SECTION 3
PRECONSTRUCTION PLANNING

Preconstruction planning is necessary to successfully administer a contract containing overhead sign structures. This stage of contract administration provides for these structures to be installed in accordance with the contract documents and can assist early on in identifying potential problems that may arise during construction. The topic of overhead sign structures should be discussed at the preconstruction meeting. The quality control program submittal requirements should be discussed. The submittal process, unusual site conditions, and/or unique design details are some items that should be discussed at the preconstruction meeting.

The first stage of preconstruction planning is verifying coordination in the contract documents and understanding the requirements that the Contractor must adhere to. The special provisions should be the first contract document referenced, followed by the project plans, Standard Plans, and Standard Specifications.[1]

[1] Standard Specifications Section 5-1.04 "Project plans shall govern over Standard Plans; Standard Plans and project plans shall govern over [the] Standard Specifications; and the special provisions shall govern over both [the] Standard Specifications and the plans."

3-1 Contract Information

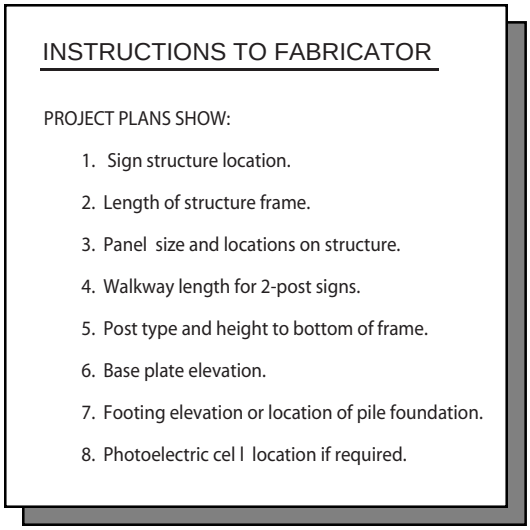
For each contract, the special provisions contain several sections relevant to overhead sign structures, with the primary section being "Sign Structures," found in Section 10-1, "Construction Details; General." Amendments to Section 56, "Sign Structures", of the Standard Specifications are found in Section 1 of the special provisions. In the special provisions, many items are covered including working drawing submittal requirements, material specifications, fabrication requirements, and welding specifications. If a contract contains an overhead sign structure that is to be relocated, removed, or salvaged, requirements pertaining to this work can also be found in Section 10-1 and is commonly listed under "Existing Highway Facilities."

Section 8-3, "Materials-Welding", in the special provisions contains requirements pertaining to welding that is to be done on multiple contract items including overhead sign structures. One of many contractual obligations found here states that the Contractor shall submit a Welding Quality Control Plan in accordance with Section 5-1.02, "Plans and Working Drawings," of the Standard Specifications prior to doing any welding pertaining to overhead sign structures. Note that changes are under consideration that would alter this requirement on future contracts.

Contract requirements may vary depending upon which version of the Standard Plans and Specifications are referenced. The front cover of the special provisions should be referenced to ensure that the correct version of the Standard Plans and Specifications are used. Additionally, a Standard Plans List is included in the special provisions indicating each Standard Plan sheet that is to be referenced including any Revised Standard Plan (RSP) or New Standard Plan (NSP) that is to be used. All RSP's and NSP's will be included as separate sheets included in the project plans. If the project plans do not include an RSP or NSP when the Standard Plans List indicates that one should be included, the Designer must be contacted to provide a contract change order. This will ensure that all necessary components of the contract documents are included in the contract.

