

Cost Estimating Requirements for Veterans Affairs Facilities

August 1, 2022



U.S. Department
of Veterans Affairs

A/E Submissions

Table of Contents

	Preface	3
	Introduction and Revision History	4
Chapter 1	 Objectives and Responsibilities	5
Chapter 2	 Requirements	9
Chapter 3	 Deliverables	13
Appendix 1	 Definitions	23

Preface

Our collective goal is to manage the execution of the project within the funding limit approved by Congress. VA has a responsibility to act as a steward of tax dollars. That stewardship is conveyed in turn to the design team. VA expects the entire design team to take ownership of the project construction budget and to be an advocate for successful execution of the project within the available funding. The A/E cost estimator's role is a critical element of project cost management. Rather than limiting responsibilities to simply reporting costs, the estimator must be an integral part of the design team, continually interacting and providing input to design decisions at every stage of development.

Introduction

Department of Veterans Affairs (VA), Office of Construction and Facilities Management (CFM) projects, Cost Estimating rely on the following sound and effective practices, including:

- Ensure due diligence by following industry-accepted practices for cost planning, estimating, and control, as are those published as AACEi Recommended Practices, ASPE Standard Estimating Practice and ASTM Building Economic Standards.
- Conform to the best practices defined in the Government Accountability Office (GAO) Cost Estimating and Assessment Guide.
- Implement effective Quality Assurance / Quality Control Protocols to confirm adherence to the policy and practices.
- Integrate total facility life cycle management, including planning, design, procurement and award, construction and facility operations and maintenance – within the entire VA owned and leased portfolio. This policy establishes key cost management principles and basic processes that must be applied to all VA projects, including capital, non-capital costs and leased facilities.
- Utilization of independent / 3rd party cost estimators as described in Chapter 1, Section 1, Part 3.

The A/E Manual for the Preparation of Cost Estimates is organized into (3) Chapters with accompanying appendices. It is the requirement of the A/E cost estimator to fully comply with the contents of this manual.

Revision History

The following changes have been made since the December 2021 Manual. It is the A/E's responsibility to incorporate all changes made to this Manual in the development of required deliverables.

Revision 1 – August 1, 2022 Release

1. Modified Chapter 1, Section 1, Part 3 – Independent / 3rd Party Estimating

Chapter 1

Objectives and Responsibilities

Section 1: The Process of Project Cost Estimating

1. Overview

The CFM Cost Estimating Manual provides cohesive, seamless policies and procedures that must be followed in providing effective cost estimating throughout the life of all planning, design, construction and construction-related building maintenance / repair projects and programs across all VA Real Property organizations.

Controlling and managing project performance relies on the project planning process: integrating the planning process is essential to managing the relationship between cost, time and scope. Coordinating requirements for cost, time and scope is the path to achieving project success.

CFM applies the GAO best practice guides for Cost Estimating (GAO-20-195G) and Scheduling (GAO-16-89G) to its Cost and Schedule Management policy.

The CFM Cost Estimating Requirements document is a part of the Technical Information Library (TIL). Estimators will adhere to this policy and the requirements set forth within the respective PG guidance documents for A/E submissions.

2. QA/QC Responsibilities

The primary responsibility of cost management is to assure that the projects are successfully delivered within their respective budgets and constraints. To accomplish this, cost management must be integrated with scope, time and quality management. Due diligence to this purpose throughout the project life cycle requires consistent and continual involvement at all design phases.

3. Independent / 3rd Party Estimating

The deliverables within this Cost Manual will be independently prepared by and under the supervision of a professional cost estimator employed or affiliated with the A/E contractor, or by a 3rd party sub-consultant, at the A/E contractor's discretion. The cost estimate shall be certified by a professional cost estimator accredited by the American Society of Cost Estimators (ASPE), the Association for the Advancement of Cost Engineering International (AACEi), or similar organization.

4. Team Composition and Work Plan

The 3rd party cost estimating team is to be comprised of individuals with the requisite skill sets to accomplish the scope of work. Team members will be communicated to the A/E at the beginning of the project, prior to the start of work.

A written study plan, documenting the estimating approach will be provided and incorporated into the A/E project management, communication, schedule and overall work plan. The estimating team will communicate timelines and deliverables to ensure the timing of deliverables (see Chapter 3) is met.

