



Construction & Facilities Management
CFM

Cost Estimating Service

Manual for Preparation of Cost Estimates & Related Documents for VA Facilities

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Department of Veterans Affairs

MANUAL FOR PREPARATION OF COST ESTIMATES & RELATED DOCUMENTS FOR VA FACILITIES

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1. PHILOSOPHY

Cost management is the task - the cost estimate is a tool

Our goal is to manage the execution of the project within the funding limit approved by Congress. VA has a responsibility to act as a responsible 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 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.

2. DEFINITIONS

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:

> VA"s 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. Allowance should not be greater than 10% 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 midpoint of construction:

> 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 VA will pay to the contractor. Current cost, plus escalation to bid date.

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.

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 making a decision as to the type of construction contract vehicle that would be most advantageous.

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/

VA Hospital Building System (VAHBS):

An approach to the design and construction of large, multi-story hospital buildings based on the principal of integrating systems and service zones with a prototype design. The primary objectives of systems integration are cost control, improved building performance, schedule reduction and the ability to modify the building as changes to building uses occur over time. A full description of the VAHBS is found in VA Office of Construction Research Study Report, Project No. 99-R047 (U.S. Government Printing Office Stock No. 051-000-00 112-5), otherwise known as the Red Book.

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.

3. DELIVERABLES

Each submission shall include the following:

1. Cost model
2. Estimate
3. Market survey

4. Project data sheet(s)
5. Building gross area computations

3.1 COST MODEL

Prepare a WBS Level 2 breakdown of the **construction budget** ECCA. Cost allocation percentage for each element shall be based on past experience with projects of similar scope. Expand the elemental breakdown if necessary to capture components of the project that do not fall within the WBS if necessary.

At each submission, prepare a breakdown of the estimated cost in the same format, and a comparison of the actual design to the model. Model shall be adjusted to reflect design decisions as design progresses, however, it shall not exceed the construction budget ECCA.

For projects with multiple buildings or phases, prepare a model for each building or phase.

3.2 ESTIMATE

3.2.1 A project estimate shall reflect the anticipated bid price of a responsible contractor in a normal competitive market. All costs the contractor would be expected to incur must be included and identified in the estimate, including any allowance for construction period cost escalation that a contractor would build in to the bid amount. The construction cost estimate shall represent the “fair and reasonable” cost to the Government.

3.2.2 Estimating system shall be at the preparer’s discretion. Format shall generally follow the examples included in the appendices. Content, clarity, and consistency are most important. Use a consistent format with each submission to facilitate comparison of one version to another.

3.2.3 Show the current cost of construction as of the date of the estimate. The base estimate shall reflect current costs on the date the estimate is received. Escalation to bid date shall be identified as a separate line item.

3.2.4 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. For detailed elements, "lump sum" or "allowance" figures will not be acceptable. Project estimates will include all elements within the contractor’s bid such as insurance, bonds, hazardous abatement and any other such items.

3.2.5 Provide a separate estimate, summary sheet and supporting worksheets for each building and phase.

3.2.6 Provide separate estimates for new construction, alteration work and site work.

3.2.7 A recapitulation sheet of the total project, listing each new building, each renovated building and site work, shall precede the summary sheets. Organize by bid packages if applicable. Recapitulation sheet shall show actual award amount of any phases previously bid, to provide an accurate running total at the time of submission.

3.2.8 Format shall generally follow the example shown in Attachment B, VA forms HO-18-B, Estimate Worksheet; and Attachment C, HO-18-C, Cost Summary Sheet.

3.2.9 Provide a brief narrative including:

a. Basis of estimate. Status and date of design documents used to perform quantity take-offs.

b. Ground rules and assumptions

c. Clarifications

d. Exclusions

e. Rationale for rates used for escalation, overhead, profit, and any other factors applied.

3.2.10 At each progress submission, confirm that all previous comments by the peer reviewer and any other reviewers have been addressed.

3.2.11 Provide a sensitivity analysis of the estimate. Identify the key cost drivers and their effects on the estimate if they were to vary from assumed values.

3.2.12 Provide a 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.

3.3 MARKET SURVEY

3.3.1 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. 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.

