Chapter 3: Contract Administration

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3-1 Introduction

This chapter will discuss some of the items of contract administration that are unique to building construction. This will include working with multiple design disciplines and outside agencies and jurisdictions that will be involved in the construction phase of the project. It will also be a guide to managing the lump sum bid price for the entire building or buildings on the project, as well as how to handle changes that will occur in the building work.

3-2 Relationships with Caltrans Design Team

3-2.01 The Caltrans Project Design Team

The project design team consists of professional architects, engineers, and designers within the Office of Transportation Architecture (OTA) and the Office of Electrical, Mechanical, Water and Wastewater Engineering (EMWW); both subdivisions are found within the Division of Engineering Services (DES) Structures & Engineering Services (SES). Although the designer may not necessarily be a licensed architect or engineer, their designs will be stamped by their branch chief, who is a registered professional.

The Project Architect serves as the lead on most building projects. Their role is similar to that of the Bridge Design Project Engineer on bridge projects. When the project consists primarily of mechanical, electrical, water, or wastewater work with little or no building work, the lead EMWW designer will be the professional responsible for the greatest value of the work for the project.

The members of the project design team that may be licensed or registered professionals include the following: Project Architect, structural designers, mechanical engineers, electrical engineers, civil engineers, landscape architects, and specification engineers. Other members that are not required to be licensed/registered include estimators, designers, and detailers. Through a coordinated effort, the design team provides all the technical expertise for the project design, development of the contract documents, and construction support. The construction support includes such activities as: the submittal review and approval process; the response and clarification to a request for information (RFI); response and assistance in the preparation and review of change orders; periodic inspections; final inspections; preparation of punch lists; and, if required, the project start-up and testing process.

3-2.02 Determining Your Project Design Team Members

Identifying the appropriate project design team members can be challenging, particularly given the current pace of retirements and staff reassignments. A practical

starting point is to review the names listed on the plan sheets—specifically those who stamped the documents or are noted in the “Design By” section of the title block.

If possible, locate the project lead—such as the Project Architect or the EMWW engineer—and reach out to them for a list of current team members responsible for construction support. Additionally, the VISION[1] system, accessible through the Structure Construction website, provides information on staff assignments, design units, and the project manager.

In cases where the individuals listed on the plan sheets are no longer in their roles, the district project manager should be able to provide updated contact information. Alternatively, you may need to consult with the senior engineers in either OTA or EMWW to determine who is currently handling construction support for the project.

Once the design team has been identified, it is recommended to compile a contact list that includes their phone numbers and email addresses for ease of communication.

3-3 Relationships with Consultant Design Team

3-3.01 Communications

Communication between the field and design team is essential. The Project Architect is the lead for the development of the structure portion of the project plans. The Project Architect should be the primary contact for both the Structure Representative and the Resident Engineer. The Project Architect may redirect questions to one of the other disciplines (e.g., electrical, mechanical, structural, etc.) as needed. All comments and directions received from any of the other disciplines must be approved by the Project Architect before being incorporated in the work. It is essential that the Structure Representative and the Resident Engineer provide confirmation of any direction in writing to all those involved in making decisions, including the Project Architect. This can be done via e-mail to ensure that the Project Architect is informed and concurs with any direction given.

3-3.02 Submittals

Usually, contracts with consultant designers provide for an extra week of submittal review time. Check the special provisions to become familiar with the contract time allowed for the review process of submittals. This information will help to monitor the review process and keep the Project Architect informed to minimize the risk of delay. Similarly, the time to review and respond to a Request for Information (RFI) must be closely monitored. Submittals flow from the Contractor through the Structure Representative or Engineer of Record. Submittals are then routed through SC Office

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Associates and will be distributed to the consultant designer. The consultant designer will review and authorize the submittal. If acceptable after consultation and agreement by the Structure Representative, the authorized submittal will be routed back through SC Office Associates to the Structure Representative.

3-3.03 Final Inspection

While construction support is a priority, consultant firms often have numerous commitments and may not be able to respond to scheduled inspections on short notice.

In some instances, the contract with the consultant may have expired prior to construction. In the event that a consultant is not available, the Office of Transportation Architecture and Electrical, Mechanical, Water and Wastewater Engineering (TAEMWW) will assign the appropriate personnel for construction support to handle potential problems, changes, and final inspections.

3-4 Relationships with Design Team

3-4.01 Internal Preconstruction Meeting with the Design Team

It is highly recommended to hold a coordination meeting between the Structure Representative, the Resident Engineer, and the project design team to review the contract documents prior to the start of construction. While an in-person meeting is preferred, a virtual meeting is also acceptable if necessary. Note: this meeting is not to be confused with the preconstruction conference described in Section 3-10, *Preconstruction Conference with Contractor.*

This meeting serves several important purposes:

1. It allows Structure Construction (SC) staff to become familiar with the design team members and their respective roles.
2. It provides an opportunity to discuss key topics such as:
   a. Design considerations or construction-related concerns
   b. Anticipated construction challenges requiring design team input
   c. Submittal and shop drawing review procedures
   d. Access to full-size plan sheets or blank floor/site plan sheets
   e. Utility connection details and contact information.

3-4.01A Preparation Prior to the Meeting

Before the meeting, the Structure Representative should:

1. Request and review the RE Pending File and any constructability reviews; see Bridge Construction Memo C-2, *Using the Resident Engineer's Pending File for Structure Work*.

2. Compare these documents carefully against the final contract documents.
3. Conduct a thorough review of the contract documents to fully understand the project scope.

3-4.01B Meeting Objectives

The primary goals of the meeting are to:

1. Familiarize the Structure Representative and Resident Engineer with the project and design team.
2. Allow the design team to highlight any areas of the project that may present challenges or require special attention.
3. Review constructability comments, especially those not fully addressed or incorporated into the final design.
4. Identify any issues that may need resolution before they are raised by the Contractor as potential change orders or delay claims.

3-4.01C Process Discussions

The meeting should also include a review of the following processes:

1. Submittal and shop drawing review procedures, including expectations for concurrent vs. sequential reviews
2. RFI (Request for Information) process
3. Change order procedures
4. Alternative product proposal process
5. Tracking and managing the review timeline, particularly the 15-day contractual turnaround requirement.

3-4.01D Inspection and Close-Out Expectations

Clarify the design team's preferences regarding:

1. Timing and stages for site inspections
2. Expectations for start-up and testing procedures
3. Project close-out requirements, including:
    a. Review and approval of Operation and Maintenance manuals
    b. Test and balancing procedures
    c. Warranties and guarantees.

This meeting also provides an opportunity for the design team to share any additional insights or lessons learned during project development that may benefit the construction phase.

3-5 Project Review with Resident Engineer

Building contracts will often include several independent interrelated structures, utilities, and other elements. This combination within the scope of the work will require considerable time to review the documents and to coordinate the work. Although the Resident Engineer (RE) may provide a review and coordination of some of the work associated with the buildings, the primary responsibility resides with the Structure Representative (SR). Also, be careful to coordinate the work of the buildings with the civil site work.

The RE and SR should make a detailed study of the project plans, special provisions, and other related contract documents in advance of the project being awarded. It would be better if that review could be completed before the project is bid, as there may still be an opportunity to make any needed changes and/or corrections. Note that various Standard Special Provisions (SSPs) from Section 99[1], *Building Construction,* are likely customized in the project *Special Provisions*.