If a contract contains an overhead sign structure which supports a Changeable Message Sign (CMS), Extinguishable Message Sign (EMS), light fixtures, or any other electronic equipment, the special provisions will contain additional information under Section 10-3, "Construction Details; Signals, Lighting, and Electrical Systems." However, the entire contract should be reviewed to ensure compliance with all sections associated with the work. The project plans contain information not found in the special provisions pertaining to the line, grade, and dimensions of overhead sign structures. Information that can be obtained from the project plans includes, but is not limited to, the following: sign structure

location, length of structure frame, sign panel type, sign panel size, sign structure name or number, base plate elevation, footing size, pile depth, reinforcement details, soil type and groundwater elevation. A list of those items that are to be included in the project plans can be found on Sheet S1 of the Standard Plans. *Refer to Figure 3-1.1.*


INSTRUCTIONS TO FABRICATOR

PROJECT PLANS SHOW:

1. Sign structure location.
2. Length of structure frame.
3. Panel size and locations on structure.
4. Walkway length for 2-post signs.
5. Post type and height to bottom of frame.
6. Base plate elevation.
7. Footing elevation or location of pile foundation.
8. Photoelectric cel l location if required.

Figure 3-1.1 Excerpt from Sheet S1 of the 1999 Standard Plans.

The project plans contain sections that have a layout view, detailed elevation view, and quantity summary table for each overhead sign structure. *Refer to Figures 3-1.2, 3-1.3, and 3-1.4.* Although this section is included in every contract, it is often referred to in different ways. This section is usually entitled "Sign Plans, Details, and Quantities" or "Pavement Delineation and Sign Plans and Quantities." Sometimes, these details can be included in the "Layout" or "Electrical Plans" sections.

The "Electrical Plans" contain information for all signs that are to be illuminated. In this section, there are sheets specific to "Sign Illumination" that show a wiring layout which includes the sign illumination control type (i.e. SC1, SC4A…). Knowing the sign illumination control type, Sheet ES-15D of the Standard Plans can be referenced to see a detailed wiring diagram for each sign illumination control type. *Refer to Figure 3-1.5.* These diagrams indicate whether or not a photoelectric unit is required

