
Introduction

In recent years the Department has been experiencing rapidly increasing project costs and bids well above the Engineer’s Estimate. The resulting increase in supplemental fund requests to the CTC triggered the Department to take a closer look at its cost estimating practices.

A September 15, 2005 memorandum from Chief Engineer Rick Land (Attachment 1) required each District or Region to establish and maintain a Quality Control/Quality Assurance process to improve their project cost estimating practices. Another memorandum from the Chief Engineer dated December 14, 2005 (Attachment 2) required, for projects with an Engineer’s Estimate over $5 million, District Director certification that the contract cost estimate is complete and accurate, reflecting the true scope of the work to be performed and representative of the most current market trends. During the Fall of 2006, as a follow-up to the direction given by the Chief Engineer, the Division of Design surveyed each District/Region to see specifically what QC/QA processes had been implemented. The survey findings are summarized below:

North Region

- Developed and implemented an Estimating Certification Policy (Attachment 3). The policy set forth process, preparation guidelines and roles and responsibilities.
- Major portions of estimates are to be prepared utilizing the 'Complete Analysis Method' as set forth in PDPM.
- Hired dedicated staff to prepare estimates from a geographical perspective.
- Developed an Estimating Website to share estimating information.
- Purchased subscription to Construction Daily. Also purchased Caterpillar Performance Handbooks and R S Means Heavy Construction Cost Data manuals.
- Developed and delivered a Quantities and Estimating OJT course for design staff.
- Have conducted Contractor outreach with respect to specific projects.
- Instituted a second level review process for all estimates to be certified.

District 4

- District 4 has created a stand alone Cost Estimate Certification Form (Attachment 4) which must be processed for every project in the District. The form lists factors considered in developing an estimate including: assumptions, source of unit prices, the Risk Management plan, the Traffic Management plan and the escalation rate. The form also documents the quality control and quality assurance process and includes Value Analysis, Constructability, DES/OS, DOE, and consultant-prepared independent cost estimate reviews. The Form must be signed by the PE, Design Senior, Design Office Chief and Design Division Chief and initialed by the Deputy District Director. For projects over $5 million, it must also be forwarded, along with the request for funds, to the District Director for approval.
District 4 has implemented quarterly contractor outreach meetings with industry and small business representatives where projects in the next three months are discussed and handouts with pertinent project information for each region (e.g. quantities for major items of work, detailed project description, unique elements and project constraints) are made available. Projected use of rubberized asphalt concrete (RAC) over the next 12 months is also provided. The district has also held individual contractor outreach meetings for large projects (Devil Slide and various toll bridge projects).

The district relies on a cost estimate database developed by District 8 as well as a bid summary document produced by the Program Management Division that links directly to bids and summarizes all District 4 projects, all received bids and unit cost of AC.

District 4 uses bid stipends on large projects.

The District has started to use consultants to develop a critical path construction schedule for major projects.

District 4 carefully analyzes recent bids when preparing cost estimates for other projects. Additionally, bi-monthly Project Engineer meetings always includes a “lessons learned” item from construction which contributes to better quality PS&Es and project cost estimates in the future.

Central Region

Last January the Central Region issued memo (CR-PJD-7) "QC/QA Estimate Certification Process" (Attachment 5) which outlines roles and responsibilities and procedures.

The Central Region established an "Estimate Specialist in Central Region Office Engineer". This individual provides information on a regular basis to Design staff on current trends in the construction industry (suppliers, AGC, equipment). They also provide info from Headquarters OE on statewide trends, provide data to Design staff on the results of recent bids within the Central Region and review project estimates at critical points in the project development process.

New CR process (CR-PJD-9) requiring Preparer's/Checkers for Quantity Calculations and Unit Costs (Attachment 6).

New CR process (CR-PJD-10) requiring Estimate Certification Packages (Attachment 7).

District 7

District 7 has created a Cost Estimating Unit, within their District Office Engineer office, to provide a level of quality assurance for project cost estimates developed by the design squads. The individual design squads are still responsible for providing the quality control of their estimates.

Rather than relying on the Cost Data book, District 7 is also compiling data from the most recent bid prices for Districts 7, 8 & 12 projects and are making this data available to the engineers developing the project cost estimates.
• Additionally, District 7 is looking at the most recent local, national and international trends (e.g. costs of steel, oil, etc.) to get a better handle on where futures bid prices will be headed, similar to what DES Structures has been doing.
• With the requirement for District Director certification of engineer’s estimates over $5 million, District 7 has implemented an additional layer of QC/QA review for these estimates. Before any estimates go to the District Director, they are first reviewed and signed off by the District Office Engineer and Deputy District Director for Design.

District 8

• In February 2006, a memo (Attachment 8) was issued to staff that discussed best practices, how often and when cost estimates should be prepared, and changed the constructability review to include the review and approval of cost estimates. The memo included information on where to obtain information to prepare a cost estimate and required that the district office engineer and construction be consulted before finalizing the estimate.
• Documentation and verification of our estimates is critical. The District has developed a new form (Attachment 9) that is now required as part of the project file. The PE is required to document when the estimate was prepared, how the cost was developed including who was contacted, what reference material was used, and what assumptions were made. This document must also include the name of the person who prepared it and who checked it.
• All projects on the delivery plan are required to have an independent check by a consultant. The consultant is asked to conduct a constructability review and prepare a cost estimate for the project. If, for example, the District ends up with three different estimates (this happened) they have a joint meeting to develop one estimate that everyone can support.

District 11

• For programming, an “11-Page Estimate” (Attachment 10) is used. This format was developed, and is regularly updated, in collaboration with the local MPO. Unique elements of the estimate include:
  ✓ Variable escalation rates (capital and support) that are periodically adjusted, with input from our local MPO, to reflect market conditions;
  ✓ Right of Way cost estimates that include anticipated condemnation settlements, and that are signed-off by the R/W Project Coordinator, Utility Coordinator, and Cost Estimator;
  ✓ Structure cost estimates that are signed-off by the ESC Project Coordination Engineer;
  ✓ support cost estimates that are signed-off by the Project Control Engineer in Program/Project Management;
  ✓ approving signatures for the estimate, by the District Office Engineer and the Project Manager.
Office Engineering in the District provides QA/QC of the estimates during the Planning and Design Phases. One person in the office is tasked with tracking multiple cost databases and maintaining production rate records for use in the estimates.

Two cost estimate (studies/)pilots have been done. One sponsored by SANDAG and one by HQ Design, which quantified risk (on select items) and incorporated it into the cost. The methodology of the studies was similar, with the difference being that the SANDAG study assessed risk with team members individually, and the HQ Design study did it with team members as a group.

District Design has received approval for a new Unit that will provide independent construction cost estimate checks that include quantifying risk, on select projects. In addition to working with the Design Manager, Functional Managers, and Office Engineer, it will work with construction contractors and consultant estimators. The Unit, which should be functional around February 2007, will have a working knowledge of the projects, as it will also direct constructability reviews for all projects in the Design Phase.

District 12

The District 12 Project Engineer is required to research and use the Contract Cost Database for preparation of the project cost estimate. The PE then verifies the project prices using the recently received bids for similar work of similar quantity.

The Project Engineer compares and checks “commodity” items of work and the PE and Design Senior contacts contractors regarding current pricing for “commodity” items of work.

The Project Engineer requests Office of Structure Design to provide a Certification of the Structures Estimate for Structures Item of Work in the project.

The Project Engineer and Design Senior provide the draft final cost estimate to Construction, Project Management and Office Engineer for review and comment prior to the finalization of the cost estimate and BEES.

The Project Engineer, Design Senior and Design Office Chief present the final cost estimate to the Deputy District Director for Capital Outlay Program and District Director prior to signing the Certification.

Division of Engineering Services – Structures Office Engineer

The Division of Engineering Services (DES), Structure Office Engineer, Cost Estimates Branch supports the cost estimating QC/QA effort by providing the Districts with the basis of how the structure cost estimate was derived. This includes information regarding significant project variables, the source or basis for unit prices, the assumed project construction start date and the midpoint of construction date. This information is transmitted to the District under the “Estimate Certification Data” section on the “Structure Cost Estimates PS&E Transmittal Data/Estimate Certification Data” form (Attachment 11), which is available on the Caltrans Internet site at:
http://www.dot.ca.gov/hq/esc/estimates/forms/.
Summary/Recommendations:

- Several Districts/Regions reported establishing a dedicated person or unit to provide support concerning local trends in individual item costs. For those Districts that have not yet done so, it is recommended that they pursue establishment of such support services, in conformance with Rick Land’s September 15, 2005 Memorandum.

- There were several reports of Districts/Regions implementing policies to require checking of quantity calculations and/or unit costs using either internal staff or external consultants. It is recommended that this process be implemented in all Districts statewide to reduce the risk of errors and improve cost estimate quality.

- It is further recommended that each District /Region evaluate the success of the QC/QA procedures they’ve implemented over the past year and look for opportunities to add to or modify those procedures as appropriate to continuously improve their project cost estimates.

List of Attachments:

Attachment 1 - Chief Engineer’s September 15, 2005 memorandum - Engineer Estimates
Attachment 2 - Chief Engineer’s December 14, 2005 memorandum - Certification of Project Cost Estimates
Attachment 3 - North Region Estimating Certification Policy
Attachment 4 - District 4 Cost Estimating Certification Form
Attachment 5 - Central Region “QC/QA Estimate Certification Process” memo (CR-PJD-7)
Attachment 6 - Central Region Quantity/Estimate Check memo (CR-PJD-9)
Attachment 7 - Central Region Estimate Cert Package memo (CR-PJD-10)
Attachment 8 - District 8 Cost Estimates memo
Attachment 9 - District 8 Estimate Documentation Form
Attachment 10 - District 11 11-page Estimate Form
Attachment 11 – DES’s January 17, 2007 memorandum - Structures Cost Certification, and “Structures Cost Estimates PS&E Transmittal Data/Estimate Certification Data” form
Attachment 1

Chief Engineer’s September 15, 2005 memorandum – Engineer Estimates
Memorandum

To: DISTRICT DIRECTORS

From: RICHARD D. LAND
Chief Engineer

Date: September 15, 2005

Subject: Engineer Estimates

The California Department of Transportation (Department) and our transportation partners are facing great challenges in delivering up to $4.152 billion dollars worth of vital transportation projects this fiscal year. One of these challenges is providing quality projects with Engineer Estimates that reflect the true cost of construction. Currently, up to 10 percent of projects statewide are requiring supplemental votes in order to award.

The Federal Highway Administration (FHWA) Guidelines on Preparing Engineer’s Estimate, Bid Reviews and Evaluation states, “…the engineer’s estimate should be within +/-10 percent of the low bid for at least 50 percent of the projects. If this degree of accuracy is not being achieved over a period of time, such as one year, confidence in the engineer’s estimates may decline.” For comparison to that target, attached are five-year histories showing for each district the percentage of bids within +/-10 percent of the engineer’s estimate and of bids less than 110 percent of the engineer’s estimate.

The Project Delivery Toolbox (http://pd.dot.ca.gov/pd_guidance.asp) and the Office Engineer RTL Guide (http://www.dot.ca.gov/hq/esc/oe/specifications/rtl_guide/) provide practices useful to achieve and maintain quality estimates. Practices include, but are not limited to, timely constructability reviews and adherence to change control policy. Following those instructions is the first step toward achieving a quality estimate. The second step is to ensure that each specific estimate is being tailored to the project specific parameters. Application of historic bid prices is not sufficient by itself to ensure quality estimates. Finally, it is necessary to apply prudent Quality Control (QC) and Quality Assurance (QA) practices. Each district or region is responsible for establishing and maintaining a QC/QA process to improve project-estimating practices.

The Division of Engineering Services is in the process of establishing and filling a specialist position to provide district support concerning overall trends in individual item costs statewide. This individual will be in place within 30 days. Regions and/or districts
are to establish similar services within their areas so that individuals estimating projects in those regions/districts can get information on local trends.