Section 2: CFM Cost Estimating Requirements and GAO Cost Assessment Guide

1. Introduction

GAO Document No. GAO-20-195G, GAO Cost Estimating and Assessment Guide (GAO Guide) identifies four key requirements to be met in preparation of any estimate. They are:

a. Well-documented

The estimate is thoroughly documented, including source data and significance, clearly detailed calculations and results, and explanations for choosing a particular method or reference.

b. Comprehensive

The estimate's level of detail ensures that cost elements are neither omitted nor double counted.

c. Accurate

The estimate is unbiased, neither overly conservative nor overly optimistic, and based on an assessment of most likely costs.

d. Credible

Discusses any limitations of the analysis from uncertainty or biases surrounding data or assumptions.

This policy will ensure that all cost estimate submittal packages prepared for the VA meet the four key requirements as identified by the GAO.

2. GAO-Defined Best Practices

In addition to the four key characteristics expected to be met in order to generate a quality estimate, the GAO Guide defines twelve best practices intended to be followed in meeting the four primary characteristics of a quality estimate. The Cost Management Policy will ensure that all cost estimate submittal packages prepared for the VA implement the twelve GAO best practices appropriate for any project in planning and execution.

Table 1-1 reflects the twelve best practices and the associated alignment with the four characteristics associated with a quality estimate. These best practices are integrated with Cost Management Policy and overall project execution, and the scalability of the best practices.

Table 1-1 GAO Twelve Best Practices and Four Characteristics of a Quality Cost Estimate

GAO Twelve Best Practices	Four Characteristics of a Reliable Estimate			
	<i>Well Documented</i>	<i>Comprehensive</i>	<i>Accurate</i>	<i>Credible</i>
1. Define the estimate’s purpose	•			
2. Develop the estimating plan		•		
3. Define the program	•			
4. Determine the estimating approach	•			
5. Identify ground rules	•			
6. Obtain the data	•			
7. Develop the point of estimate and compare it to an independent cost estimate			•	•
8. Conduct sensitivity analysis			•	
9. Conduct risk and uncertainty analysis			•	
10. Document the estimate	•			
11. Present the estimate to management	•			
12. Update the estimate to reflect actual costs and changes		•		

3. GAO Best Practices and Iterative Estimating Process

In all cases, cost estimation is a continuous process that is repeated over the life of a project. Within the progression of the project development and delivery, cost estimating must be considered as an iterative process with steps that may be accomplished in varying order or concurrently. Four primary steps defined in the iterative process are:

a. Initiation and Research

Initiation and Research begins a project. It is critical to clearly identify the estimate audience and what is being estimated. The project goals, key deliverables and milestones will identify purpose of the estimates that will be prepared.

b. Project Progression

Cost estimates must be brought up-to-date and refined as the project progresses through milestones or phases as more and better data becomes available, and the underlying assumptions change.

c. Cost Analysis

Cost estimating involves collecting and analyzing data and applying quantitative methods to determine future costs. It is crucial that decision-makers have accurate, comprehensive, credible and current estimates.

d. Presentation

It is critical to present the estimate in a form that can be understood by all stakeholders. Presentation of the estimate is critical to making a cost estimating decision. The A/E estimator is responsible for presenting the cost estimate to VA stakeholders and obtaining approval at each deliverable stage.

Continuous updating and refinement of the cost estimate throughout life cycles, processes, or at regular intervals ensures that information used by VA decision-makers satisfies all four of the key requirements for quality cost estimates.

Chapter 2

Requirements

Section 1: Introduction

Chapter 2 introduces the basic components of the of the CFM cost estimating requirements. This includes the practice of Project Screening as a means for scaling projects appropriate for the application of CFM requirements and the twelve GAO Cost Estimating Best Practices. Requirements for projects of the smallest magnitude will be limited to the basic estimating practices, while larger, more complex and higher magnitude projects have enough uncertainty and risk as to warrant application of all 12 best practices.

Section 2: Project Specific Requirements

Requirements will be scaled by project type and magnitude, based on the guidelines below. If the requirements conflict with the A/E Submission Requirements PG-18-15 and the A/E Contract, the more stringent requirement is applied.

