OFFICE OF SPECIAL FUNDED PROJECTS

INFORMATION AND PROCEDURES GUIDE

CHAPTER 4: DESIGN AND AWARD

STRUCTURES & ENGINEERING SERVICES
DIVISION OF ENGINEERING SERVICES
DEPARTMENT OF TRANSPORTATION
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Updates and information concerning the contents of this guide may be obtained from:

Office of Special Funded Projects and Structure Local Assistance (OSFP/SLA) page
or
Contact the Caltrans, Office of Special Funded Projects, American Council of Engineering Companies (ACEC) representative.

The Office of Special Funded Projects has prepared the contents of this guide. When necessary, revisions are made and posted on the web site listed above. It is the responsibility of all that use this guide to verify it is current and appropriateness for the use intended, to obtain the revisions, and to disregard obsolete or inapplicable information.

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Other documents referenced in this Guide are available at the Caltrans internet website: https://dot.ca.gov/ or https://dot.ca.gov/manuals/

INDEX TO ABBREVIATIONS:

AAA	Advertise, Award and Administer
AASHTO	AASHTO LRFD Bridge Design Specifications
ACEC	American Council of Engineering Companies
A&E	Architectural and Engineering Contract
APS	Advance Planning Study
BLCCA	Bridge Life-Cycle Cost Analysis
BD	Bridge Design
BDD	Bridge Design Detail
BDM	Bridge Design Memo
BDP	Bridge Design Practice
CA	California Amendments to AASHTO LRFD Bridge Design Specifications
CMGC	Construction Manager/General Contractor
DB	Design Build
DES	Division of Engineering Services
DRP	Draft Project Report
EE	Earthquake Engineering
GS	Geotechnical Services
MTD	Bridge Memos to Designers
OC	Overcrossing
OH	Overhead (railroad)
OSFP	Office of Special Funded Projects
PDPM	Project Development Procedures Manual
PDT	Project Development Team
PID	Project Initiation Document
POC	Pedestrian Overcrossing
PM	Project Manager
RP	Project Report
PS&E	Plans, Specifications and Estimate
PUC	Pedestrian Undercrossing
QC	Quality Control
SC	Structures Construction
SDC	Caltrans Seismic Design Criteria
SM&I	Structures Maintenance and Investigations
SOE	Structure Office Engineer
SFP	Special Funded Projects
STP	Structure Technical Policies
UC	Undercrossing
UP	Underpass (railroad)
VECP	Value Engineering Change Proposal

4 DESIGN AND AWARD

4.1 PRELIMINARY DATA

The following editable forms are available upon request from the SFP Liaison:

- 4.1.1a Bridge Site Data Submittal
- 4.1.1b Bridge Site Data Submittal-Minor Bridge Modifications
- 4.1.1c Bridge Site Data Submittal Non-Standard RW/SW
- 4.1.2 Bridge or Structure Field Site Investigation Checklist
- 4.1.3 Railroad Separation Field Site Investigation Checklist
- 4.1.4 Bridge or Structure Hydraulic Site Survey Checklist
- 4.1.5 Foundation Plan Preparation Checklist

The forms should be submitted as required by the Liaison Engineer.

Preliminary Data is the essential information fundamental to the design of structures. Preliminary Data includes information about existing site conditions, planned geometrics, scope of structure work, design and construction constraints, and other factors on which structure designs are based.

This section highlights the Bridge Site Data Submittal Package and other checklists available for consultants to use to compile pertinent preliminary information. Consultants may utilize their own forms in addition to the forms and checklists described.

As the minimum preliminary information for projects that involve state highway structures, consultants must prepare a Bridge Site Data Submittal (BSDS) package for each structure in the project. Ordinarily, the roadway designers should prepare BSDS package(s) for the structure designers' use and consultant contracts should account for this task accordingly.

4.1.1 BRIDGE SITE DATA SUBMITTAL PACKAGE

The BSDS package consists of completed BSDS forms and associated attachments. The BSDS forms are essentially checklists of pertinent layout, environmental, site information and other constraints needed to design structures. The checklist requires the attachment of various site drawings, layouts, and other information to make the BSDS package complete.

There are different forms for bridges, minor bridge modifications, and non-standard retaining walls/soundwalls. When a project involves any of these features, the appropriate forms shall be used. Each structure within the project requires a separate BSDS package. Before preparing BSDS packages, the most current forms should be obtained from the SFP Liaison engineer.