If you have questions concerning estimating please contact John C. McMillan, Deputy Division Chief, Office Engineer, Division of Engineering Services at (916) 227-6300.

c: District Deputy Directors – Project Delivery  
Division Chiefs  
Deputy Directors

Attachment(s)
### Lowbid in 10% +/- of Engrs Estimate By District

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### Low Bid in 10% +/- of EE By District

![Graph showing low bid in 10% +/- of EE by district](image-url)
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Attachment 2

Chief Engineer’s December 14, 2005 memorandum – Certification of Project Cost Estimates
Memorandum

To: CHIEF DEPUTY DIRECTOR
   DISTRICT DIRECTORS
   DEPUTY DIRECTORS
   DIVISION CHIEFS

From: RICHARD D. LAND
      Chief Engineer

Date: December 14, 2005

Subject: Certification of Project Cost Estimate

Historically, the Department has been very successful in forecasting project cost estimates that are within a reasonable range of the contractor's low bid. This success has allowed the Department to maximize the number of projects planned, programmed, and delivered within given budget constraints. Recent market trends have seen escalating costs of key construction commodities used in transportation projects, making it difficult even at Construction Contract Ready to accurately forecast bid item costs. The California Transportation Commission (CTC) holds the Department accountable for project cost increases, whether they be at time of funds vote, award, or during construction.

It is imperative that the funds voted and allocated by the CTC are based on current and accurate project cost estimates developed using the Department's best forecasting capabilities. To drive accountability at the District level for those estimates, the District Director will be required, for all projects with an Engineer's Estimate over $5 million, to certify that the contract cost estimate is complete and accurate, reflecting the true scope of the work to be performed and representative of the most current market trends. This District Director certification will be required to achieve Ready to List (RTL) beginning January 1, 2006. The RTL Certification form has been revised to include this signature and is available from the District Office Engineers. Also, contract estimates must be updated and re-certified by the District Director for these projects with an Engineer's Estimate more than three months old. Updating estimates due solely to item cost increases will not change the District RTL certification date if it has already been achieved.

The Division of Engineering Services-Office Engineers will monitor the success of these measures, tracking the Engineer's Estimate relative to the low bids. These measures may be relaxed, strengthened or eliminated depending on the lessons learned from this new requirement.

Your continued efforts to accurately forecast the costs of our transportation improvement projects is greatly appreciated. Please contact John McMillan, Deputy Division Chief, Office Engineer, Division of Engineering Services at 916-227-6300 if you have questions.

"Caltrans improves mobility across California"
Attachment 3

North Region Estimating Certification Policy
### North Region Project Development Directive

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## Activity

Project Development staff in the North Region produce high-quality plans and specifications along with accurate project design cost estimates in accordance with the North Region Quality Management Plan.

The Region will change its project estimating practices by requiring an Estimate Certification for all projects. A focal point position (District Estimator) will be established to work in concert with the Project Engineer (PE) and Design Senior, in estimating unit prices, and prepare documentation for the Estimate Certification. The District Estimator will seek input from many sources including the Construction Industry. All project design estimates will undergo rigorous QC/QA checks to ensure construction item quantities are accurate and their estimated unit prices are reasonable.

## Procedure

Project Development staff engaged in the preparation of design estimates will follow the procedures outlined in Chapter 20 and Appendix AA of the Project Development Procedures Manual (Gold Book).

All design estimates will be submitted to the District Estimator (DE) at Project Initiation, Project Report, Draft PS&E, Ready to List, Revised Ready to List and annually. The DE will work with the PE and Design Senior to determine roadway unit prices, taking into account influential factors that could impact the estimate. The District Estimator will document significant factors on the Estimate Certification (Supporting Data) form (see attached). All applicable estimates from other sources such as Structures, Electrical, Landscape, etc., will be listed and verified by their author. Also, for projects greater than $5 million, an Estimate Certification Memo (see attached) will be prepared. The District Director will certify the estimate by signing the Estimate Certification Memo. For all projects, the Estimate Certification Supporting Data form will be signed by the Design Senior and initialed by the PE, DE, Construction Representative and Project Manager. By signing, the Design Senior verifies that Construction and Project Management were involved in the process, quality input was incorporated, and conflicts were addressed. If conflicts cannot be resolved between parties, the Region’s Conflict Resolution Process will be utilized. As early as possible, all imbalances between the project estimate and the
project budget shall be reported to the Project Manager and the District SFP. If needed, the PM will lead the PDT in activities that will bring the project scope and project budget into alignment.

Methodology
Per the Gold Book (PDPM, Appendix AA), it states that the use of previous bid prices as a basis for cost estimating is probably the most frequently used method and in most cases the most practical method. It has become evident, that due to the volatility of today’s market, more aggressive analysis is needed. The Gold Book discusses an analysis method commonly used by the Construction Industry, called the “Complete Analysis Method.” This method analyzes construction operations, production rates, and material costs. Unit item costs are calculated based upon labor and equipment rental rates at the specified production rates. Overhead costs and profit are then added to obtain the final unit cost. The “Complete Analysis Method” for determining unit prices shall be utilized for major items of work, effective immediately (see PDPM, Appendix AA). The results of this analysis can be crosschecked by utilizing the “Previous Bid Prices Method” (see PDPM, Appendix AA). In light of the need for more aggressive analysis, the District Estimator will proactively pursue Construction Industry knowledge and become specialized in contractor estimating methodology, recognizing common factors that affect unit prices, and timely identification of sudden changes in the market that could influence bids. The District Estimator will be a key resource for the PE and Design Senior to utilize.

Roles and Responsibilities
The process of preparing complete and accurate project estimates, which are in balance with the project scope and budget, relies upon an empowered project development team. The responsibility matrix describes the major activities of the process and displays related responsibilities.

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<td><strong>Assistant PE</strong></td>
<td><strong>District Estimator</strong></td>
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<td>Ensures project estimate is not inflated or constrained</td>
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<td>QC</td>
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<td>Ensures project scope and estimate is within budget</td>
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<td>Prepares Estimate Certification (Supporting Data) form</td>
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<td>Prepares Certification Memo for estimates &gt; $5 Million</td>
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<td>Verifies all estimates</td>
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Applicability
The procedure outlined above will apply to all projects in the North Region (including major maintenance).

References
- PDPM, Chap 20, Project Development Cost Estimates
- PDPM, Appendix AA, Cost Estimate
- Design Memorandum, Certification of Project Cost Estimate, Richard D. Land, December 14, 2005

Attachments
- Estimate Certification (Supporting Data) form
- Sample Estimate Certification Memo
DISCUSSION OF FACTORS INFLUENCING ESTIMATE:
A narrative discussing influential factors has been requested by the District Directors. Replace this instruction text with the actual narrative. Refer to PDPM, Appendix AA. Consider the following factors: California Construction Cost Index, costs adjustment for future bid date, fluctuation of costs such as: wage increases and time of advertisement, construction work windows due to: environmental, traffic, and holidays, staging/restrictive work methods, quantities of work, separate operations, handwork/inefficient operations, accessibility, geographic location, construction methods, material shortages/industry issues, adequate competition, specialty work, sole source, etc.…

Other areas to discuss:
- Comparison of “complete analysis method” to “previous bid price” method.
- Discussion of Contractor contacts made, # of likely bidders and who they might be, and any information the Contractor shares that will likely influence his estimate.
- Recent projects that have advertised in the geographic area, along with the type of work
- Location of material sources/disposal sites

A discussion of the realistic range of low to high unit prices for the higher priced items, and the impact this variability could have on the estimate may be useful. This could be done in table summary format as follows:

<table>
<thead>
<tr>
<th>Item #</th>
<th>Item Description</th>
<th>Quantity</th>
<th>Engineer’s Estimate</th>
<th>Realistic Range</th>
<th>Item Cost @ High End</th>
</tr>
</thead>
<tbody>
<tr>
<td>xxxxx</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>xxxx</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Cumulative Impact: Total $5 Uncertainty
OTHER ESTIMATE SOURCES:

<table>
<thead>
<tr>
<th>Function</th>
<th>Estimate Amount</th>
<th>Date Last Verified</th>
<th>By Whom</th>
</tr>
</thead>
<tbody>
<tr>
<td>Structures</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Electrical</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Landscape/Erosion</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Signing &amp; Striping</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TMP</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Only use this table as needed. Modify to reflect those units that are actually involved with the project. You are accountable to review the estimates with these specialty units to better be able to recognize industry trends that may be affecting their estimates. This is also a good opportunity to understand their estimating practices and gain confidence in their process.

SUPPLEMENTAL FUNDS:
Discuss the percentage of supplemental funds to the overall amount of the job, if relevant. Communicate the reason for each supplemental item, the cost, and any other pertinent information (such as location: *i.e.* additional work may be needed around the bridge abutments).

STATE FURNISHED MATERIALS:
Discuss the state furnished materials included in the estimate.
- For example, a discussion of an RE Office item may include other projects in the area, or that staff will work out of the Red Bluff office, or that Construction communicated a certain dollar value to share in the cost of the RE Office. The RE Office item should not be considered an automatic; it should reflect thoughtful consideration of need.
- Discussion of items such as revegetation or mitigation should include reference to permits that require specific needs, or other related pertinent info to the item
- Connection fees should discuss what utility is anticipating connection: sewer, water, reclaimed water, etc.

CONTINGENCIES
Only include this heading with a general discussion, when an Exception has been processed through the Construction Office Chief to allow a deviation from the standard 5%.

PROJECT ESTIMATE CERTIFICATION:
The Engineer’s Estimate was developed in a collaborative team environment including, but not limited to, the PM, PE, Construction Engineer and District Estimator. Issues raised during this process have been resolved and incorporated in the Estimate and this certification.

Design Senior          Date
Memorandum

To: DES OE

Date:

File: County, Route, PM, EA, Dollar Amount

From: Enter District Director’s name
District X (enter 1, 2, or 3) Director

Subject: Project Cost Estimate Certification

I certify that the contract cost estimate for the above mentioned project is complete and accurate reflecting the true scope of the work to be performed and representative of the most current market trends.

Attach: Estimate Certification (Supporting Data) form (District Director gets a copy of this attachment, the original goes in the Project Files. When this cert letter is sent to HQ, strikethrough the attachment info and note that the attachment is located in the Design Project Files. Do not send the attachment to HQ.)

cc: District Estimator, Spec Writer, Project Engineer, Design Engineer

"Caltrans improves mobility across California"
Attachment 4

District 4 Cost Estimating Certification Form
COST ESTIMATE CERTIFICATION (CERT) FORM (Version 3—Sept. 15, 2006)

<table>
<thead>
<tr>
<th>DIST-UNIT-CO-PM</th>
<th>DIST-EA</th>
</tr>
</thead>
<tbody>
<tr>
<td>PROJECT DESCRIPTION</td>
<td>PROGRAM</td>
</tr>
<tr>
<td>CURRENT PROGRAM COST</td>
<td>NUMBER OF WORKING DAYS</td>
</tr>
<tr>
<td>A+B Contract? (Yes or No)</td>
<td></td>
</tr>
<tr>
<td>PROJECT ROLE</td>
<td>PRINTED NAME</td>
</tr>
<tr>
<td>Project Engineer (QC)</td>
<td></td>
</tr>
<tr>
<td>Design Senior (QA)</td>
<td></td>
</tr>
<tr>
<td>Design Office Chief (QA)</td>
<td></td>
</tr>
<tr>
<td>Design Division Chief (QA) (South/North, East Region)</td>
<td>DDC to approve CERT for all regional projects in 2 days.</td>
</tr>
<tr>
<td>Project Manager</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>DATE</th>
<th>WBS</th>
<th>PROJECT DELIVERABLE</th>
<th>COST ESTIMATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>150</td>
<td>PID (Program S)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>180</td>
<td>PAED</td>
<td></td>
<td></td>
</tr>
<tr>
<td>255</td>
<td>PS&amp;E</td>
<td></td>
<td></td>
</tr>
<tr>
<td>260</td>
<td>Update CTC vote</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Briefly provide details below.

Assumptions
How did assumptions about location (e.g., terrain, distance to construction site, etc.), relative availability of materials, weather conditions, etc. influence the cost estimate? What other elements influenced the estimate?

Source of Unit Prices
What factors were considered to determine unit prices of major items? Provide EAs of projects considered, unit prices and quantities used. Add specialty items and costs as appropriate. Provide TRO cost.

Traffic Management Plan
Identify lane closure windows and assumptions about traffic control costs and elements (e.g., number of signs, public outreach component, night work, etc.).

Risk Management Plan
Identify risks relating to the development and management of the construction capital cost estimate (BEES).

Escalation Factors Used
Explain forecasted variables and assumptions used. Demonstrate forward estimating method.

Contingencies
Is 5% contingency adequate to address each risk factor? If not, why not? How much more is needed?

DES Structures Verification of Estimate and Quantities
List preparer of calculations, date calculated, name of verifier, and date verified.

Constructability Review
What is the assumed construction method and what risks are associated with that method? Indicate when reviews occurred and major findings.

DOE Cost Estimate Review
List completion date and conclusions of the review.

Value Analysis Performed
List completion date and any alternatives that impact cost.

DES Structural Liaison Review
List date and conclusions of Review and name of reviewer.