Conflicts between various documents, details, and existing site conditions will frequently occur. It is important that these conflicts be discovered as early as possible and corrected prior to the Contractor making purchases or any other commitments relating to that work, and prior to the beginning of the construction phase of those items. This will help to minimize the risk of additional changes and/or delays to the project. Any questions that may arise from this project review regarding corrections, clarifications, or required changes are to be relayed to the design team. This will allow the design team to anticipate the need for coordination, support, and implementation for any revisions that may be needed to the contract documents.

3-6 The Construction Team

The construction team onsite responsible for contract administration, project management, and inspection usually will primarily consist of the RE, assistant RE(s), SR, and assistant SR(s).

The RE and SR provide the day-to-day onsite inspection, administration, and management for the project. Materials testing and inspection of materials at the manufacturer's facilities are performed by Materials Engineering and Testing Services (METS).

The RE retains full authority and responsibility to ensure:

1. The project is built in accordance with the contract documents.
2. The materials incorporated in the work meet the requirements of the plans and specifications.

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3. The quality of the work, through quality assurance (QA), is per the project plans, special provisions, and authorized submittals.
4. Timely review and approval of monthly progress payments for the work completed by the Contractor.
5. Thorough review and timely processing of project change orders.

The SR provides technical support to the RE in the areas of contract administration and project management for all structural components of the project. This role includes facilitating, coordinating, and inspecting the Contractor's and subcontractors' work related to all aspects of the building structure(s). The SR is also responsible for reviewing and approving monthly progress payments for non-unit cost structure bid items, as outlined in the schedule of values.

Prior to the start of construction—or early in the construction phase—it is advisable for the SR and RE to meet with the facility supervisor, managers, and any agencies that will ultimately occupy or use the completed facilities. This meeting allows end users to communicate any additional concerns or functional requirements for the final product. It can also provide valuable insight into existing site conditions, including utilities, access constraints, and security considerations.

For projects involving the renovation or rehabilitation of an occupied facility, coordination with the State facility supervisor is essential to ensure that ongoing facility operations are maintained with minimal disruption. During this coordination, it is important to clarify that all communication regarding changes to the project must be directed through the RE and SR. These two roles are the only individuals authorized to issue changes or revisions to the contract.

3-7 Permits and Outside Agencies and Jurisdictions

Permits serve to ensure that all work will comply with applicable codes and assure utility suppliers that the quality and status of the work are satisfactory for service connection. For utility connections, see details in Section 3-9, *Relationships with Utility Companies.*

Building permits may be required when the work is for private businesses or a right-of-way obligation. State buildings are not subject to permit requirements of lesser political subdivisions (i.e., cities and counties); notable exceptions are as follows:

1. State facilities are subject to the requirements and restrictions (including some permits) for items which directly affect the local community, property protection, and the environment. Connections to local sewer and water districts, encroachment permits for work on local streets and roads, groundwater issues

such as well abandonment and septic system leach fields, and stormwater drainage all must comply with local ordinances.

2. Operating permits for some specific items such as pressure vessels (compressors and LPG storage tanks), other storage tanks, fuel facilities, elevators, fire protection systems, etc. may be required prior to facility operation. These requirements are usually listed in the special provisions and are part of the contract. Pressure vessels, for example, are under the jurisdiction of the Pressure Vessel Unit of Cal-OSHA and will require a permit to operate.

If a county or city building official, the fire department, or other outside agency representative visits the project and challenges any part of the design or construction, the SR and/or the RE should address the concerns. Determine what the concerns of the outside agency are, investigate and gather facts, consult with the designer(s) to assist with any responses and decisions, obtain concurrence with the Project Architect, and then respond to the outside jurisdiction regarding any decision, actions, or resolution.

3-8 Relationships with the State Fire Marshal

The Office of the State Fire Marshal (SFM) is responsible for fire and life safety. The SFM enforces laws and regulations related to fire prevention, life safety, fire protection systems, and building construction and protection. This is done through code compliance plan reviews and inspections of state-owned and state-occupied buildings and institutions, as well as other types of occupancies under the jurisdiction of the SFM.

3-8.01 Deputy State Fire Marshal Inspections

3-8.01A Before Construction

Before construction begins, the SR must ensure that all building-related contract plan sheets bear the California State Fire Marshal (SFM) approval stamp. This stamp is typically located near the upper-right corner of each sheet and indicates that final approval is subject to field inspection. Additionally, a code analysis sheet should be included, listing applicable fire and occupancy codes along with the SFM permit number obtained during design.

The SR should then identify and contact the local Deputy State Fire Marshal (DSFM) responsible for field inspections; the DSFM acts as a designated representative of the SFM. DSFMs are part of CalFire's Office of the State Fire Marshal (OSFM Contact List), within the Fire & Life Safety Division. The most current contact information can be found by either contacting the Division at:

- OSFMFireLifeSafetyGOVmotus@fire.ca.gov (email)
- 916-568-3801 (phone)

Or locating and contacting the appropriate area DSFM based on:

- Complete Fire and Life Safety Contact List

The SR may also contact the supervising DSFM for the region if multiple DSFMs serve the area, or search for their contact in Microsoft Outlook.

Once the appropriate DSFM is identified, the SR should provide:

1. A complete set of project plans
2. Project details and anticipated schedule
3. SR's contact information.

In return, the SR should request the DSFM's:

1. Contact information
2. Inspection procedures and expectations
3. Required lead times and preferred methods for scheduling inspections.

It is recommended to hold a preconstruction coordination meeting with the DSFM to review the project scope and inspection requirements, particularly for fire-life-safety systems.

3-8.01B During Construction

Throughout construction, the SR and/or Contractor must maintain regular communication with the DSFM and provide sufficient lead time to schedule inspections. This is especially important for any work that will be concealed or that requires in-process inspection.

The DSFM is responsible for inspecting all elements related to fire and life safety, including but not limited to:

1. Fire sprinkler and fire alarm systems
2. Fire-rated walls, doors, and building separations
3. Through-penetration firestopping
4. Occupancy zones and exit routes
5. Fuel facilities, propane tanks, and fire hydrants
6. Fire pump and fire pump controller.

Underground Fire Water Systems, including:

1. Piping joints and thrust blocks (before, during, or after placement, as coordinated)

2. Pressure and flow testing
3. Backflow preventer connecting to fire pump system.

Fire Protection Systems

Coordinate inspections for:

1. Installation and testing of fire sprinkler systems
2. Installation and testing of fire alarm systems
3. Fire sprinkler control cabinet testing.

Fire-Rated Assemblies

If the project includes fire-rated walls, doors, or other assemblies, coordinate with the DSFM to determine the appropriate inspection stages. Confirm which specific installations they need to witness.

Keep the DSFM informed of the construction schedule to ensure timely inspections of all fire and life safety-related work.

A Clean Agent Fire Extinguishing System may be required for an IT server room or an electrical control room. An IT room sometimes gets installed in the building by IT without the building designer's knowledge. Contact OTA and IT for clarification if a server room is discovered that is not shown in the plans.

3-8.01C Project Completion and Final Inspection

As the project nears completion, the DSFM will conduct a final inspection to verify:

1. Exit routes and signage
2. Fire extinguisher placement
3. Overall compliance with fire and life safety requirements.

Once all inspections are satisfactorily completed, the DSFM will issue a Certificate of Occupancy. This certificate is required before the facility can be occupied. A copy must be provided to the building end user.