The BSDS shall be prepared in accordance with the instructions on the forms. Though the forms were developed for Caltrans in-house use, consultants must use the forms in a similar fashion. Generally, references in the forms to the District and Structures correspond to the Roadway Design and Structure Design Consultants, respectively. The forms should be filled in electronically to utilize the standardized entries via dropdown menus many fields contain.

On the first page of the BSDS forms, in the table that shows the information/documents provided, instead of writing the name of the file in the “File Name” column, the consultant may write “Provided to Structure Designer” or “Not Provided to Structure Designer”.

BSDS packages should be completed with enough lead time to allow for Caltrans review and approval before the structure designer develops General Plans for the structures.

Once prepared, the BSDS packages must be submitted to the District and the OSFP Liaison Engineer for review. Unless otherwise requested, the following attachments need to be submitted with the BSDS checklist for review:

- APS and Feasibility study
- Strip Map
- Aerial photo of site
- Bridge Site Plan
- Profile Grade
- Superelevations
- Typical Sections
- Detour or stage construction plans
- Utility map & Utility information sheets
- Lane Closure Charts
- Survey Information Sheet
- Supplemental Structure Clearance Calculations

The District has the primary approval responsibility for BSDS checklists and attachments. The Liaison Engineer will provide support as necessary.

Approved BDSD packages must be submitted to the Liaison Engineer with the Type Selection Report.

GAD approval memo from District design oversight must be received by the OSFP Liaison before scheduling Type Selection Meeting.

4.2 STRUCTURE TYPE SELECTION – 35%

The Structure Type Selection process is a fundamental step in the design of structures on State Right-of-Way. This step must be completed before extensive structure design work is performed. The Type Selection process involves the following primary elements: 1) Preparation and Submittal of Type Selection Documents, 2) Type Selection Meeting and Approval, and 3) Updated Type Selection Documents and General Plan Submittal and Distribution. These elements are further described below.

4.2.1 PREPARATION AND SUBMITTAL OF TYPE SELECTION DOCUMENTS

The initial stage of the Type Selection Process involves discerning all parameters that govern the design of a bridge. These parameters are contained in the following which must be submitted before a Type Selection Meeting is scheduled:

- Bridge Site Data Submittal Package (BSDS)
- Preliminary Hydrology/Hydraulics Report
- Preliminary Foundation Report (with optional Boring Plan)
- Draft Foundation Plan
- Type Selection Report
- GAD approval memo from District design oversight

The BSDS must be prepared and submitted sufficiently in advance of the other documents so that the BSDS and the GAD are approved by the District resolving issues prior to the Type Selection Meeting. The remaining documents may be submitted with the Type Selection Report.

Information relative to the Preliminary Hydrology/Hydraulics Report; BSDS; Preliminary Foundation Report and Boring Plan, which may be submitted for comments at the consultant's option, can be found in the appropriate sections elsewhere in this Guide.

The Draft Foundation Plan only need be a working draft of the most current foundation plan the consultant has available. As a minimum, the draft plan should show the site's topography, existing utilities, centerlines of the proposed supports, and other features that may create potential issues or may need to be discussed at the Type Selection Meeting.

The Type Selection report should follow the format described in the *Memo to Designers.* The report must include a discussion of the structure types considered and reasons for selection of the proposed structure and the following:

- Type Selection Memo
- Vicinity Map
- General Plan
- General Plan Estimate
- Project Seismic Design Criteria
- Preliminary Foundation Recommendations
- A statement that indicates which Agency will advertise, award, and administer (AAA) the construction contract.

In the case of modifying or widening existing structures, the Type Selection Report shall also include a summary of the seismic evaluation of the existing bridge, the potential retrofit strategies with supporting documentation, and associated costs.

4.2.2 TYPE SELECTION MEETING AND APPROVAL

The Type Selection Meeting will be scheduled after the District has approved the project geometrics (GAD) and a minimum of 2 to 4 weeks following receipt of an acceptable Type Selection Report and related documents. The meeting will be held online or in Sacramento. At the meeting, the consultant shall present the proposed structure and shall briefly discuss issues pertinent to the selection of the structure type, particularly requirements for foundations, hydraulics, construction (including falsework), seismic design, retrofit strategy, aesthetics, traffic handling, and other information needed to support the structure type.

After the meeting, the Consultant shall prepare a meeting summary and provide a copy to the Liaison Engineer within one week. The meeting summary may be used to update or supplement the information in the Type Selection Report to address comments raised at the meeting. Provided all issues raised at the Type Selection Meeting are satisfactorily addressed, the Liaison Engineer will provide written approval of the proposed structure type within two weeks of receiving the meeting

summary. No further design work should be performed until written approval of the structure type is issued by OSFP.