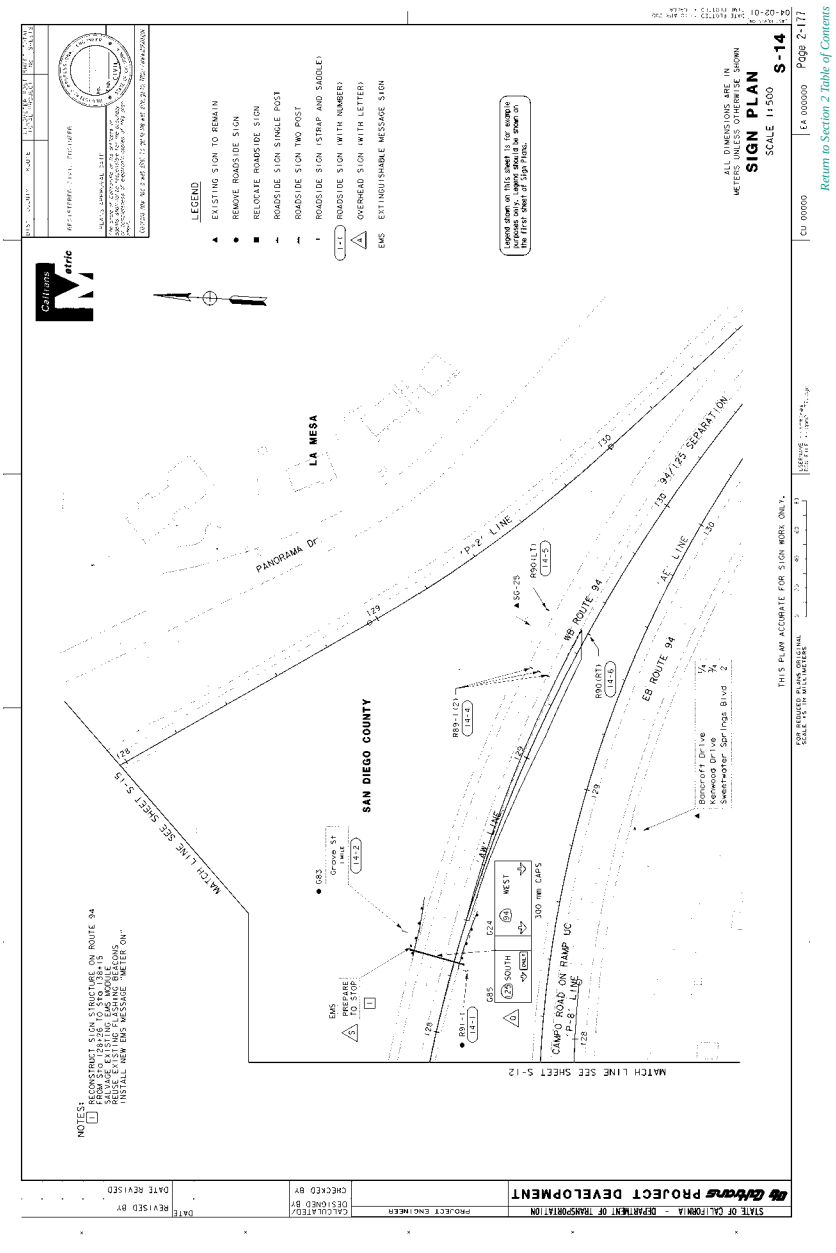


Figure 3-1.2 A project plan sheet with layout view of sign structures. In this case, overhead signs are indicated by triangles and roadside signs are indicated by ovals.

