OFFICE OF SPECIAL FUNDED PROJECTS

INFORMATION AND PROCEDURES GUIDE

CHAPTER 3: PROJECT INITIATION AND PRELIMINARY ENGINEERING

STRUCTURES & ENGINEERING SERVICES
DIVISION OF ENGINEERING SERVICES
DEPARTMENT OF TRANSPORTATION
STATE OF CALIFORNIA

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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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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

3.1 PROJECT INITIATION

3.1.1 INTRODUCTION

The OSFP Liaison Engineer strives to assist in the delivery of quality projects at all phases of project development. This is particularly the case in the project initiation stage when the sponsoring agency decides to go forward with a project and will proceed through the consultant selection process to begin project development. Because these initial activities are critical to promote success in future project stages, it is important at the project initiation stage for Districts and sponsoring agencies to engage the OSFP Liaison Engineer.

Districts and sponsoring agencies are strongly encouraged to take advantage of the Liaison Engineer's services when initiating special funded projects involving structures. The services provided by the Liaison Engineer at this time include assistance and expertise, especially in the following areas:

- Request for Proposals or Qualifications
- A&E Contract Statement of Work
- Consultant Selection
- Project Kickoff Meetings

These areas are further discussed below.

3.1.2 REQUEST FOR PROPOSAL OR QUALIFICATIONS

The Liaison Engineer will assist in the development of the scope of consultant services associated with the structure work.

The Liaison Engineer will meet with the sponsoring agencies to review and discuss site conditions, constraints, available project information, and details existing structures, and will provide recommendations accordingly.

In addition to bridges, the Liaison Engineer will assist districts and sponsoring agencies with the development of the scope of consultant services for special earth retaining systems, pump plants, buildings, moveable bridges, and other special structures.

3.1.3 A&E CONTRACT STATEMENT OF WORK

The Liaison Engineer will assist Districts and sponsoring agencies with the development of the structure portion of the Statement of Work for the Architectural and Engineering Contract (A&E). This ensures that the structure's project development phases, milestones, and related deliverables are clearly identified.

3.1.4 Consultant Selection

The selection of consultants who possess the knowledge, and experience, and that have successfully demonstrated these qualities and capabilities on other projects will offer the greatest opportunity to achieve a successful project. The Liaison Engineers reviews projects prepared by many consultants statewide and will offer useful insight on their capabilities.

The Liaison Engineer will assist with the review of proposals or qualifications, ranking of consultants for interview purposes, and final selection of the most qualified firm.

3.1.5 PROJECT KICKOFF MEETINGS

The Liaison Engineer will participate in project kickoff meeting. Once the consultant selection and contractual process are complete, a project kickoff meeting should be held with the project personnel who will be involved in the project. This should include key representatives from the sponsoring agency, the consultants, District functional units, as well as the Liaison Engineer.

The Liaison Engineer will share vital information necessary for project development, make all parties aware of Caltrans requirements for structure work, will provide input for determining the project schedule, and will establish vital communication links.

3.1.6 SUMMARY

The goal of the project initiation effort is to identify the main project features early on; establish vital communication links with the project sponsors, District staff, Liaison Engineer, and consultant staff; develop accurate project schedules; and convey the project requirements for structures to the project team.

Early participation by the OSFP provides Districts and sponsoring agencies the opportunity to improve the quality and delivery of projects and while ensuring projects conform to Caltrans policies, standards and practices.

3.2 ADVANCE PLANNING STUDY SUBMITTAL

The Consultant Prepared Advance Planning Study (APS) Checklist is an editable form that is available upon request from the OSFP Liaison.

APS plan sheets are required in Project Study Reports (PSR) and Project Reports (PR) to document the scope, cost of structure work, working days, feasibility, traffic handling, other impacts in projects. An APS consists of one (or more) APS plan sheet(s) for each structure showing the basic structure layout details, traffic handling/openings and cost estimate. Unless otherwise determined by the OSFP Liaison Engineer, APS must be prepared for all structure work including bridges, culverts, tunnels, retaining walls, pumping plants, structure modifications, and any non-standard or special design structures.

The APS shall be prepared in accordance with guidelines set forth in Memo to Designers, Structure Technical Policies, Bridge Design Memos, etc. Consultants shall be responsible for developing feasible structure alternatives, costs, and controls appropriate for the specific location. The structure consultant and the roadway consultant must coordinate project and structure alternatives and associated estimates to arrive at the best project solution. The lowest structure cost does not always translate to the lowest project cost or the optimal project solution. For example, a higher-cost precast structure will eliminate the need for falsework potentially reduce other project costs enough to result in the lowest over-all project cost and meet other project objectives.

Seismic evaluation of existing structures is required to ensure conformance with current standards or to determine the extent of retrofit required. Evaluation and analysis shall be done as specified in the Memo to Designers, Structure Technical Policies, Bridge Design Memos, etc. Early consultation and coordination between OSFP, the District, consultants, and the sponsoring agency is necessary to achieve early convergence on the scope of design effort required and eliminate wasted effort on unnecessary analysis.

For widenings and modifications of existing structures, the Structures Maintenance records shall be reviewed for deficiencies and any recommended work that should be included with the project. This work shall be documented in a design memo by the consultant.