4.2.3 UPDATED GENERAL PLAN SUBMITTAL AND DISTRIBUTION

The consultant shall submit the updated the General Plans and General Plan Estimates for distribution to other Caltrans functional units. Comments resulting from this distribution will be returned to the consultant to incorporate in final design.

If the issues raised at the Type Selection meeting are not resolved, the Type Selection documents must be revised and submitted for review to the OSFP Liaison. The OSFP Liaison will determine if another Type Selection meeting is needed.

4.3 UNCHECKED DETAILS SUBMITTAL – 65%

The Unchecked Details Submittal is also known as the 65% submittal where the consultant submits unchecked plan details and draft foundation and draft hydraulics reports for review.

Unchecked details are structure plans with construction details that are generally complete but not yet independently checked. OSFP performs a cursory review of these details to identify and raise potential issues that the consultant should consider in preparing subsequent PS&E submittals. OSFP will normally return review comments within four weeks. Occasionally, a longer review period is necessary due to staff availability, workload priorities, and project complexities.

Contract special provisions are not reviewed at this time and therefore are not submitted.

Sponsoring agencies and consultants should contact the OSFP Liaison Engineer well in advance of the submittal to coordinate the review schedule and to discuss the exact documents to submit.

Responses to any outstanding Type Selection comments must be submitted with the Unchecked Details Submittal.

4.4 PS&E DELIVERABLES, REVIEW & APPROVAL – 90% to 100%

The intent of the PS&E review is to assure that projects meet applicable Caltrans standards, policies and procedures. The OSFP Liaison Engineers perform the reviews with support from OSFP staff, DES functional units and Technical Specialists, and other departmental functional units.

When the various units issue their review comments, the Liaison Engineer reviews and consolidates the comments and sends to the District Project Manager (PM) and the consultant. The final comments that must be addressed. The final comments are ordinarily noted on a set of red-marked plans, comments and responses forms, and in various review memos/letters.

For typical projects, the review duration is six weeks for the Initial PS&E Submittal and four weeks for each subsequent submittal. Longer review durations may be required for projects with numerous, large, or complex structures. The Liaison Engineer will determine the exact review duration, as early in the project development stage as possible, in partnership with the District, consultant, sponsoring agency, and other Caltrans functional units that may be involved.

Deliverables required for the different PS&E reviews are shown below. The documents must be prepared in accordance to Caltrans standards, guidelines, and practices. **The PS&E review process will not formally begin until all required PS&E documents are received.** When submitted documents are unsatisfactorily prepared, the entire PS&E package may be returned for revision and the review terminated. The review period, with the full review duration, will restart once the appropriate documents are received.

Responses to Unchecked Details Submittal comments must be submitted with the Initial PS&E Submittal.

Approval of a PS&E package will be dependent on all outstanding review comments being resolved for all documents in the package.

4.4.1 OSFP OVERSIGHT SIGNATURES

Once the PS&E package is approved, the OSFP Liaison Engineer will sign and date the plans if advertisement is imminent.

For projects that will not advertise within approximately six months of approval, oversight signatures will be withheld from the plans and the Liaison Engineer will

write a memo documenting the PS&E approval. When advertisement for these projects will finally occur, the consultant must update the project documents in accordance to “Updating Projects for Advertisement” elsewhere in this guide. Once the structure portion of the project is updated and found acceptable, the Liaison Engineer will sign and date the plans.

For locally advertised projects, the Liaison Engineer will send electronically signed structures plans to District PM and the design consultant for final processing**. The signed structure plans and the approved structure special provisions must be used in the advertise and award contract documents. This will be verified by the OSFP Liaison during the Contract Advertisement submittal, see Section 1-7.**

For State advertised projects, contract plans are produced for advertisement from electronic files and OSFP will electronically place oversight signatures on the plans. Electronic plans and special provisions can be obtained by the consultant from HQ OE once these documents are posted for advertisement.

4.5 STRUCTURE CALCULATIONS

Structure design calculations, independent design check calculations, and design-check comparison log must be submitted as part of PS&E submittals.

Design calculations shall include all analysis and computations that were necessary in designing the bridge including the bridge layout, structural elements, and operational features such as deck drains. Check calculations shall include all analysis and computations that are necessary to independently check all aspects of the design shown on the unchecked details. Results from the check calculations shall be compared with the design. Discrepancies shall be resolved between the designer and checker and the resolutions documented in the calculations. Also all discrepancies between the design / check calculations, plan details and corresponding resolutions must be recorded in a Design-Check Discrepancies Comparison Log.

