight, dimensions, and rigidity. Ensure the forms are cleaned and oiled before each use.
 - b. Ensure that installation of the forms complies with the specifications. Order any necessary corrective work before the placement of concrete.
 - c. Inspect the paving equipment for specification compliance.
 2. For slip-form construction, examine the paver for the specified attributes. Require the specified demonstration of satisfactory operation and note such activity in the daily report.

- Prefabricated epoxy-coated reinforcing steel (purple or gray in color) is cut to size and bent to shape before applying the coating. Prefabricated epoxy-coated rebars must not be bent or rebent after the coating.
- Postfabricated epoxy-coated reinforcement (green in color) is more flexible. It is applied to straight rebar, which is subsequently cut and bent to shape.
- Until the engineer approves the proper submittals, do not permit welding of any type on reinforcing steel. Refer to the *Bridge Construction Records and Procedures Manual*, Volume II, Section 180, for guidelines.
- Bar reinforcing steel is spliced by lapping bars, by butt welding bars, or by using mechanical couplers. Mesh reinforcement, reinforcing wire, or plain bars are generally spliced by lapping. Inspect all lapped splices to ensure the minimum lengths of lap and stagger distances conform to the plans and specifications. In particular, notice that the size of a bar and the grade of steel will determine the length of lap required. Ensure the laps are securely wired to maintain the alignment of the bars. Lap splices of mesh reinforcement must be tied securely with wire to prevent distortion of the mesh.
- All mechanical butt splices, butt welds, and lap welds on epoxy-coated reinforcing steel must be protected from corrosion with an approved mastic-lined shrink tube protective cover. You can find the METS list of approved coverings to protect against corrosion at:

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

The mastic-lined shrink tubing must be used as specified in accordance with manufacturer and Caltrans requirements. Ensure the shrink tubing is installed as a continuous tube with sufficient diameter and length to achieve an adequate seal and bond length. The tubing must not have any dirt, grease, sharp edges, tears, or pinholes. After the tubing is heated as specified, ensure it extends a minimum of 50 mm onto the epoxy-coated reinforcing steel.

4-5204 Measurement and Payment

Refer to appropriate sections of the special provisions and *Standard Specifications* for the basis of measurement and payment. If payment is on a unit basis, you may need to keep records of reinforcement that is actually in place in the structure. Also, calculate any changes that result in increases or decreases in quantities of reinforcement.

4-5204

Measurement and Payment

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/ab_3098_list/index.htm

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 1 Project Records and Reports

5-101 Forms Used For Contract Administration

5-101A General

One of the duties of the resident engineer is to keep accurate and complete records of the work. This section includes a list of forms used in administering a construction project and maintaining records. Use forms not related directly to contract administration, such as personnel documents and accounting forms, in accordance with instructions contained in other Caltrans manuals.

The Division of Construction issues new or revised construction forms. All Division of Construction forms have a prefix of CEM and a number that is related to the form's uniform filing system category. If an existing form no longer meets the need that it was designed for, use the following procedure to implement a change:

- Complete Form CEM-9001, "Construction Manual Proposed Change," and send it to the Division of Construction forms coordinator. Explain the reason for the proposed change and attach a draft of the proposed revised form.
- The Division of Construction will review the proposed change and make a decision regarding any future revision.

Not all forms issued by the Office of Materials Engineering and Testing Services (METS) are listed in this manual. If a test method includes a specific form, contact METS.

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

5-101B Construction Forms

Order construction forms by stock number from district warehouses or stockrooms. Forms without stock numbers may be found on the Caltrans Electronic Form System's (CEFS) Intranet web site:

| <http://cefs.dot.ca.gov/>

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

| <http://www.dot.ca.gov/hq/construc/>

The appendix to the *Construction Manual* (manual) contains samples of the construction forms.

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

Form CEM-0101, Resident Engineer's Report of Assignment

When assigned to a new project, the resident engineer must use Form CEM-0101, "Resident Engineer's Report of Assignment." This provides contact information. Distribute copies of the report according to instructions on the form and any district instructions.

It is not necessary or desirable to hold the form until all information is available. Submit partial information with a note that a supplemental form will follow.

Section 1 Project Records and Reports

5-101 Forms Used For Contract Administration

Form CEM-0501, Relief from Maintenance

The resident engineer uses Form CEM-0501, “Relief from Maintenance,” to recommend that the contractor be relieved from maintenance and responsibility in accordance with Section 7-1.15, “Relief from Maintenance and Responsibility,” of the *Standard Specifications*. For more information see Section 3-709, “Relief from Maintenance and Responsibility,” of this manual.

