

SECTION 7 PREPARING THE PROJECT COST ESTIMATE

7.1 PURPOSE

This section 7 provides guidance for preparing the project cost estimate.

7.2 BACKGROUND

Prepare the project cost estimate using the Department's best cost forecasting capabilities and BEES. The BEES printout of the project cost estimate is called the engineer's estimate.

Documents pertaining to this section include:

- *Basic Engineering Estimating System (BEES) User Guide and Reference Manual*
- *Certification of Project Cost Estimate*, memorandum signed by Robert Pieplow, dated January 5, 2012.
- *PD-04 Project Contingencies and Supplemental Work*, project development directive

The project cost estimate includes:

- Bid item quantities, units of measure, and item costs
- Supplemental work items and costs
- Department-furnished materials costs
- Department expense costs
- Contingencies
- Funding segregation with identification of funding participation levels

The amount of allocated funds should not influence the estimate. Reducing the estimate to be within the allocated amount or within the limit for minor projects will not reduce bids. Bid overruns can cause serious problems such as delay of award, rejection of bids, and re-advertisement.

Project construction funds (capital outlay) are only for project improvement and not for maintenance.

Construction contracts must not include purchasing supplies or equipment for the Department. State law prohibits using capital outlay funds for such purchases. For example, it is prohibited to require the Contractor to provide a changeable message sign for Department use either during construction or after construction is complete.

7.3 RESPONSIBILITIES

7.3.1 GENERAL

Details on responsibilities for approval of supplemental work and nonstandard contingencies are in the project development directive *PD-04 Project Contingencies and Supplemental Work*.

FHWA approval is required on federal-aid projects for items not on the FHWA pre-approved supplemental work list.

For Federal aid projects, FHWA approval is required for contingencies (1) greater than 5 percent and (2) when the increase in contingencies is greater than \$200,000.

7.3.2 PROJECT ENGINEER

- Generates the District portion of the project cost estimate
- Ensures the project cost estimate is complete and accurate including:
 - Complete and accurate bid item quantities for both district and Structures work
 - Consistency between the plans, specifications, and estimate
 - Appropriate final pay designations
- Coordinates with SOE for common bid items
- Prepares the justification and obtains approval for supplemental work not on the FHWA pre-approved list. For high profile projects, obtains FHWA approval of these items before obtaining Department approval.
- Prepares the justification and obtains approval for supplemental work when this work totals more than 5 percent of the project cost estimate
- Prepares the justification and obtains approval for use of nonstandard contingencies (other than 5 percent)

- Corrects BEES entries as necessary to achieve DR milestone
- Ensures accurate funding segregation when applicable
- Prepares justification for Department-furnished materials and Department expenses

7.3.3 OTHER FUNCTIONAL DISTRICT ENGINEERS

- Provides complete and accurate contract quantities for their portion of the project

7.3.4 STRUCTURE OFFICE ENGINEER

- Generates the portion of the project cost estimate for structures work
- Ensures their portion of the project cost estimate is complete, accurate, and consistent with the plans and specifications
- Ensures the final pay designation is appropriate for Structures work
- Coordinates with the District for common bid items and working days
- Reviews the combined project cost estimate and resolves issues with the District as necessary

7.3.5 DISTRICT OFFICE ENGINEER

- Verifies the project cost estimate is complete and consistent with the plans and specifications
- Coordinates with SOE on combined bid items and working days
- Verifies final pay designation is appropriate
- Verifies the funding segregation is complete and accurate

7.3.6 DIVISION ENGINEERING SERVICES, OFFICE ENGINEER

- Verifies the bid item list is consistent with the plans and special provisions
- Verifies final pay designation is appropriate
- Assigns one-time item numbers for nonstandard items

- Locks BEES after DCR
- Maintains standard bid item codes

7.3.7 DESIGN ENGINEER OR PROJECT MANAGER

- Ensures the estimate complies with standard contingencies, pre-approved supplemental work items, and standard limits on supplemental work costs
- Ensures the PE obtains applicable approvals

7.3.8 DEPUTY CHIEF, OFFICE ENGINEER

- Approves or rejects changes to supplemental work or Department-furnished materials items after bid opening.

7.3.9 DEPUTY DISTRICT DIRECTOR OR REGION DIVISION CHIEF

- Rejects or recommends approval to the Chief, Division of Design for the use of nonstandard contingencies
- Rejects or recommends approval to the District Director for the use of supplemental work items not pre-approved by FHWA
- Rejects or recommends approval to the District Director for supplemental funds over 5 percent of the project cost estimate

7.3.10 DISTRICT PROJECT DELIVERY DEPUTY

- When delegated, certifies project cost estimates between \$1,000,000 and \$5,000,000.