For Initial PS&E submittals, full sets of design and check calculations, design-check comparison log are required. For Intermediate and Final PS&E submittals, only supplemental design and check calculations, and Design-Check Discrepancies Comparison Log need to be submitted for re-designs and any other changes made to the structure since the initial submittal. Supplemental design and check calculations must be signed, sealed and meet all the requirements of the initial submittal.

The consultant must retain the design and check calculations, and Design-Check Comparison Log at least one year after the project has reached Contract Acceptance (project Milestone 600), which indicates any disputes or legal issues have been resolved. OSFP will not retain submitted copies of the calculations once the PS&E is approved.

Design and check calculations shall conform to the following additional requirements:

- Must be separate from each other for each bridge.
- Must be labeled with whether they are design or check calculations they are and with the District, EA, Project ID, Bridge Name, and Bridge Number.
- Must bear the State of California Registered Professional Engineer Registration seal with the signature, license number, and registration certificate expiration date of the design engineer and independent check engineer.
- Must contain a table of contents that refers to page numbers--all pages must be numbered.
- Must be legible and organized so that the design logic can be easily followed.
- Must contain only final computer runs including input and output sheets.
- Must contain enough notes on calculation sheets, computer input/output, and on other documentation to clearly show the design logic.
- Must contain copies of design charts with the specific entries highlighted that were used in the design.
- Must document all assumptions and conclusions.
- Maximum file size is 20 MBs. Large documents shall be submitted using multiple electronic files.

Design-Check Discrepancies Comparison Log shall conform to the follow requirements:

For each discrepancy in design/check calculations and plan details:

- Initial design results
- Initial check results
- Discrepancy comparison of initial design results and initial check results.
- Resolution of discrepancy with justification.

4.6 CONTRACT SPECIAL PROVISIONS

Contract Special Provisions shall be prepared in accordance with the Construction Contract Development Guide and Project Development Procedures Manual. The Special Provisions shall consist of the most current versions of Caltrans Standard Special Provisions (SSPs) edited to suit the specific project. The most current versions of the SSPs can be accessed through Caltrans Standards .

Special Provisions submitted for review, shall show all edits and hidden text. Special Provisions that do not show these items will not be accepted for review.

Special Provisions shall have a title sheet that shows the District, EA, Project ID, the date prepared, and the Professional Engineer registration seal with the signature, license number and expiration date of the Engineer who prepared the provisions. The Special Provisions files must descript the contents (i.e., Structure Specifications, Roadway Specifications, or both).

A Bid Item List shall be included in front of the structure Special Provisions. The list shall show the item number, item code number, unit of measure, and Estimated Quantity. For example, a portion of such an item list is as follows:

Item No.	Item Code	Item Description	Unit of Measure	Unit of Measure
0001	157561	Bridge Removal (Portion), Location A	LS	1
0002	192003	Structure Excavation (Bridge)	CY	150
0003	490753	Furnish Piling (Class 90)	LF	560
0004	510053	Structural Concrete, Bridge	CY	88

Standard contract items should be used whenever possible and especially for contracts to be advertised by Caltrans.

Also submitted with the special provisions shall be a completed Structure P&Q Submittal Checklist and the Structure Standard Plan List Transmittal. The purpose of this form is to identify the crucial aspects of projects that writers and reviewers of the special provision must consider.

4.7 PS&E ESTIMATES

Once a structure design is complete and checked, PS&E estimates must be prepared and submitted as part of the PS&E package. PS&E estimates are comprised of quantity calculations, quantity check calculations, cost estimates, and estimates of working days. Preparation of these documents shall conform to the requirements Estimating Quantities guide. Consultant designer can contact the OSFP Liaison for the Estimating Quantities guide.

Quantity calculations, and check quantities calculations calculated by an independent checker, shall be based on the design shown on the checked structure plans. The quantities and check quantities shall be compared and the differences more than those allowed in the Estimating Quantities guide.

Quantities and check quantities shall be separate from each other. A set of quantities and check quantities shall be prepared for each structure when a project involves multiple structures.