Table 2-1 Project Requirements and Deliverable Matrix

Project Value	Typical Project / Program Type	1: Define the estimate's purpose	2: Develop estimating plan	3: Determine program characteristics	4: Determine estimating structure	5: Identify Ground Rules and Assumptions	6: Obtain data	7: Develop Point Estimate and Compare	8: Conduct sensitivity analysis	9: Conduct a Risk and Uncertainty Analysis	10: Document the Estimate	11: Present Estimate for Approval	12: Update the Cost Estimate	13: Conduct Market Studies	14: Conduct Project Labor Agreement Study	15: Conduct Life Cycle Cost Analysis
< \$5M	Minor Construction Program and NRM	R	R	R	R	R	R	R	R	R	R	R	R	N	N	N
>= \$5M < \$20M	Minor Construction Program and NRM	R	R	R	R	R	R	R	R	R	R	R	R	R	N	P*
>= \$20M < \$100M	Major Capital Projects	R	R	R	R	R	R	R	R	R	R	R	R	R	P*	P*
>= \$100M	Major Capital Projects with NDFE	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
Various	Special Projects*	R	R	R	R	R	R	R	R	R	R	R	R	P	P	P

Section 3: Estimate Organization – Work Breakdown Structure (WBS)

Effective Project Management relies on a common language for the project across all participants of the project delivery process. The project Work Breakdown Structure (WBS) is the fundamental language used for the three cornerstone elements of effective project control: Scope Management, Cost Management and Schedule Management.

1. A hierarchical WBS serves several critical functions:
 - a. It defines the work that is needed ensuring that no portions of the project are omitted or duplicated. The definition should clearly delineate the boundaries of the elements.

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- b. It provides for easy sharing of common information among various practices required to deliver the project.
 - c. Providing consistent data for comparative purposes.
 2. The WBS has consistent organizing principles, but the actual structure is typically unique for each project. This allows flexibility to define the actual project within the constraints of the broad definitions of CFM project elements. The WBS is consistent throughout the project life cycle, modified only as project scope is adjusted. It is used by all parties during planning, design and project delivery. The WBS should remain fixed unless the project is changed to add or deduct project elements.
 3. Situations that influence a Work Breakdown Structure (WBS) include:
 - a. The need for separate contracts for buildings and their site work, such as at campus development(s).
 - b. Phased renovation projects requiring swing space for a variety of departments.
 - c. Multi-year project funding.
 - d. Separation of a project into base-contract work and options or alternates.
 4. Cost Estimates prepared for planning and early design will be required in a systems-based WBS (Uniformat II), while the later design and construction requires a product-based WBS (or Masterformat). Refer to Chapter 3 Deliverables.
 5. The cost estimate WBS will be aligned with the CPM schedule and earned value management system, as required, within the PG 18-15 and/or A/E SOW. When a cost and resource loaded schedule is required, the A/E cost estimator will coordinate with the A/E to facilitate the population of costs and resources.

Section 4: Quality Control, Quality Assurance, and Project Closeout

1. Quality control (QC) and quality assurance (QA) practices assure proper due diligence throughout the project life cycle. The QC/QA efforts involve all levels of CFM.
 - a. The project team is responsible for completion of the cost management deliverables for projects, as required by this manual and the contract. Each party producing a deliverable is responsible for quality control in the preparation of their deliverable.
 - b. The A/E cost estimator is responsible for quality control to ensure that the deliverables are completed in accordance with this manual and other governing documents.

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2. Quality assurance is the responsibility of the A/E cost estimator. The activities include, but are not limited to, 1) oversight of quality control activities to assure that policies are being adequately implemented and followed; 2) independent evaluation of high risk / high magnitude projects to mitigate the risk and undesirable project outcomes; 3) analysis of high cost and high-volume line items in the estimate, performing cross checks and verification of costs, scope and quantities.
 3. At the completion of the A/E estimator's scope of work, and at the completion of the project, lessons learned and bid variances will be documented and analyzed for use on future projects. It is the expectation of the VA that the cost estimator will participate in a project postmortem and assist in documenting the performance of the cost estimate.

Section 5: Project Delivery Methods

1. The VA utilizes several project delivery methods including design-bid-build and design-build. Please refer to the A/E SOW and the respective PG 18-15 to determine what phases the project delivery method includes.
 - a. Design-Bid-Build (DBB) – This is the traditional delivery method that involves the architect of record (AOR) completing a design package that is issued for construction. A general contractor bids on the completed set of construction documents.
 - i. Typical planning and design phases include project book, concept, schematics, design development, and construction documents.
 1. Estimates Master planning may be included on programs such as National Cemeteries or Medical Center Master Plans
 - b. Design Build (DB) – A delivery method that involves early planning and design efforts and/or bridging design prior to the hiring of a design build team. The design build team completes the design and construction as a single unified project team.
 - i. Typical phases for single step DB, where no bridging documents are produced include project book and possibly concept design.
 - ii. Typical phases for DB with bridging include project book and schematic design.