3-8.02 State Fire Marshal Deferred Submittals

Certain items in your building contract may be classified as "Deferred Submittals," meaning they require separate authorization by the SFM. Common examples include:

1. Fire sprinkler systems
2. Fire alarm systems
3. Standby generators

4. Smoke control
5. Clean Agent Fire Extinguishing System.

These systems are not fully designed by the State and require contractor-provided design or submittal information. Deferred submittals are typically identified on the "Code Analysis" sheet in the contract plans or referenced in the applicable sections of the *Special Provisions*.

3-8.02A Current Specification Requirements

Under current specifications, the Contractor is required to obtain SFM authorization—with the submittals stamped "Approved" by the State Fire Marshal—prior to submitting them to DES for final authorization. Contractors are advised to allow 12 weeks for SFM review and authorization.

For deferred submittals, this procedure is different. To improve coordination and reduce the risk of conflicting approvals, the following revised procedure is used:

1. Initial Review by DES
   Deferred submittals should first be submitted electronically to DES for review and conditional approval, subject to final approval by the SFM.
2. Subsequent Review by SFM
   Once DES has completed its review for contract compliance, the Contractor submits the deferred submittal (with conditional approval) to the State Fire Marshal for review of fire and life safety code requirements.
3. Final Submittal to DES
   Once SFM issues final approval for the deferred submittal, the Contractor is required to submit the final drawings to the DES that are stamped "APPROVED" by the SFM.

This revised process is necessary because the SFM review is limited to code compliance and does not consider project-specific contract requirements. By allowing DES to review first, potential conflicts can be identified early, thus avoiding situations where a submittal is authorized by the SFM but later rejected by DES, which would otherwise require a full resubmittal.

If the SFM issues final approval for the deferred submittal after DES's conditional authorization, a Change Order (CO) is not required. In contrast, a CO may be required if the SFM rejected the deferred submittal after DES's conditional authorization. DES/RE and the Contractor determine what the CO will entail. A resubmittal is required that must incorporate all the SFM's comments.

Deferred submittals requiring SFM authorization must be submitted to the Sacramento office of the State Fire Marshal, either in paper or electronic format.

Detailed submission instructions can be found on the SFM website under the Fire and Life Safety Division, by navigating to the "Construction Permitting and Plan Review" section and related links.

3-9 Relationships with Utility Companies

Determine whether any utility companies will be involved in the construction of your project. Review the project plans and RE pending file for any utilities for which new or upgraded service will be required. Utilities may include electric, natural gas, water, sewer, fiber optics, and telephone. Discussions with your project design team will be helpful in this endeavor; this should be done at an internal preconstruction meeting with your project design team (described in preceding Section 3-4.01).

3-9.01 Application for Service Providing by Utility Company

Typically, the OTA and EMWW designers have established contacts with the serving utility companies, and there may be agreements in place or at least contact names and phone numbers for the utility company representatives. Sometimes, particularly with the larger utility companies, if agreements for service have been made during design a year or more prior to construction, these agreements may have been placed in an inactive file with the utility company and they may be hard to retrieve, or a new agreement may need to be started. It is usually the SR who will need to contact the utility company representative to determine which agreements are in place and what is required to reactivate or start a new agreement.

Depending on the utility company, there can sometimes be long lead times between activating or commencing an agreement and the new or upgraded utility connection work being performed. Therefore, this process should be started early during construction or even during the preconstruction or project development phase.

The first step in the process is often an application for service with the applicable utility company. The application will need to be filled out by the SR with assistance from the RE and the appropriate design engineer to provide load information or services needed. The following subsections provide notes for coordinating specific utilities.

3-9.01A Electric Service

Most electric utility providers require the submittal of potential load usage information in advance of providing commercial service. An initial contact is usually made by the design team early in the process to ascertain that adequate electric service will be available. As the design develops, additional and upsized electrical equipment will sometimes increase the size of the service required. You will need to consult with your

electrical design engineer for the final load data that will be needed for the electric service application.

3-9.01B Water Service

The interpretation and administration of “cross-connection” regulations can vary greatly between individual water suppliers. It should be assumed that the project plans include all the backflow devices required. The SR/RE should verify that the degree of protection included in the scope of work will satisfy the water supplier’s requirements.

Local water system pressures can vary greatly and may exceed the design capability of the plumbing fixtures and valves. When contact is made with the water supplier, maximum pressure data should be obtained. If the local pressure is more than 60 psi, the possible need for a pressure regulator should be discussed with the mechanical engineer who designed the system. On the opposite extreme, the water pressure may be low (30 psi) in older residential areas. A booster pump may be required after discussion with the designer and the State Fire Marshal.

Projects with fire sprinkler systems have specific requirements for water system volume and pressure. While this will be field-measured by a fire-sprinkler subcontractor as part of the system design, the SR should verify with the water supplier that these requirements are met. Maximum operating pressure should also be determined to ensure that the planned fire system piping pressure rating is adequate.

3-9.01C Sewer Connections

Connection to existing or new sewer system laterals will usually not present major problems. However, the details of new connections to a municipal system should be discussed with the sanitary district being connected to.

3-9.01D Natural Gas

The natural gas piping and connection details should be coordinated with the local gas supplier.

3-9.01E Telephone and Fiber Optics

Conduit and connection details should be coordinated with the serving utility. The actual location of each conduit riser at telephone/electric joint poles, or telephone/fiber optic underground vaults is determined by the serving utility.

3-9.02 Additional Steps after Application Submitted

After the application for service has been accepted by the utility company, they will then provide a contract for the services to be supplied by the utility company on their side of the connection point. An example is electric conductors and/or a transformer from an electric company transformer or power pole to the electric meter point. This utility

service contract will usually need to be executed (signed) by the SR or the RE on behalf of the State, who will be the ultimate user of the utility services. This contract will contain the utility company's fee for the services they will be providing. This fee will usually need to be paid prior to the utility doing their work to make the connection to a State facility.

Design should have estimated these utility connection fees and included money in supplemental funds to pay for this. Consult the *Utility Connections* section of the special provisions, usually within Section 99-01000, *General Requirements*, to determine who is responsible for applying for utility connections and how payments for those connections will be made. Often the connection costs will be considered change order work and will be paid by the Contractor to the utility company and then reimbursed via change order by the State. There may also be methods for the State to pay the utility companies directly for this work.

The SR may investigate other methods of payment to utility companies. The District electrical construction RE typically has a wealth of experience in methods of payment for traffic signals and highway lighting and may be helpful with determining appropriate payment methods.

3-9.03 Utility Connections Construction Considerations

Review the project plans and special provisions to determine which items for the connection will be provided by the utility company and which will be provided by the construction Contractor.

For underground electric, gas, telephone, and similar services, the piping or conduit between the service point and the meter may be installed by the construction Contractor but may be under the control of the serving utility company. Often the utility provider will insist on inspecting these installations before they are covered. There may also be utility company standard construction details for this piping or conduit that need to be followed.

For private construction, utility companies that supply electricity, gas, and similar services will not provide a service connection until a certificate of inspection—or a similar "tag"—is affixed to the building by the local building official. This requirement can sometimes present an obstacle on State projects and should be addressed well in advance of the scheduled connection date.

In such cases, it may be necessary for the SR, acting as the Engineer, to send a formal notification to the serving utility. This notification should state that the building has been inspected, complies with the California Building Code, and is safe to receive the service connection. It's important to coordinate this step with your design engineers.

For electrical service, a District electrical construction engineer may sometimes assist by inspecting the service cabinet or metering compartment. In some cases, they may have an inspection tag that is acceptable to the electric company and can be affixed to the meter point. Before the service connection is made, the SR must ensure that the electrical disconnect is installed and locked off, and that any temporary feeds are properly protected. All such work must be reviewed and approved in writing by the electrical engineer before proceeding.