Independent Estimate Performed
List completion date and variance, if any, from Caltrans estimate. If variance, explain how resolved.
<table>
<thead>
<tr>
<th>Status</th>
<th>Variance from Programmed Funds (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Compare current program cost to 255 PS&amp;E BEES.</td>
</tr>
<tr>
<td></td>
<td>Next cost estimate update</td>
</tr>
<tr>
<td></td>
<td>List projected date (three weeks before CTC vote).</td>
</tr>
</tbody>
</table>
Attachment 5

Central Region “QC/QA Estimate Certification Process” memo (CR-PJD-7)
Memorandum

To: R. GREGG ALBRIGHT
   J. MIKE LEONARDO
   TOM HALLENBECK
   KOME AJISE

Date: January 12, 2006

File: PJD-7

From: KIM E. ANDERSON
Chief, Central Region Project Development

Subject: QC/QA Estimate Certification Process

Based on the direction given in Rick Land’s memorandum, “Certification of Project Estimates”, dated December 14, 2005, Central Region Project Development proposes utilization of the following quality control/quality assurance (QC/QA) process prior to submittal to the District Directors for their certification. This QC/QA verification process utilizes some procedures already in place and also adds to existing processes. This process by no means lists all QC/QA procedures used within Project Development during the life of a project. It simply summarizes the procedures proposed to insure the District Directors that appropriate QC/QA has occurred to develop the best estimate possible for Estimate Certification.

Proposal of Central Region Project Development Procedures for Estimate Certification by District Directors:

Noted below is a summary of Central Region Project Development’s proposal to the District Directors. Reviews by the individuals noted below will occur for all projects over $5 million per Mr. Land’s memorandum. Documentation of said reviews, via signatures, will be part of the submittal to the District Director and part of the certification to be signed by the District Director. The documentation to the District Director will include the date of the BEES and an actual copy of the BEES will be an attachment. Attached is a sample of the proposed documentation to be submitted to the District Directors:

1. Project Engineer
2. Division of Engineering Services (if applicable)
3. Design Senior
4. Estimate Specialist in Central Region Office Engineer
5. Design Office Chief

“Caltrans improves mobility across California”
Submittal of Estimate to District Program/Project Management:

Once the above QC/QA efforts have occurred, and corresponding signatures obtained, said documentation will be forwarded to the Project Manager for their review and signature. It should be noted that this process will need to occur very quickly and Project Managers will need to be advised of potential cost changes as soon as possible. If the Project Manager, Single Focal Point or District Director need additional clarification or have questions regarding an Engineer's Estimate and potentially how it coincides with programming amounts prior to certification, they should contact the appropriate Office Chief in Project Development to resolve.

Rational for Proposal:

Project Engineer: The Project Engineer would be the Licensed P.E. who signs and seals the project title sheet. Various QC/QA procedures are undertaken by Project Development prior to the initial submittal of the PS&E to Headquarters OE. Set procedures include verification of quantities and item costs. At the time of Estimate Certification, changes in quantities are normally minimal, however with the volatility occurring in the Construction Industry, changes in unit costs are likely. The Project Engineer is the most knowledgeable individual of all aspects of the project and needs to again review the unit costs in comparison with recent bid openings and market trends throughout the state.

Division of Engineering Services: For projects including work prepared by units within the Division of Engineering Services, DES is responsible for preparing quantities and unit cost estimates. While some minimal verification can be done by Central Region Project Development in relation to DES work, it would seem appropriate that they also document that they have again verified quantities and updated unit costs per the latest available data. Documentation of this subsequent review may have to occur via fax or email due to the limitations in time for the Estimate Certification process.

Design Senior: Review by the Design Senior will largely concentrate on an overview of the estimate to cover all needs of the project. Although this will have occurred at the initial submittal of the PS&E, the Design Senior will insure that all work to be done on the project has been identified and included in the Engineer’s Estimate. This would include any changes that may have occurred during the Headquarters OE process. More importantly, the Design Senior will review unit costs in light of their added experience/perspective of other projects and industry trends.

Should the Licensed P.E. for the project and the Design Senior be the same individual. Another Design Senior within Central Region Project Development will serve to perform this review and sign as per this QC/QA process.

Estimate Specialist in Central Region Office Engineer: Identification of one specific individual in Central Region Office Engineer to specialize in estimates is a new improvement to be added to our current processes. Steps have been taken to implement this immediately. This individual, in coordination with Central Region Construction, will do some of the following:

“Caltrans improves mobility across California”
1. Provide information on a regular basis to Design staff on current trends in the construction industry (suppliers, AGC, equipment). Provide info from Headquarters OE on statewide trends.
2. Provide data to Design staff on the results of recent bids within the Central Region.
3. Review project estimates at critical points in the project development process.

Design Office Chief: Review by the Design Office Chief is similar to the review done by the Design Senior, but at a higher level. Because of the breadth of experience/perspective of the Office Chiefs, they are a final check for the estimate and their signature verifies completion of Project Development’s QC/QA efforts for Estimate Certification.

Project Manager: The Project Manager is the team leader and the primary individual responsible to communicate with the project sponsor(s). The Project Manager will be responsible to address funding or programming issues that may exist due to updated project estimates.

Should you have any questions or feedback regarding the process described within, please do not hesitate to contact myself or Malcolm Dougherty.

c: Tim Gubbins
   Mike Rastegar
   Craig Holste
   Dennis Agar
   RQuince
   DFapp
   MSheridan
   TOgle

QC/QA Documentation for Estimate Certification
Certification of Project Cost Estimate Sample Memo
Estimate Certification Timeline Chart
QC/QA Documentation for Estimate Certification

Engineer’s Estimate Prepared By:

_________________________________________  ____________________________
, Project Engineer  Date

DES Structures Verification of Estimate and Quantities:

☐ See Attached Email
☐ See Attached Fax
☐ Not Applicable to Project

Engineer’s Estimate Checked By:

_________________________________________  ____________________________
, Design Senior  Date

Engineer’s Estimate Concurred By:

_________________________________________  ____________________________
Robert D. Morrison, Central Region OE Estimate Specialist  Date

CR PJD Verification of QC/QA Processing:

_________________________________________  ____________________________
, Office Chief, Central Region Design  Date

Recommend Certification:

_________________________________________  ____________________________
, Project Manager  Date

Attachment:
BEES dated __________
DES Structures Verification (if applicable)

“Caltrans improves mobility across California”
Memorandum

To: ROBERT L. BUCKLEY, Chief
Division of Engineering Services

Date:

File: - - / 06-

Attn: John McMillan

From: District Director

Subject: Certification of Project Cost Estimate

I certify that the contract cost estimate is complete and accurate, reflecting the true scope of the work to be performed and representative of the most current market trends.

In reference to the above noted project, the Engineer’s Estimate (BEES) is dated: 

.
ESTIMATE CERTIFICATION
TIMELINE
(PROJECTS $5 MILLION & OVER)

OE NOTIFIES DESIGN SENIOR & PM

ESTIMATE CERT. SIGN-OFFS MUST BEGIN **

For above $5 Million Projects

TARGET COMPLETION OF ESTIMATE CERTIFICATION

* DESIGN TO RESOLVE BEES ISSUES FROM HQ-OE AND UPDATE UNIT COSTS AS NECESSARY

** SIGN-OFF BY PE & SENIOR SHOULD HAVE OCCURRED. INFORM (NOT FOR SIGNATURE) PM OF ESTIMATE - SEND TO OE ESTIMATE SPECIALIST & REST OF REVIEWERS

PS&E TO HQ             Draft Contract         District Response           DRAFT CONTRACT            RTL
(MS 380)                 (Comments from HQ-OE)             (PS&E Ready)                                 (MS 460)

Varies 12.5 to 14.5 weeks

2 weeks *

1 week

3 days

Approx. 4 weeks

Final BEES

BEES Locked

RTL CERTIFICATION
MUST INCLUDE DISTRICT DIRECTOR EST CERT
Attachment 6

Central Region Quantity/Estimate Check memo (CR-PJD-9)
Memorandum

To: NABEELAH HANIF, Office Chief, Program/Project Management
RORY V. QUINCE, Chief Office Design I
DAVID FAPP, Chief Office Design II
MICHAEL F. SHERIDAN, Chief Office Design III
TERRY OGLE, Chief Office Design IV
Central Region Design Seniors
Central Region Landscape Architects

Date: November 1, 2006

File: Project Development
Central Region
CR-PJD-09

From: KIM E. ANDERSON, Chief, Central Region
Project Development

Original signed by K. E. Anderson

Subject: Quantity Calculations and Unit Cost Estimate Calculations

Background

This memorandum is to stress the importance of conducting complete and accurate estimates of quantities and unit costs along with the proper documentation of procedures throughout the life of a project. To achieve this goal, Project Development in the Central Region shall conduct a thorough preparation and checking procedure outlined below.

It is the responsibility of Design Seniors in Project Development to ensure that proper calculation and checking of project quantities and unit costs are being conducted to produce complete and accurate project estimates.

General Guidelines

All project quantity and unit cost calculations shall be properly documented, updated appropriately throughout the life of the project (ex: at key milestones, annual cost updates, when significant changes in unit costs occur), and filed in the project records. All documents, including updates to the original work, pertaining to project quantities and unit costs shall include the following:

1. Project EA, County, Route, and KP.
2. Name of Preparer and date.
3. Name of the Checker and date.
4. Title of the quantity being calculated or the unit cost being estimated.

Responsibilities

Preparers:

The Preparer is the original individual who develops a sound calculation of project quantities and unit costs. The Preparer shall ensure that the work is logically and clearly presented in such a...
way that the Checker and others can reasonably understand the methodologies, locations, and determinations. The Preparer's work shall include the following:

1. All assumptions, clearly stated.
2. References to other sheets, sources, and files listed.
3. Quantity sheets, cross sections, sketches, layouts, tabulation of earthwork generated by Caice, Microstation, etc., attached as necessary to ensure clarity
4. Sources/rational for unit costs, clearly stated
5. Lump sum item content with unit cost calculations used to determine the lump sum cost, documented.
7. Errors found, crossed out, and corrected during the review process showing the initials of the Preparer and date noted next to the correction.
8. Upon completion by the Checker as outlined in this memorandum, placement of all backup documentation in the project records in a timely manner.

Checkers:

The Checker shall have an equal responsibility in achieving a sound estimate of quantities and unit costs. The Checker shall consider the following while reviewing the Preparer's work:

1. Correctness of the methodology and rational used.
2. Completeness of work (examples – all locations included in calculations, consistent with Special Provisions).
3. Mathematical accuracy of the work.
4. Correctness of outputs generated by Caice and/or Microstation including design quantities, cross sections, surfaces, areas, item counts, etc.
5. Understandability of work by others.
6. Clarification of any questions or concerns with the Preparer and/or his/her supervisor
7. Marking of any found errors, and returning sheet to Preparer for correction.
8. Rechecking any previously found errors for correctness, initialing and dating same, signing, dating, and returning completed sheet to the Preparer for inclusion in the project records.

Preparer of the BEES Document:

BEES should match the project quantities and unit costs with the project quantities sheets and calculations in the project file and the project quantities sheets. The Preparer should also produce a final BEES that conforms with the RTL Guide instructions on specialty items, rounding, etc.

Prior to submitting to Central Region Office Engineer, the Design Senior shall ensure that the BEES has been properly developed by the Preparer and verified by the Checker.

The names of the Preparer and Checker, and the date, are to be recorded on the BEES.

**Estimates for Project Initiation Document (PID), Project Report (PR), and Annual Cost Estimate:**
For project estimates (commonly referred to as “six page estimates”) prepared for PID’s, PR’s, and Annual Cost Estimates, the Senior Design Engineer and the licensed Project Engineer shall ensure that the estimate has been developed using a Preparer and a Checker, as outlined above.

The Preparer/Checker shall use unit costs comparable to recent market trends. Any and all backup documentation as referenced by this memorandum shall be placed in the project records in a timely manner.

The Design Senior and the licensed Project Engineer shall review the estimate for the following:

1. Completeness of all work needed for the ultimate project is identified and is accounted for.
2. Quality and clarity, so that it may be understood by others who will utilize the information.
3. Item costs reflect the estimated quantities, current trends, and project potential conditions, (ex: location, availability of materials, equipment, and labor).
4. Compliance with any applicable requirements of this memorandum whether stated here or elsewhere within same.