Chapter 3

Deliverables

Section 1: Introduction

CFM expects the entire design team to take ownership of the project construction budget and to be an advocate for successful execution of the project within the available funding. The A/E cost estimator's role must be viewed as a critical element of project cost management. Rather than limiting responsibilities to simply reporting costs, the estimator must be an integral part of the design team, continually interacting and providing input to design decisions at every stage of development.

Section 2: Overview

1. An estimate must be prepared for any capital or non-capital expenditure. Every Government estimate shall be prepared as though the Government were competing for the award (Federal Acquisition Regulation (FAR 36.203). Therefore, all estimates, regardless of the project/program phase must reflect costs that a prudent and experienced contractor or entity would incur.
2. This estimating manual establishes format, structure, frequency and required supporting analyses for the cost management submittals. The purpose is to establish a cost management system that tracks budgets based on the established project funding budget, in a Uniformat Level II, comparing cost growth and cost modifications for all Uniformat Level II elements through design, procurement, construction and project completion.
3. Estimate structure is required to be Uniformat for all early-phase submissions (Project Book, Concepts, Schematics) and Masterformat for latter submissions (Design Development through Construction Documents and Construction Phase Change Order Estimates). Summary level Uniformat reports are required at all design phases.
4. CFM requires a narrative of known facts, construction tasks, and supplemental judgments that form the basis of the estimate at each cost estimate deliverable. This documents that a realistic approach was used to calculate the estimate. It also serves to document the cost development history of project.
5. The cost of construction shall be calculated including all applicable markups, including escalation. Escalation will be calculated utilizing:
 - a. Date upon which the estimate is prepared, and
 - b. Date representing the midpoint of construction

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- c. The base estimate shall reflect current costs on the date the estimate is received. Escalation to mid-point of construction shall be identified as a separate line item
 - d. Escalation and markup recommendations to be generated during the Market Study requirement. See Chapter 3, Section 3, Part 6.
 - e. The A/E estimator's deliverables are a critical resource to obtain design approval by VA Project Managers and Contracting Officers at each design phase to confirm the design-to-budget and obtain technical clearances to proceed to the next phase of design and/or enable the solicitation of the construction contract.

Section 3: Elemental Content of Estimate and Deliverables

The following describes the elements associated with a cost estimate submission:

1. Executive Summary

Includes the overall description of the project including key characteristics. Serves as a recapitulation sheet of the total project, listing each new building, each renovated building and site work. The summary will include names, roles and responsibilities of the A/E estimators involved in the creation of the estimate and quality control.

- a. **Deliverable Requirement** – Narrative for each deliverable per A/E Submission Requirements, All Projects

2. Basis of Estimate, Rationale and Assumptions

Basis of Estimate defines the rules, methodology, logic, data, and calculations used to prepare the estimate, including the following:

- a. Supporting facts and necessary assumptions made for each of stage of analysis in the estimate
- b. Base project parameters
- c. Ground rules and assumptions
- d. Clarifications
- e. Identification of major changes from previously prepared project estimates
- f. Exclusions
- g. Rationale for rates used for escalation, schedule durations, phasing, overhead, profit, and any other factors applied
- h. Program acquisition schedule and strategy (project delivery method)
- i. **Deliverable Requirement** – Narrative for each deliverable per A/E Submission Requirements, All Projects

3. Building Gross Area Computations

- a. Building Gross Area Computations - New Construction Projects
 - Building Gross Areas are to be extracted from the Building Information Model (BIM) as available. Confirm that measurements used in the estimate agree with measurements reported by the rest of the design team in their drawings, narratives, calculations, or other documentation. Flag and explain any differences as part of the Project Tracking / Cost Variance Report
- b. For smaller, renovation projects, either Building Gross Area or Affected Area are to be tracked
- c. **Deliverable Requirement** – Each deliverable per A/E Submission Requirements, All Projects

4. Project Tracking/Cost Variance Report/Bid Analysis

Track costs in tabular form, at the Summary Level (Uniformat II Level 2 and/or CSI Divisions), progressively through design. Tracks cost and program area growth for the project from the Cost Model prepared as the target estimate throughout the progressive design submissions. The Project Tracking Report a) displays the scope/cost growth to take actions and ensure effective project delivery and b) program differences as measured in the Area Computations. During the bidding phase, a comparison report analyzing the A/E estimate and the bid proposal will be provided and broken down into the requisite estimating format.