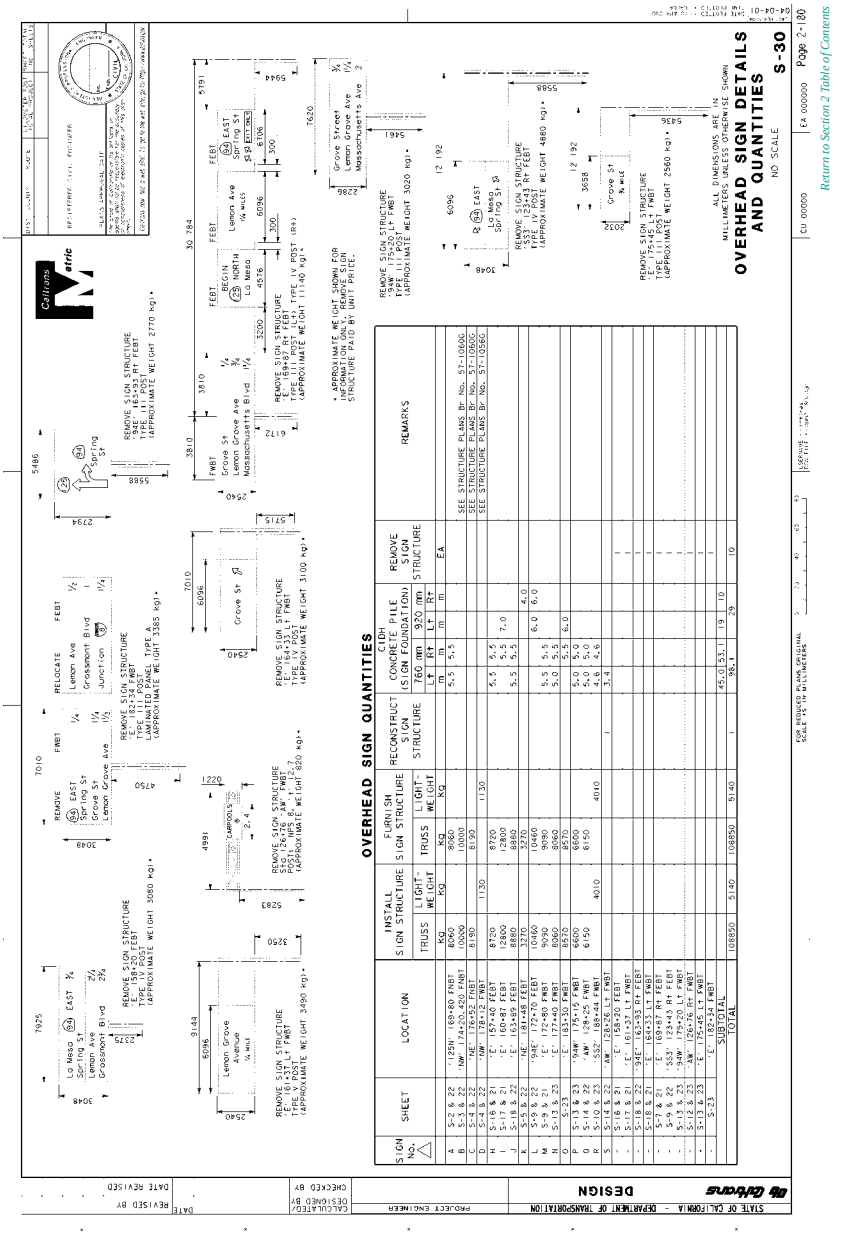


Figure 3-1.3 A project plan sheet with overhead sign quantities

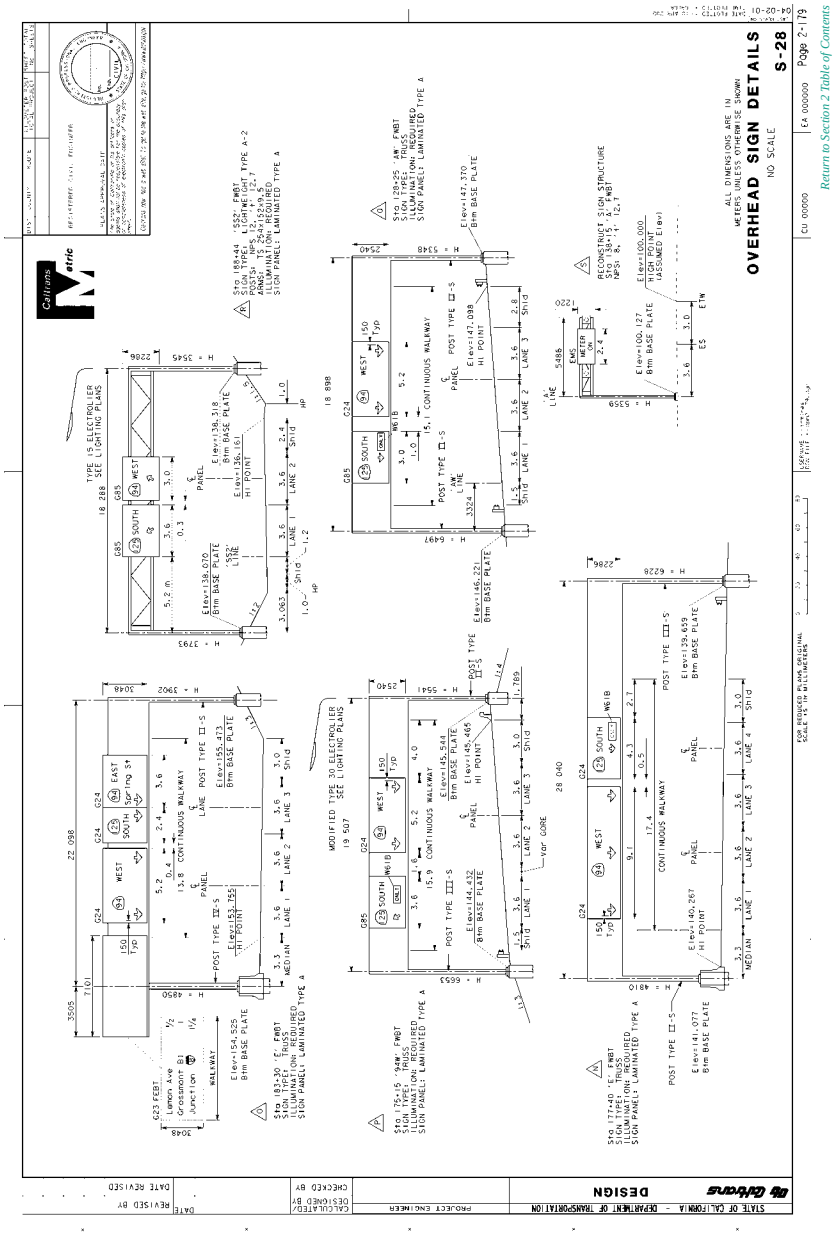


Figure 3-1.4 A project plan sheet with a detailed elevation view. This example has rounded off the sign panel lengths to one tenth meter, which can create some confusion when Standard Plans dimensions have not been rounded off.