**Preparation of Quantity Calculation Sheets and Unit Price Calculation Sheets**

Quantity Calculation Sheets shall be developed on standard forms (DC-CEM-4801) showing how quantities were derived with ‘Calculated By’, ‘Checked By’, and all other heading information along with the project EA filled in. A sheet shall be submitted for each item, including ‘lump sum’ items. Examples are attached.

Unit Cost Calculation Sheets shall be utilized for each item to show how unit costs were derived with ‘Calculated By’, ‘Checked By’, and all other heading information filled in. A blank example and an executed example are attached. Also attached are several sample item analyses demonstrating how to execute a typical item unit cost analysis.

**Implementation**

These QC/QA procedures are to be implemented immediately on all projects.

The following attachments are included as examples only. The Engineer is responsible for final calculation methodology and documentation.

Attachments:

- [Sample Quantity Sheet #1](#)
- [Sample Quantity Sheet #2](#)
- [Sample Quantity Sheet #3](#)
- [Engineer’s Estimate – Unit Cost Calculation Sheet](#)
- [Example Engineer’s Estimate – Unit Cost Calculation Sheet](#)
- [Sample Unit Cost Analysis #1](#)
- [Sample Unit Cost Analysis #2](#)
- [Sample Unit Cost Analysis #3](#)
- [List to useful web sites](#)
- [Consideration Factors Affecting Unit Cost Estimates](#)
# QUANTITY CALCULATIONS

<table>
<thead>
<tr>
<th>ITEM CODE</th>
<th>ITEM</th>
<th>FILE NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>397001</td>
<td>ASPHALTIC EMULSION (PAINT Binder)</td>
<td>05-0G4101</td>
</tr>
</tbody>
</table>

## Calculation Details

**Calculation by:**

- Item Code: 397001
- File No: 05-0G4101
- Item: ASPHALTIC EMULSION (PAINT BINDER)
- Location: 05-Scr-17 KP 15.12-15.52 (PM 9.4-9.6)
- Segregation: Yes

**Calculation by:**

- John Smith, Project Engineer
  - Date: February 25, 2005
- Bill Jones, TET
  - Date: September 2, 2005

**Asphaltic Emulsion (A.E.) Spread Rate:**

- Spread rate = 0.45 L/M², Sec 39-4.02
- Mass = 1002 L/tonne

**Area to be Covered by Emulsion:**

- South Bound, A_SB = 3,980 M²
- North Bound, A_NB = 5,260 M²

**Mass Used per Layer:**

- Southbound:
  
  \[
  M_{SB} = 3,980 \text{ M}^2 \times (0.45 \text{ L/M}^2) \times \left( \frac{1 \text{ Tonne}}{1002 \text{ L}} \right) = 1.8 \text{ Tonnes}
  \]

- Northbound:
  
  \[
  M_{NB} = 5,260 \text{ M}^2 \times (0.45 \text{ L/M}^2) \times \left( \frac{1 \text{ Tonne}}{1002 \text{ L}} \right) = 2.42 \text{ Tonnes}
  \]

**Total:**

\[
\text{Sum} = 4.2 \text{ Tonnes}
\]

**Section 2**

- Use 4.2 tonnes

Standard Plan: ____________  SSP: ____________
### Quantity Calculations

**ITEM CODE** 150662

**ITEM CODE** | **ITEM** | **FILE NO**
--- | --- | ---
 | REMOVE METAL BEAM GUARD RAILING | 05-0G4101 |

**LOCATION**
05-SCr-17 KP 15.12-15.52 (PM 9.4-9.6)

**SEGREGATION**

**CALCULATION BY** JOHNSON SMITH, PROJECT ENGINEER
**DATE** July 26, 2005

**CHECKED BY** BILL JONES, TET
**DATE** 09/02/05

<table>
<thead>
<tr>
<th>Sheet</th>
<th>Location</th>
<th>From</th>
<th>To</th>
<th>L (m)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>L-1</td>
<td>1</td>
<td>&quot;A&quot; 78+40</td>
<td>&quot;A&quot; 78+74.9</td>
<td>34.9</td>
<td>SB Turnout</td>
</tr>
<tr>
<td>L-1</td>
<td>2</td>
<td>&quot;B&quot; 78+70.4</td>
<td>&quot;B&quot; 78+11.4</td>
<td>43.0</td>
<td>Ret Wall Approach</td>
</tr>
<tr>
<td>L-1</td>
<td>3</td>
<td>&quot;B&quot; 79+49.6</td>
<td>&quot;L&quot; 79+55.5</td>
<td>19.5</td>
<td>Turn Pocket to Laurel Rd</td>
</tr>
<tr>
<td>L-1 - L-2</td>
<td>4</td>
<td>&quot;L&quot; 79+25.0</td>
<td>&quot;B&quot; 81+05.6</td>
<td>166.9</td>
<td>Laurel Rd and NB Shoulder</td>
</tr>
<tr>
<td>SC-5</td>
<td>5</td>
<td>&quot;4&quot; 78+76.6</td>
<td>&quot;A&quot; 82+27.1</td>
<td>350.5</td>
<td>SB Shoulder</td>
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<td><strong>Total</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>614.8 m</strong></td>
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</tbody>
</table>

**SECTION USE** 620.0 M

Standard Plan       SSP       _____
STAGE 1 PHASE 2

<table>
<thead>
<tr>
<th>Sheet</th>
<th>LOL</th>
<th>EA</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>TH-1</td>
<td>&quot;A&quot;</td>
<td>10</td>
<td>Route 41 NB Shld (Alluvial Ave str. widening)</td>
</tr>
<tr>
<td>TH-2-3</td>
<td>&quot;A&quot;</td>
<td>28</td>
<td>Route 41 NB Shld (Friant Rd. str. widening)</td>
</tr>
<tr>
<td>TH-6</td>
<td></td>
<td>4</td>
<td>closing nb on ramp and herndon ave</td>
</tr>
<tr>
<td>TH-11</td>
<td>&quot;F&quot;</td>
<td>17</td>
<td>Friant Road</td>
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<td>&quot;F&quot;</td>
<td>23</td>
<td>Friant Road</td>
</tr>
<tr>
<td>TH-13</td>
<td>&quot;C&quot;</td>
<td>36</td>
<td>Alluvial Ave</td>
</tr>
</tbody>
</table>

TOTAL 114 EA 118 EA

Note: No channelizers will be used on mailine during stage 2 of construction. At this time, K-Rail will begin on the NB on ramp from WB Herndon, and ramp will be closed for the duration of construction. (see plansheets for illustration)
<table>
<thead>
<tr>
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<tbody>
<tr>
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<td>QUANTITY:</td>
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**RESEARCH/CALCULATIONS:**

**METHODOLOGY/ASSUMPTIONS:**

**REFERENCES USED:**

**CONTACTS/REVIEWED BY:**

**FILE LOCATION:**
**ENGINEER’S ESTIMATE – UNIT COST CALCULATION SHEET**

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<td>DESCRIPTION:</td>
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<tr>
<td>UNIT:</td>
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<tr>
<td>UNIT PRICE:</td>
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</table>

**PREPARED BY:** Jane Doe  
**DATE:** 02/13/06  
**CHECKED BY:** John Doe  
**DATE:** 03/02/06

**RESEARCH/CALCULATIONS:**

1. Contract Cost Database (see attached) > weighted average $1900 EA  
   - Districts: 7, 8, 11 and 12  
   - Years: 2003, 2004 and 2005  
   - Minimum Quantity: 5  
   - Maximum Quantity: 15

2. Removed high and low bids > weighted average $1460 EA

3. Recent bid openings in D8  
   - EA 08-11111, 1/26/06, 9 EA > $4500  
   - Second bidder > $3500  
   - Third bidder > $5500

4. Recent bid openings for SANBAG  
   - EA 08-22222, 2/23/06, 12 EA > $1200

5. $1460 + 25% = $1825

6. ($1825 + $1200)/2 = $1512 > SA& $1500

**METHODOLOGY/ASSUMPTIONS:**

1. EA 1111 was located in rural San Bernardino County. The location and type of work was very different.  
   - Therefore the prices were discarded.

2. Assumed 25% inflation on historic data based on increases in similar items of work.

3. Averaged inflated historic data price with recent SANBAG bid.

**REFERENCES USED:**

- District 08 Contract Cost Database  
- Caltrans Bid Summary Results  
- SANBAG Bid Results

**CONTACTS/REVIEWED BY:**

- 95% Constructibility Review Meeting held on 2/1/06  
- 60% Review by DOE Construction Estimates Branch on 10/15/05

**FILE LOCATION:**

- Server: File Path\File Name
Sample Unit Cost Analysis #1

COLD PLANING EXAMPLE

09/06/06
Spoke with Bobby Mack (Penhall) on cold planing. He says the following: 4’ machine - $2700/8hrs. 6ft – $3300, 7 ft - $4500. Mobilization is $250 to $500 or more on occasion. Haul off and sweeping is in addition to the above prices. Minimum time is one day. Production is 75mm – 18’/min, 60mm - 20’/min, 30mm – 25’/min (all times the machine width to get sq ft. area/minute). Automatic controls are available but additional charge for setup depending on circumstances/situation.

Example of cold planing calculation for EA 06-342431, a new freeway construction job on SR180 east of Fresno and was calc’d on 100506:

Assumptions:
Cold plane operation is on surface streets and is done in the latter stages of the project. Due to some small locations, cold plane operation will require 13 days and include 4 mobilizations at $250/mobilization
Total cold plane quantity = 80,300 m2
Automatic controls on grinder not required
Grindings must be hauled off instead of placing in fill (fill completed)
Dump site for grindings is a/c recycle plant on North and Cedar, south of Fresno
Round trip haul time including fill and dump is estimated to be 1 hr.
Truck load quantity is 22.6 tonnes
Truck cost is $90.00 / hr
Water Truck @ $90.00 / hr will be required 25% of the shift
Street sweeper @ $150 / hr will be required for full shift
Specific Density of grindings is 2.2
Maintenance and overhead is 10%
Contractor profit is 15%

Machine to be used is 7’ wide at $4500.00 per 8 hr shift
Machine production for 45mm grind is (metric)

\[(7')(0.3048m/ft)\left[\frac{(20ft/min)(0.3048m/ft)+(25ft/min)(0.3048m/ft)}{2}\right](60min/hr)(8hr/shift) = 7000m^2/shift\]

Volume of grindings generated per shift = (7000m2/shift)(.045m) = 315m3/shift
Weight of grindings = (315m3)(2.2 tonnes/m3) = 693 tonnes/shift
# of truckloads per shift = 693 tonnes per shift/22.6 tonnes/truckload = 31 truck loads/shift
# of trucks required per shift = (31 truckloads per shift)(1 hr haul time/truckload)/8 hr/shift) = 4 Trucks

Total cost of grinding per shift = ($4500.00 machine cost/shift)+(4 trucks)(8 hr/shift) + ($90.00/hr for water truck)(8hr/shift)(.25 shift) + ($150.00/hr for sweeper)(8 hr/shift) = $8,760.00 per shift

Maintenance and overhead = (10%)($8760.00) = $876.00/shift
Contractor profit = (15%)($8760.00+$876.00) = $1445.00/shift

Total Cold plane operation contract cost to Caltrans = 13 days ($8760.00 + $876.00 + $1445.00) + (4 mobilizations)($250.00/mobilization) = $145,000.00

Cost per m2 = $145,000.00 / 80,300 m2 = $1.81/m2  USE  $1.90
Sample Unit Cost Analysis #2

Cost of I/B EA 06-342431

Trucking at $90.00/hr.
Material cost at $1.90 / M3 (Source: FMFCD @ McCall and McKinley
Pit operation
   Excavator at $109.52
   Operator at 53.25
   Loader at $82.89
   Dozer at $75.53
   Operator at 53.25
   Water truck at 45.00
   Entry/exit protection $0.25 / M3
   Finish grading $0.10 / M3
Fill operation
   Compactor at $70.84
   Operator at 53.25
   Dozer (D4) at 35.00
   Operator at 53.25
   Blade at $96.11
   Laborer (2) at 33.75
   Grade setter at 53.25
   Pickup at 10.00
   Water Truck at 45.00

Total hourly labor and equipment cost = $741.00

Estimated M3 at 12 trucks per hour  12*10.5 = 126 M3
Material cost per M3 =($1.90+0.14 (tax)) x 1.05 (shrinkage factor) = $2.15/m3
Freight per M3
   10 miles per trip, includes 2 stop signs = 30 minutes
Cost per M3 = $2.15 (Raw Material Cost) + $4.28 (freight) + $5.90 (excavation & placement)

Total cost per M3 in place to finish grade = $12.33

Add 10% for maintenance, oversite, etc and 15% profit $12.33 + $1.23 + $2.03 = $15.60  Use $16.00
Sample Unit Cost Analysis #3