7.3.11 DISTRICT DIRECTOR

- Certifies the project cost estimate for all projects
- Recertifies the project cost estimate for certifications
- Rejects or recommends approval to the Chief Engineer for the use of nonstandard contingencies

- Approves or rejects use of nonstandard supplemental funds that are exceeding 5 percent but up to 10 percent of the project cost estimate. This authority cannot be delegated below the Deputy District Director or Region Division Chief level.
- Rejects or recommends approval to the Chief, Division of Construction for the use of supplemental funds that exceeds more than 10 percent of the project cost estimate. This authority cannot be delegated.
- Rejects or recommends approval to the Chief, Division of Construction for supplemental work items not on FHWA's pre-approved list or on the Department's acceptable supplemental work items list. This authority cannot be delegated below the Deputy District Director or Region Division Chief level.

7.3.12 CHIEF, DIVISION OF CONSTRUCTION

- Approves or rejects request for use of State funds for supplemental work not approved by FHWA
- Approves or rejects request for total supplemental work costs that exceed 10 percent of the project cost estimate
- Works biennially with FHWA to maintain FHWA's pre-approved list of supplemental work items. Department-furnished materials and Department expenses

7.3.13 CHIEF, DIVISION OF DESIGN

- Rejects or recommends approval to the Chief Engineer for the use of nonstandard contingencies

7.3.14 CHIEF ENGINEER

- Approves or rejects the use of nonstandard contingencies

7.4 BASIC ENGINEERING ESTIMATING SYSTEM (BEES)

7.4.1 GENERAL

Prepare estimates using BEES. This system:

- Provides data files required for the project information systems and analysis (PISA).

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- Provides data needed by the bid opening and progress pay systems
- Produces segregated estimates according to funding sources

For each project cost estimate, BEES limits the maximum number of bid items to 350. BEES limits the combined number of supplemental work items and Department-furnished items to 50.

For projects that include Structures work, the DOE submits a project cost estimate that is a combination of the estimate from the District and SOE. Structures work may include railroad work, temporary structures, supplemental work, Department-furnished items, and Department expenses.

For a given project, BEES permits separate storage of the District from the SOE estimate. The District and SOE must use the same EA and keyword when inputting their portion of the items into BEES. Phase 1 must be used for the EA. If the District and SOE do not use the same EA and keyword, BEES cannot generate a combined estimate. District files are designated with "H" and SOE files are designated with "B". The combined file is designated with "C". Each office is responsible for completing and updating their portion of the estimate. BEES reports may be generated for just the "H" or "B" portions or may be generated for the combined "C". When BEES generates a combined estimate, the quantities for District and structures are integrated. If District and SOE estimates have the same bid item but different unit prices, the District unit price prevails. Before finalizing the estimate, District and SOE estimators must agree on the pricing for items with the same bid item.

The PE reviews all items and ensures that quantities and costs are not duplicated. Duplication may occur for items such as temporary railing or retaining walls. For project with work where a portion of an element (such as a retaining wall) is designed by both the District and Structures, the same bid item should be used. If the Structures portion is designated as final pay, final pay designation should also be used for the District portion. In the rare case where it is appropriate to pay for the same work with different bid items, the plans must clearly show the limits for payment.

If federal or local funding is included, segregate the estimate before submitting the PS&E to DES-OE under Section 7.11.

The project estimate should be certified at the DR milestone, and must be certified no later than the DCR milestone.

DES-OE locks the estimate in BEES at DCR. If updates are necessary after DCR, submit redline changes to DES-OE.

Estimate updates are only accepted for changes to unit prices and changes to federal trainees as supplemental work. Include any changes to structure unit prices with the update request.

A copy of the most current certified estimate must be attached to the request for funding. Recertification is required if updates have been made.

The certified estimate must not be older than 90 days at the time of CTC vote.

7.4.2 ROUNDING QUANTITIES

The PS&E contains two kinds of quantities:

- Actual calculated quantities shown on the plans to help the Contractor and the Engineer complete the project
- Rounded quantities shown on the bid item list to simplify bidding.

Quantities on plans must be actual calculated quantities and never rounded quantities.

When applicable, round the quantities in BEES and on the bid item list. Round using the total quantities and not partial quantities or subtotals. Typically, quantities should be rounded up. Do not round such that the quantity is changed by more than 25 percent. Do not round structure bid items.

