

CHAPTER 20 – Project Development Cost Estimates

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CHAPTER 20 – Project Development Cost Estimates

SECTION 1 Project Cost Estimating

ARTICLE 1 General

Reference Information

Some of the references found in this chapter have hyperlinks that connect to Caltrans intranet pages which are not displayable to the general public. Until such time that the specific reference becomes available on the internet, the user will have to contact their district liaison, Caltrans project manager, or the appropriate Headquarters division to inquire about the availability of the reference.

Importance of Quality Cost Estimates

Reliable cost estimates are necessary for responsible fiscal management at every stage of the project. Unreliable cost estimates cause significant problems for Caltrans' programming and budgeting as well as local and regional planning. Unreliable cost estimates may also lead to staffing and budgeting decisions that use resources incorrectly or inefficiently. These problems, in turn, affect Caltrans' relationships with the California Transportation Commission (CTC), the California Legislature, local and regional agencies, and the public, and results in loss of credibility.

The term "project cost estimate", as used during the project development process, includes all capital outlay costs, including right-of-way, structures and landscaping, but does not normally include capital outlay support costs. Project cost estimates should never be artificially reduced to stay within the funding limits, nor should they be reduced to make more project funding available for the district. Likewise, project cost estimates should not be artificially raised beyond the contingency percentages provided in this chapter unless the increase is adequately justified.

Cost Estimate Categories

There are two categories of project cost estimates: project planning cost estimates and project design cost estimates. Project planning cost estimates are used for project justification, programming, analysis of alternatives, and approval. Project design cost estimates are used to summarize the cost of a project's contract items of work and are used for the bid item list in the construction contract documents.

Consistent and Comprehensive Methodology

Estimating cost is not an exact science. However, Caltrans must strive for reliable project cost estimates, so that projects can be delivered within budget. Caltrans requires that project cost estimates be prepared using a consistent and comprehensive methodology. Careful attention is needed to ensure a quality estimate. The cost estimator needs to research costs, compare costs, and use professional judgment to prepare a quality cost estimate. Consideration of project scope, schedule, and level of design details is required to develop accurate cost estimates.

Cost Estimates are Not Static

Cost estimates, in a sense, are never completed. They must be reviewed continually to keep them current. The project engineer (PE) is responsible for keeping the project cost estimates updated throughout the project development process, while the project manager (PM) is responsible for reviewing and approving all project cost estimates.

ARTICLE 2 Policies

Goal and Objective

Caltrans' goal is to avoid project cost overrun and also avoid excessive cost underrun. Cost overrun leads to shortage of funding to deliver the project, while cost underrun leaves unused funds that could have been used to deliver other important projects. The objective is to produce reliable construction cost estimates throughout project planning, development, and delivery process. It is important to identify costly unforeseen items of work before the project has been programmed to avoid delays and/or cancelation of the project.

Project Cost Awareness

Project cost awareness and control must be practiced throughout the planning and design of projects. This begins by establishing realistic assumptions as to final concept, scope and cost as early in the life of the project as possible.

Standard Formats

Standard project estimating formats must be followed for all project cost estimates.

Project planning cost estimates must be prepared using the standard format available on the Headquarters Division of Design cost estimating website at:

<http://www.dot.ca.gov/hq/oppd/costest/costest.htm>

Project design cost estimates must be prepared using the Basic Engineering Estimating System (BEES); information is available at:

<http://it.onramp.dot.ca.gov/information-about-bees>

Accountability

District management and the project manager are to be directly involved and held accountable in estimating project costs, controlling costs and submitting changes to cost estimates for approval.

Monitoring and Updating Cost Estimates

All project cost estimates are to be monitored and maintained current. Following the initial estimate, the timing of updates is guided by the following factors:

- Annual updates – All cost estimates must be kept current and updated at least once a year. If nothing else has changed, the annual update should focus on the unit costs used for the various items in the estimate. An annual update is only necessary if the estimate is not updated for any of the following listed factors.
- Programming cycle – A current cost estimate is needed at the start of each programming cycle so that the next programming document reflects current cost estimates. Most programming documents are prepared on a two-year cycle. The escalated amount used in each programming document establishes a new base against which future cost changes are compared.
- Approval of project development reports – Project development reports authorizing a project to proceed further in the project development process require the development and inclusion of a project cost estimate.