CLASS II AGGREGATE BASE

Cost of Cl II a/b EA 06-342431

Trucking at $90.00/hr.
Truck load is 22.3 tonnes or 10.3 m³ at 2.16 density
Material cost at $11.00/ton + tax at the plant (Convert to Tonnes)(From Vulcan on SR180)
Blade at 75.42
Operator at 53.25
Broom at $18.31/hr.
Operator at 53.25 (use 1 hr. per shift)
Laborer (2) at 33.75
Grade setter at 53.25
Pickup at 10.00
Vibratory roller at 70.00
Operator at 53.25
Skip loader at 20.00
Operator at 53.25
Water Truck at 90.00

Total hourly cost = $570.00

Estimated tonnes at 12 trucks per hour 12*22.3=267 tonnes
Convert Tonnes to M³ 267/(2.16 tonnes per m³)=124 M³/hr.
Material cost per M³ 2.16 tonnes per m³*$11.00 per ton*1.12 tons per tonn*1.075 (sales tax)=28.60
Freight per M³ $90 per hour * 0.75 hour per round trip * $90 per hour / 10.3 M³ per truck = $6.50 per M³
Cost per M³ = $28.60+$6.50 =$34.10

Total cost per M³ in place to finish grade = $34.10+$570/124 M³ per hour = $38.70

Add 10% for maintenance, oversite, etc and 15% profit $38.70 + $3.87 + $6.39 = $48.96 Use $49.00 /m³
Links to useful web sites

District 8 bid results database: http://t8web/design/contractcost/links.htm

Bid Summary Results: http://www.dot.ca.gov/hq/esc/oe/awards/bidsum/


Caltrans Asphalt Price Index: http://www.dot.ca.gov/hq/esc/oe/asphalt_index/astable.html


CONSIDERATION FACTORS AFFECTING UNIT COST ESTIMATES
Office of Construction Estimate Review (OCER)
October 13, 2006

Unit Cost Data
- Caltrans Annual Contract Cost Books
- Caltrans Cost Database
- Awarded contracts
- Other bidders
- Force account analysis

Project Location
- Rural locations
- Mountainous Terrain
- Coastal zone or coastal bluff
- Desert
- Roadways adjacent to rivers

Item Availability
- National shortages
- Special product vendor

Unusual or Special Materials
- Lightweight fills
- Special aggregates

Unusual or Unique Construction
- Soundwall or structure decorative surfaces

Difficult Construction
- Irregular areas
- Repeated start and stop of work
- Difficult terrain
- Intersection construction
- Cross slope & profile correction

Haul Distances Within Project Limits

Plant / Material Source Distance to Project

Imbalanced Excavation/Embankment Quantity

Difficult Slope Construction
- Steep cuts or fills
- Rocky slopes
- Unstable slopes excavation
- Potential for rock blasting

Accelerated Construction
- Emergency repair work

A+B Contracts

Large Incentive or Liquidated Damages

Economic Price Trends
- Oil
- Steel

Construction Windows
- Nighttime work
- Excessive Noise from pile driving
- Lane Closures of short duration

Longitudinal Dropoffs

Special Work Forces Required

Climate Conditions
- Seasonal water flow
- Desert high heat
- Freeze or Snow conditions
Attachment 7

Central Region Estimate Cert Package memo (CR-PJD-10)
Memorandum

To: RORY V. QUINCE, Chief Office Design I
    DAVID FAPP, Chief Office Design II
    MICHAEL F. SHERIDAN, Chief Office Design III
    TERRY OGLE, Chief Office Design IV
    Central Region Design Seniors
    Central Region Landscape Architects

From: KIM E. ANDERSON,  Original signed by Kim E Anderson
    Chief, Central Region
    Project Development

Date: December 5, 2006
File: Project Development
Central Region
CR-PJD-10

Subject: Estimate Certification Package

Background

Based on the direction given in Rick Land’s memorandum, “Certification of Project Estimates,” dated December 14, 2005, Central Region Project Development has implemented a quality control/quality assurance (QC/QA) process prior to submittal to the District Directors for their certification per Kim Anderson’s Policy Memo (CR PJD-7), QC/QA Estimate Certification Process, dated January 12, 2006. This process by no means lists all QC/QA procedures used within Project Development during the life of a project. It simply summarizes the procedures to ensure the District Directors that appropriate QC/QA processes have been instituted to develop the best estimate possible for Estimate Certification.

The purpose of this memorandum is to outline the documentation necessary for the Estimate Certification package/process.

Documentation for Estimate Certification Package/Process

The minimum documentation for verifying estimates for certification is as follows:

1. Engineer’s Estimate Unit Cost Calculation Sheets (highways only) showing how item unit costs were derived per Kim Anderson’s Policy Memo (CR PJD-09), Quantity Calculations and Unit Cost Estimate Calculations, dated November 1, 2006.
2. Plan set (11x17 hard copy).
5. Executed DES - VERIFICATION OF ESTIMATE (if Structures or any other DES unit is involved with producing costs that affect the estimate, is involved).

For projects including work prepared by units within the Division of Engineering Services, DES is responsible for preparing quantities and unit cost estimates. While some minimal verification
can be done by Central Region Project Development in relation to DES work, DES should document that they have again verified quantities and updated unit costs per the latest available data. Documentation of this subsequent review can occur via fax or email due to the limitations in time for the Estimate Certification process.

6. BEES for Highways, Structures (if involved) and Combined. (8 ½ x 11 hard copy)

NOTES RELATING TO ITEMS NOS. 1-8, ABOVE:

A. All documentation submittals shall be accompanied by a memo that includes the contents and purpose of the submittal, along with the desired completion date.
B. Item Nos. 1-4, 6 and 7 are required prior to the Draft Contract Ready date, minimum review time is two weeks, and does not commence until all documentation requirements are met.
C. Item No. 5 is required prior to verification and re-verification.
D. BEES should be revised at each review/submittal and the most current submitted for review/verification.
E. Office of Construction Estimate Review (OCER) shall be notified of any delivery date changes that occur after submittal of estimate data for verification.
F. Engineer’s Estimate Unit Cost Calculation Sheets should be submitted only one time unless changes are made, in which case, changes should be re-submitted along with supporting documentation, an updated BEES, and a cover memo.
G. The timing of the “three-month” review/verification is based on the original certification date, and is the responsibility of the Design Engineer, or his delegate, to track and notify the OCER that re-verification is required along with the due date of said review/verification.
H. The estimate unit costs should be reviewed, and unit cost changes along with a cover memo, sent to OCER at the time of submittal for the “three-month” review/verification.
I. Minimum “three-month” review/verification time required is one week.
J. The BEES will be reopened only to update unit costs as necessary per re-verification.

Implementation

These Estimate Certification Package guidelines are to be implemented immediately on all projects with an engineer’s estimate exceeding five million dollars.

Attachments:
- PJD-3 Rev1, Construction Contract Time Implementation
- PJD-7 QC/QA, Estimate Certification Process
- CR PJD-09 Quantity Calculations and Unit Cost Estimate Calculations
- FAQ Document
Designer submits draft 60% PS&E Package to Construction Estimate Branch. Must include:
- Draft 60% Plans (11 x 17)

Design Senior performs quality review check of draft 95% PS&E Package prior to draft 95% PS&E Constructibility Review.

Designer prepares draft 95% PS&E Package and submits to Design Senior for review and concurrence.

Construction Estimate Branch performs 1st Review and makes recommendations to Designer.

Designer submits draft 95% PS&E Package to Construction Estimate Branch concurrent with 95% Constructibility Review. Package must include:
- Draft 60% Plans (11 x 17)
- Quantity & Unit Cost Calculations on Unit Cost Calculation Sheet form
- Draft Special Provisions (showing edits & hidden text)
- Draft CPM Project Schedule
- Draft BEES (8 ½ x 11)
- Executed DES Structures Estimate Verification (if structures is involved)

Construction Estimate Branch performs 1st Review and makes recommendations to Designer.

Designer updates BEES in consideration of recommendations and re-submits revised BEES.

Concurrent with DOE’s second review PS&E, Designer submits draft PS&E to Construction Estimate Branch for final review prior to PS&E to DES-OE.

Final District Draft PS&E Package is transmitted to DES – Office Engineer. MS 380 WBS Activity 255.20

DES-Office Engineer prepares Draft Contract & submits “red lines” to District WBS Activity 260.15.10

Project Engineer signs Certification Form

Design Senior signs Certification Form

Estimate Branch signs Certification Form or may attach list of “Risks”

Office Chief signs Certification Form.

PM signs Certification Form.

District Director signs Certification of Cost Estimate memo to Robert Buckley. Target date of approval is PS&E Ready Latest date of approval is “RTL” MS 460 WBS 260.15.25 Verification of RTL Requirements Completion

If District Director does not sign Certification of Cost Estimate memo, the matter is directed to PM for resolution.

Re-verification is required every 3 months until project is voted by CTC.
CONSIDERATION FACTORS AFFECTING UNIT COST ESTIMATES
Office of Construction Estimate Review (OCER)
October 13, 2006

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- Emergency repair work

A+B Contracts
- Large Incentive or Liquidated Damages

Economic Price Trends
- Oil
- Steel

Construction Windows
- Nighttime work
- Excessive Noise from pile driving
- Lane Closures of short duration

Longitudinal Dropoffs

Special Work Forces Required

Climate Conditions
- Seasonal water flow
- Desert high heat
- Freeze or Snow conditions
What projects are required to be reviewed by the Office of Construction Estimates Branch?

*Estimate Certification by the District Director is required for projects within the Central Region that have Engineer’s Estimates that are $5 million and over and will require funding vote by the CTC.*

Where can information about Estimate Certification policies be found?

*Refer to the Central Region policy PJD-7 memorandum, QC/QA Estimate Certification Process, by Kim Anderson, dated January 12, 2006 (including the Estimate Certification form) is found on the Central Region PJD web site under PJD Policies, PJD-7 ([http://sv06web/pjd/home/docs/crpjdpolicy/crpjdpolicy.htm](http://sv06web/pjd/home/docs/crpjdpolicy/crpjdpolicy.htm)).*  
The initiating policy from headquarters Certification of Project Cost Estimate by Rick Land, Chief Engineer dated December 14, 2005 may be found on the headquarters Project Delivery Memorandums website ([http://pd.dot.ca.gov/pd_memos.asp](http://pd.dot.ca.gov/pd_memos.asp)).

When is the Design Engineer required to submit estimates to the Construction Estimate Review Branch for review?

*Estimate review by OCER is required at 60% Constructibility Review (if Level 1 or Level 2 project over $5 million). 95% Constructibility Review (all projects over 5 million). DOE 2nd Draft PS&E Review (concurrent with final draft PS&E review by Environmental, Traffic Operations & Construction units just prior to PS&E submittal to DES-Office Engineer).*

How long will review by OCER Branch usually take?

*The normal minimum estimate review time is two weeks and the maximum is five weeks. (If additional review time is required due to project complexity or OCER workload, the Project Engineer will be informed of the additional time required.)*

What must the Design Engineer do after submitting the project estimate for review?

*Following the review by the Estimates Branch, suggested changes will be submitted to the Design Engineer by OCER. The Project Engineer shall update the estimate and re-submit the estimate for verification.*
What must be included in the Estimate Review Package?

The minimum required information for checking estimates is as follows:

- Quantity Calculation Sheets on standard form DC-CEM-4801 (highways only) showing how quantities were derived with ‘Calculated By’, ‘Checked By’, and all other project heading information filled in.
- Unit Cost Calculation Sheets showing how unit costs were derived with ‘Calculated By’, ‘Checked By’, and all other project heading information filled in. This includes “Lump Sum” items and unit cost items from other functional units such as Electrical and Traffic.
- One hard copy reduced size draft set of plans.
- Draft CPM (if available at 60% but no later than 95%) Suretrak format preferred.
- Draft Special Provisions printed showing hidden text and showing all edits, number all pages, perform a spellcheck, and copy the SSPs back-to-back. Draft SSPs are not typically available until 95%. Special Provisions should also be submitted electronically.
- Draft BEES for Highways, Structures (if involved) and Combined. Print BEES file to fit an 8-1/2 x 11 page (do not reduce). Prior to 95% an Excel Spreadsheet estimate is acceptable.

What if the Engineer Estimate changes after submittal to OCER?

The Designer is to submit revised estimates along with a cover memo outlining the changes.

What if the Project Engineer does not agree with changes recommended by OCER?