- a. **Deliverable Requirement** – Each deliverable per A/E Submission Requirements, All Projects

5. Summary Reports

Uniformat II Level 1 and 2 reports and/or CSI reports (as applicable, see 3.7.g), progressively more detailed as the design develops.

- a. **Deliverable Requirement** – Each deliverable per A/E Submission Requirements, All Projects
- b. Lease projects will require a completed GSA summary TICS table.

6. Market Study

Market Study serves as a basis for the many elements of uncertainty which are driven by the economy. A sample of such uncertainties include, but are not limited to market escalation, competition among contractors, contractor's margins, wage rates, and resource availability. Market Study procedure includes the following:

- a. Conduct a complete and detailed "Local Market Survey", exploring all factors that will affect the bid cost. Pertinent data shall be gathered by interviewing local firms having knowledge of the construction activity in the area and the skills / capacity to complete the respective project. Possible sources include but are not limited to: general and subcontractors, builder's associations, local government officials, architectural and engineering firms, builders' exchange and construction-reporting firms, and lenders.

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- b. The survey report shall discuss recent and expected future bidding conditions that may influence the cost of VA construction. Address the general construction market, and project specific market, i.e., healthcare construction of similar size and dollar value. Emphasis should be placed on ascertaining the availability of mechanical and electrical sub-contractors. Evaluate and report anticipated cost trends with a narrative and/or accompanying tabular forms / graphical illustrations.
 - c. List sources of data. Note, while internet research is a valuable tool, copying entire web pages verbatim is not professional research. Obtain the data, analyze it, and describe its application and relevancy to the project.
 - d. Discuss labor supply, strike possibilities, availability of skilled labor covering all major sub trades. Provide the labor cost differential between closed shop, union and open shop competition.
 - e. Discuss material availability: shortages, oversupplies, or normal market conditions.
 - f. Ascertain the “Hunger Factor” among general and sub-contractors, the anticipated number of bidders (both general and sub-contractors), and their respective experience on similar projects.
 - g. Ascertain level of interest among general and sub-contractors in working with the local VA, and the VA in general, as opposed to other owners.
 - h. Provide a table listing projects in the market area currently in the planning, design, bid, and construction phase. List, at a minimum, project name, owner, current status, estimated bid timeframe, estimated construction contract value. If available, list type of contract vehicle. For projects already awarded, list award date and amount.
 - i. Provide an estimate of probable cost escalation through the duration of the project. Basis for escalation is to be provided, and cited, through market research and multiple reputable industry sources of cost escalation and indices.
 - j. For each subsequent submission of the market survey, updated information shall be shown as addenda to the preceding version, so that the original verbiage remains, and new developments are easily tracked.
 - k. For all projects with a total estimated cost of \$25M or more, provide an analysis of the potential cost and schedule impact of Project Labor Agreements (PLA). The market analysis shall provide information on local labor market conditions, feedback from local PLA research, PLA bidding effect, local market stability, local strike information, PLA cost impact analysis, and any other useful market information regarding PLAs to assist VA in determining whether the use or nonuse of a PLA is in the best interest of the government. In the report, the A/E shall provide a conclusion and recommendations to the VA regarding the use or nonuse of a PLA for the project.
 - l. Upon completion of the market study, the A/E estimator will store the collected market information for future estimates as a best practice.

m. **Deliverable Requirement**

- Contingent upon the magnitude of the project, refer to the A/E Submission Requirements, A/E Scope of Work, and Table 2-1.
- Market studies may be required for Project Books, refer to the A/E Submission Requirements, A/E Scope of Work, and Table 2-1.
- All projects that require a market study are to complete the market study during schematic design and provide a final update during the CD phase.
- Project Labor Agreement to be conducted on all projects with an ECCA of \$25M or greater per FAR Part 22.502.