- Significant changes in identified project costs – Another appropriate time to update the project cost estimate is when a project development workflow task supports the preparation of a more detailed cost estimate (that is, when a task involves an activity to review the project and create a cost estimate). For example, when a preliminary site investigation more clearly identifies contamination issues, or when a geotechnical design report clarifies sub-surface conditions.
- After Plans, Specifications, and Estimate (PS&E) – Final engineer’s cost estimates that are more than three months old must be updated for projects that have achieved the Plans, Specifications, and Estimate milestone.

Changes to cost estimates for programmed projects require program change requests as described in and following the procedures in [Chapter 6](#) – Project Cost, Scope, and Schedule Changes and the [Project Changes Handbook](#).

ARTICLE 3 Current Project Cost Estimate

The current project cost estimate is the most recent project cost estimate available during either the planning phase or the design phase, regardless of whether it is approved as the “approved cost.” It is adjusted from the date of the estimate to January 1 of the current State fiscal year.

Since the current project cost estimate is an estimate of the capital outlay costs, it includes right-of-way costs. Refer to Section 3, Article 1, for a discussion of the relationship of the right-of-way cost estimate to the project design cost estimate during the design phase of project development.

ARTICLE 4 Responsibilities

Project Engineer

The responsibilities include the following:

- Prepare, revise and update project cost estimates.
- For project cost estimates that have achieved the PS&E milestone, update final engineer’s cost estimates that are more than three months old.
- Incorporate new or revised cost data from functional units in project cost estimates.
- Maintain a record of successive cost estimates for each project, including structure and right-of-way cost estimates, with documentation of the reasons for significant changes.

Project Manager

The responsibilities include the following:

- Review and approve all project cost estimates.
- Review and sign program change requests.

Headquarters Division of Engineering Services-Structure Design

The responsibilities include the following:

- Prepare, revise and update structure cost estimates.
- Promptly advise the project manager of the availability of the structure cost estimate or any significant changes to the estimate along with the reasons for the changes.

District Right-of-way

The responsibilities include the following:

- Prepare, revise, and update right-of-way cost estimates.
- Ensure that expended right-of-way cost is included or excluded in a consistent manner for cost comparison with earlier estimates.
- Review and sign program change requests (Deputy District Director).
- Promptly advise the project manager of the availability of the right-of-way cost estimates or any significant changes to the estimates along with the reasons for the changes.

District Project Management

The responsibilities include the following:

- Process program change requests.

District Director

The responsibilities include the following:

- Review all cost estimates prepared at major milestones and prepared for specific project documents at project initiation, project approval, and PS&E.
- Monitor project cost and adjust scope to stay within funding capabilities throughout the project development process. This includes taking action at the district level where such action is within district jurisdiction.

- Review and recommend approval of program change requests, or approve if within delegated authority.
- For all major projects, certify that the a final engineer’s 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).
- Re-certify projects with a final engineer’s cost estimate more than three months old.
- Request contingency other than 5 percent at RTL.

Headquarters Division of Design

The responsibilities include the following:

- Maintain appropriate cost estimate formats for use in preparing estimates for all projects.
- Through the Headquarters Project Delivery Coordinator, review, comment on, and recommend approval of all change control documents for scope changes and cost changes, when the costs exceed the District Director approval threshold.
- Approve contingency other than 5 percent at RTL.

Headquarters Division of Project Management-Project Delivery & Workload Development

The responsibilities include the following:

- Process all program change requests for projects submitted to Headquarters when costs exceed the District Director approval threshold.
- Hold project delivery meetings to monitor and evaluate scope, cost and schedule changes.

Headquarters Management

The responsibilities include the following:

- The Deputy Director for Project Delivery makes recommendation for program change requests when approval is not delegated to the District Director.
- The Deputy Director of Finance approves (or rejects) program change requests when approval is not delegated to the District Director.

ARTICLE 5 Coordination with Other Functional Units and Agencies

Consult Others

Other functional units (structures, right-of-way, traffic operations, materials, maintenance, construction, environmental, landscape architecture, etc.) and local entities should be involved, as appropriate, in the preparation of both project planning cost estimates and project design cost estimates. Project cost estimates should be developed through consultation with the project development team (PDT).