While the contract typically includes conduits, pull boxes, and outlets for telephone and data services, the responsibility for ordering and obtaining these services usually falls on the facility user—not the Contractor. Therefore, it is essential for the SR to keep the facility user informed of construction progress so that arrangements for telephone and data service can be made prior to occupancy. At the beginning of the project, consult with the District telephone and IT coordinator to identify the appropriate contact person(s) for these services.

3-9.04 Utility Connection Payment for Monthly Utility Bills

It is important to determine who is responsible for providing and paying for temporary power during construction. This responsibility varies depending on the project type:

- For new construction projects, the Contractor is typically responsible for establishing and paying for temporary power and utility services until final project acceptance.
- For rehabilitation or remodel projects at existing facilities, temporary power may be provided by the State.

The project *Special Provisions* will specify the responsibilities for your particular contract.

If the State is covering the cost of temporary power, you must determine whether the utility bills will be paid through funds from the construction contract or by the facility user (e.g., District Maintenance).

- For remodels or additions where the utility service is an upgrade to an existing account, it is often simplest to retain the existing utility account number. This ensures continuity in billing, as the account is already active in the State's automatic payment system and the utility company is accustomed to receiving timely payments.
- For new utility services or new meters, a new account number will be issued. In this case, you must complete a Form FA-2134[1], *Utility Account Action Request* (UAAR), to enter the account into the State's accounting system for payment processing.

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3-9.04A Utility Bills Paid from Construction Contract Funds

If utility bills are to be paid from the contract funds, consult the District construction office for the correct procedure to be followed for submission of bills for payment. Typically, the first utility bill should be sent to the District Construction Office, which will process the paperwork and forward it to Accounting for payment. The District Construction Office will then notify the utility company of the Accounting Office's address for future billing.

Important: Even if the construction contract is paying the utility bills, you must still complete a UAAR (Form FA-2134) at project closeout to transfer billing responsibility to the permanent facility expenditure authorization. To ensure this step is not missed, file a copy or note of the UAAR in Project File Category 63 – Project Completion Documents. Failure to complete the UAAR at project closeout may result in:

1. Continued billing to the construction contract until funds are exhausted or the expenditure authorization is closed.
2. Unpaid bills being placed in a holding file in Accounting, which may go unnoticed until the utility company initiates service disconnection due to nonpayment.

3-9.04B Utility Bills Paid by Facility User

If the facility user is responsible for utility payments or when transferring billing responsibility to them at project closeout, the UAAR (Form FA-2134) must be completed to set up the account in the State's accounting system and assign the correct expenditure charge code. Complete the UAAR with as much detail as possible, including utility company name, meter number, account number, service address, and account open date. For assistance with charge codes or other form details, contact the District Utility Coordinator, typically located within the District Maintenance and Operations Division.

3-9.04C Utility Billing for Other Agencies

If the project is for another agency (e.g., California Highway Patrol), coordinate with the agency's designated contact or the project manager to ensure utility billing is transferred to that agency's Accounting Department for payment.

More information on utility billing procedures can be found on the Caltrans Intranet under Division of Accounting – Utility Service Payments Section[1].

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3-10 Preconstruction Conference with Contractor

Hold a preconstruction conference before the work begins and no later than 15 days after contract award. The preconstruction conference is a contract requirement, found in *Contract Specifications* Section 8-1.03, *Prosecution and Progress – Preconstruction Conference*, with some guidance for the same provided in the *Construction Manual*, Section 3-802, *General Provisions – Preconstruction Conference*. In addition to the prime Contractor and major subcontractors, attendees should include the District Safety Engineer, District Labor Compliance, District Environmental, a representative of the facility operator, and the Deputy State Fire Marshal.

An agenda should be provided and distributed to the prime Contractor, subcontractor(s), and all other invitees prior to the meeting. The agenda should include the processes and contract requirements such as:

1. Submittal transmittal
2. Submittal review and approval
3. Progress payments
4. Schedule of values submittal
    a. Review and approval (no progress payment until approved)
5. Progress schedules, baseline and update requirements
6. Any unique staging
7. Contract change requests
8. Change orders
9. Course of construction inspections
10. Inspection requirements (targets and requests)
11. Final inspections
12. Tests and balancing
13. Required equipment and systems training
14. Approval of owner and operating manuals
15. Completion and project closeout.

The agenda should include other site and facility items, such as concurrent use of an existing property in the event of a site or rehabilitation type project, Department-furnished materials, utilities and utility connections, site security, continuous site supervision, etc.

Review the special provisions to address any unique conditions such as demolition, removal and disposal of hazardous material, order, and sequence of work.

Appendix B, *Pre-job Agenda: Building Work Project*, provides a sample pre-job agenda for building projects that may be used and edited as necessary to suit the project. The order of the topics should be adjusted to suit the time schedules of attendees. For example, Labor Compliance staff and the Safety Engineer may only need to be present for their portions of the meeting, and other attendees may not need to be present for the labor compliance and safety portions of the meeting.

3-11 Department-furnished Materials

Any Department-furnished materials should be listed in the project *Special Provisions* under 99-01000, *General Requirements*, or may be listed in one of the other technical sections. Occasionally, Department-furnished material may be included on plan sheets.

The detailed estimate of project cost should have a line item with funds set up for State-furnished materials. Some typical materials are fuels, lubricants, liquefied petroleum gas, or other items for system tests as well as items such as padlocks.

The procurement process for these items may take some time and some research to find who will be able to procure these. One possibility is the District Construction Office purchasing person. However, items such as fuels and lubricants may have to be sourced through the local equipment shop or a maintenance-contracted vendor.

There may even be some items that the State is unable to procure and may need to be purchased through the Contractor by change order. The SR and/or RE will need to identify any Department-furnished materials and start the procurement process well in advance of the need for the materials.

3-12 Building Submittals

3-12.01 Overview of the Submittal Process

The submittal process for products, shop drawings, samples, and descriptive data is a critical step in approving materials for incorporation into the work. It serves a similar function as the inspection and release of materials by METS or field staff on bridge projects. Submittal requirements are outlined in each section of Section 99, *Building Construction*, of the special provisions.

The Project Architect or lead design engineer is primarily responsible for reviewing and either authorizing or rejecting submittals. The SR should conduct a concurrent review and share any comments or concerns with the architect or engineer so they can be addressed before the submittal is returned.

3-12.02 Timing and Coordination

Although the specifications typically require the Contractor to submit building submittals within 50 days of contract approval, this deadline is rarely met. Even if it were, it could overwhelm the RE, SR, and design team. The key is to ensure submittals are submitted early enough to avoid delaying the work. They must allow sufficient time for review, ordering, fabrication, and delivery. This timeline should be discussed with the Contractor during the preconstruction conference to set clear expectations.

3-12.03 Electronic Submission Requirements

Contractors are required to send submittals electronically to the SC Office Associates email box at sc.office.associates@dot.ca.gov. The requirements for electronic submission, including file size and naming conventions, are detailed in *Standard Specifications* Section 5-1.23B(2), *Control of Work – Electronic Shop Drawings*.

3-12.04 Submittal Workflow

The current submittal process begins with the Contractor submitting documents to the SC Office Associates. These are then forwarded to the SR and the project design lead, along with their senior. The design lead either reviews the submittal or forwards it to the appropriate engineer or architect. The SR provides comments to the Designer of Record through the Office Associates but does not directly authorize submittals.