OCER and the Design Engineer must meet and try to reach agreement. If agreement is not reached, then the OCER will not verify the estimate but will attach a list of risks to the QC/QA Documentation for Estimate Certification document for consideration by the Director.

When does the Project Engineer begin the QC/QA Documentation for Estimate Certification and approval by District Director process?

The Project Engineer begins completion of the QC/QA Documentation for Estimate Certification process when DES-Office Engineer submits the Draft Contract to the District for “red line” review. This will occur after the PS&E to HQ Milestone 380 and prior to the Ready to List Milestone 460. The Project Engineer must obtain the final BEES Estimate from DES-Office Engineer and attach the BEES Estimate to the QC/QA Documentation for Estimate Certification form. The Project Engineer may continue to process by submitting the form for required signature approvals.
How long does it take for the District Director to approve the Certification of Project Cost Estimate memo after being submitted by the Project Manager?

The District Director determines this on a project-by-project basis. Approval by the District Director should require one week provided the QC/QA Documentation for Estimate form was “verified” and signed by the Construction Estimate Branch and there are no identified risks.

Does the estimate verification and certification need to be redone if it is less than 3 months old and a new fiscal year begins?

No. A change in fiscal year is not pertinent. Following initial certification by the District Director, the verification and certification must be re-done every three months to remain current.

After District Director initial certification approval, how long does it take to have the Estimate Certification re-verified?

The minimum re-verification time is one week.

What is the role of the Design Engineer in the re-verification process?

It is the responsibility of the Design Engineer to track the re-verification calendar, review the estimate, make any necessary unit cost changes, and re-submit the updated estimate along with supporting documentation to OCER. Quantities are not to be changed.

I thought the BEES system was locked at RTL. Does the project lose the RTL date if the BEES is changed?

DES – Office Engineer has established a procedure that will allow BEES to be reopened for adjustment of unit costs only and the project RTL date will not be changed. No changes other than unit costs may be made.

What if the project delivery schedule changes after the start of the estimate review and certification process?

The Design Engineer shall notify OCER of the schedule change and the affect on project delivery.

What happens if during the review and certification process the project is found to require more or less funding than is programmed for the project?

Project cost versus the programmed budget issues are the responsibility of the Project manager. The project cost estimate should reflect the true estimated cost as determined by the Design Engineer, and shall not be adjusted to “fit” the programmed budget. The CTC acknowledges the effects of economic changes that can cause the project cost to fluctuate significantly. The CTC wants to know as early in the process as possible of the need to adjust funding.
Attachment 8

District 8 Cost Estimates memo
Memorandum

To: ALL EMPLOYEES

Date: February 8, 2006

File:

From: MICHAEL A. PEROVICH
District Director

Subject: Preparation of Cost Estimates

The purpose of this memo is to re-emphasize the importance of preparing complete and accurate estimates that reflect the true scope of work to be performed.

The December 14, 2005, memo from Chief Engineer Richard Land (attached) was issued to drive accountability at the District level and will require the District Director to certify that contract cost estimates over $5 million are complete and accurate.

The District will meet this requirement by implementing the following procedures:

1. As of this year, projects over $5 million will require the attached certification memo to be completed prior to the project being considered Ready to List (RTL). In addition, a copy of the signed and checked calculation package used to develop the estimate is to be submitted with the request for certification. This will prove the accuracy of the estimate.

2. Project cost estimates shall be updated throughout the project development process, specifically:
   - At the beginning of the calendar year
   - Prior to Ready to List (RTL)
   - Prior to California Transportation Commission (CTC) vote
   - As trends dictate

3. The constructability review meeting will now include the review and approval of the cost estimate.

"Caltrans improves mobility across California"
All estimates, regardless of the dollar amount, will require the review and approval of the deputies of the Constructability Review Senior, Project Manager and Design Senior four weeks prior to RTL (see attached memo).

The District has begun updating and improving the Contract Cost Database and will be providing training aimed at preparing estimates. There is also a project development toolbox on the web at (http://pd.dot.ca.gov/pd_guidance.asp) and the RTL guide at (http://www.dot.ca.gov/hq/esc/oe/specifications/rtl_guide) that provides practices useful in preparing estimates.

Moreover, any person or persons responsible for the preparation of estimates must consult with the district office engineer (OE) and construction staff before finalizing an estimate.

Your efforts to continue to provide accurate cost estimates have not gone unnoticed and are greatly appreciated. Implementation of the above-mentioned procedures will ensure continued accuracy of project cost estimates.

Attachments
Memorandum

To: CHIEF DEPUTY DIRECTOR
   DISTRICT DIRECTORS
   DEPUTY DIRECTORS
   DIVISION CHIEFS

From: RICHARD D. LAND
      Chief Engineer

Subject: Certification of Project Cost Estimate

Historically the Department has been very successful in forecasting project cost estimates that are within a reasonable range of the contractor’s low bid. This success has allowed the Department to maximize the number of projects planned, programmed and delivered within given budget constraints. Recent market trends have seen escalating costs of key construction commodities used in transportation projects, making it difficult even at Construction Contract Ready to accurately forecast bid item costs. The California Transportation Commission (CTC) holds the Department accountable for project cost increases, whether they be at time of funds vote, award, or during construction.

It is imperative that the funds voted and allocated by the CTC are based on current and accurate project cost estimates developed using the Department’s best forecasting capabilities. To drive accountability at the District level for those estimates, the District Director will be required, for all projects with an Engineer’s Estimate over $5 million, to certify that the contract cost estimate is complete and accurate, reflecting the true scope of the work to be performed and representative of the most current market trends. This District Director certification will be required to achieve Ready to List (RTL) beginning January 1, 2006. The RTL Certification form has been revised to include this signature and is available from the District Office Engineers. Also, contract estimates must be updated and re-certified by the District Director for these projects with an Engineer’s Estimate more than three months old. Updating estimates due solely to item cost increases will not change the District RTL certification date if it has already been achieved.

The Division of Engineering Services-Office Engineers will monitor the success of these measures, tracking the Engineer’s Estimate relative to the low bids. These measures may be relaxed, strengthened or eliminated depending on the lessons learned from this new requirement.

Your continued efforts to accurately forecast the costs of our transportation improvement projects is greatly appreciated. Please contact John McMillan, Deputy Division Chief, Office Engineer, Division of Engineering Services at 916-227-6300 if you have questions.
Memorandum

To: MICHAEL A. PEROVICH
   District Director

From: PATRICIA ROMO
   Deputy District Director
   Design

Subject: Certification of Project Cost Estimate Over $5 Million

The contract cost estimate is complete and accurate, reflecting the true scope of the work to be performed and is representative of the most current market trends.

Recommend Approval:

_________________________________________  ____________________________
PATRICIA ROMO  Date
Deputy District Director
Design

APPROVED BY:

_________________________________________  ____________________________
MICHAEL A. PEROVICH  Date
District Director
District 8
Memorandum

To: PATRICIA ROMO
Deputy District Director
Design

Date:

File:

From: Office Chief

Subject: Certification of Project Cost Estimate

The cost estimate for this project has been prepared under the direction of the following registered engineer:

<table>
<thead>
<tr>
<th>Project Engineer</th>
<th>Date</th>
<th>Constructability Review</th>
<th>Date</th>
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<tbody>
<tr>
<td>Senior</td>
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<td></td>
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</tbody>
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The contract cost estimate is complete and accurate, reflecting the true scope of the work to be performed and is representative of the most current market trends.

Recommend Approval:

<table>
<thead>
<tr>
<th>Design Senior</th>
<th>Date</th>
<th>Project Manager</th>
<th>Date</th>
</tr>
</thead>
</table>

APPROVED BY:

PATRICIA ROMO
Deputy District Director
Design

Date
Attachment 9

District 8 Estimate Documentation Form
<table>
<thead>
<tr>
<th>ITEM CODE:</th>
<th>120200</th>
<th>EA:</th>
<th>12345</th>
</tr>
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<tbody>
<tr>
<td>DESCRIPTION:</td>
<td>Flashing Beacon (Portable)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QUANTITY:</td>
<td>10</td>
<td>UNIT:</td>
<td>EA</td>
</tr>
</tbody>
</table>

PREPARED BY: Jane Doe
DATE: 2/13/06

CHECKED BY: John Doe
DATE: 3/2/06

**RESEARCH/CALCULATIONS:**

1. Contract Cost Database (see attached) \( \rightarrow \) weighted average $1900 EA
   - Districts: 7, 8, 11 and 12
   - Years: 2003, 2004 and 2005
   - Minimum Quantity: 5
   - Maximum Quantity: 15
2. Removed high and low bids \( \rightarrow \) weighted average $1460 EA
3. Recent bid openings in D8
   - EA 08-11111, 1/26/06, 9 EA \( \rightarrow \) $4500
   - Second bidder \( \rightarrow \) $3500
   - Third Bidder \( \rightarrow \) $5500
4. Recent bid opening for SANBAG
   - EA 08-22222, 2/23/06, 12 EA \( \rightarrow \) $1200
5. $1460 + 25% = $1825
6. \((1825 + 1200)/2 = $1512 \rightarrow \textbf{SAY} $1500\)

**METHODOLOGY/ASSUMPTIONS:**

1. EA 11111 was located in rural San Bernardino County. The location and type of work was very different, therefore the prices were discarded
2. Assumed 25% inflation on historic data based on increases in similar items of work
3. Averaged inflated historic data price with recent SANBAG bid

**REFERENCES USED:**

District 08 Contract Cost Database
Caltrans Bid Summary Results
SANBAG Bid Results

**CONTACTS/REVIEWED BY:**

Constructability Reviewer
Resident Engineer
Construction on-call consultant
Office Engineer

**FILE LOCATION:**

J:\12345\DES\Est\backup\120200\summary.doc
J:\12345\DES\Est\backup\120200\08-22222.pdf
J:\12345\DES\Est\backup\120200\database.pdf
J:\12345\DES\Est\backup\120200\08-11111.pdf
Attachment 10

District 11 “11-page Estimate Form”
**DISTRICT 11**
**PRELIMINARY**
**PROJECT COST ESTIMATE**

<table>
<thead>
<tr>
<th>Type of Estimate</th>
<th>Program Code</th>
<th>Project Limits</th>
<th>Description</th>
<th>Scope</th>
<th>Alternative</th>
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### Preliminary Project Cost Estimate

<table>
<thead>
<tr>
<th>Current Cost</th>
<th>Escalated Cost</th>
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<tr>
<td>ROADWAY ITEMS</td>
<td>$ -</td>
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<tr>
<td>STRUCTURE ITEMS</td>
<td>$ -</td>
</tr>
<tr>
<td>SUBTOTAL CONSTRUCTION COST</td>
<td>$ -</td>
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<tr>
<td>RIGHT OF WAY</td>
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</tr>
<tr>
<td>TOTAL CAPITAL COST</td>
<td>$ -</td>
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<tr>
<td>PR/ED SUPPORT</td>
<td>$ -</td>
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<tr>
<td>PS&amp;E SUPPORT</td>
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</tr>
<tr>
<td>RIGHT OF WAY SUPPORT</td>
<td>$ -</td>
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<tr>
<td>CONSTRUCTION SUPPORT</td>
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<tr>
<td>TOTAL SUPPORT COST</td>
<td>$ -</td>
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</table>

### TOTAL PROJECT COST

| $ - | $ - |

**Notes:**
- Escalation rates used on this estimate are 2.3% for Support Cost and 5.0% for Highway Construction Capital Costs compounded annually to Construction year. These rates are different than the suggested 2006 STIP of 8.3% for fiscal year 05/06 and 3.0% thereafter. The decision to use 5.0% for this estimate was as per the Office of Office Engineer.