Structure and Right-of-way Cost Estimates

The Headquarters Division of Engineering Services-Structure Design will prepare all structure cost estimates. The district right-of-way unit will prepare all right-of-way cost estimates. The estimates prepared by those functional units are to be combined with the roadway estimate to obtain the capital outlay costs for the project. For further information on structure cost estimating and right-of-way cost estimating contact those functional units.

Cooperative Projects

Projects with contributor funding may require segregated cost estimates. To avoid confusion, as soon as the participatory rules for the project are determined, use segregated cost estimates that show the funding responsibilities of the various partners on the project. Define the various participants' funding responsibilities as early as possible in the project development process. Communication among the various partners is necessary to ensure reliable project cost estimates.

Intercounty Projects

Projects situated in more than one county may require segregated cost estimates. This allows proper crediting against county minimum funding requirements. Segregated cost estimates do not need to be completed for each item, but should be a percentage of the total project cost estimate.

Federal-aid Projects

Segregated cost estimates are required for those projects with federal funding. To avoid confusion on Federal-aid projects, use segregated cost estimates as soon as the participatory rules for the project are determined. The FHWA liaison engineer should be contacted to discuss any issues relating to Federal-aid.

SECTION 2 Project Planning Cost Estimates

ARTICLE 1 General

Project planning cost estimates are cost estimates prepared in advance of project approval. The initial programmed cost that appears the first time a project is listed in the State Transportation Improvement Program (STIP) or, State Highway Operation and Protection Program (SHOPP) is based on an escalation of a project planning cost estimate. Project planning cost estimates are categorized as: project feasibility, project initiation, draft project report, and project report.

ARTICLE 2 Project Feasibility Cost Estimate

Initial Cost Estimate

A project feasibility cost estimate may be required by management to determine whether or not to proceed with development of a project initiation document (PID). It is prepared prior to the project initiation process at the beginning of project planning studies when a highway improvement need has been identified and a project cost estimate is needed to evaluate the proposed improvements.

With management's approval to proceed, the normal process is to update the cost estimate with additional data to produce a project initiation cost estimate and a programmable project. The project feasibility cost estimate serves as background information for the project initiation cost estimate and is not used for programming the project.

Required Level of Detail

There may not be sufficient data available to prepare detailed project cost estimates prior to project initiation. However, management may still need project cost information at very early stages to make decisions on whether to proceed with development of a project initiation document. The cost estimate must be factual and could be based on similar projects.

When the majority of State highway projects were new roadways with new alignments and a well-defined scope, the project feasibility cost estimates may have been based on a cost per mile for a particular type of facility. Today, the majority of projects either maintain or improve the operation of the existing system. Cost

estimates for these projects are more difficult to develop and cannot be determined by driving through the project limits. It may be necessary to conduct a thorough onsite field review to obtain factual data to prepare realistic estimates that can be used with confidence.

Scoping for Project Feasibility Cost Estimates

Since the project feasibility cost estimate is the initial cost estimate prepared for the project, it is essential that the project be adequately scoped. The worst probable case should usually be assumed. Existing facilities thought to be adequate may become inadequate because of changes to standards, new data, further deterioration prior to construction, or other factors.

High Cost Items

To give management the best information available on which to base decisions, project feasibility cost estimates must be as realistic and accurate as possible. Estimators should be aware of features that have the potential of requiring high cost items. Items relating to the cost of mitigating hazardous waste and other environmental impacts, utility relocation, noise barriers, retaining walls, major storm drains, transportation management plan, and traffic handling must be quantified. Assumptions made during development of the cost estimate should be documented.

If structural design work is required, the Headquarters Division of Engineering Services-Structure Design should be consulted to obtain cost data for the project feasibility cost estimate.

At the feasibility stage, the right-of-way unit will normally complete the first sheet of the right-of-way data sheet with a notation, “Not Valid for Programming Purposes.”

Contingencies

Contingencies should be between 30 and 50 percent at this stage, depending on the factual data available for preparing the estimate.

ARTICLE 3 Project Initiation Cost Estimate

Required Level of Detail

The project initiation cost estimate is required for project initiation. This cost estimate is an expansion of the project feasibility cost estimate using the same format, but with more detail. Because the project initiation cost estimate will be used to program project costs, the importance of a reliable estimate at this stage cannot be overemphasized. It is the initial base against which following estimates are measured and has extremely high visibility.