For each structure in a project, the following State forms shall be prepared for quantity summaries and cost estimates:

- BD-0362 Structure Quantity Summary
  - Earthwork
  - Pile Summary
  - Precast
  - Concrete
  - Rebar by component
  - Rebar Summary
  - Rebar Quantity
  - Misc. Metal
  - Br. Removal (Portion)
  - RW Area
- BD-0363 Structure Quantity Summary – Structure Work Other than Replace/Widen Bridge

These forms are available through the OSFP Liaison.

In addition to completing the forms above, the following documents must also be prepared:

- Working Days Schedule prepared to show the estimated working days to construct the structure work. Only one form per project is required. For projects involving multiple structures, the schedule will show all the structures. Separate schedules for each structure will be required only in exceptional cases.

- An additional BD-0362 Structure Quantity Summary prepared to show combined structure quantities and the total structure cost on projects with multiple structures.

For projects advertised by those other than Caltrans, the quantity calculations, summary forms and working day schedules will not be reviewed and are not a required submittal. The exception is that the BD-0362 Structure Quantity Summary showing the quantities and cost estimate for each structure must be submitted for informational purposes.

4.8 ROAD PLANS AND SPECIAL PROVISIONS

Consultant structure and roadway designers must review each other's plans and specifications to ensure consistency between plan details and specifications, to identify points of conflict, and to identify features on the road plans that require a special structure design and OSFP oversight. The reviews must cover all aspects of the project with special attention to the following items that frequently have conflicts or are overlooked:

- Falsework openings
- Utilities
- Contractor staging areas
- Bridge/roadway drainage
- Layout lines, profiles, typical sections
- Construction staging/traffic handling
- Right of Way conflicts
- Special designed retaining walls or soundwalls and elements thereof
- Special designed sign structures (bridge mounted, and non-bridge mounted)
- Late plan changes

The submittal of road plans and road special provisions are required at the Initial, Intermediate and Final PS&E submittals unless otherwise requested by OSFP.

4.9 AS-ADVERTISED CONTRACT PLANS AND SPECIAL PROVISIONS (LOCALLY ADVERTISED PROJECT ONLY)

For all locally advertised projects, the design consultant or the local agency shall submit the as-advertised contract plans and as-advertise special provision to the OSFP**. The OSFP Liaison will review the as-advertised contract plans and as-advertise special provision to ensure the approved structure PS&E plans and special provisions are incorporated in the as-advertised contact documents**. If the as-advertised documents deviate from the approved structure plans and special provisions, the as-advertised documents may need to be corrected by addendum or change order.

4.10 RESIDENT ENGINEER'S PENDING FILE

The Resident Engineer's (RE) Pending File contains construction related documents and information assembled by the consultant through the various project development phases for structure work. For Caltrans advertised projects, the RE Pending File shall be submitted to OSFP with the Final PS&E Package. For a project advertised by locals, the RE Pending File must be transmitted to the representative who will administer and inspect the structure construction.

The RE Pending File shall typically contain the following consultant provided documents and information:

- Notes from Designer/Project Engineer
- Joint Movement Rating Calculations for bridge expansion joints (using Caltrans Form DSD -D-0129) prepared in accordance with *Bridge Memo to Designers*.
- Shaft Design Information sheet, per Memo to Designer 3-7 Attachment 1
- Final Foundation Report
- Final Hydrology/Hydraulics Report
- Special instructions or information from the Designer to the Resident Engineer/Structure Representative. As a minimum, this should include the following:

1) The intent of the designer where misinterpretation of contract documents is possible
2) Alerts to details or sequences.
3) A description of construction methods anticipated for unique or unusual designs.

- Special falsework or shoring concepts and requirements.
- As-Built plans for existing structures.
- 1" = 4'–Deck Contour Plots (4-Scales) prepared in accordance with *Bridge Memo to Designers.*

The Joint Movement Rating Calculations and Shaft Design Information sheets are available from the OSFP Liaison.

4.11 PUMPING PLANTS

Pumping plants involved in Special Funded Projects require essentially the same procedural steps and documents as for any other Special Funded structure on State right of way. The purpose of this section is to outline the differences in all project phases from project development through construction support.

4.11.1 GENERAL PUMPING PLANT SCOPING AND DESIGN CONSIDERATIONS

Pumping plants have high initial cost, operational liability, maintenance expense, power cost, and are susceptible to untimely power outages and therefore should be used only when gravity flow systems are too costly or are otherwise not feasible.