Do not round final pay quantities unless the quantity is more than 5. In this case, round up to the nearest whole number. For example, round 6.3 to 7.

For quantities greater than 1,000, round to no more than three significant figures. The significant figures are those figures of a number that begin with the leftmost figure and extend to the last nonzero figure to right. For example:

- 5,050 and 1,620,000 are correctly rounded
- Round 1,103 to 1,110
- Round 2,234,541 to 2,240,000

For quantities less than 1,000, round to no more than two significant figures. For example, round 426 to 430.

Avoid decimal quantities. Consider using a unit of measure that avoids this problem such as using 1,000 lb and not 0.5 ton. Do not use more than 1 decimal place in a BEES quantity. Currently the programs used for opening bids and accounting during construction accept only 1 decimal place. Any quantity with two or decimal places must be corrected prior to bid opening, even if an addendum is required.

It is not always possible to eliminate using one decimal place for small quantities. For example, 1.4 lb of seed for erosion control cannot be rounded up to 2 lb or down to 1 lb without changing the quantity by more than 25 percent. For decimal quantities less than 5, round to one decimal place. For volumetric or weight quantities of 5 or more, round to the nearest whole number.

7.5 ESTIMATING COSTS

7.5.1 GENERAL

The estimate must be current, complete, and accurate at RTL. For AADD projects, the estimate in the PS&E submittal is the final project cost estimate.

If the CTC votes on the project funding, the project cost estimate should be reviewed and updated before being listed for the CTC vote. Data entered into the BEES should not be changed after the CTC vote.

If a CTC vote is not required, estimates should be reviewed and updated as necessary before funds are allocated. Data entered into the BEES should not be changed after funds are allocated.

Estimating is not an exact science and analysis should include evaluation of the following issues.

a. COST FLUCTUATION

The project cost estimate must be reviewed and corrected as conditions change and costs fluctuate.

Construction costs may fluctuate due to issues including:

- Material shortages which may develop at unexpected intervals and cause an increase of the material prices

- Wages increases which typically occur a somewhat predictable rate
- Time of the year that the contract is advertised

b. TRAFFIC CONDITIONS

Traffic conditions can have a significant effect on costs. Adjust unit prices to reflect special difficulties, dangers, and expenses caused by traffic. Contractors are inclined to raise their bids for projects with difficult traffic conditions.

c. RESTRICTIVE WORK HOURS OR METHOD OF WORK

Restricting the working hours or the method of work on a project may have a major effect on costs. If the special provisions limit work to nighttime or short shifts, increase unit prices to reflect:

- The cost of premium wages for night work
- Premium payment for partial shifts
- General decreases in productivity and efficiency

Night work for HMA can be especially expensive where small quantities are involved. HMA plants do not usually operate at night. Small quantities and night deliveries increase the unit prices.

d. SMALL QUANTITIES

Small quantities of work and materials will nearly always have higher unit prices than identical work in larger quantities. Equipment and labor must be distributed over a much smaller base. Production is usually inefficient and slow for small quantities and this also increases unit costs.

e. SEPARATED OPERATIONS

Separated operations will generally have higher unit prices. Staged construction, specified order of work, or scattered locations may require portions of the work to be constructed as separate operations. Each operation may require separate equipment and labor. In this case the unit prices should then be based on the smaller operations and not on the total quantities for the project. Consider separated operations when estimating mobilization.

f. HANDWORK AND INEFFICIENT OPERATIONS

Handwork, small, and low production rate operations (even though equipment may be used) have higher unit costs than work adaptable to machine operation, mass production, and high production rates.

g. ACCESSIBILITY

Difficult job site access increases cost.

Work on an existing interchange may require long out-of-direction movements by construction personnel and equipment if the Contractor must observe one-way ramp movements or enter or leave at restricted locations (such as only ramps or interchanges). Hauling materials for earthwork under these conditions can be especially expensive.

Work at the top of retaining walls, on slopes, or where workers must climb slopes to get to the work area is expensive. This is true regardless of whether the operation is handwork or is done by equipment. Work that is easy to do on level ground or a gentle slope may be almost impossible to do on steep slopes.

h. GEOGRAPHIC LOCATION

Geographically remote locations usually result in higher unit prices.

Where applicable, the unit prices should include consideration of the Contractor's costs for the worker's subsistence.

The source of supplies and the distance to the job site from these sources should also be considered.

i. CONSTRUCTION SEASON

The time of the year when the Contract is awarded may affect cost. Contractors are usually more available for work early in the spring and will therefore bid more competitively at that time. Later in the spring or summer, many contractors have on-going contracts to keep them busy and therefore tend to bid higher or not at all.