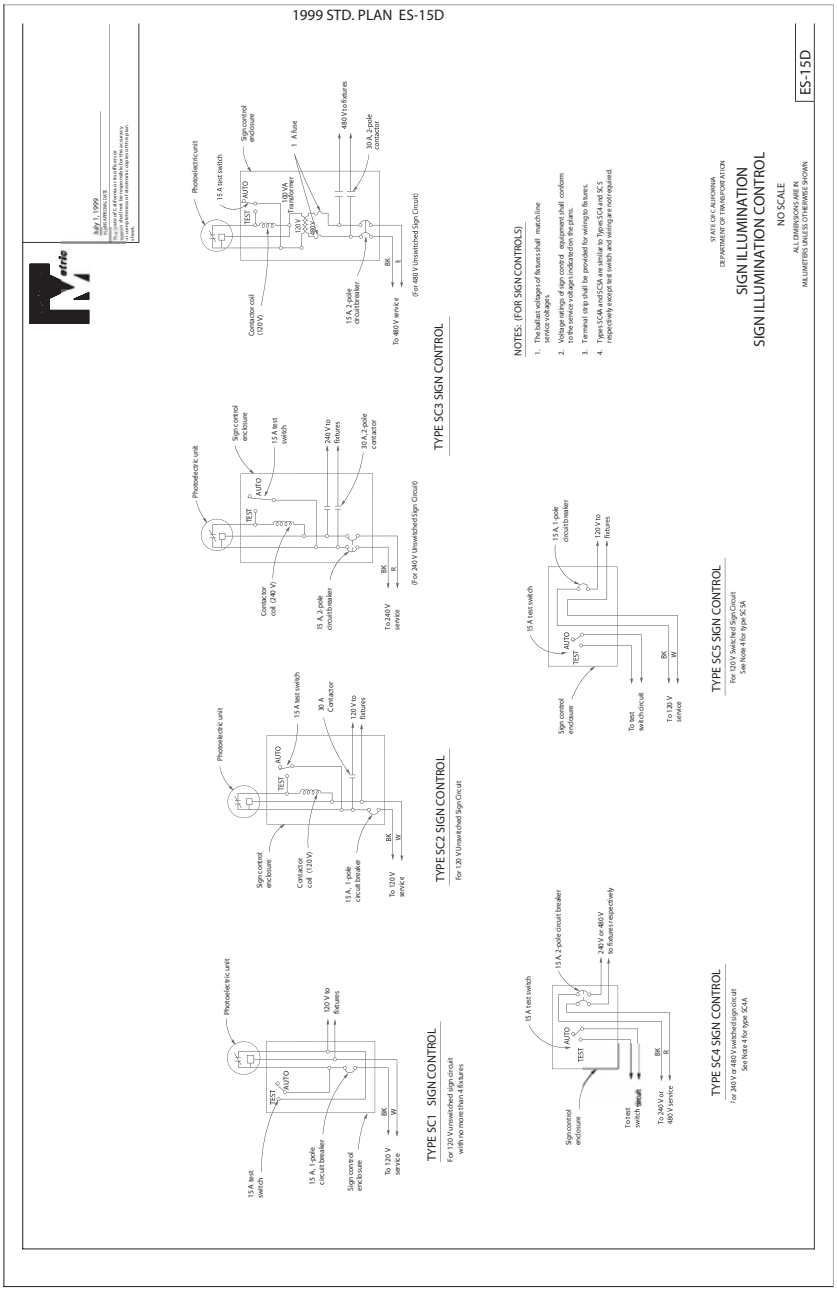


Figure 3-1.5 Sheet ES-15D of the 1999 Standard Plans details wiring diagrams for sign illumination control. Photoelectric units are included on some signs and not on others.

for each overhead sign structure. *Refer to Figure 3-1.5*. Note that the sign name/number found in the "Electrical Plans" is not always equivalent to the sign name/number found in the "Sign Plans, Details, and Quantities" sheets. For this reason, to locate a specific sign in the "Electrical Plans," one needs to locate the sign by its line and stationing rather than its name/number. For EMS sign structures, Sheet ES-14B of the Standard Plans should be referenced to obtain the appropriate wiring diagram.