Caltrans pumping plants are custom designed based on site specific criteria formed around Caltrans design philosophies for protecting the roadway from storm water flooding. In addition to site specific criteria, pumping plant designs are based on standard engineering principals for industry stormwater lift station facilities and Caltrans Pumping Plant Design manual 4th edition (July 2019).
Some general but significant Caltrans pumping plant design philosophies include the following:

- Storage is designed to store significant runoff before pumps switch on. This makes the storage need significantly larger than for usual industry pumping plants.
- Pump sizes are limited so that standardized trailer mounted generators, owned by Caltrans, can power them. Compared to industry pumps, pump sizes are smaller and cycle on less frequently.

- Pumps and outflow pipes are orientated to allow ease of inspection and maintenance.
- Pumping plants are dedicated specifically to the roadway drainage area contained within State right of way.
- Storm water runoff originating from outside Caltrans right of way must not enter the pumping plant drainage area.
- Pumps start/stop control system is designed to have a main level monitoring control system with back-up controls to provide system operational redundancy. This control system also provides the option for remote monitoring and integration with department enterprise SCADA system.
- Groundwater pumping requirements must be handled by a separate system.

The design philosophies add cost as compared to typical industrial pumping plants (e.g. utility companies) but are essential to meet Caltrans operational requirements. Consultants must be aware of the philosophies in the early stages of projects when pumping plants are scoped and later when designed. As projects are developed, the design philosophies and site-specific design criteria are discussed in detail with consultants at the pre-Type Selection Meeting discussed later in this section.

Caltrans pumping plants must be designed to meet the pumping plant philosophies; the California Building Code; the regulations and codes listed in Section 7-1.02, “Regulations and Codes” of the Standard Specifications; Section 74, Pumping Equipment and Controls of the Standard Specification and the industry standards that are applicable.

The Caltrans Pumping Plant Design manual 4th edition (July 2019) is available from the SFP Liaison.

4.11.2 PROJECT DEVELOPMENT

The project development steps, processes and documents required for pumping plants are the same as for other structures on Caltrans right of way as described in sections elsewhere in this Guide. The basic project development steps as they pertain to pumping plants are described below.

4.11.3 ADVANCED PLANNING STUDY

For new pumping plants, the APS must show the anticipated layout, estimated cost and other information customarily shown on APS’s. In addition, the APS must note

the approximate area to be drained, the assumed rainfall intensity, the estimated storage capacity, and an estimate of the pump horsepower required.

The consultant may base the costs of new pumping plants on the amount of runoff that will be pumped or by other means that will produce a viable estimate.

For pumping plant modifications, the same information must be shown as appropriate and estimates must be based primarily on the items of work involved.

4.11.4 TYPE SELECTION

The Type Selection process requires significant preparatory work and analysis beyond that required for usual bridge structures. Consultants and sponsoring agencies must factor this lead-time into their project schedules. A lead time of no less than one month should assumed.

The Type Selection Process for pumping plants consists of the following steps:

- The preparation of a pumping plant data submittal (PPDS)
- District approval of the PPDS
- Pre-Type Selection Meeting
- Preparation of the General Plan
- Type Selection Meeting

The pumping plant data submittal (PPDS) must contain the preliminary information that Districts normally furnish DES for pumping plants designed by Caltrans. The information required is published in the *Highway Design Manual* and in Chapter 3 of the *Drafting and Plans Manual of Instructions.*

The PPDS must be prepared by the consultant and approved by the District as a first step in the Type Selection process and before submitting it to the Liaison Engineer.

Once the PPDS is submitted to the Liaison Engineer and is reviewed, the consultant must attend a Pre-Type Selection meeting at which the Caltrans pumping plant design philosophy will be discussed in detail and site-specific parameters for the design will be established. The meeting will be held with PDT in Sacramento or on-line.

Based on the requirements discussed at the meeting, the consultant must prepare a General Plan that will be used for Type Selection. As a step in determining the structure layout and layout of pump equipment on the General Plan, the consultant must perform the necessary iterative head calculations to determine the storage box volume and the number and horsepower of the pumps.

Other documents the consultant must prepare and submit for the pumping plant Type Selection meeting are the same as for other structures discussed in sections elsewhere in this Guide.

Pumping plant Type Selection Meetings are typically held separate from the other structures on a project because of the preliminary work required and the fact that pumping plant Type Selection issues generate significant and detailed discussions.

4.11.5 UNCHECKED DETAILS AND PS&E SUBMITTALS

The unchecked details and PS&E submittals should coincide with the same submittals for the other structures on the project whether or not the pumping plant Type Selection meeting was held separately.

Review durations for the pumping plant submittals may extend up to two weeks beyond the durations for other structures. The Liaison Engineer should be contacted to determine the durations to be anticipated.