7. **Detailed Estimate Report**

Detail Report displays the detailed content of the estimate tree. The level of detail for this estimate shall be consistent with the degree of completeness of the drawings being submitted. Simply stated, this means that if a construction element is shown, it must be priced; if it is shown in detail, it must be priced in detail. *(References may be made to the industry standards a) AACEi Recommended Practice RP 17r-97, Cost Estimate Classification System, or b) ASTM Standard E2516, Standard Classification for Cost Estimate Classification System for further definition).*

- a. For detailed elements, “lump sum” or “allowance” figures will not be acceptable.
- b. Project estimates will include all elements within the contractor’s bid such as insurance, bonds, hazardous abatement and any other such items.
- c. At each progress submission, confirm that all previous comments by the peer reviewer and any other reviewers have been addressed.
- d. All estimate tree structure beyond Concept and Schematic design (Design Development, Construction Documents, and Construction Phase) are required to be organized with and reported with the unit costs for Material, Labor and Equipment.
 - a. Concept and Schematic Phase Estimates, as well as Planning Phase estimates can be structured with single unit costs per line item (Material, Labor, Equipment summed together).
- e. **Deliverable Requirement** – Each deliverable per A/E Submission Requirements, minimum format and detail requirements are indicated below:
 - Project Book/Concept – Unifomat II Level 2
 - Schematic – Unifomat II Level 3
 - Design Development – Unifomat II Level 4 and CSI 2020 Masterformat
 - Construction Documents / Bid – Unifomat II Level 4 and CSI 2020 Masterformat
 - Lease estimates will be provided in the GSA TICS format utilizing the GSA Pricing Desk Guidelines

8. Markup Structure

- a. Net direct construction costs, or trade level costs, will be marked up in accordance with the following guidelines and requirements to develop the ECCA. The ECCA represents the construction award contract value.
 - Design Contingency – The allowance to complete design, considered a part of the construction value of the project. The percentages are to be determined by the estimator’s professional judgement and coordinated with the VA prior to release of each cost estimate.
 - Probable Contingency Level Ranges
 - Project Book – 20% – 25%
 - Concept Design – 15% – 20%
 - Schematic Design – 10% – 15%
 - Design Development – 7.5% – 10%
 - Construction Documents – 2.5% – 5%
 - Bidding Documents / Final Estimate – 0%
 - Construction Phasing
 - Costs include any additional level of effort not defined within the net direct construction costs to accommodate phasing, swing space, etc.
 - Escalation
 - Escalation to the defined mid-point of construction is to be provided. The escalation rate, as a percentage, will be determined as a part of research during the market study and/or by utilizing industry accepted escalation recommendations.
 - General Conditions and Requirements
 - Project Book through Schematic
 - A percentage markup is allowable as justified by the project type, duration, and complexity of the work.
 - Estimator to provide detail on how the percentage was calculated.
 - Design Development through Bidding Documents / Final Estimate
 - Detailed, line-item breakdown of all general conditions and requirements are to be provided. Items to include all project and construction site management personnel, job-site equipment, and consumables, sundries, temporary provisions, computers, etc.
 - Contractor Overhead and Profit
 - These costs include home office costs and profit / risk commensurate with the requirements of the project.
 - The cost will be calculated as a percentage-based subtotal, including net direct costs, general conditions and general requirements.

- Insurance and Bonds
 - These costs include all applicable professional liability, builder’s risk (as applicable), payment and performance bonds, and other requirements of the project.
 - Market and Bidding Conditions
 - A premium associated to market and bidding conditions, economies of scale, limited subcontractor and prime contractor participation, as validated by the market study.
- b. The standard markup structure below should be applied to provide consistency and clarity.

EXAMPLE NET DIRECT COST BREAKDOWN	NEW CONST	RENOVATION	COST/SF	COST EXTENDED
A. SUBSTRUCTURE	\$ -	\$ -	\$0.00 / \$0.00	\$ -
A10 FOUNDATIONS	\$ -	\$ -	\$0.00 / \$0.00	\$ -
A1010 STANDARD FOUNDATIONS	\$ -	\$ -	\$0.00 / \$0.00	\$ -
A1020 SPECIAL FOUNDATIONS	\$ -	\$ -	\$0.00 / \$0.00	\$ -
A1030 SLAB ON GRADE	\$ -	\$ -	\$0.00 / \$0.00	\$ -
A20 BASEMENT CONSTRUCTION	\$ -	\$ -	\$0.00 / \$0.00	\$ -