---

**Reviewed by District 0.E.**

Leon G. Edmonds District 11 Office Engineer

(619) 688-6735

---

2 Escalation rates used on this estimate are 2.3% for Support Cost and 5.0% for Highway Construction Capital Costs compounded annually to Construction year. These rates are different than the suggested 2006 STIP of 8.3% for fiscal year 05/06 and 3.0% thereafter. The decision to use 5.0% for this estimate was as per the Office of Office Engineer.
### I. ROADWAY ITEMS

<table>
<thead>
<tr>
<th>Section</th>
<th>Cost</th>
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<tbody>
<tr>
<td>1 Earthwork</td>
<td>$ -</td>
</tr>
<tr>
<td>2 Structural Section</td>
<td>$ -</td>
</tr>
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<td>3 Drainage</td>
<td>$ -</td>
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<tr>
<td>4 Specialty Items</td>
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<td>5 Environmental</td>
<td>$ -</td>
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<tr>
<td>5A Environmental Mitigation</td>
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<tr>
<td>5B Landscape and Irrigation</td>
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<td>5C NPDES</td>
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<td>6 Traffic Items</td>
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<tr>
<td>6A Electrical</td>
<td>$ -</td>
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<tr>
<td>6B Signing and Striping</td>
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<td>6C Traffic Management Plan</td>
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<tr>
<td>6D Traffic Control</td>
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<tr>
<td>7 Detours</td>
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<tr>
<td>8 Minor Items</td>
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<td>9 Roadway Mobilization</td>
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<tr>
<td>10 Supplemental Work</td>
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<td>12 Contingencies</td>
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<tr>
<td>13 Overhead</td>
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**TOTAL ROADWAY ITEMS**  
$ -

---

By signing this estimate you are attesting that you have discussed your project with all functional units and have incorporated all their comments or have discussed with them why they will not be incorporated.
**SECTION 1  EARTHWORK**

<table>
<thead>
<tr>
<th>Item code</th>
<th>Item description</th>
<th>Unit</th>
<th>Quantity</th>
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<tr>
<td>198001</td>
<td>Imported Borrow</td>
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<tr>
<td>198007</td>
<td>Imported Material (Shoulder Backing)</td>
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<tr>
<td>192037</td>
<td>Structure Excavation (Retaining Wall)</td>
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<tr>
<td>193013</td>
<td>Structure Backfill (Retaining Wall)</td>
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<td>193031</td>
<td>Pervious Backfill Material (Retaining Wall)</td>
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<tr>
<td>161010</td>
<td>Clearing &amp; Grubbing</td>
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<tr>
<td>170101</td>
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**TOTAL EARTHWORK SECTION ITEMS $**

**Section 2  STRUCTURAL SECTION**

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<td>401000</td>
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<tr>
<td>404092</td>
<td>Seal Pavement Joint</td>
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<td>404094</td>
<td>Seal Longitudinal Isolation Joint</td>
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<td>413115</td>
<td>Seal Existing Concrete Pavement Joint</td>
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<td>401108</td>
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<tr>
<td>390102</td>
<td>Asphalt Concrete (Type A)</td>
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<tr>
<td>390108</td>
<td>Asphalt Concrete Base (Type A)</td>
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<tr>
<td>390126</td>
<td>Rubberized AC (Type G)</td>
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<td>393001</td>
<td>Pavement Reinforcing Fabric</td>
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<tr>
<td>260201</td>
<td>Class 2 Aggregate Base</td>
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<td>290201</td>
<td>Asphalt Treated Permeable Base</td>
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<td>250401</td>
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<td>374002</td>
<td>Asphaltic Emulsion (Fog Seal Coat)</td>
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<td>397001</td>
<td>Asphaltic Emulsion (Paint Binder)</td>
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<td>377501</td>
<td>Slurry Seal</td>
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<td>3750XX</td>
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<td>150771</td>
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<td>390095</td>
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<td>1532XX</td>
<td>Remove Concrete (type)</td>
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<td>394002</td>
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<td>153103</td>
<td>Cold Plane Asphalt Concrete Pavement</td>
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<td>394050</td>
<td>Rumble Strip</td>
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<td>41312A</td>
<td>Repair Spalled Joints (Polyester Grout)</td>
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<tr>
<td>420102</td>
<td>Groove Existing Concrete Pavement</td>
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</tbody>
</table>

**TOTAL STRUCTURAL SECTION ITEMS $**

---

*Include item for "lead compliance plan" under "specialty items".*

*Include item for "lead compliance plan" under "specialty items."*

*Shoulder backing is a thin course of granular material that is used to protect the outside edge of pavement by providing support that prevents edge cracking and pavement edge loss. It also minimizes drop-off heights for overlays. Measured by the tonne. Minimum unit weight to be used on all new or existing AC surfaces within the project limits, excluding traveled way and detours, per D11 PDPM manual. Estimate: 0.38 L/M2 and 1002 L/Tonne. This item is also paid by the tonne, and added to other work as "asphalt concrete (misc. area)."

*Required for cold plane/AC projects. All vertical and horizontal cold planed surfaces are tacked with binder prior to AC placement. Estimate 0.27 L/M2 and 1002 L/Tonne. This item is also used on seal coat projects. Use on all new or existing AC surfaces within the project limits, excluding traveled way and detours, per D11 PDPM manual. Estimate: 0.38 L/M2 and 1002 L/Tonne. This item is also paid by the tonne, and added to other work as "asphalt concrete (misc. area)."

*Include item for "lead compliance plan" under "specialty items."*

*If you have this item, you may also have items for "seal pavement joint" and "seal longitudinal isolation joint."

*Use the conversion: 2.373 Tonne/m3*

*Use the conversion: 2.373 Tonne/m3*

*Use the conversion: 2.373 Tonne/m3*

*If you have this item, you may also have items for "seal existing concrete pavement joint", "grind existing concrete pavement" and "repair spalled joints (polyester grout)."*

*Required for cold plane/AC projects. All vertical and horizontal cold planed surfaces are tacked with binder prior to AC placement. Estimate 0.27 L/M2 and 1002 L/Tonne. This item is also used on seal coat projects. Use on all new or existing AC surfaces within the project limits, excluding traveled way and detours, per D11 PDPM manual. Estimate: 0.38 L/M2 and 1002 L/Tonne. This item is also paid by the tonne, and added to other work as "asphalt concrete (misc. area)."

In addition to per meter quantity, place AC dike is also paid by the tonne, and added to other work as "Asphalt Concrete (Type A)." See standard plan A67B for dike quantities.

*Dike removal, when part of roadway excavation for pavement widening, is NOT a pay item. Use this item when dike is removed as part of a rehabilitation (cold planing), etc.

*Usually required on slab replacement projects to restore ride quality.*

*Primarily used to remove detours. When pavement and portions of base are removed for other cases, the item should be "roadway excavation."

*In addition to m2 quantity, place AC (misc. area) is also paid by the tonne, and added to other work as "asphalt concrete (Type A)."

*Although plans include a breakdown of different cold plane depths, for project studies purposes, add all quantities together here. Include an item for "asphaltic emulsion (paint binder)."*

Include this item if earthwork exceeds 1,800m3. Depending on difficulty, use $10,000 as an initial estimate of cost.

Include item for "lead compliance plan" under "specialty items."
### SECTION 3 DRAINAGE

<table>
<thead>
<tr>
<th>Item code</th>
<th>Description</th>
<th>Unit</th>
<th>Quantity</th>
<th>Price ($/unit)</th>
<th>Amount ($)</th>
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<tbody>
<tr>
<td>150805</td>
<td>Remove Culvert</td>
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<td>x</td>
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<td></td>
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<tr>
<td>150820</td>
<td>Modify Inlet</td>
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<td>193114</td>
<td>Sand Backfill</td>
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<td>x</td>
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<tr>
<td>150206</td>
<td>Abandon Culvert</td>
<td>M</td>
<td>x</td>
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<tr>
<td>152430</td>
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<td>155003</td>
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<td>XXX mm Pipe Riser</td>
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**TOTAL DRAINAGE ITEMS** $ -

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**TOTAL SPECIALTY ITEMS** $ -
# Section 5 ENVIRONMENTAL

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Subtotal Environmental $ -

## 5B - LANDSCAPE AND IRRIGATION

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Subtotal Landscape and Irrigation $ -

## 5C - NPDES

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Subtotal NPDES (Without Supplemental Work) $ -

* Applies only to project with SWPPP's

** TOTAL ENVIRONMENTAL ** $ -
## Section 6  TRAFFIC ITEMS

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**Subtotal Traffic Electrical** $ 

**Subtotal Traffic Signing and Striping** $ 

**Subtotal Traffic Management Plan** $ 

**Subtotal Stage Construction and Traffic Handling** $ 

**TOTAL TRAFFIC ITEMS** $ 

---

Include item for "lead compliance plan" under "specialty items."
Section 7 DETOURS*

- For Project less than 50 Working Days "Mobilization" is not required as a separate contract item, however contract item prices should take into consideration mobilization as part of the price.

* Includes constructing, maintaining, and removal

TOTAL DETOURS $ -

Section 8 MINOR ITEMS (Use Appropriate percentage between 5%-10%)

Total of Section 1-7

$ 0 x 10% = $ -

TOTAL MINOR ITEMS $ -

Section 9 ROADWAY MOBILIZATION*

- For Project less than 50 Working Days "Mobilization" is not required as part of the price.

* Includes constructing, maintaining, and removal

When project cost exceeds $5 million dollars, insert $10,000

If project cost exceeds $10 million dollars AND has at least 200 working days, insert the following: 200-400 working days= insert $15,000 401-600 working days= insert $22,500 Increase funding by $7,500 for each additional 200 WDs.

If project cost exceeds $5 million dollars AND has at least 150 working days, which does not meet the criteria above, insert the following: 150-300 working days= insert $10,000 Increase funding by $5,000 for each additional block of 150 working days.

Check if applicable to your project:
- Project must have Federal Aid.
- Project must have more than 100 working days.
- See Section 7.14 of the RTL guide for additional requirements and how to calculate estimate.

NPDES Supplemental Work specified in Section 5

TOTAL SUPPLEMENTAL WORK $ -

**Section 11  STATE FURNISHED MATERIALS**

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<td>06684X</td>
<td>Ramp Meter Controller Assembly</td>
<td>LS</td>
<td>x</td>
<td>=</td>
<td>$0</td>
</tr>
<tr>
<td>06684X</td>
<td>TMS Controller Assembly</td>
<td>LS</td>
<td>x</td>
<td>=</td>
<td>$0</td>
</tr>
<tr>
<td>06684X</td>
<td>Traffic Signal Controller Assembly</td>
<td>WD</td>
<td>x 880.00</td>
<td>=</td>
<td>$0</td>
</tr>
<tr>
<td>066838</td>
<td>Reflective Numbers and Edge Sealer</td>
<td>LS</td>
<td>x 880.00</td>
<td>=</td>
<td>$0</td>
</tr>
<tr>
<td>066803</td>
<td>Padlocks</td>
<td>LS</td>
<td>x</td>
<td>=</td>
<td>$0</td>
</tr>
</tbody>
</table>

*Insert (at a minimum) amount from approved Traffic Management Plan.*

**Section 12  CONTINGENCY**

Total Section 1-11

$0 x 20% = $0

**TOTAL CONTINGENCY $0**

*Justification:

**Section 13  OVERHEAD**

<table>
<thead>
<tr>
<th>Item code</th>
<th>Item Description</th>
<th>Unit</th>
<th>Quantity</th>
<th>Unit Price ($)</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>070018</td>
<td>Time Related Overhead (TRO)</td>
<td>WD</td>
<td>0</td>
<td>#DIV/0!</td>
<td>$</td>
</tr>
</tbody>
</table>

**TOTAL OVERHEAD $0**

Estimate as follows: working days **DO NOT** include plant establishment days.
- For project size under $150,000 or consisting mainly of signals or landscaping
- Projects between $150,000-$500,000: \( \frac{(\text{WDs}/18)+2}{2} \times 1.200 \)
- Projects between $500,000-$2,000,000: \( \frac{(\text{WDs}/18)+4}{2} \times 1.700 \)
- Projects between $2,000,000-$5,000,000: \( \frac{(\text{WDs}/18)+2}{2} \times 2.200 \)

Use appropriate percentage based on the detail of estimate. Anything other than the suggested contingency in the PDPM needs to be *justified. (Pre-PSR 30%-50%, PSR 25%, PAR 15%, After PAR 10%)*

**Required if project cost (non-escalated) exceeds $5 million. The quantity is calculated for you as 10% of the sum of all contract items, supplemental work and contingencies.**
## II. STRUCTURES ITEMS