Form CEM-0601, Construction Safety Report

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

Form CEM-0602, Project Safety Program Statement

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

Form CEM-0603, Major Construction Incident Notification

The resident engineer uses Form CEM-0603, “Major Construction Incident Notification,” to report major construction incidents. Instructions for use are included on the back of the form.

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

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

Form CEM-1201, Subcontracting Request (Stock # 7541-3514-7)

The contractor submits Form CEM-1201, “Subcontracting Request.” The resident engineer uses the form to calculate the percentage of work to be performed by the contractor. Section 3-8, “Prosecution and Progress,” of this manual describes the procedures. The resident engineer must approve this form before the contractor can begin on the applicable subcontracted work. Before approval, verify that subcontractors are not on the Debarred Contractors list on the Division of Construction’s web site.

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

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

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

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



Example 5-4.11 - Sample District Director Determination of Claims Major and Minor A Contracts

STATE OF CALIFORNIA -- BUSINESS, TRANSPORTATION AND HOUSING AGENCY

ARNOLD SCHWARZENEGGER, Governor

DEPARTMENT OF TRANSPORTATION

DISTRICT NUMBER

ADDRESS

PHONE NUMBER

FAX NUMBER



*Flex your power!
Be energy efficient!*

CERTIFIED MAIL RETURN RECEIPT REQUESTED

Date

Dist-EA

Dist-Co-Rte-PM

Federal Aid Project: FA#

Contractor's Name

Contractor's Address

Subject: Final Determination of Claims

Gentlemen:

District (district number) has reviewed the (number of exceptions) exceptions (claims) that (contractor's name) filed in response to the proposed final estimate. These exceptions total \$ (amount).

Mr. (Name) of (Name of Contractor) and district staff met with the board of review to present claim numbers (BOR claim numbers) on (date). The board of review, at the conclusion of the contractor and district presentations, made its investigation of said claim(s) and has submitted its report and recommendations to me. In addition, claim numbers (non-BOR claim numbers) investigated by district personnel have also been referred to me for final decision. Having considered said information, I determine, in accordance with the authority vested in me under provisions of the contract, as follows:

Claim No. X	Claim Description	\$ (Amount Claimed)
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1. That.....
2. That.....
3. Etc.

Example 5-4.11 - Sample District Director Determination of Claims (continued)

Claim No.Y	Claim Description	\$ (Amount Claimed)
1. That.....		
2. That.....		
3. Etc.		

Summary

The payment of each of the various claims is summarized as follows:

Claim No.	Description	\$ Amount Claimed	\$ Amount Paid
X		\$(Amount)	\$ (Amount)
Y		\$(Amount)	\$ (Amount)
TOTAL		\$(SUM)	\$(SUM)

This concludes Caltrans administration of the claims process. The district will process the final estimate in accordance with this Final Determination of Claims by the district director.

If you wish to pursue this matter further, arbitration is available, as provided in Section 9-1.10, "Arbitrations," of *the Standard Specifications*. You must file a complaint in arbitration within 90 days of receipt of this final decision at the following address:

Office of Administrative Hearings
Public Works Contract Arbitration Program,
2349 Gateway Oaks Drive, Suite 200
Sacramento, CA 95833-4231,

The copy of your complaint also must be served on the following:

Department of Transportation
Chief Counsel, Legal Division
1120 N Street MS 57
Sacramento, CA 95812



Section 2 Acceptance of Manufactured Material and Sampling Methods

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

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//ab_3098_list/index.htm

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.

Section 2 Acceptance of Manufactured Material and Sampling Methods

6-201 General

6-202 Responsibilities and Procedures for Acceptance of Materials

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.)

6-305D (3) Identification of Test Cylinders

For compressive strength tests, use Form TL-0502, “Field Sample of Portland Cement Concrete Sample Card.” The card must be complete. Do not leave any blank spaces. Designation of the type of concrete must be included (such as Class 1 or 25 MPa).

In accordance with the State Contract Act, 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. Form TL-0502 should be filled out with the appropriate SMARA Listing number. This list can be obtained from the Division of Construction or at the Department of Conservation’s web site:

http://www.consrv.ca.gov/OMR/ab_3098_list/index.htm

Refer to Chapter 7, “Environmental,” of this manual for further information on SMARA requirements

In the space for “water-weight per sack,” indicate the total weight of water used per sack of cement in the mix based on actual weights (not design weights). On the last blank line of the concrete information box indicate the specified concrete strength or class if any. Otherwise mark the space with a line. Under “remarks” indicate if the unit weight of the hardened concrete cylinder(s) is required. The laboratory will not furnish unit weight data unless it is specifically requested. Make out a sample card for each pair of cylinders shipped in the same carton.