For contracts awarded near the end of summer or end of the construction season for a given location, it is important to determine if construction can be finished before the construction season ends. If the Contract cannot be finished before the end of the construction season, contractors increase their bids to cover work delays due to bad weather and winter suspension. Even if contractors reasonably expect to finish before winter, they increase their bids to cover costs

from delays due to early rains. This is especially true if construction involves work in or around drainage channels, rivers, rainy areas, and snow areas.

7.5.2 PRICING METHODS

a. GENERAL

There are two methods commonly used for estimating prices. One method uses previous bid prices as a basis for establishing prices. The other method makes a complete analysis of production rates, labor costs, and material costs. One or both methods can be used.

b. PREVIOUS BID PRICES METHOD

Basing estimates on previous bid prices is probably the most widely used and the most practical method. When using this method, consider:

- Using approximately the same size and type of projects that have similar quantities for individual items
- Using an average price from the 3 lowest bidders, using prices from the 2nd lowest bidder, or using the District 8 cost database
- At a minimum, revising previous bid prices by the projected change in the California Construction Cost Index between the date of the old bid and the anticipated date of the new bid. See Section 8 for typical schedules to calculate the time to the probable new bid opening date.
- Adjusting the reference bid price to reflect conditions of the project, such as type of terrain, geographical location, soil, traffic, and other related factors
- Not using lump sum bid prices or unit prices for items of work (such as culverts) that include varying amounts of other related work
- Using comparable months. Seasonal work items vary by the time of year.

To estimate the price of individual items, start with bid prices from similar projects. Pricing tools available on the DES-OE Internet site include:

- *Contract Cost Data*. These books are published annually.
- Quarterly California highway construction cost index
- Asphalt price index
- Bid summary results from projects with bid opening (1) within the last six weeks (2) less recent

Item cost databases are available on the DES-OE Intranet site. These FileMaker Pro databases containing all contract items with quantities and prices used in the past four quarters and the past several years, listed by item code number. District 8 maintains a comparable Intranet site that does not require FileMaker Pro.

The scheduling chart showing average times from submittal of PS&E to award is available on the DES-OE Intranet site. This can be used to help determine the time of year that bid opening will occur.

c. COMPLETE ANALYSIS METHOD

This method is not usually practical for all estimating all bid items. It may be practical for estimating earthwork items where rock or unusual haul is required, or for lump sum items such as signals and lighting. Use the following steps:

1. Compile a materials list
2. Estimate materials costs using available price lists
3. Estimate production rates
4. Determine labor and equipment costs based on production rates
5. Calculate the subtotal
6. Add overhead and profit

It is important to consider subsistence cost and premium pay for overtime on night work. On larger projects with long time limits, determine if the majority of a bid item is paid early or late in the project. To estimate items that cannot be completed early in the project, it may be necessary to forecast wage scales and material cost increases to accurately estimate bid item costs.

7.6 BID ITEMS

7.6.1 GENERAL

Bid items are listed in numerical sequence. Item descriptions must match the item descriptions in the *Coded Contract Item Lists* shown on the DES-OE Web site.

7.6.2 TIME RELATED OVERHEAD

The bid item for TRO compensates the Contractor for overhead expenses such as those for a field and home office. Include this bid item on all projects over \$5 million and with at least 100 working days.

The standard for TRO is 10 percent of the total of the all bid items except for mobilization (i.e., do not include mobilization, supplemental work, and contingencies when calculating TRO).

Unique project requirements may justify a nonstandard TRO calculation. Justification for a nonstandard TRO calculation must include recent cost data from similar projects and consideration of project size, duration, location, and other applicable unique conditions. The PE must obtain approval from the Chief, Division of Construction for use of a nonstandard calculation of the TRO.

7.6.3 MOBILIZATION

The bid item for mobilization compensates the Contractor for preconstruction construction expenses due to preparatory work and assembly of staff.

Include mobilization for contracts with at least 50 working days not including plant establishment days. Mobilization may be included for projects with less than 50 days if the work is primarily structures work. Mobilization is not typically included on contracts that are mostly building work.

BEES automatically calculates the amount for mobilization based on the percentage entered. Enter the percentage into BEES as a decimal such as 0.1 for 10 percent or 0.02 for 2 percent. The percent for mobilization should be based on the evaluation of cost data from recent similar projects and other considerations such as project scope, location, and unique conditions.