If an overhead sign structure is to be installed on top of or behind a retaining wall or sound wall, often there are details pertaining to the overhead sign structure on those sheets that reference the retaining wall or sound wall. Additionally, overhead sign structures can be detailed as being anchored onto a bridge deck, barrier rail, and/or girder. For these cases, unless the "Signs Plans, Details, and Quantities" sheet includes all necessary details, the structure plans will contain information relevant to these overhead sign structures. Each project is unique. Be sure to verify that all sheets referencing overhead sign structures do not conflict with each other. If an error is discovered in the contract document, contact the designer, and request that they issue a contract change order request to correct the error.

The majority of details that pertain to the structural components of an overhead sign structure typically are not included in the project plans. These details for construction of overhead sign structures can be found in the Standard Plans. The Standard Plan sheets detail each structural member's size, layout, and connection. Details for the construction of the foundation for the overhead sign structure is also found in the Standard Plans.

For some sign structure types, the Standard Plans indicate the minimum vertical roadway clearance to be 5.5 meters (18 feet).[2] In addition to the vertical roadway clearance requirement, certain sign structures have their own unique height limitations such as a maximum post height. The Engineer should verify that these requirements are met for each overhead sign structure in the contract. All pavement overlays to be performed as part of the contract should be included when performing this check.

Project plans for contracts that contain CMS structures or bridge mounted sign structures have individual sheets that detail most or all of the structural components for these overhead sign structures. These sheets are included because some details in the Standard Plans are not intended to be used for these types of structures. All details in the project plans have precedence over the Standard Plans.

[2] Standard Plans Sheet S1, Notes "MINIMUM CLEARANCE: Vertical roadway clearance 5.5 m [18 feet]."

However, some details may be found in the Standard Plans for these types of overhead sign structures in cases where the Standard Plan details have not been modified by and are referenced in the project plans.

Additional requirements can be found in Section 56-1, "Overhead Sign Structures," of the Standard Specifications. Much of the information that is found in this section is not included in any other part of the contract. Other sections of the Standard Specifications are referenced in this section including Section 55-3.14, "Bolted Connections," Section 75-1.05, "Galvanizing," Section 59-5, "Painting Sign Structures," and Section 49, "Piling." Section 1, "Specifications and Plans," of the special provisions should be referenced for any amendments to the Standard Specifications.

3-2 Construction Records

Section 6, "Control of Materials," of the Standard Specifications requires the Contractor to furnish the Engineer with a list of his sources of materials in sufficient time to permit proper inspection and testing of materials in advance of their use.[3] This list shall be submitted on the State-furnished Form CEM-3101, "Notice of Materials to Be Used." *Refer to Figure 3-2.1.* The Contractor need not submit all items on one form as he has the option to submit multiple forms pertaining to different contract items at various times in the contract as long as the requirements of the aforementioned section of the Standard Specifications are adhered to. This requirement should be discussed in the preconstruction meeting.

In addition to the contract number and the contract item(s) for which the material will be used, the Form CEM-3101 shall include the name, address, and telephone number of the supplier or manufacturer where the material can be inspected. For materials in which their source is out-of-state, the name, address, and telephone number of the Contractor or Subcontractor placing the order and the order number must be included.

Upon receipt of a completed Form CEM-3101, it is the Resident Engineer's responsibility to ensure that all the required information has been included. If the Contractor fails to properly complete the form, the Resident Engineer shall require the Contractor to correct or supplement the submitted form

[3] Standard Specifications Section 6-1.01 "The Contractor shall furnish the Engineer a list of the Contractor's sources of materials and the locations at which those materials will be available for inspection."