4.11.6 PROJECT DEVELOPMENT DELIVERABLES

Other than for the PPDS discussed under “Type Selection” above, the types of documents, their content, and formatting is the same as for other structures. This includes plans, special provisions, foundation reports, design calculations, independent check calculations, quantity calculations, etc. Significant differences are outlined below.

4.11.7 PLAN SHEETS

Pumping plant plans must consist of the following sheets assembled in the order shown:

- General Plan
- Structural drawings

- Mechanical drawings
- Electrical drawings

Plan sheet numbers in the lower right corner of the drawings are preceded by “GP”, “ST”, “M”, and “EE” respectively. Numbering restarts with each type of drawing.

4.11.8 SPECIAL PROVISIONS

Standard Special Provisions (SSPs) for the structural work are available from the internet for consultants to download and use. For mechanical and electrical work, standard specifications are modified by NSSPs (non-standard specifications) specific to each design criteria which are not available from the internet and must be requested from the Liaison Engineer.

Sections in the Special Provisions must include the following:

Section 10:

- Contractual requirements in “Order of Work” that specify how the contractor must maintain pumping capacity within the drainage area during construction.
- Special provisions throughout for the structural work.

Section 74:

- Special provisions for Pumping Equipment and Controls.

4.11.9 CONSTRUCTION SUPPORT

Construction support of pumping plants involves the same duties as for other structures where the consultant must perform the following:

- Answer questions and address issues that arise as the pumping plant is constructed.
- Prepare change order revisions.
- Review shop drawings and submittals*
- Make on-site visits when necessary*
- Prepare and submit as-built drawings

Of the above, the two items marked with an asterisk require further elaboration.

4.11.10 REVIEW SHOP DRAWINGS AND SUBMITTALS

Review of shop drawings and submittals requires more intensive effort than for usual bridge designs because of the number of submittals that are required.

The construction contractor must submit schedules of components to be installed in pumping plants to the Caltrans Structure Rep. The schedules must be submitted to the Caltrans Structure Rep regardless of whether the project is advertised by Caltrans or by others. The consultant must ensure the contract documents require this. Caltrans Structure Rep distributes the submittals to the Liaison Engineer, other DES functional units, and the consultant for review.

Once DES reviews are complete, the comments and recommendations will be transmitted to the consultant. The consultant must notify the Liaison Engineer immediately should there be an issue with the comments or recommendations provided. Otherwise, the consultant must incorporate the comments and recommendations into their own comments.

The submittals must be reviewed by the Engineer of Record, and if the Engineer of Record is not available, by another registered employee of the firm.

After review, the consultant must stamp each item of the submittal with a review stamp and return the submittal to the Caltrans Structure Rep and the Liaison within 5 working days. The review stamp used by consultant must be similar to the one shown at the end of this section.

4.11.11 VISITS TO THE CONSTRUCTION SITE

When requested by the Liaison Engineer, the consultant must visit the construction site to address design issues that arise during construction. When requested consultant must also visit the electrical equipment supplier facility for pump controls testing and verifying its conformity with the approved submittals before shipping the equipment to the job site.
When the construction contractor tests pumping plants, Structure Representatives and consultants must inform the Liaison Engineer of the upcoming tests.

The Liaison Engineer will arrange for Caltrans representatives from the appropriate disciplines to attend the testing and make the final inspections and the final determination as to whether the test results are acceptable and in accordance with the contract documents. The Liaison Engineer will ensure the consultant is informed of the test should the consultant wish to attend.

4.11.12 SAMPLE REVIEW STAMP FOR SUBMITTALS

As discussed previously in this section, the consultant must stamp the construction contractor's submittals after review. The stamp must be similar to the one shown below.

REVIEWED FOR THE STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION
DIVISION OF STRUCTURE DESIGN
by (consultant's name here)

☐ APPROVED: NO EXCEPTIONS TAKEN

☐ APPROVED: AS NOTED—SUBJECT TO NOTATIONS INDICATED IN RED

☐ NOT APPROVED: RESUBMIT

BY:_____DATE:_____

4.12 BUILDINGS

Pending development

4.13 CONTRACT DOCUMENTS

Contract Documents consist of complete sets of project plans and special provisions as printed to advertise and construct a project.

For projects advertised by Caltrans, the Structures Specifications unit will distribute Contract Documents to Caltrans functional units as necessary.

Contract Documents for projects not advertised by Caltrans shall be submitted to the OSFP Liaison Engineer by the consultant.