Once the review is complete, the submittal is marked with one of the following statuses:

- Authorized – no exception taken
- Authorized – subject to notations in red
- Not Authorized – resubmit.

The reviewed submittal is then returned to the Office Associates and the SR for transmittal back to the Contractor.

3-12.05 Coordination with the Design Team

At the start of the contract, the SR should reach out to the design lead and their senior to review the submittal process and emphasize the importance of timely reviews. Since the contract includes review timeframes, these reviews should take precedence over future project design work. The design senior may designate an alternate reviewer to ensure continuity if the design lead is unavailable.

The SR should notify the Office Associates of both the designated design lead and alternate reviewer. When a submittal is received, the SR should follow up with the design team to confirm that the submittal has been received and is being processed. This helps ensure the submittal continues to move forward without delay.

3-12.06 Filing System for Submittals

A well-organized filing system is essential for tracking submittals and referencing them when materials arrive on-site. Submittals should be filed in Category 41, *Report of Inspection of Material*, similar to other material inspection reports. Within this category, create subfolders based on the building work bid item numbers and further subdivide them by Construction Specifications Institute (CSI) division numbers, using either the 16-division or 50-division format.

For example, if *Building Work* is contract item number 25 and the submittal is for electrical switches and outlets (Division 16, *Electrical*), it would be filed under 41.25.16. A submittal for wood trusses, which fall under Division 06 (*Wood and Plastics*), would be filed under 41.25.06.

Additional guidance on filing categories can be found in the *Construction Manual* Section 5-102, *Contract Administration – Organization of Project Documents*.

3-12.07 Initial Review and Field Verification

When a submittal is first received from the SC Office Associates, the SR must immediately perform a cursory review to ensure completeness. Any construction-related concerns should be communicated to the reviewing architect or design engineer so they can be addressed during the review.

Authorized submittals must be used to verify that delivered products or materials match what was approved for the project. Before any product is installed, the SR or Assistant Structure Representative (ASR) should take a copy of the authorized submittal and confirm that the make and model number of the delivered item matches the approved documentation.

If the product matches, the submittal should be marked as field checked, including the ASR's initials or signature and the date of inspection. This process serves the same purpose as collecting orange inspection release tags from METS-inspected materials on bridge projects. It becomes the official record that the material was inspected and complies with contract requirements.

If the delivered product or material does not match the authorized submittal, the Contractor must be notified immediately. They must either resubmit the actual product for approval or provide the product that was originally authorized.

The ideal time to perform this inspection is when the material is first delivered to the jobsite and still in its original packaging—before it is incorporated into the work.

3-12.08 State Fire Marshal Deferred Submittals

For submittals requiring approval by the State Fire Marshal (SFM), current specifications state that the submittal must first be approved by the SFM before being sent to DES. However, this process should be reversed. As outlined in Section 3-8.02, *State Fire Marshal Deferred Submittals*, the submittal should first go to DES for review and conditional authorization, contingent upon SFM approval.

This change is necessary because the SFM reviews only for compliance with fire and life safety codes, not for contract-specific requirements that may exceed code minimums. Reversing the order helps avoid multiple review cycles if DES rejects a submittal already approved by the SFM. More information can be found in Section 3-8, *Relationships with the State Fire Marshal*.

3-13 Schedule of Values

All the buildings of a contract are normally a lump sum bid item. This sum includes the work of all buildings and structures on-site, as well as other related items of work that are not listed as unit cost bid items of the contract. Consequently, the lump sum bid item will likely represent the largest amount of work with respect to the time required to complete, and the largest percentage of the total cost of the contract.

The schedule of values (SOV) is governed by Section 99-01, *General Requirements*, of the special provisions. It must be structured to reflect:

1. Separate sections for each individual building or structure.
2. A “General Work” or “Sitework” section for items not tied to a specific building or that serve multiple buildings (e.g., utility work).
3. Indirect costs and bond premiums listed as separate line items under “General Work” or “Sitework.”
4. Overhead and profit ideally distributed across all line items.
5. The total cost of all the buildings, including general or site work and indirect line items, must match the contract lump sum bid item for building work.

The goal of the schedule of values is to provide an efficient means of making progress payments for the lump sum item of BUILDING WORK. It also provides the building estimating section and the design team the cost of the individual buildings on the project. As such, when the SOV is authorized, a copy should be sent to the design team lead for their records, and it will likely be shared with the building estimating section.

The greater the detail in the divisions of the SOV, the easier it will be to do the monthly progress payment estimates, and the less debate there will be with the Contractor regarding the percentage of work completed. With a good SOV, the progress estimates are vastly simplified as one can walk the site and mark off what is done and what is not done. Obtaining a good SOV usually requires a joint effort between the Contractor and the SR. Many times, the Contractor may want to give an SOV divided by each major division of the CSI specification format. However, as the contract administrator, the SR will want greater detail than that, as the major divisions will most likely have work over multiple estimate periods.

As stated in the special provisions, the SOV should be divided with the total cost for each individual building or structure and any work not directly associated with a particular building, or work that serves more than one building (such as utility sitework), to be listed under the heading of *General Work* or *Sitework*.

Within each building, the work should be broken down into sufficient detail to permit easy measurement to obtain the progress percentage complete in any given month. The level of detail should consider the steps or order of the project construction and will depend on the size and duration of the project; a short duration project of a few months will require less detail than a larger project with a duration of a year or more. Some examples include concrete divided into footings, slab(s), and aprons; also plumbing, sewer, electrical, and HVAC which are often divided into underground work, and rough-in, as well as finish work. Preparing or reviewing an SOV is a good opportunity to review the plans and special provisions for items of work that will need to take place and the materials or equipment that will be part of the construction contract.

A spreadsheet is an effective tool for preparing the SOV. It should include columns for:

1. CSI specification section
2. Item description
3. Scheduled amount
4. Percent complete (prior estimate, current estimate, and total to date).

While contractors may use internal cost codes to track dollar values, Caltrans typically calculates payment by multiplying the percent complete by the scheduled value.

During each monthly progress payment, inform the Contractor that the current Caltrans contract payments system only works to three decimal places for the amount of work completed in any month; this equates to a tenth of one percent (0.001). As a result, there will be a rounding error on any month's payment voucher that may be slightly more or less than the exact dollar value calculated from the payment spreadsheet.

A careful review of the SOV is necessary to ensure that the costs shown are representative of the actual cost to complete the items of work. When reviewing the Contractor's submittals, consider evaluating the baseline schedule side-by-side with the SOV. This helps you understand how the building construction is planned to progress and ensures that the SOV's cost loading aligns with the sequence, durations, and logical flow of work in the baseline schedule. It also allows you to verify that any unique building-specific staging or phasing requirements are properly reflected in the schedule. Look for any attempt by the Contractor to place excess value on the work that occurs early in the contract, also known as front-loading. The Office of Transportation Architecture[1] through their Estimating Section may be able to provide assistance in evaluating and reviewing schedules submitted by the Contractor.

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Some contractors may break down some items into unit-measured prices, such as dollars per cubic yard for concrete. If this is the case, expect a lower price per cubic yard for footing concrete than for slab concrete, as there are significantly more finishing costs in slab concrete than in footing concrete, as an example. Some items, such as reinforcing bars (rebar), should be broken down into an item for furnishing the material and an item for placing or installing the material. This can avoid the Materials on Hand form that has to be submitted and updated every month.