A uniform system of marking cylinders is used. This system consists of the contract number and the sample number. The sample number consists of a series of digits separated by dashes (-) to indicate: method of storage for curing, age at which cylinder(s) are to be tested, the cylinder number of the pair, or the group of 5, which is to be tested, and job coding. Use a flow pen to mark each sample can. Examples of this marking system follows:

Example 6-3.1 Sample Cylinder Label

Contract No.	03-100844
Sample No.	1-28-1/5 _ _ _ _ _
Date Cast	_____

In the sample number shown above, the first digit indicates method 1 storage for curing; use only one digit for this designation. The second group of two digits indicates that the cylinder is to be tested at 28 days; use two digits for the test age. The third 1/5 symbol indicates that it is the No. 1 cylinder of a 5-cylinder trial batch sample; the No. 2 cylinder would be marked 2/5, and so on. If only one sample card was made for two cylinders, the third symbol on the card would be 1,2/5. The last four spaces are reserved for any desired job coding consisting of numbers, letters, or a combination of both.

Example 6-3.2 Sample Cylinder Label

Contract No.	03-100844
Sample No.	2-14-2/2 _ _ _ _ _
Date Cast	_____

In this example the first digit indicates method 2 storage for curing. The second group of two digits indicates that the cylinder is to be tested at 14 days. The third 2/

2 symbol indicates that it is the No. 2 cylinder of a 2-cylinder test group. Again, if only one sample card is made for the two cylinders, the third symbol on the card would be 1,2/2. The last four spaces represent any desired job coding consisting of numbers, letters, or a combination of both.

6-305D (4) Shipping

Cylinders are shipped to the laboratory in accordance with the provisions of California Test 540, "Making, Handling, and Storing Concrete Compressive Test Specimens in the Field." Cylinders are shipped without removing the mold and are packed in cardboard containers that are available from district warehouse. Each carton holds two cylinders.

If the district transportation laboratory is equipped to test concrete cylinders they should be sent there. Otherwise cylinders may be shipped or delivered either to METS in Sacramento or Los Angeles, whichever is more convenient. Cylinders are not to be shipped cash on deliver to METS. Do not accumulate test cylinders at the job site. Ship them within the time limit specified in California Test 540.

6-305E Relative Compaction Using Nuclear Gauges

California Tests 231, "Relative Compaction of Untreated/Treated Soils and Aggregates (Area Concept Utilizing Nuclear Gauges)," and 375, "Determining the In-Place Density and Relative Compaction of AC Pavement," set forth the procedures for determination of relative compaction by use of nuclear gauges.

In addition to California Test 231, use of nuclear gauges is contained in California Test 121, "Administrative Instructions For Use of Nuclear Gauges," as well as the manufacturer's manual pertaining to the gauge being used. A copy of these documents must be kept with each gauge. Each operator must report missing documents and arrange for their replacement.

The person responsible for general inspection of the work and the person performing the test measurements, are both involved in performing the complete test. The progressive steps are:

- Designating the test area.
- Selecting test sites within the test area.
- Taking physical measurements.
- Determining test maximum value for comparison with the average in-place density (California Test 231 only)
- Evaluation.

6-305F Determining the Accuracy and Suitability of Scales and Meters used in Materials-Processing Plants

California Test 109, "Test for Weighing and Measuring Devices," is the test method for determining the accuracy and suitability of weighing and measuring devices used to proportion materials in materials producing plants. See Section 3-9, "Measurement and Payment," of this manual for weighing and metering procedures.

The maximum interval for retesting proportioning equipment is as follows:

- Asphalt concrete and portland cement concrete batch plants - 1 year
- Asphalt concrete continuous mixing plants - 6 months
- Slurry seal mixer-spreader trucks - 6 months or when aggregate sources are changed.

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. Provide 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 (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 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:

http://www.consrv.ca.gov/OMR/ab_3098_list/index.htm

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 when an agreement exists between the federal landholding agency and the California Department of Conservation that SMARA applies, and



- Materials from Native American reservations when 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 when 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 when 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.



- 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

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.

7-105

Permits

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 110.11, “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.