Appropriate Mapping

To adequately prepare a project initiation cost estimate, it is essential to obtain appropriate mapping. Consultation with the district survey unit and a review of the [*Plans Preparation Manual*](#) is advisable.

Additional Information

Additional information that must be obtained includes: existing and forecasted traffic volume; geotechnical design information (particularly where foundation and slope stability problems can be anticipated); materials and pavement structural section design information; advance planning studies for new structures and modifying existing structures; hazardous waste assessment; potential environmental issues and mitigation; right-of-way and utilities data sheets; traffic handling and transportation management plans; and utilization of existing resources (recycling). Constructability reviews should evaluate and validate the project cost estimate and assumptions made.

Basis for Programming

The project initiation cost estimate is dated January 1 of the current State fiscal year. For programming, the cost estimate is escalated to determine the project cost for a particular year of construction. The project sponsor establishes the escalation rate.

Caltrans is the sponsor for all projects funded solely from the SHOPP and most projects funded from the Interregional Improvement Program. Because funding capacity is spread over multiple years, it may be necessary to develop more than one project cost. Each project cost is based on a different fiscal year of funding capacity. The Headquarters Division of Transportation Programming provides direction regarding funding capacity.

Use Most Up-To-Date Cost Estimate

If the time period between the approval of the project initiation document and the date of programming the project is significant, the cost estimate must be updated. In this case, a current project cost estimate should be used to program the project.

Base for Future Planning Cost Estimates

The programmed cost is the base for comparing future planning or design cost estimates. All percentage increases (or decreases) are applied from the programmed cost. Approved cost changes do not change the programmed cost, but become input to the next programming cycle. See Section 1, Article 2 – Policy for information on updating costs for programmed projects.

Contingencies

Contingencies should be 25 percent at this stage.

ARTICLE 4 Draft Project Report Cost Estimate

Required Level of Detail

Draft project report cost estimates use the same format as the project feasibility and the project initiation cost estimates, except they are considerably more detailed. At this time, the cost estimate for each competing project alternative needs to be calculated using updated data from the various functional units involved on the project (such as: materials, structure design, traffic, hydraulics, right-of-way, etc.) to produce a quality cost estimate. In addition, environmental and hazardous waste studies should have been completed by this time, so unforeseen costs should be minimal. Assumptions and costs for the transportation management plan should be updated.

Cost Estimate Changes

Cost increases or decreases from the project initiation cost estimate must be discussed in the draft project report.

Contingencies

Contingencies should be 20 percent at this stage.

ARTICLE 5 Project Report Cost Estimate

Required Level of Detail

Project report cost estimates are prepared as part of the project approval process. This occurs after completion of the public hearing process, selection of the preferred alternative, and completion of the environmental document.

Project report cost estimates are prepared using the same format as used for the project planning cost estimates. However, since the preferred alternative has been selected, the project cost estimate can now be more definitive.

Cost Estimate Changes and Approval

If the project report cost estimate results in a revised project cost estimate, the procedures for establishing and approving the revised project cost estimate must be followed. The project report cost estimate does not become the base for all future current project cost estimates comparisons unless it is used to establish a new programmed cost, either in an update of the programming document or by amendment of the programming document. All percentage increases (or decreases) are applied from the programmed cost. Approved cost changes do not change the programmed cost, but become input to the next programming cycle. See Section 1, Article 2 – Policy for information on updating costs for programmed projects.

Cost increases or decreases from the project initiation cost estimate must be discussed in the project report.

Contingencies

Contingencies should be 15 percent at this stage.

SECTION 3 Project Design Cost Estimates

ARTICLE 1 General

Design Cost Estimates

Project design cost estimates are made after project approval, updated throughout development of the PS&E, and are categorized as either preliminary or final. Project design cost estimates focus on the construction costs of the project and are input into the Basic Engineering Estimating System (BEES).

Project design cost estimates should be considerably more detailed than project planning cost estimates. As engineering and environmental studies progress, more information, such as final contour mapping, materials and drainage information, refined transportation management plans, structure studies, and evaluations from design phase constructability reviews becomes available. This data allows for the preparation of more detailed cost estimates.

Construction Costs Only

Project construction costs are only a portion of the project's capital outlay costs that have been programmed and reported upon during the project planning phase. When current project cost estimates are required during the project design phase, the total project capital outlay costs are implied unless otherwise specified.