7.6.4 NONSTANDARD ITEMS

If the work is not accurately represented by a standard bid item, you may establish use of a nonstandard bid item. Ensure that payment is covered by the specifications, and if necessary obtain approval of an NSSP to cover payment. For use of nonstandard bid items, consult with the owner of the associated specification.

Nonstandard bid items must be consistent in style with standard bid items.

To create a nonstandard bid item in BEES:

- Find a bid item code (1) not already being used for the Contract and (2) with the most similar bid item description and most applicable unit of payment. Use only the units of measure and abbreviations shown in the BEES manual.
- Make the bid item code nonstandard by adding “A” to the end (such as 390104A)
- Do not use bid item codes that are hidden and not shown on the current standard bid item list. If BEES shows the item to be active, but it is not listed on the standard bid item list, it is an obsolete item code that has been hidden and should not be used.

Add nonstandard items to the table in SSP 1-1.01.

Before advertisement, DES-OE replaces the nonstandard bid item code with a unique, one-time bid item code. These one-time bid item codes are shown in the bid item list in the *Bid* book. DES-OE corrects SSP 1-1.01 with the final nonstandard bid item codes.

7.6.5 FINAL PAY DESIGNATION

Bid items may be designated as final pay if either (1) the quantity can be independently verified or (2) the exact quantity is not critical.

Final pay bid quantities must be correct. The Contractor will not receive payment for less than or more than the quantity shown. Do not round the quantities for items designated as final pay, except as described in Section 7.4.

Show the final pay designation on the bid item list.

Do not show the final pay designation on the plans.

Use the following table to assign final pay designation to the bid items.

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Guidance for Final Pay Designation

Items	Work
Architectural Treatment	Bridges, Walls
Bar Reinforcing Steel	Box Culverts and Wingwalls
Bar Reinforcing Steel (Bridge)	Bridges
Bar Reinforcing Steel (Bridge, Retaining Wall, Soundwall, Tunnel, or Pumping Plant)	Bridge, Retaining Wall, Soundwall, Tunnel, or Pumping Plant
Bar Reinforcing Steel (Retaining Wall)	Retaining Walls
Bridge Deck Drainage System	Bridges
Channel, Stripping or Tunnel Excavation	Channels, Tunnels
Class 1 Concrete (Structure)	Box Culverts and Wingwalls
Communication Conduit (Bridge)	Bridges
Concrete Closure Wall	Bridges
Conduit	Communication
Deck Seal	Bridges
Earth Retaining Structure	Retaining Structures
Erect Structural Steel Bridge	Bridges
Furnish and Install Sign Structure (Tubular, Truss, Lightweight, etc.)	Overhead Sign Structures
Furnish Structural Steel Bridge	Bridges
Grind Bridge Deck	Bridges
Handrailing	Bridges
Minor Concrete (Minor Structure)	Drainage Inlets and Pipe Headwalls
Miscellaneous Iron and Steel	Frames and Grates
Miscellaneous Metal (Bridge)	Bridges
Miscellaneous Metal (Restrainer)	Bridges
Miscellaneous Metal (Retaining Wall)	Retaining Wall
Miscellaneous Metal (Tie Rod, Restrainer)	Bridges
Pervious Backfill Material	Bridges, Retaining Walls
Pipe (Supply Line)	Irrigation Systems
Place Deck Overlay (Concrete)	Bridges
Place Polyester Concrete Overlay	Bridges
Pumping Plant Metal Work	Pumping Plant
Railings and Concrete Barrier on Structures	Bridges
Seal Concrete Surface	Bridges
Shotcrete	Bridges, Walls
Sound Wall (Masonry Block)	Walls, Bridges
Sprinkler Control Conduit Bridge	Bridges

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Items	Work
Structural Concrete, Approach Slabs (except Type R)	Bridges
Structural Concrete, Bridge	Bridges
Structural Concrete, Bridge Footing	Bridges
Structural Concrete, Deck Overlay	Bridges
Structural Concrete, Pier Column	Bridges
Structural Concrete, Pumping Plant	Pumping Plants
Structural Concrete, Retaining Wall	Retaining Walls
Structural Concrete, Retaining Wall	Retaining Walls
Structural Concrete, Tunnel	Tunnels
Structural Concrete, Tunnel Footing	Tunnels
Structural Steel	Bridges
Structural Steel (Bridge)	Bridges
Structure Backfill (Bridge)	Bridges
Structure Excavation (Bridge, Tunnel)	Bridges, Tunnels
Treat Bridge Deck	Bridges

7.7 SUPPLEMENTAL WORK

7.7.1 GENERAL

Supplemental funds are used for either (1) work that may or may not be required to complete the project, or (2) work that is not bid. When approved, supplemental funds may be used for work that is anticipated but cannot be quantified. Supplemental work must be within the scope of the Contract.