3.3.2 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. Particular emphasis should be placed on ascertaining the availability of mechanical and electrical sub-contractors. Discuss anticipated cost trends.

3.3.3 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 tell us what it means to VA.

3.3.4 Discuss labor supply, strike possibilities, availability of skilled labor covering all major sub trades. Provide the labor cost differential between closed shop and open shop competition.

3.3.5 Discuss material availability: shortages, oversupplies or normal market conditions.

3.3.6 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.

3.3.7 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.

3.3.8 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.

3.3.9 Provide an estimate of probable cost escalation through the duration of the project.

3.3.10 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.

3.3.11 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.

3.4 PROJECT DATA SHEETS

3.4.1 Provide completed Project Data Sheet 1 & 2 in each submission as shown in Attachment A.

3.5 BUILDING AREA GROSS COMPUTATIONS

Extract areas from the Building Information Model (BIM). 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.

3.6 TIMING OF SUBMISSIONS

Responsible decisions cannot be made without knowing the associated cost. Cost documentation must be delivered at the same time as other design submissions. The design team 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. Cost data shall be submitted on the most up to date design information possible, with a narrative of any late developments that will affect cost.

4. PEER REVIEWS

4.1 Peer review of all projects shall include review of deliverables required by this manual.

4.2 Review for accuracy of quantities, and reasonableness of unit costs. Confirm that level of detail is appropriate for the design submission stage. Peer reviewers are not expected to perform an independent quantity take-off; however, they should question quantities and unit costs that appear out of range

4.3 Confirm that costs reflect the true, current, market driven material, labor, & equipment prices for the project location. Review all rates and multipliers, including design contingency, general conditions, overhead, profit, escalation, bonds, insurance, and any other factors listed in the estimate. Submit comments, either concurring with or questioning mark-up rates and general conditions.

4.4 Confirm that costs for each building, phase, construction, and renovations are broken out and summarized, and that a recapitulation sheet is provided for the entire project.

4.5 Confirm that cost impacts of VAHBS are appropriately addressed, including impact on project duration.

4.6 Confirm that a cost model for each building has been provided, and that relative costs for each element are realistic. Identify any exceptions.

4.7 Review proposed phasing & schedule. Identify potential problems and opportunities for improvement.

4.8 Comment on constructability issues that will impact cost and schedule.

4.9 Comments on the quality of AE‟s market survey are required as part of peer review. Confirm that it is understandable, and presents a realistic view of the current market.

4.10 When entering comments pertaining to cost estimates in DrChecks, always select “Estimating” for field “a. Comment Discipline”.

5. VA HOSPITAL BUILDING SYSTEM (VAHBS)

5.1 POLICY

Hospitals Incorporating VA Hospital Building System – Current VA policy is to design new hospital buildings for continuing adaptability and the integration of the various systems,

subsystems and functional zones throughout the facility. In accordance with these principals, the VA has published the VAHBS Research Study Report (Red Book) and Supplement. To download a copy, visit the following web site and select the link for VA Hospital Building System Development Study: https://www.cfm.va.gov/TIL/spclRqmts.asp.

5.2 ESTIMATING FOR VAHBS

A thorough understanding of the VAHBS, its impact on scheduling of construction operations and facilitating ease of systems installation, is required to accurately estimate the cost. Modularization, prefabrication opportunities, and scheduling efficiencies must be considered, above and beyond merely quantifying materials. This information should be submitted to VA for review.

6. BUILDING INFORMATION MODELING (BIM)

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. 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.

ATTACHMENT A, PROJECT DATA SHEETS

PROJECT DATA SHEET No. 1, page 1 of 2 DATE: _____

LOCATION: _____ PROJECT NO: _____

TITLE: _____

DESIGNER:

_____

SUBMISSION NO: _____ BUILDING NO.: _____

AREA CALCULATIONS

BASEMENT: _____ GSF (m^2)

SUB-BSMT: _____ GSF (m^2)

PENTHOUSE: _____ GSF (m^2)

FLOORS (TOTAL): _____ GSF (m^2)

AREA OF BLDG: _____ GSF (m^2)

(SUM OF ABOVE)

INTERSTITIAL SPACE (VAHBS):

_____ GSF (m^2)

HEIGHT OF INTERSTITIAL SPACE: ____ FT (mm)

CONN. CORR.: _____ GSF (m^2)

MECHANICAL: _____ SF (m^2)

CIRCULATION: _____ SF (m^2)

CONSTRUCTION: _____ SF (m^2)

DESIGN NET: _____ SF (m^2)

AREA OF BLDG: _____ SF (m^2)

(SUM OF ABOVE)

PROGRAM NET: _____ SF (m^2)

ALTERATION: _____ SF (m^2)

ATTACHMENT A, PROJECT DATA SHEETS.