For other items, when there is no separate item for the materials and the Contractor requests payment for the materials on site, you can request an invoice from the Contractor for the materials and pay the invoice price with no markup as work completed on the appropriate line item in the SOV. Ensure that the materials are on site or in secure storage to prevent damage and have been checked against the authorized submittals.

The first pay application cannot be processed for payment until the SOV is submitted and has been authorized. This is motivation for the Contractor to submit a responsible SOV that represents the work in a timely manner. Caltrans has the right to require justification to be submitted by the Contractor to support the SOV.

Appendix C, *Schedule of Values*, provides two sample SOVs from different projects:

- **Hat Creek Maintenance Station (2007)**: A large project with multiple buildings. The SOV was developed collaboratively between the SR and the Contractor.
- **Grass Lake Rest Area**: A smaller project focused on constructing a well, a well house, and sewage treatment upgrades. The Contractor initially submitted a basic SOV by CSI division. The SR then created a more detailed version and asked the Contractor to assign prices to each item.

These examples illustrate what a well-prepared SOV should include and can help SRs work with contractors to develop project-specific schedules that are clear, detailed, and effective.

3-14 Progress Payments and Preliminary Notices

3-14.01 Progress Payments

Most contracts will fall under the category of major contracts, and payments will be processed in the Contract Administration System (CAS) similar to a bridge or road contract. Progress payment estimates will be made monthly on or about the 20th of the month for work done from the 21st of the previous month through the 20th of the current month. Payments are made to the Contractor usually in the first week of the following month. The yearly schedule of progress payment cutoff dates and the dates the electronic funds transfer (EFT) or check are sent to the Contractor can be found on the

Caltrans internet site under Programs - Accounting: look for a link that takes you to "Major Construction Payment Progress Payment Schedule (20YY)", with (20YY) being the current year. It may be helpful to your Contractor to print a copy of this schedule and give it to them at the preconstruction conference.

Usually about the 15th of the month, or a few days before the estimate cutoff date on the Major Construction Progress Payment Schedule, the Contractor is to submit their payment request based on the SOV for the lump sum building work contract item.

The SR should make their own estimate of work completed using the SOV spreadsheet, to compare with the Contractor's estimate. The SR and the Contractor should then meet prior to the estimate cutoff date to discuss and come to an agreement on the work completed in the current estimate period.

This is where a good, detailed SOV is a tremendous help. The SOV spreadsheet can be used to calculate the dollar value of the monthly payment based on actual work completed and the decimal fraction of the lump sum price.

The decimal fraction of the lump sum item is entered in the Contract Transaction Input (CTI) sheet for the building work item along with any quantities of unit price items on the contract to be paid in the current month. Be sure to enter "B" in the Bridge column of the CTI sheet for the building work item or remind your RE to do the same, if they are the one filling out the CTI sheet for the project.

3-14.02 Preliminary Notices for Building Work

In a building project, you may receive a form called a *Preliminary Notice* (not a State form but a legal industry one for a lien against payments or property from subcontractors and/or material suppliers. This is a legal notice to the property owner or public agency that a subcontractor or supplier has provided work or materials to the project and is a precursor to filing a lien against payments (public works) or property (private works) in the event of non-payment by the prime Contractor. There are legal time limits for when these must be submitted to the owner to protect the subcontractor or material supplier's rights to the lien process. These are not actual liens but are a prerequisite for a subcontractor or material supplier to file a lien against contract payments if they are not paid.

There are two different legal forms (non-State forms) for these notices:

- *Preliminary Notice for Public Works Projects*: The correct form that should be used (on a State project), which is a potential lien against project funding.
- *Preliminary Notice for Private Works Projects* form is for a potential lien against the property in private work, which cannot be filed against public property.

This topic should be discussed at the preconstruction conference, including mention of the correct version of the preliminary notice form to be used. In addition, the prime Contractor should be provided the address for the Contractor Payment Unit and instructed to share this information with the project subcontractors and suppliers.

Many times, these *Preliminary Notices* will be received on site during the project, in which case they should be date-stamped with the date received, then scanned and emailed to the Contractor Payment Unit in Accounting. Even if the private work form is used, send it to the Contractor Payment Unit and let them determine whether the form needs to be corrected.

Address for mailing *Preliminary Notice* forms:

Caltrans
Contractor Payment Unit
P.O. Box 168043, Suite PETS
Sacramento, CA 95816-8043
Attn: Ms. Amelita Cruz, Associate Accounting Analyst

Or email to: Stop.Notice.OCCP@dot.ca.gov.
The above information is correct at the time of manual publication.

The name of the current contact person can be found through the Caltrans Accounting website, under the “Liens” tab; locate the person that handles stop notices and liens.

3-15 Change Orders and Changes in Building Work

Due to the complexity and magnitude of detail involved in building work, there are always numerous changes necessary. The Engineer can use various methods to notify the Contractor of an ordered or anticipated change. The standard change order form (Form CEM-4900, *Change Order*) or the “Building Change Request” form found in Appendix D, *Change Order Examples*, may be used.

Many of these changes are small in nature, involving a few hundred to a few thousand dollars. Individual change amounts can be less than the cost to the State to process a change order. It is often best to combine several small changes into one Change Order, as this will decrease the associated processing cost of contract administration

The “Building Change Request” form (in Appendix D) is a helpful tool to document changes to the work as work progresses. It is a method to request change pricing from the Contractor and also to document an agreed price with the Contractor. Remember

the “Building Change Request” itself will not generate payment to the Contractor for the changed work. To make payment, the agreed-upon building changes will need to be formalized using Form CEM-4900, *Change Order.*

3-15.01 Change Order Process

Determine the need for the change and whether the work needs to be done right away or the change can be determined in advance of the work.

If the change is anticipated in advance of the work, determine if the scope of the change can be defined accurately enough that the Contractor can provide a lump sum price for the work. If both of these conditions can be met, the Engineer will notify the Contractor in writing of the proposed change and request that the Contractor provide a proposed cost and time estimate for the work, usually within 15 days. The Building Change Request Form is useful for this purpose. The method to administer various changes to a contract is outlined below:

1. If there is agreement on the cost of the change, the Engineer will issue a written order with the agreed-upon amount of cost and time required for the change.
2. When agreement cannot be reached, the Engineer will inform the Contractor to proceed with the work, and the cost will be determined as follows:
    a. When the change increases the cost, the Contractor will be issued a written order and instructed to proceed with the work. Compensation for the work will be established in accordance with the extra work at force account requirements provided in *Contract Specifications* Section 9-1.04, *Payment – Force Account*. The Engineer and the Contractor will meet after each day that force account work is performed and agree on the time, material, and equipment used for the force account work. Both parties should sign Form CEM-4907[1], *Tentative Daily Extra Work Agreement*, or an equivalent form. These records will become the basis for extra work or for a lump sum adjustment for the changed work.
    b. When the proposed change decreases the cost and there is disagreement, the Engineer will issue a written order using the Engineer’s estimated cost. The Contractor will have 15 days to file a written protest stating why he differs with the Engineer’s estimated cost.
    c. If there is both an increase and decrease in the cost because of the change, the cost of both will be determined separately without markups. The difference between the increase and decrease will then have the respective markups added.

[1] Caltrans internal use only

For additional information on the change order process, see Bridge Construction Memo (BCM) C-10, *Change Orders*. For examples of Building Change Orders, see Appendix D, *Change Order Examples*.