A SUBTOTAL - NET DIRECT CONSTRUCTION	\$ -	\$ -	\$0.00 / \$0.00	\$ -
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	INDIRECT COST BREAKDOWN	CALCULATION	UOM	VALUE	COST EXTENDED
B	001 - DESIGN CONTINGENCY	A	PERCENTAGE	%	\$ -
C	002 - ESCALATION	A+B	PERCENTAGE	%	\$ -
D	003 - GENERAL CONDITIONS AND REQUIREMENTS	A+B+C	PERCENTAGE OR DETAILED	%	\$ -
E	004 - OVERHEAD AND PROFIT	A+B+C+D	PERCENTAGE	%	\$ -
F	005 - DESIGN BUILD FEE (IF APPLICABLE)	A+B	PERCENTAGE	%	\$ -
I	TOTAL - ECCA	A+B+C+D+E+F	VARIABLE	N/A	\$ -

9. Risk Analysis

The risk analysis shall examine all internal, external, organizational, project management, technical, and schedule risks that could affect the estimate. The effects of the risk shall be quantified and the results utilized to objectively determine the project contingency.

Conduct a risk and uncertainty analysis that includes the following steps:

- a. Model probability distributions based on data availability, reliability, and variability.
- b. Account for correlation between cost elements.
- c. Use a Monte Carlo simulation model (or other modeling technique) to develop a distribution of total possible costs and an S-curve showing alternative cost estimate probabilities.
- d. Identify the cumulative probability associated with the point estimate.
- e. Identify contingency for achieving the desired confidence level.
- f. Allocate the risk-adjusted cost estimate to WBS elements, if necessary.
- g. Phase and convert the risk-adjusted estimate into budget year dollars.

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- h. Perform a risk and uncertainty analysis periodically as the cost estimate is updated to reflect progress and changes to risks.
 - i. **Deliverable Requirement** – Each deliverable per A/E Submission Requirements

10. Sensitivity Analysis

Provide a sensitivity analysis of the estimate as defined by the GAO Manual Step 8:

Sensitivity analysis examines how changes to key assumptions and inputs affect the estimate and can help mitigate uncertainty. Best practice cost models incorporate sensitivity analysis without altering the model so that the effect of varying inputs can be quickly determined (more information is in GAO Chapters 11 and 12). For example, a decision-maker may challenge the assumption that 5 percent of the installed equipment will be needed for spares and asks that the factor be raised to 10 percent. A sensitivity analysis would show the cost impact of this change. The cost estimator should always perform a sensitivity analysis that portrays the effects on the cost and schedule of an invalid assumption. Such analysis often provides management with an invaluable perspective for decision making.

The A/E estimator is to identify assumptions and parameters, including key cost drivers, as factors for sensitivity testing, test the sensitivity of cost elements to changes in identified factors, document the results, including those factors that are most sensitive to change.

- a. **Deliverable Requirement** – Each deliverable per A/E Submission Requirements

Section 4: Building Information Modeling (BIM)

1. Computerized design and documentation tools are evolving rapidly. VA requires the use of BIM for all new major projects and intends to utilize adoption of as many efficiency measures as possible for design, construction, and facilities management. The VA BIM standard is located here:
<https://www.cfm.va.gov/til/projReq.asp>
2. The cost consultant is encouraged to take full advantage of the modeling and documentation tools used by the design and construction teams to derive data from the model(s) that will enable accurate quantity take-offs, assist in analyzing construction sequencing, and provide other efficiency (LEAN) advantages. The A/E estimator is responsible for BIM quantities used and should not solely rely on the BIM model as a justification for quantities.

Section 5: Timing of Deliverables

1. Responsible decisions cannot be made without knowing the associated cost. Cost documentation must be delivered in conjunction with the design submissions. Responses to comments must be provided within the timelines established within the PG 18-15.
2. The A/E team, in conjunction with the A/E estimator, is responsible for managing workflow and communications to ensure that this can be accomplished. It is understood that some details may change in the final days preceding a submission. The cost estimator is responsible for meeting deliverable dates as prescribed by the VA.
3. Cost data shall be submitted on the most up to date design information possible, with a narrative of any late developments that will impact cost.

Section 6: Deliverable Format

All deliverables will be produced in a consistent manner by adhering to the following. Each estimate submission must contain a deliverable in PDF format in conjunction with the editable native file (Word, Excel, etc.).