Do not use supplemental items to:

- Cover an incomplete design or lack of quantities
- Add more contingency funds
- Pay for work that should be paid by maintenance funds. Maintenance work is not eligible for federal funding.
- Pay for work not performed by the Contractor such as the inspection of work by the railroad

Supplemental work must be identified, justified, and approved. Approval request forms and procedures are provided in project development directive *PD-04 Project Contingencies and Supplemental Work*.

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The items for supplemental work are numbered 06XXXX. Items pre-approved by FHWA are shown in the following table:

FHWA Pre-approved Supplemental Work Items

Item Code	Work Description Specification section	Guidance
066094	Value Analysis Section 4-1.07C	Use on nonbuilding projects when the total of the bid items is over \$5 million. Estimate \$10,000 to reimburse the Contractor for 50% of the value analysis workshop costs.
066610	Partnering Section 5-1.09	Use when the total of the bid items is over \$1 million. Estimate the cost using the guidance in Section 7.7.2.
066921	Dispute Resolution Advisor Section 5-1.43E	Use when the total of the bid items is at least \$3 million and not more than \$10 million and if the project has 100 or more working days. Estimate the cost as \$5,000.
066919	Dispute Resolution Board Section 5-1.43E	Use when the total of the bid items is over \$10 million. Estimate the cost using the table in Section 7.7.3.2.
066015	Federal Trainee Program Section 7-1.11D	Use for federally funded projects with at least 100 working days. Estimate the cost using the guidance in Section 7.7.4
066008	Incentive Payments Section 8-1.10	Use when authorized for encouraging early project completion. Estimate using Delegation of Authority for Use of A+B Bidding and Incentive/Disincentive (I/D) Provisions, memorandum signed by Brent Felker, June 12, 2000.
066670	Payment Adjustments for Price Index Fluctuations Section 9-1.07	Use for projects with paving asphalt items. Funds compensate the Contractor for fluctuations in the statewide crude oil price index. Estimate using the guidance in Section 7.7.5.
066070	Maintain Traffic Sections 12-1.03 & 12-3.01C	Use to compensate the Contractor for 50% of the cost-for flagging and 100% for other traffic-handling equipment and devices ordered by the Engineer.
066597	Storm Water Sampling and Analysis Section 13-3	Use to compensate the Contractor for sampling storm water as sampling fluctuates with storm frequency and severity.
066595	Water Pollution Control Maintenance Sharing Sections 13-1, 13-5.04, 13-6.04, 13-7.04	Use to compensate the Contractor for 50% of the cost to maintain temporary water pollution control items identified as approved BMPs on the Contract.

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066596	Additional Water Pollution Control Sections 13-1, 13-2, 13-3, 13-7	Use to compensate the Contractor for overruns and additions when abnormally heavy rainfall occurs during the project and estimated BMPs are inadequate.
066846	Incentive for Hot Mix Asphalt (QC/QA) Section 39-4.04B(3)	Use if QC/QA provisions are included in the contract. Provide 4% of the estimated HMA item cost for monetary incentive to meet contract testing requirements.

7.7.2 PARTNERING

Professionally facilitated project partnering is required for a contract when the total of the bid items is estimated to be over \$10 million. The Department shares the cost. Estimate the cost using the following table:

Partnering

Project cost estimate		Number of working days		Supplemental funds
Over	To	Over	To	
\$1 million	\$10 million	0	50	\$7,000
\$1 million	\$10 million	50	150	\$12,000
\$1 million	\$10 million	150		\$20,000
\$10 million	\$25 million	0	200	\$20,000
\$10 million	\$25 million	200	300	\$35,000
\$10 million	\$25 million	300		\$50,000
\$25 million		0	400	\$50,000
\$25 million		400	600	\$70,000
\$25 million		600		\$90,000

7.7.3 DISPUTE RESOLUTION

When applicable include a supplemental funds for either a dispute resolution advisor or a dispute resolution board. Do not include funds for both on the same contract.

a. DISPUTE RESOLUTION ADVISOR

If the project cost estimate is at least \$3 million and not more than \$10 million, and if the project has 100 or more working days, include the supplemental item for a dispute resolution advisor. Estimate the cost as \$5,000.

b. DISPUTE RESOLUTION BOARD

If the project cost estimate is over \$10 million, and if the project has 100 or more working days, include the supplemental item for a dispute resolution board. Estimate the cost using the following table:

Dispute Resolution Board

Total working days	Supplemental funds
100 to 200	\$7,500
201 to 400	\$15,000
401 to 600	\$22,500
601 to 800*	\$30,000*

*Increase supplemental funds by \$7,500 for each additional block of 200 working days in conformance with the pattern shown above

7.7.4 FEDERAL TRAINEE PROGRAM

For federally funded projects with at least 100 working days, include supplemental funds for the federal trainee program. Trainee funds are required for each of the following work categories:

- Earthwork (except for imported borrow)
- Pile driving
- Portland Cement Concrete (except for precast concrete)
- Masonry

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- Bar reinforcing and prestressing steel
- Structural steel erection
- Electrical
- Buildings

Use the following table to calculate the number of trainees for each work category:

Cost for work category	Number of trainees	Cost for work category	Number of trainees
400,000	0		
≥ 400,000	1	16,000,000	15
700,000	2	18,000,000	16
1,000,000	3	20,000,000	17
1,500,000	4	23,000,000	18
2,000,000	5	26,000,000	19
2,500,000	6	29,000,000	20
3,000,000	7	33,000,000	21
4,000,000	8	37,000,000	22
5,000,000	9	41,000,000	23
6,500,000	10	45,000,000	24
8,000,000	11	50,000,000	25
10,000,000	12	> 50,000,000	*
12,000,000	13		
14,000,000	14		

* 25, plus 1 additional trainee for every \$5,000,000 over \$50,000,000

The number of federal trainees for the Contract is the sum from all work categories. Calculate the contract cost using \$800 per trainee.

7.7.5 PAYMENT ADJUSTMENTS FOR PRICE INDEX FLUCTUATIONS

In order to limit the financial exposure of both the Department and the construction industry to dramatic swings in the crude oil prices, for all projects with HMA pavement, include supplemental funds for payment adjustments for price index fluctuations.

The calculated amount may vary substantially from the actual amount since the change in crude oil prices cannot be predicted with accuracy.

Estimate the cost using the formula: one of the following formulas:

$$F_s \times Q_t \times I_c$$

Where:

- F_s = Supplemental work allotment factor:
 - Use 0.15 for projects with less than 250 working days
 - Use 0.25 for projects with 250 to 500 working days
 - Use 0.35 for projects with more than 500 working days
- Q_t = Total estimated asphalt quantity contained in materials for pavement structural sections and surface treatments to be placed in the work. Use the formulas in specification section 9-1.07B.
- I_c = California Statewide Crude Oil Price Index. Use the current month's index. Update your estimate as close to advertisement as possible.

Include with your PS&E submittal:

- List of materials containing asphalt and the values used for X (percent asphalt content as specified in specification section 9-1.07B), such as:
 - HMA: $X_a = \underline{\hspace{2cm}}\%$
- Total estimated asphalt quantity (Q_t) used for the supplemental item for price adjustments for price index fluctuations
- California Statewide Crude Oil Price Index month
- California Statewide Crude Oil Price Index

7.8 DEPARTMENT-FURNISHED MATERIALS

Items for Department-furnished materials are numbered 06XXXX.

(Subject to Change)

FHWA has pre-approved the following Department-furnished items:

- Permanent sign panels and mounting hardware
- Types N, P, and R object marker panels and reflectors
- Laminated wood box posts and metal caps
- Monument disks
- Markers for railings and concrete barriers
- Traffic signal controller assemblies, including wired cabinets and loop detector units
- Changeable message signs and assemblies
- Asphalt concrete sealant for inductive detector loops
- Self-adhesive reflective numbers and sealer for numbering lighting equipment
- Salvaged material in stock, such as temporary traffic signals and flashing beacons
- Project specific seed and plants that are not commercially available
- Battery backup system (BBS), electronics assembly

If items on the FHWA pre-approved Department-furnished material list are included in a contract, the PE must sign a letter justifying the cost of each item and send it to the Office of Federal Resources. A copy of this letter must be included in the PS&E package.

For items not on the FHWA pre-approved list, the PE must generate a PIF. A new PIF is required for each contract.