3-15.02 Emergency and Indeterminate Type Changes

In this type of change, the work either needs to be done immediately or the scope or schedule of the work cannot be determined in advance. In these situations, the Engineer will issue a written order authorizing the Contractor to proceed with the work for the ordered change. The payment process will be similar to changes when agreement cannot be reached. The Engineer and the Contractor will keep accurate daily job records of the time, materials, and equipment used on the force account work (defined in the specifications). It is desirable to meet with the Contractor each day and reach agreement on the time, materials, and equipment for that day. At the completion of the extra work, the Contractor can submit extra work bills or submit an itemized billing for the extra work. When using an itemized billing after the cost has been agreed upon, a change order or agreed building change will be issued for the agreed lump sum price.

Using the “Building Change Request” form (Appendix D-2 and D-5):

1. Fill out the form and place an “X” indicating what you are requesting of the Contractor- whether cost information (top section of the form) or to proceed with the work of the requested change and how it will be paid for.
2. Fill in the description of the work portion of the form.
3. Fill in the cost information and whether it is estimated or agreed, and the time adjustment information.
4. Sign the form (usually by SR for the RE) and request the Contractor’s signature as agreeing to a price, or when providing cost information.

When requesting a building change, it is best practice to concurrently create a “Building Change Memo”. This helps ensure all necessary information is captured early and simplifies the process of writing the *Change Order Transmittal Memo* (Form CEM-4903) later. Recommended steps are as follows:

1. Create the ”Building Change Memo” in a Word document.
2. Answer the following questions in the memo:
    a. What does the change provide for?
    b. What is the reason for the change?
    c. Who was the change discussed with, and who concurred? Include names and dates.
    d. How will the change be paid for?

e. What effect if any, will the change have on:
   i. The controlling operation?
   ii. Contract time?

Why is this important? Because capturing this information at the time of the building change request ensures accuracy and completeness. Documentation of changes makes it easier to prepare Form CEM-4903 when the actual Change Order is written.

If your Contractor is familiar and comfortable with the electronic extra work billing system, this system can be used with the Change Order written as extra work at force account. Most building contractors are not familiar or comfortable with the extra work at force account process. In this case, it is easiest to document the work during progress as you would for force account work and come to a daily agreement with the Contractor for the labor, equipment, and materials used in the change order work (utilizing Form CEM-4907,*Tentative Daily Extra Work Agreement*). Then a spreadsheet can be developed to tabulate the labor, equipment, and materials used in the change and the items totaled with force account rates and markups, to arrive at a lump sum for the change. This does not void the requirement to use the Internet Extra Work Bill (iEWB) for tracking payment.

Multiple building changes can be combined on one Change Order; see examples in Appendix D, *Change Order Examples*. If the “Building Change Requests” and “Building Change Memos” have been written, the verbiage of these can be copied and pasted into the Change Order and Transmittal Memo forms. A few ideas for combining building changes in a Change Order include:

- Combine several changes involving the same contractor or subcontractor (this is often helpful to the prime Contractor when they must connect the Change Order to adjustments to their subcontracts).
- Combine several changes involving similar work.
- Combine several changes in the same building or portion of the project.

As a reminder when preparing Form CEM-4901, *Change Order Input*, fill in the “Net $ Amount Bridge Work This CCO” in the “Card Type 4” section located on the right side of the form in the upper-middle section. If your RE is writing the Change Order, please remind them to use this section of the input form to record the amount of bridge work.

3-16 As-Built Project Plans

The special provisions for building work (Section 99-01) require the Contractor to prepare and maintain one set of as-built project plans (referred to as “as-built drawings”

in the special provisions). They require the Contractor to show all as-constructed information, including:

1. Any plan clarification or Change Order changes.
2. Locations of any underground utilities.
3. Location, size, type, and manufacturer of major products or components used in the work.

The SR shall maintain an independent set of as-builts. The SR and the Contractor should review the as-built project plans monthly during the progress of the work to ensure that all changes are being recorded. A PDF set of plans may be used for as-built project plans depending on your and your Contractor's proficiency in editing PDF files and CADD.

If the project includes several underground utilities, a clean site plan with just the building layout on it, is useful to create a map of all the underground utilities on one sheet. This is helpful for any future work on the site and for the facility operator to be able to locate where the utilities are. Locations of underground utilities should be dimensioned to fixed points such as building walls or corners. If the project is in snow country, it is helpful to create a map of all the electrical pull boxes and mechanical valve boxes on the site with dimensions to fixed objects. This should be given to the facility operator, as a couple inches of snow renders all objects on the ground invisible, and this map will allow someone to measure off and locate a valve or pull box if necessary.

The practice for the SR to keep a set of as-built project plans in addition to what the Contractor maintains serves two purposes. First, the SR may catch some information the Contractor missed and vice-versa. Second, you will end up with two sets at the completion of the work. The information from the two sets can be combined to have one complete set. When the project is complete, a copy is sent electronically to SC Office Associates in Sacramento for transmittal to the designer for detailing and filing. One set is given to the State Facility Supervisor for their use and records.

Confirm with the State Fire Marshall what format they require for as-builts.

3-17 Job Closeout

3-17.01 Contract Closeout Submittals and Requirements

Prior to contract acceptance, the Contractor is required to submit the following documentation:

1. As-built project plans
2. As-built shop drawings

3. Operation and maintenance (O&M) manuals
4. Parts lists and service instructions
5. Manufacturer's warranties for various items and equipment installed in the work.

3-17.02 Operation and Maintenance Manuals

The specifications will identify which items or equipment require operation and maintenance (O&M) manuals in the submittal section of each applicable work item. Any additional items not specifically listed, but that include parts lists and service instructions, should also be compiled and submitted as a package before contract acceptance.

The specifications will also define the required number of copies and the format for O&M manual submittals.

3-17.02A Review and Delivery of O&M Documentation:

Upon receipt, O&M manuals must be reviewed for completeness by the SR, with assistance from DES design team members as needed. Once complete, the following should be packaged together for delivery to the State Facility Supervisor:

1. O&M manuals
2. Equipment manufacturer's warranties
3. Parts lists and service instructions for all incorporated items.

3-17.02B Training Requirements

Some equipment or systems may require training for facility operator personnel, as specified in the contract documents.

The Contractor is responsible for:

1. Providing the required training
2. Giving the Engineer advance notice of the training schedule.

The SR should assist in coordinating between the Contractor and the facility operator to ensure training is scheduled and completed.

Refer to the project's *Special Provisions* for a list of items requiring training.

3-17.03 Permits and Warranty Requirements

Review the *Special Provisions* for any equipment that requires a permit, or permit to operate, to be furnished by the Contractor. An example of this includes air compressors, which may require a permit to operate from the Division of Industrial Safety.

Some items or equipment may require the Contractor to provide a warranty for a specified duration. This may include ongoing maintenance and inspection services for a year or more after contract completion, as outlined in the specifications.

3-18 Building Construction Inspection

3-18.01 Overview

The Structure Construction (SC) policy of benchmark inspection[1] is applicable to building work. However, since we deal with a great variety of project types and sizes, the inspection points (benchmarks) will vary with each job. In general, they should be points beyond which we would no longer have access to the work in question. Another benchmark could be before subsequent corrective action would be detrimental to both the in-place work and any construction steps which follow.

As-builts maintained by the SR should be kept current–with special attention, in the form of offsets and elevations–to new and existing underground utilities.

Inspection requirements and major "benchmarks" should be discussed in as much detail as possible at the preconstruction conference. It is likely that some typical jobs could have many "benchmarks" occurring daily. It is also noted that for many portions of the work, verification of work quality and specification compliance can only be confirmed by observation of each preparation, application, and/or installation step.