Total Capital Outlay Costs

Project total capital outlay costs include the right-of-way costs and the construction costs. Right-of-way funds are typically expended during the design phase to acquire parcels needed to construct the project. For this reason, there must be close coordination with the district right-of-way unit when comparing project cost estimates with the programmed project costs during the design phase. Care must be taken to ensure that all right-of-way funds (either expended or unexpended) are accounted for and are consistent with the programmed cost.

ARTICLE 2 Transitioning from Project Planning to Project Design Cost Estimates

Identify Contract Items of Work

Management approval of the project allows the project to transition from the project planning phase to the project design phase. All of the project features should be known and many contract items of work can be identified. In addition, the items of work identified and estimated during the project planning phase should now be better defined as work performed by the design staff and the other functional units is completed.

The construction contract related portions of the project report cost estimate are put into the BEES format. To do this, specific contract items of work need to be identified and the quantities associated with them need to be calculated. Most of this work should have been done previously to complete the project report cost estimate used to approve the project, but not to the detail required for project design cost estimates.

Project Design Cost Estimate Components

The project design cost estimate consists of the district cost estimate and when applicable, the structure cost estimate. The district cost estimate is compiled by the PE to capture all of the highway contract items of work and the costs associated with construction of those items. The structure cost estimate is compiled by the Headquarters Division of Engineering Services-Structure Design to capture all of the structural contract items of work on the project and the costs associated with their construction.

ARTICLE 3 Basic Engineering Estimating System

General

Project design cost estimates must be prepared using the Basic Engineering Estimating System (BEES); information is available at:

<http://it.onramp.dot.ca.gov/information-about-bees>

Additionally the [*Ready to List and Construction Contract Award Guide \(RTL Guide\)*](#) contains important information about the requirements for preparing the project cost estimate.

The BEES provides the data files required for the Project Information Systems and Analysis (PISA), and the Bid Opening and Progress Pay System, and produces segregated cost estimates according to fund source.

Highway, Bridge, and Combined Cost Estimate Files

The BEES permits independent storage of data from the district and Headquarters Division of Engineering Services-Structure Design for each project and the recall of separate or combined cost estimates. The district and Structure Design are each responsible for independently establishing and updating their own estimate data. The highway cost estimate is established by the district and the bridge cost estimate is established by Structure Design. Reports may be requested as highway (H), bridge (B) or combined (C) by entering the code (H, B, or C) in the appropriate area on the BEES Report Request Form.

Common Highway and Bridge Items

When a combined cost estimate report is requested, the quantities for highway and bridge items are integrated. Estimators in Structure Design and the district should reach prior mutual agreement for prices on common items. Items in common to Structure Design and the district, such as temporary railing, must be reviewed carefully to avoid duplicating quantities or overlooking items in the cost estimate.

Highway Cost Estimate

The district portion of the cost estimate should be entered into the BEES at the beginning of the design phase using the coded contract items list located at:

<http://oe.dot.ca.gov/occs.html>

As contract items of work are identified and quantities calculated, these quantities should be entered into the BEES. Entering the completed quantities into the BEES as soon as they are calculated facilitates cost estimate updates and eases the preparation of the final engineer's cost estimate.

For projects with contributor funding or Federal-aid funding and projects located in multiple counties, segregated cost estimates must be available in the BEES at the time

of PS&E delivery. As soon as the participatory rules for the project are determined, estimators must use segregated cost estimates in the BEES. By doing this, no changes should be necessary to any segregation once the project is listed for advertisement.

The highway cost estimate consists of the following BEES components:

- Contract Items – These are the items of work for the project and are used for the bid item list in the construction contract documents.
- Supplemental Work – Supplemental work is work of an uncertain nature or amount and is not paid for on a contract item basis. Work that is known but cannot be predetermined and provided for under contract items of work should be included as supplemental work. Supplemental work identified in the contract special provisions must be included.
- State-Furnished Materials and Expenses – Items listed under this component consist either of work done by State forces, or others, concurrently with contract construction operations; or materials to be purchased and charged against the project, but which will be paid for directly by the State, not the contractor.
- Contingencies – Contingencies are a percentage of the subtotal of the cost of contract items, supplemental work, and State-furnished materials and expenses, and are included in the grand total of the highway cost estimate to allow for unforeseen increases.