4.14 ADDENDA

Addenda are issued at the advertising agency's discretion to effect changes in contract documents during a project's advertisement period for construction. Advertising agencies should consider issuing addenda to add or remove significant work, to correct significant errors and omissions, and to resolve conflicts in the contract documents. Whether a project is advertised by Caltrans or by other agencies, structure related addenda must be reviewed and approved by the OSFP Liaison Engineer prior to being issued.

4.14.1 ADDENDA FOR CALTRANS ADVERTISED PROJECTS

For Caltrans advertised projects, the District makes the final decision on whether to issue an addendum. However, when structures are involved, the Division of Engineering Services (DES) provides input into the decision through the Office Structure Office Engineer (SOE), the focal point in DES for preparing structure portions of addenda.

When a change warrants an addendum related to structure work, SOE coordinates with the District, the structure designer, SFP Liaison and other applicable functional units to assemble and integrate the revised plan details, quantities, and specifications into a structure's addendum package. SOE transmits the package to the District who processes the structure amendments with their own and submits the combined package to the Division of Office Engineer (DOE). DOE issues the final addendum to prospective bidders and distributes copies of the addendum to the appropriate Caltrans units.

For projects that are consultant designed (and Caltrans advertised), the addendum process is the same as above except that SOE coordinates with the OSFP Liaison Engineer who then provides the necessary consultant coordination and oversight

to procure the needed details, quantities, specifications, and approvals to support the addendum.

The Liaison Engineer is the point of contact for consultants and others who discover an issue or conflict that involve consultant designed structures. When issues and conflicts are discovered, the Liaison Engineer must be notified immediately to expedite the preparation of an addendum if one is warranted.

4.14.2 ADDENDA FOR PROJECTS ADVERTISED BY OTHERS

For projects advertised by others, the sponsoring agencies determine whether to issue addenda and must coordinate with consultants as necessary to obtain the required plan, specification, and estimate amendments. The sponsoring agencies or consultants must then coordinate with the Liaison Engineer to obtain review and approval of the addenda.
When the sponsoring agency considers issuing addenda that could potentially impact structures, the Liaison Engineer must be notified immediately to discuss the submittals and reviews required as well as the coordination and timeframes involved. Required submittals may consist of plans, specifications, estimates, and necessary supporting documents like design and check calculations, reports, and quantities.

It is the Liaison Engineers' goal to team with the consultant and sponsoring agency to complete the addenda process as expeditiously as possible.

There are instances where Caltrans will require the local agency to issue an addendum to incorporate changes into the contract documents as a condition of oversight approval. In these cases, the local agency must prepare an addendum unless a mutually agreed alternative is found.

4.15 BIDDER INQUIRIES

During the advertisement period for a construction project, contractors, fabricators and suppliers often have questions regarding the plans and specifications and will contact designers and others for an answer. During advertisement, those making bidder inquiries must be referred to the contact information listed in the bid documents to get their question answered. Inquiries made after award of the construction contract must be referred to the Resident Engineer.

For projects advertised by Caltrans, the contact information specified is that of the Caltrans Office Engineer. The Office Engineer will then forward any structure

related inquires to the Structures Duty Senior. The Structure Duty Senior resides in Structure Office Engineer (SOE) and serves as the designated point of contact for structure related inquiries.

The purpose of having the Structures Duty Senior designated as the point of contact is to provide all potential bidders with uniform responses to questions and to provide the same information given to one bidder to all bidders. This avoids inadvertently giving a bidder an unfair advantage. The Structures Duty Senior also triggers the issuance of addenda or other action necessary to deal with issues in contract documents that bidder's inquires expose.

Potential bidders can also make inquiries and see the results of previous inquiries through the Division of Office Engineer's web site.

Other key elements of the Caltrans bidders' inquiry process are as follows:

- A systematic distribution to all contract document holders of all inquiries, responses, and actions.
- A systematic distribution of all inquiries and responses to Caltrans units with an interest in the project. This includes the District, Structures Design, Construction, OSFP (in the case of OSFP projects), and others. Copies are also forwarded to the RE pending file.

Sponsoring agencies are strongly encouraged to establish a similar process to deal with such inquiries.

Regardless of the bidder's inquiry process used by other advertising agencies, the agencies shall forward to the OSFP Liaison Engineer documentation of all inquiries and responses and actions that affect the structure work.

Any actions that result in modifications to the approved contract documents must be made by addendum or contract change order, either which must be reviewed and approved by OSFP before being issued.