1. Font Size – use standard font sizes between 9 and 12.
2. Font Type – utilize standard font types such as Times New Roman, Arial, Calibri, etc.
3. Organization – deliverable content should be ordered by descending levels of information (example estimate deliverable: cover sheet, introductory notes, basis of estimate, variance report, project data sheets, summary sheets, detail sheets, backup documents, quotes).
4. Information – all pages should include project name, location, building / area identification, date, design phase, document type, page number, name of estimating firm.
5. Compliance with PG 18-15 – the minimum A/E Submission Requirements specific to each project should be met with each deliverable. The requirements of this cost manual apply to all projects and cannot be modified unless written direction is provided by VA.
6. For projects with multi-building and / or multi-phase, provide a separate estimate, summary sheet and supporting worksheets for each building and phase. Provide separate estimates for new construction, alteration work, site work, and off-site work.
7. A bid analysis sheet, comparing the A/E estimate vs. the bid will be provided. The sheet will breakdown the cost in the required format to determine discrepancies.

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Appendix 1

Definitions

A/E Submissions and Review:

Located within the VA Technical Information Library, A/E Submission Requirements are organized by type of project and include specific guidance and requirements for the A/E and consultants, including A/E Cost Estimator. <https://www.cfm.va.gov/til/aeDesSubReq.asp>

Construction Contingency:

Owner's reserve to cover unanticipated costs during construction. This contingency is not part of the current cost, or Estimated Contract Cost at Award (ECCA), but it is part of the Total Estimated Cost (TEC).

Cost Model:

A plan, broken down by Work Breakdown Structure (WBS) Level 2 group elements, to be used as a guide for designing within the construction budget.

Cost Target:

VAs funding limit for the construction contract, or multiple contracts if project is phased. Represents the limiting dollar amount for ECCA.

Current Cost:

The amount VA would pay if today was bid day. The anticipated bid price received from a responsible contractor in a normal competitive market, as of the current date. Represents all costs the contractor would be expected to incur, including any allowance for construction period cost escalation that a contractor would include in the bid amount.

Design Contingency:

An allowance in the estimate for work that is not fully defined at the time the estimate is prepared. Amount of contingency is based on level of design completion, and level of confidence. Allowances should not exceed values denoted in Chapter 3, Section 3, Part 8 unless project risk analysis has justified a higher value, at schematic design and shall diminish as design progresses. Construction

documents submission shall not include a design contingency. Design contingency is part of the current cost and ECCA.

Escalation to Mid-Point of Construction Date:

Inflationary cost growth during the construction contract period. Also referred to as construction period cost escalation. In a project of long duration, cost of items purchased or contracted for in the later stages of the project may increase. A responsible contractor will include enough money in his bid to cover such increases. Escalation to midpoint is part of the current cost and ECCA.

Escalation to Bid Date:

Inflationary cost growth from the time the estimate is prepared, to the date contractors submit proposals. Escalation to bid date is not part of the current cost, but it is part of the ECCA and ETPC. This provides a means of showing the cost impact of schedule changes.

Estimated Contract Cost at Award (ECCA):

The amount the VA will pay to the contractor.

Total Estimated Cost (TEC):

Total cost to VA to accomplish the project. ECCA, plus all design costs, construction management, construction contingencies, land costs, and other owner costs that are in addition to the contractor's bid. The TEC value represents the appropriation required to complete the project and is tracked for each project / phase by CFM and Congress.

Market Survey:

Research and documentation of local market conditions that will affect the bid cost. The market survey serves many purposes:

- a. Provides information on factors affecting material, labor, and equipment costs.
- b. Provides information on potential general and sub-contractors, their capacity to perform the work, and probable interest in competing for the project.
- c. Provides information on other project activity that may be competing with the VA project for construction resources. Aids in acquisition planning to determine an advantageous schedule.
- d. Provides VA with information to aid in decision making as to the type of construction contract vehicle that would be most advantageous.

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- e. Assists in determining an appropriate rate of cost escalation for the local market. Provides VA with authoritative data to support allowances for escalation and market conditions.
 - f. Serves as a means of informing the local construction community of the upcoming project to generate interest among potential bidders. In other words, markets the project to contractors.

VA Cost Estimating Website:

A resource for estimating references. <http://www.cfm.va.gov/cost/>

Work Breakdown Structure (WBS):

An organization of building elements by system. VA has adopted the Tri-Service Modified Uniformat II structure WBS. Level 1, Major Group Elements; Level 2, Group Elements; Level 3, Individual Elements; and Level 4, Assemblies. A copy of the WBS definitions can be downloaded from the VA Cost Estimating website.