7.9 DEPARTMENT EXPENSES

Department expenses are directly related to project construction and do not include work done by the Contractor. FHWA has approved the following Department expenses as eligible for federal reimbursement. (Subject to Change)

FHWA Approved Department Expenses

Item Code	Item Description	Guidance
066020	Railroad Work	Use for work done by a railroad agency.
066063	Traffic Management Plan - Public Information	Use for projects funded by capital outlay and on the State highway system. These funds are for traffic mitigation and public information strategies.
066062	COZEEP Contract	These funds are for the construction zone enforcement enhancement program (COZEEP) where compensation is paid to the California Highway Patrol. Verify cost with District coordinator. For rough cost use either (1) \$85/officer/hour and \$0.70/mile travel expense, or (2) \$90/officer/hour and no travel expenses.
066871	Electrical Service Connections	These funds are for providing electrical meters and connections at the job site to (1) temporary facilities and (2) permanent Department facilities
066893	Utility Service	These funds are for providing telephone connection at the job site to (1) temporary facilities and (2) permanent Department facilities
066901	Water Expenses	For convenience, the Contractor is allowed to use water from Department facilities where available within project limits for landscape work. Since the water is not free to the Department, it has to be charged to the project as a Department expense. Where the Department cannot provide water, the Contractor directly pays the water provider.

A PIF is not required for the FHWA pre-approved Department expense items. However, if these items are included in a contract, the PE must sign a letter justifying the cost of each item and send it to the Office of Federal Resources. A copy of this letter must be included in the PS&E package.

To request Federal participation for items not pre-approved by FHWA, the PE must generate a PIF and obtain approval. A new PIF is required for each contract.

For federally funded project, if the RE Office is furnished by the Department, it shall not be federally funded. However, if the RE Office is provided by the contractor as a bid item, it shall be federally funded.

7.10 CONTINGENCIES

Contingency funds are included to compensate the Contractor for work:

- Not covered by the bid items
- Not covered by supplemental work
- Within the scope of the Contract
- Necessary for completion of the Contract
- Ordered by the Engineer

The standard contingency is 5 percent of the project cost estimate and calculation is automated in BEES. The amount calculated with BEES will be rounded by ± 0.1 so that the amount has no more than 4 significant figures.

Document the need and cost for nonstandard contingencies. The maximum contingency is 10 percent.

Requests for use of nonstandard contingencies must be approved by the Chief Engineer. Forms and procedures are included in the project development directive *PD-04 Project Contingencies and Supplemental Work*.

7.11 SEGREGATING THE ESTIMATE

7.11.1 GENERAL

It is the District's responsibility to segregate the BEES. Projects with multiple funding sources or Structures items must have a segregated BEES estimate identifying the funding sources and levels of funding. Enter all segregated estimates into the BEES during project design. Because funding segregations are required in the funding summary, estimates must be segregated when the District submits the PS&E to DES-OE. Incorrectly segregated estimates may delay contract award.

7.11.2 FEDERAL AID

Federal-aid contracts must be segregated by:

- District work. Segregate each item quantity according to federal fund type using the appropriate reimbursement ratio. Current reimbursement ratios and applications can be obtained from the Division of Budgets, Office of Federal Resources, or the appropriate FHWA Engineer.
- Structures work. Separate each structure by component level. Funding segregation used in District work is not applicable to Structures work because FHWA requires costs to be identified by individual Structures for:
 - Nonparticipating items of work
 - Nonparticipating portions of the project
 - Work paid for by others (for example, cities, counties, or local transportation agencies contributing to construction costs under cooperative agreements)
 - Utility relocation when done by contract item work (by right-of-way, utility, or railroad agreement)
 - Work done on the same Contract but outside of the federal-aid-project limits

If a cooperative agreement or utility agreement requires anyone other than the State to pay for any of the bid items or supplemental work, those items must be segregated as nonparticipating work.

The information needed to prepare federal segregated estimates is generally available to the PE before the District completes the PS&E. All funding sources and levels should be determined before PS&E submittal input into BEES.

Submit the segregated estimate and the draft Form E-76 to the Division of Budgets, Office of Federal Resources either:

- At the time the District responds to DES-OE's request for additional information
- With the PS&E when submitted as and AADD project

7.11.3 FUNDING BY NONFEDERAL SOURCES

When funding is from sources other than federal or State, the project cost estimate must be segregated. Other sources may include those from a cooperative agreement, utility agreement, right-of-way contract, purchase order, or other instrument. Each source must be identified. If there is a cooperative agreement on a project, a copy of the agreement must be included with the PS&E submittal and must also be sent to the Office of Federal Resources.

7.12 DETERMINING CONTRACTOR'S LICENSE REQUIREMENTS

Contractor license requirements are shown in the notice to bidders. The Contractor's classification must cover the majority of the work.

For AADD projects, the District determines the applicable contractor license classifications. For all other projects, DES-OE makes this determination. See the Description of CSLB License Classifications at www.cslb.ca.gov.