Specific requirements and required approvals for the use of bid items (contract items), supplemental work, department-furnished materials as well as department expenses (state-furnished materials and expenses), and contingencies can be found in the [Ready to List and Construction Contract Award Guide \(RTL Guide\)](#).

Bridge Cost Estimate

The bridge cost estimate should be entered into the BEES by Structure Design, as soon as possible after project approval, using the BEES coded item list. However, many contract items of work for structures are not known in enough detail until late in the design phase. For that reason, the bridge cost estimate may not be available for use until all of the structural design work is complete. Until the bridge cost estimate is available, the cost data used for the project report cost estimate should be used as the bridge cost estimate. It is important to keep in close contact with the Headquarters Division of Engineering Services-Structure Design project functional manager and the structure designer during this time-frame. The PE must determine

whether any unforeseen complications have occurred that will alter the estimated cost of the structures for the project.

When Structure Design completes its portion of the project cost estimate during the design phase, that data is input in the BEES similar to the way that the highway contract items of work are input by the district.

ARTICLE 4 Preliminary Engineer’s Cost Estimate

General

The conversion of the construction related portions of the project report cost estimate into the BEES creates the preliminary engineer’s cost estimate. The preliminary engineer’s cost estimate is an estimate of the fair and reasonable price the State should expect to pay for each of the contract items of work to be performed. The preliminary engineer’s cost estimate should be updated frequently during the design phase as the project construction details, specifications and plans are finalized into a contract document. The preliminary engineer’s cost estimate is based on the expected contract item prices as of the date of the estimate.

Portion of Capital Outlay Cost

The preliminary engineer’s cost estimate must be used in combination with other cost estimates (right-of-way, cooperative features, etc.) during the design phase to obtain the capital outlay costs for the project. The preliminary engineer’s cost estimate is used until the project reaches the end of the PS&E development and the contract documents are finalized. When this happens, the preliminary engineer’s cost estimate becomes the final engineer’s cost estimate.

Contingencies

Preliminary engineer’s cost estimates prepared prior to PS&E submittal may include an amount up to 10 percent of the cost estimate for contingencies.

ARTICLE 5 Final Engineer’s Cost Estimate

General

The final engineer’s cost estimate, also commonly referred to as the Engineer’s Estimate, is completed at the end of the PS&E development. All contract items have been identified, had the quantities calculated, and entered into the BEES.

The final bridge cost estimate is prepared by Structure Design and transmitted to the district. The district combines the final highway cost estimate and the final bridge cost estimate into the final engineer’s cost estimate.

Certification of Final Engineer’s Cost Estimate

For major projects, the District Director will be required to certify that the estimate is complete and accurate, reflects the true scope of work to be performed, and accounts for current market trends. This certification is required before a project can achieve Ready to List. Final engineer’s cost estimates that are more than three months old must be updated and recertified.

Locking Files

After compilation of the PS&E has been completed and the project is Ready to List (for advertising), the final engineer’s cost estimate is “locked” in the BEES by Headquarters Division of Engineering Services-Office Engineer. After it is locked, only Office Engineer can alter the BEES file. If changes to the cost estimate are necessary after it has been locked, contact the project management unit in Office Engineer. Office Engineer will review the request and will make the changes or, if timing is such that it is practical, will arrange for unlocking the BEES to allow the district and/or Structure Design to make the changes.

Comparison with Contractor Bids Received

The final engineer’s cost estimate is used for comparison with the various contractor bids received for the project and is the basis for the award of the contract. It should be noted that the money available to construct the project is the sum total of the dollar amount of the low bidder’s contract bid items plus the dollar amounts of the supplemental work, State-furnished materials and expenses, and contingencies from the final engineer’s cost estimate.

Contingencies

Contingencies are a percentage of the subtotal of the cost of contract items, supplemental work, and State-furnished materials and expenses, and are included in the grand total of the final engineer's cost estimate to allow for unforeseen increases. Contingencies should be 5 percent or less at this stage. The BEES automatically allows for a contingency of 5 percent, but any amount may be entered, either by percent or by specified dollar amount. Justification is required when a contingency other than 5 percent is to be included in the final engineer's cost estimate. Contingency justifications should be supported by a risk analysis. Requests are submitted to the Chief, Headquarters Division of Design, for approval.