Accelerated Bridge Construction (ABC) evaluation must be performed as part of the APS. The structure design consultant can contact the OSFP Liaison for ABC evaluation documents.

Bridge Life-Cycle Cost Analysis (BLCCA) may be required as part of the APS. The OSFP Liaison will determine if BLCCA shall be performed. The OSFP Liaison will provide the BLCCA documents.

3.2.1 DELIVERABLES

The following deliverables are required for review at the Advance Planning Study Submittal stage:

1. The APS plan sheet(s)
2. Preliminary Foundation Report
3. Preliminary Hydraulic Reports
4. APS Checklist
5. Design Memo
6. Itemized Cost Estimate.
7. ABC evaluation
8. BLCCA (if requested)
9. Draft Project Report
10. Responses to comments (for resubmittals)

The deliverables are required to identify site parameters that could have a significant impact on the scope or cost of the structure proposed by the APS. Additional information on the deliverables is discussed below.

3.2.2 ADVANCE PLANNING STUDY

The Advance Planning Study delineates a feasible structure type, requirements, constraints, and associated cost estimate summary for the structure work involved. The APS need only use the minimum detailing necessary and basic dimensions to clearly define the scope the structure work and to develop a reasonable cost estimate. As a minimum, the APS plan sheets should use Plan, Elevation, and Typical Section views and make note of all critical assumptions. Additional APS plan sheets must be prepared as appropriate to consider alternative structure types.

The APS plans sheets shall be prepared on the most current APS formatted plan sheet.

3.2.3 PRELIMINARY FOUNDATION AND PRELIMINARY HYDRAULICS REPORTS

Preliminary Foundation and Hydraulic Reports are required for an APS to identify basic site parameters which may have a significant impact on the structure scope and cost. For more information on these reports, refer to the foundation and hydraulics sections elsewhere in this Guide.

3.2.4 APS CHECKLIST

As an aid in the collection of the information needed to prepare the APS and estimate the cost, a checklist entitled “Consultant Prepared Structures Advance Planning Study (APS) Checklist” is available upon request from the SFP Liaison. This checklist should be utilized and submitted with the APS to document pertinent project information. One checklist may be used for all bridges on the project.

3.2.5 DESIGN MEMO

The consultant must prepare a Design Memo to summarize and document the following items:

- Important or unusual design assumptions or structure features
- Discussions with Caltrans personnel concerning any key assumptions
- Modifications from Structure Maintenance Records recommendations
- Seismic retrofit modifications
- Local agency requirements such as aesthetics, improvements in vicinity of the structure, airspace usage, or other obstructions
- Special Railroad requirements, including shoofly provisions and cost
- Special foundation requirements, including scour critical work, special excavation such as Type A, Type D, and/or hazardous or contaminated material
- Special construction requirements, including limited site accessibility or seasonal work.
- Identify complex bridge and future requirements per Section 2-7.
- ABC evaluation and incorporated ABC features.
- BLCCA in the evaluation and selection of alternatives.

One Design Memo per project is acceptable provided the memo cites the individual structures appropriately.

3.2.6 ITEMIZED COST ESTIMATE

The APS structure cost estimate must be supported by an itemized cost estimate which must show estimated quantities or square feet factors for major items of work, associated unit prices, extended item totals, and a subtotal of all item costs. The itemized cost estimate must also show a grand total for the structure work by the addition of a 25% contingency factor and 10% mobilization factor to the subtotal of all item costs.

3.2.7 REVIEW AND APPROVAL

Within four (4) weeks after receiving the APS submittal, OSFP will return comments to the District Project Manager.

Resubmittal may be required if extensive revisions or alternatives are necessary. When the APS is acceptable, the OSFP Liaison Engineer will sign the Oversight Approval block on the APS and transmit it by memo to the District Project Manager.

3.3 VALUE ANALYSIS STUDIES

Value Analysis (VA) studies are undertaken early in the project life typically during the development of the Project Initiation Document or Project Report. Although VA studies can be done at any time during the life of the project, studies performed after significant design effort is complete may result in project delays and project development cost overruns.

Districts and sponsoring agencies should include the OSFP Liaison Engineer in planning of the VA studies that may involve transportation structures on the State Highway. The OSFP Liaison will provide an experienced structure engineer to participate in the VA study. The involvement of the experienced structures engineer improves the quality of VA studies by ensuring that project alternatives receive appropriate consideration about feasible structural systems.

Typically, VA studies consist of three primary phases which include:

1. Pre-Study Preparation
2. Study Performance
3. Post-Study Implementation.

The Liaison Engineer and the experienced structures engineer's potential involvement in each stage is briefly described as follows:

Pre-Study Preparation--Assist with the selection of the VA Team members, collect and interpret available information, and evaluate study goals. Early contact with the Liaison Engineer is necessary at this stage to allow enough time for team selection and gathering of supporting information.

VA Study Performance--Provide trained and experienced VA Team members to participate in VA studies. The Liaison Engineer should be allowed enough lead-time in advance of the study to make the necessary arrangements.

Post-Study Implementation--Participate in the evaluation and implementation of recommended alternatives.