PROJECT DATA SHEET No. 1, page 2 of 2

QUANTITATIVE BUILDING DESCRIPTION

ROOF:_____SF (m^2)

EXT. WALL:_____SF (m^2)

(INCLUDE WINDOWS & DOORS)

INT. WALL:_____SF (m^2)

(INCLUDE DOORS)

WINDOWS:_____SF(m^2)

EST. DOORS:_____LEAVES

INT. DOORS:_____LEAVES

NO. OF FLOORS:_____(EXCLUDE BSMT, SUB-BSMT,PENT,ETC)

NO. OF ELEVATORS:_____STOPS EACH: _____

CALCULATED A/C LOAD:_____TONS (KW)

NO. OF CHILLERS:_____TOTAL TONS (KW): _____

NO. OF COOLING TOWERS: _____TOTAL TONS (KW): _____

SOLAR PANELS:_____SF (m^2)

NO. OF BOILERS:_____TOTAL LBS/HR (kg/h): _____

NO. OF FUEL OIL TANKS:_____TOTAL CAPACITY: _____

ELECTRICAL LOAD:_____KVA

NO OF EMER. GEN:_____TOTAL KW:_____

NO. OF PLUMBING FIXTURES:_____TOTAL

QUALITATIVE BUILDING DESCRIPTION (TYPE & MATERIAL)

FOUNDATION:

SUB STRUCTURE:

SUPER STRUCTURE:

EXTERIOR CLOSURE:

ROOFING:

INTERIOR WALLS:

REMARKS (DESCRIBE UNUSUAL FEATURES)

ATTACHMENT A, PROJECT DATA SHEETS

PROJECT DATA SHEET NO. 2

LABOR RATES AS OF _____

(Including Fringe Benefits)

LABORER_____	PAINTER_____
EQUIPMENT OPERATOR_____	GLAZIER _____
CRANE OPERATOR_____	ELEVATOR CONSTRUCTOR _____
HEAVY EQUIPMENT _____	INSULATION WORKER _____
SMALL EQUIPMENT _____	CARPENTER_____
CEMENT MASON _____	PLUMBER_____
BRICK MASON _____	STEAMFITTER _____
STRUCTURAL IRON WORKER_____	SHEETMETAL WORKER _____
REINFORCING STEEL _____	ELECTRICIAN_____
ROOFER_____	MILLWRIGHT_____
PLASTER _____	TEAMSTER _____

ATTACHMENT B, ESTIMATE WORKSHEET

, **ESTIMATE WORKSHEET**									DATE			SHEET NO. OF		
PROJECT NO.				LOCATION				PROJECT NAME						
TYPE OF ESTIMATE				ESTIMATOR	NEW	ALT.	INDEX NO.	BUILDING NO./NOS.				ESTIMATE NO.		
CODE				SYSTEM/SUBSYSTEM	LABOR				MATERIALS				TOTAL	
					QUANTITY	UNIT	$/UNIT	TOTAL	QUANTITY	$/UNIT	$/UNIT	TOTAL	COST	

VA FORM HO-18b
DEC 1995

ATTACHMENT C, COST SUMMARY SHEET

COST SUMMARY SHEET									DATE
PROJECT NO.	LOCATION			PROJECT NAME					
TYPE OF ESTIMATE	ESTIMATOR	GROSS AREA (New) m^2 (SQ.FT.)	GROSSAREA (Alt.) m^2 (SQ.FT.)	INDEX NO.		BUILDING NO./NOS.			ESTIMATE NO.
CODE	SYSTEM/SUBSYSTEM		QUANTITY	UNIT	$/UNIT	$/GSF	SUBSYSTEM COST		SYSTEM COST
REMARKS									

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