STATE OF CALIFORNIA • DEPARTMENT OF TRANSPORTATION

NOTICE OF MATERIALS TO BE USED

CEM-3101 (REV. 10/92) CT# 7541-3511-1

To: *(Resident Engineer)* | DATE:

You are hereby notified that materials required for use under Contract Number _____ for construction of _____

in Dist. _____ , Co. _____ , Rte. _____ , P. M. _____ will be obtained from the following sources:

CONTRACT ITEM NO.	MATERIAL TYPE	NAME AND ADDRESS OF INSPECTION SITE

It is requested that you arrange for sampling, testing and inspection of materials prior to delivery in accordance with section 6 of the Standard Specifications where the same is practicable and in accord with your policy. It is understood that source inspection does not relieve me of the full responsibility for incorporating in the work, materials that comply in all respects with the contract plans and specifications. nor does it preclude the subsequent rejection of materials found to be unsuitable.

Yours truly,

_____

Contractor

WHITE - STRUCTURAL MATERIALS
DIV. OF MATERIALS ENGINEERING & TESTING SERVICES
5900 FOLSOM BLVD.
SACRAMENTO, CA 95819

CANARY - RESIDENT ENGINEER

PINK - CONTRACTORS FILE

GREEN - DISTRICT

BUSINESS ADDRESS

BUSINESS PHONE ( ) EXTENSION -

ADA Notice For individuals with sensory disabilities, this document is available in alternate formats. For information call (916) 263-2041 or TDD (916) 263-2044 or write Records and Forms Management, 1120 N Street, MS-89, Sacramento, CA 95814.

Figure 3-2.1 Form CEM-3101

before proceeding. Once a complete form has been submitted, the Resident Engineer or Structure Representative shall promply distribute copies as required. One copy is sent to the Division of Materials Engineering and Testing Services (METS) which will then make the required assignments for inspection. The Resident Engineer's copy of Form CEM-3101 shall be filed in Category 31, "Notice of Materials to Be Used."

Chapter 6, Section 2, "Acceptance of Manufactured Material and Sampling Methods," of the Caltrans Construction Manual describes the procedures for acceptance of manufactured materials. In this section, the roles and responsibilities of the Contractor, METS, the District, and the Resident Engineer are outlined.

3-3 Field Review

Once the site is accessible, it is vital that a field review be performed for all sign locations. Possible conflicts can be identified near the beginning of the contract work by performing a thorough field review enabling corrections to be made early and more easily as needed. Items that can cause potential conflicts include, but are not limited to, other structures, electrical lines, irrigation lines, underground utilities, overhead utilities and vegetation.

Often, the Resident Engineer or Structure Representative can best determine if the proposed location for the sign structure to be installed will properly serve the intended purpose when perforning the field review. If the horizonatal or vertical sight distance appears to be inadequate then the designer should be consulted to verify the location in the field. Occasionally, steep slopes, horizontal curves, and vertical curves can affect the effectiveness of the proposed signage. Sometimes, trees or other landscape features must be adjusted for the sign structure to adequately serve the public.In this scenario the designer should be consulted to verify that the location in the field was as intended.

If the Resident Engineer or Structure Representative questions the effectiveness of an overhead sign structure, they should consult with the Designer regarding the potential change. It is possible that the lettering or another aspect of the signage will need to be adjusted because of the location change. If a change is required, the Contractor should be notified and a contract change order be issued.

For contracts that require an overhead sign structure to be removed and replaced with a new overhead sign structure using the same foundation, the engineer must verify that the foundation is suitable

for reuse. During this check, the Engineer should verify that the anchor bolts appear in satisfactory condition and that the amount of deterioration will not affect the structural integrity of the structure. Furthermore, the engineer should verify that the size and layout of the anchor bolts are in accordance with the contract plans. Throughout the years, modifications have been made to the Standard Plans to meet new criteria. It is possible that the Designer is expecting a specific anchor bolt size and layout that does not match the as-built conditions. Usually, the best solution to remedy this conflict is to abandon the existing foundation, install a new foundation upstation or downstation of the old sign structure and install the new sign structure at this location. These modifications, as well as any other changes, must be discussed with the Designer and should be resolved with a contract change order.