It must be kept in mind that benchmark inspection is not a substitution for daily inspection; benchmark inspection is the complete inspection of one particular stage or phase of the work. All significant construction benchmark inspections should be documented. While the methods used can vary depending on the complexity of the project and available staff, job records should include necessary confirmation that the work was constructed per contract. At a minimum, entries in job daily reports should include references to all benchmark inspections, pressure tests, and "approvals to proceed". References to the execution of requirements such as pressure tests and times, backfill lift thickness, ambient temperatures, and preparation steps are also important. System tests and other tests should be documented and filed in Category 37, *Initial Tests and Acceptance Tests*, of the project records.

3-18.02 General Guidelines for Building Inspection

Construction of a project portion, such as an individual framed building, can result in many related events occurring simultaneously. As the framing nears completion in an area, plumbers, electricians, and other trades may follow closely behind.

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The ideal sequence is to maintain an ongoing review of all individual portions of the work so that any errors may be found and resolved in a timely manner. This ongoing monitoring should greatly reduce the time necessary to complete some later "benchmarks."

This manual provides only a guideline toward inspection of building work during construction. The SR is responsible for ensuring that the structure portion of the project is built in accordance with the project plans and special provisions. The topics covered in this section apply to building construction inspection from the "general" and "administrative" sides only. Detailed product or item information will be found in the individual technical divisions of this manual.

3-18.03 Construction Inspection

While inspection will primarily be performed by SC field construction staff, there will be items that will require final or in-process inspections by the design professionals. Such items include electrical and mechanical work for which final inspection is required to be performed by the electrical or mechanical engineer. SC staff should review the contract documents to determine what they feel comfortable checking, based on their knowledge and experience. Discuss with the project design team at what stages they wish to perform inspections. Keep them up to date on project progress so that inspections can be completed in a timely manner to keep the project on schedule.

3-18.04 Materials Inspection

The quality assurance activities involved with building construction are considerably greater in number than those normally included in bridge construction.

Some specialty items, such as electric control systems, roof trusses, and fire sprinkler systems, are constructed to job specifications utilizing "standard" components and methods. Other items, including structural steel framing, railings, and water tanks, are constructed expressly to the requirements of the contract documents.

No matter the product source, the SR and/or the RE remains responsible for assuring that all the materials incorporated in the project are compliant with the contract documents.

3-18.04A Certificates of Compliance

The individual sections of the building work in Section 99 of the special provisions (99-02000 through 99-16000) will list many items for which a certificate of compliance is required. *Standard Specifications* Section 6-2.03C, *Control of Materials – Certificates of Compliance*, states that the certificate of compliance shall be signed by the producer of the material and that the material complies with the contract.

For items specially constructed to contract specifications, it is obvious that the certificate should be from the manufacturer and should contain reference both to the product and to the contract.

For items that are furnished by a supplier by combining individual components – such as manhole rings from one fabricator and lids from another – the supplier would be responsible for issuing the certificate.

It is important to collect certificates of compliance with the delivery information for materials and equipment as they are delivered to the job site. The materials and/or equipment, however, are not accepted until they have been installed as a part of the work in an acceptable manner, in accordance with the contract documents.

3-18.04B Review of Product or Material Installed

The ideal time for the acceptance and installation of products or materials will vary, depending on the item. Acceptance of materials such as roofing felts, roof trusses, masonry units, and underground piping must be made during or just prior to placing. Electrical and mechanical items, on the other hand, may not be ready for acceptance until all appurtenances and connections are in place.

Materials to be incorporated into the work must meet project specifications or have been approved for use by the Engineer. The remaining material quality assurance work can be reduced to the following steps:

1. Confirm that the product or material delivered exactly matches the authorized product submittal and the requirements of the contract documents. Nameplates, markings, or labels on individual items and/or package labels will identify most of the commercial products used in building work.
2. Verify that all the minor corrections noted in red on the authorized submittal have been complied with.
3. Confirm that certificates of compliance have been provided for all products and materials that require them.
4. Incorporate data confirming the above items into the job records.
5. Determine that the product is installed and/or applied in accordance with the specifications and, when applicable, the product data bulletins and manufacturer's directions.

While Item (5) is actually a construction inspection step, it is mentioned here as a reminder that some installation and application operations are dependent on the product itself and/or on the product manufacturer's directions.

Some materials have fixed specification requirements and do not require review through the submittal process. As an example, concrete, grout, reinforcing steel, framing lumber, commercial hardware, and electrical conduit may fall into this category. For these items, product review and compliance documentation are also necessary and can serve as backup for any field release of materials.

3-18.04C Documentation

Establish a system to document that all materials and products used in the work comply with the contract. Materials and products are accepted based on a field determination. Acceptance is determined by a combination of the following:

1. Visual comparison with project plans, special provisions and/or authorized submittals
2. Certificates of compliance
3. Actual field measurements
4. Sampling and testing.

The method of documenting the materials acceptability in the project records will vary depending on the various project types and the individual SR. The method of documentation is not as important as that it is performed. A few possibilities are listed below.

1. Documentation on authorized submittals such as “Field Checked, by <signature>” and “<date>.”
2. Using Form CEM 4102, *Material Inspected and Released on Job.*
3. A tabular spreadsheet listing the material and date it was verified.

For additional information on this topic, refer to the *Construction Manual* Section 6-203, *Sampling and Testing – Manufactured or Fabricated Materials and Products Acceptance*. The local Materials Engineering and Testing Services Representative (METS Rep) can also be contacted with questions related to adequacy of material.

3-18.05 Special Inspection

Certain building work items require specialized oversight beyond the standard SR/RE inspection. These requirements are detailed in the project’s *Special Provisions*, specifically under the Division XII, *Building Construction* (Section 99) headings. Field staff must review Sections 99-02000 through 99-16000 to identify which work items trigger these requirements and to verify the applicable standards.

A special inspector is a qualified professional who must demonstrate competence and relevant experience for the specific construction type being performed. For Caltrans building projects, the selection and approval process follows these guidelines:

1. The special inspector must be acceptable to the "Building Official," which in Caltrans building contracts typically refers to the Department of Engineering Services (DES), Structure Construction (SC).
2. Qualifications are verified through valid certifications from recognized agencies such as the International Code Council (ICC) or the American Concrete Institute (ACI).
3. To avoid conflicts of interest, the special inspector is often hired by the Department or an independent testing agency rather than directly by the Contractor, unless specifically authorized in the contract.
4. The inspector must observe the work for conformance with the authorized design drawings and specifications. Responsibilities include providing regular progress reports to the SR/RE and submitting a final signed report stating that the work conforms to the contract requirements "to the best of their knowledge."

For example, masonry work performed under Section 99, Division 04, *Masonry,* frequently requires a masonry special inspector. This specialized oversight is typically mandatory when the structural designer utilizes increased allowable stresses permitted by the California Building Code, as these higher performance ratings are strictly contingent upon the presence of continuous or periodic special inspection and testing.

When special masonry inspection is required, field staff should verify the following:

1. Ensure the inspector provides documentation of competence, such as ICC Structural Masonry Special Inspector certification, for authorization by the Building Official (DES).
2. Review the contract specifications to determine if the Contractor must submit a Field Quality Control Plan. This plan must be authorized before any masonry materials are placed.
3. The Structural Masonry Special Inspector is responsible for observing the placement of reinforcement and the grouting process, providing daily reports to the SR/RE, and submitting a final signed statement of compliance.