<table>
<thead>
<tr>
<th>Structure 1</th>
<th>Structure 2</th>
<th>Structure 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>DATE OF ESTIMATE</td>
<td>00/00/00</td>
<td>00/00/00</td>
</tr>
<tr>
<td>Bridge Name</td>
<td>xxxxxxxxxxxxxxxxxxxx</td>
<td>xxxxxxxxxxxxxxxxxxxx</td>
</tr>
<tr>
<td>Bridge Number</td>
<td>57-XXX</td>
<td>57-XXX</td>
</tr>
<tr>
<td>Structure Type</td>
<td>xxxxxxxxxxxxxxxxxxxx</td>
<td>xxxxxxxxxxxxxxxxxxxx</td>
</tr>
<tr>
<td>Width (Meters) [out to out]</td>
<td>0.00 m</td>
<td>0.00 m</td>
</tr>
<tr>
<td>Total Bridge Length (Meters)</td>
<td>0.00 m</td>
<td>0.00 m</td>
</tr>
<tr>
<td>Total Area (Square Meters)</td>
<td>0.00 m²</td>
<td>0.00 m²</td>
</tr>
<tr>
<td>Structure Depth (Meters)</td>
<td>0.00 m</td>
<td>0.00 m</td>
</tr>
<tr>
<td>Footing Type (pile or spread)</td>
<td>spread</td>
<td></td>
</tr>
<tr>
<td>Cost Per Square Meters</td>
<td>$0.00</td>
<td>$0.00</td>
</tr>
</tbody>
</table>

| COST OF EACH STRUCTURE | $0.00 | $0.00 | $0.00 |

<table>
<thead>
<tr>
<th>Structure 4</th>
<th>Structure 5</th>
<th>Structure 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>DATE OF ESTIMATE</td>
<td>00/00/00</td>
<td>00/00/00</td>
</tr>
<tr>
<td>Bridge Name</td>
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<tr>
<td>Bridge Number</td>
<td>57-XXX</td>
<td>57-XXX</td>
</tr>
<tr>
<td>Structure Type</td>
<td>xxxxxxxxxxxxxxxxxxxx</td>
<td>xxxxxxxxxxxxxxxxxxxx</td>
</tr>
<tr>
<td>Width (Meters) [out to out]</td>
<td>0.00 m</td>
<td>0.00 m</td>
</tr>
<tr>
<td>Total Bridge Length (Meters)</td>
<td>0.00 m</td>
<td>0.00 m</td>
</tr>
<tr>
<td>Total Area (Square Meters)</td>
<td>0.00 m²</td>
<td>0.00 m²</td>
</tr>
<tr>
<td>Structure Depth (Meters)</td>
<td>0.00 m</td>
<td>0.00 m</td>
</tr>
<tr>
<td>Footing Type (pile or spread)</td>
<td>xxxxxxxxxxxxxxxxxxxx</td>
<td>xxxxxxxxxxxxxxxxxxxx</td>
</tr>
<tr>
<td>Cost Per Square Meters</td>
<td>$0.00</td>
<td>$0.00</td>
</tr>
</tbody>
</table>

| COST OF EACH STRUCTURE | $0.00 | $0.00 | $0.00 |

## TOTAL COST OF STRUCTURES

$0.00

---

1. Structure's Estimate includes Overhead and Mobilization.

Estimate Prepared By: xxxxxxxxxxxxxxxxxxxx —— Division of Structures

Date
III. RIGHT OF WAY

A) Acquisition, including Excess Land Purchases, Damages to Remainder(s) & Goodwill Loss $ 0
B) Railroad $ 0
C) Acquisition of Offsite Mitigation $ 0
D) Utility Relocation (State Share) Potholing (Design Phase) $ 0
E) Clearance Cost $ 0
F) RAP and/or Last Resort Housing Costs $ 0
G) Title and Escrow Fees $ 0

H) Condemnation Settlements 0% $ 0
I) Design Appreciation Factor 0% (Items H & I applied to Items A + B) $ 0

J) Utility Relocation (Construction Cost) $ 0

TOTAL R/W ESTIMATE: Escalated $ 0.00

(Excluding Item #8 - Hazardous Waste)

RIGHT OF WAY SUPPORT $ 0

Support Cost Estimate Prepared By ____________________________ Project Coordinator1 Phone ____________________________

Utility Estimate Prepared By ____________________________ Utility Coordinator2 Phone ____________________________

R/W Acquisition Estimate Prepared By ____________________________ Right of Way Estimator3 Phone ____________________________

1 When estimate has Support Costs only  2 When estimate has Utility Relocation  3 When R/W Acquisition is required
### IV. SUPPORT COST ESTIMATE SUMMARY

<table>
<thead>
<tr>
<th>SB-45 CATEGORY SUPPORT COST</th>
<th>FY 00/01</th>
<th>FY 01/02</th>
<th>FY 02/03</th>
<th>FY 03/04</th>
<th>FY 04/05</th>
<th>FY 05/06</th>
<th>FY 06/07</th>
<th>FY 07/08</th>
<th>FY 08/09</th>
<th>P3 Subtotal</th>
</tr>
</thead>
<tbody>
<tr>
<td>PR/ED (PD,PE,PM)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>PS&amp;E (PS)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>R/W (RW)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>CONSTRUCTION (CM)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td><strong>Total Support Cost:</strong></td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Please obtain a P3 report (CL#3) from PPM to fill in the support cost for these categories.

### Overall Percent Support Cost:

- PR/ED (PD,PE,PM): #DIV/0!
- PS&E (PS): #DIV/0!
- R/W (RW): #DIV/0!
- CONSTRUCTION (CM): #DIV/0!

**Total Capital Cost:**  

- $0

**Overall Percent Support Cost:** #DIV/0!

Approved by: 

______________________________  ________________________________  
Project Control Engineer  Date
Attachment 11

DES’s January 17, 2007 memorandum – Structures Cost Certification, and “Structures Cost Estimates PS&E Transmittal Data/Estimate Certification Data” Form
Memorandum

To: CHARLIE FIELDER-1
   BRIAN CRANE-2
   JODY JONES-3
   BIJAN SARTIPI-4
   RICHARD KRAMMOTH-5
   MALCOLM DOUGHERTY-6
   DOUG FAILING-7
   MICHAEL PEROVICH-8
   TOM HALLENBECK-9
   KOME AJSE-10
   PEDRO ORSO-DELGADO-11
   CINDY QUON-12

From: ROBERT A. STOTT

Date: January 16, 2007

Deputy Division Chief, Structure Design Services & Earthquake Engineering
Division of Engineering Services

Subject: DES Structures Cost Estimate Certification Data

In reference to Rick Land's attached memorandum, "Certification of Project Estimates", dated December 14, 2005, the Division of Engineering Services, Structure Office Engineer, Cost Estimates Branch will support this effort by providing the District the basis of how the structure cost estimate was derived. This will include information regarding significant project variables, the source or basis for unit prices, the assumed project start of construction date, and the midpoint of construction date.

This information will be transmitted to the District under the "ESTIMATE CERTIFICATION DATA" section on the "STRUCTURE COST ESTIMATES PS&E TRANSMITTAL DATA/ESTIMATE CERTIFICATION DATA" form. A copy of this form is attached and can be found on the Caltrans Internet site at http://www.dot.ca.gov/hq/esc/estimates/forms/.

If you have any questions please contact me at (916) 227-8728.

Attachments

   c: DES – Deputies
      District Design Deputies
Memorandum

To: CHIEF DEPUTY DIRECTOR
DISTRICT DIRECTORS
DEPUTY DIRECTORS
DIVISION CHIEFS

Date: December 14, 2005

From: RICHARD D. LAND
Chief Engineer

Subject: Certification of Project Cost Estimate

Historically the Department has been very successful in forecasting project cost estimates that are within a reasonable range of the contractor’s low bid. This success has allowed the Department to maximize the number of projects planned, programmed and delivered within given budget constraints. Recent market trends have seen escalating costs of key construction commodities used in transportation projects, making it difficult even at Construction Contract Ready to accurately forecast bid item costs. The California Transportation Commission (CTC) holds the Department accountable for project cost increases, whether they be at time of funds vote, award, or during construction.

It is imperative that the funds voted and allocated by the CTC are based on current and accurate project cost estimates developed using the Department’s best forecasting capabilities. To drive accountability at the District level for those estimates, the District Director will be required, for all projects with an Engineer’s Estimate over $5 million, to certify that the contract cost estimate is complete and accurate, reflecting the true scope of the work to be performed and representative of the most current market trends. This District Director certification will be required to achieve Ready to List (RTL) beginning January 1, 2006. The RTL Certification form has been revised to include this signature and is available from the District Office Engineers. Also, contract estimates must be updated and re-certified by the District Director for these projects with an Engineer’s Estimate more than three months old. Updating estimates due solely to item cost increases will not change the District RTL certification date if it has already been achieved.

The Division of Engineering Services-Office Engineers will monitor the success of these measures, tracking the Engineer’s Estimate relative to the low bids. These measures may be relaxed, strengthened or eliminated depending on the lessons learned from this new requirement.

Your continued efforts to accurately forecast the costs of our transportation improvement projects is greatly appreciated. Please contact John McMillan, Deputy Division Chief, Office Engineer, Division of Engineering Services at 916-227-6300 if you have questions.

“Caltrans improves mobility across California”
STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

STRUCTURE COST ESTIMATES PS&E TRANSMITTAL DATA / ESTIMATE CERTIFICATION DATA

Revised - January 12, 2007

DATE:
DIST.-CO.-RTE:
EA:
LEAD STRUCTURE:
Estimate prepared by:
Phone Number:

PS&E TRANSMITTAL DATA:  KEYWORD:

The Engineer's Estimate for the structure portion of this project

☐ is available from BEES.

☐ has been revised as of this date and are available from BEES.

STRUCTURE ITEMS - Including Mobilization & Time Related Overhead
STRUCTURE ITEMS - Including Mobilization
STRUCTURE ITEMS - No Mobilization Item
Supplemental Work:

State furnished materials and expenses:

CONTINGENCIES APPROXIMATELY 5%

Total $0

SUGGESTED WORK DAYS FOR STRUCTURE WORK:
SUGGESTED WORK DAYS FOR STRUCTURE WORK WITHIN
RAILROAD RIGHT-OF-WAY:
REVISIONS TO THE ESTIMATE ARE DUE TO:

ESTIMATE CERTIFICATION DATA: (To be completed at fsPS&E only)
ASSUMED BID OPEN DATE:*
ASSUMED MID POINT OF CONSTRUCTION:*
BRIDGE COST INDEX AT TIME OF THIS ESTIMATE:
SOURCE OF UNIT PRICES:

SIGNIFICANT PROJECT VARIABLES: (That were considered in preparing the estimate)

* Note: If the actual Bid Open date or Assumed Mid Point of Construction date vary significantly from the assumed dates the estimate and suggested working days should be re-evaluated.
Instructions for completing the "STRUCTURE COST ESTIMATES PS&E TRANSMITTAL DATA/ESTIMATE CERTIFICATION DATA" form.

Complete the project specific data:
Date: – The date the project estimate and working day schedule was completed.
DIST-CO-RT: The District-County-Route of the project.
EA: The Expenditure Authorization Number
LEAD STRUCTURE: The name of lead structure.
ESTIMATE PREPARED BY: The name of the estimator who prepared the estimate.
PHONE NUMBER: The phone number of the estimator who prepared the estimate.

KEYWORD: Keyword used in the BEES file.

Check the appropriate box regarding the availability of the BEES and whether or not the BEES have been revised.

List all SUPPLEMENTAL WORK items and dollar amount for each item (add additional lines if needed)

List all STATE FURNISHED MATERIALS AND EXPENSES items and dollar amount for each item (add additional lines if needed)

CONTINGENCIES APPROXIMATELY 5% - Contingency amount (can be found in the BEES output).

SUGGESTED WORK DAYS FOR STRUCTURE WORK: The total number of structure working days calculated using Suggested Work Schedule form or SURETRAK scheduling software.

SUGGESTED WORK DAYS FOR STRUCTURE WORK WITHIN RAILROAD RIGHT-OF-WAY: The total number of structure working days within 50 feet of railroad tracks.

REVISION TO THE ESTIMATE ARE DUE TO: State why the estimate is being revised (example, prior to RTL, greater than 1 year old, re-PS&E).

ASSUMED BID OPEN DATE: The assumed bid open date can be calculated by subtracting approximately 45 days from the START CONSTRUCTION date listed on the STRUCTURE P&Q TRANSMITTAL form.

ASSUMED MID POINT OF CONSTRUCTION: Calculated by finding the midpoint between the CONSTRUCTION COMPLETE date and the START CONSTRUCTION date listed on the STRUCTURE P&Q TRANSMITTAL form.

BRIDGE COST INDEX AT TIME OF THIS ESTIMATE: The current bridge cost index at the time the estimate was prepared. This number can be found on the CALTRANS Estimating Branch website http://www.dot.ca.gov/hq/esc/estimates/

SOURCE OF UNIT PRICES: List sources used in calculating unit prices (i.e. Contract Cost Database, force account analysis, RS Means, etc.)

SIGNIFICANT PROJECT VARIABLES: List variables that were considered when estimate was prepared. As a Branch we should try to be consistent as to how we list the variables. The following is a list of possible variables.
Stage construction
Work windows
Environmental restrictions
Site access
Material availability
Accelerated construction schedule

Revised January 12, 2007