GENERAL SERVICES ADMINISTRATION
Washington, DC 20405

PBS 1000.6
August 4, 2016

GSA ORDER

SUBJECT: P-120, Public Buildings Service Cost and Schedule Management Policy Requirements

1. Purpose. This Order issues and transmits a new Handbook, PBS Design and Construction Cost and Schedule Management Policy

2. Background. This handbook establishes the quality and level of cost and schedule management services to be provided during the planning, design and construction phases of projects. Whether delivered by in-house or contracted resources, this HB defines the deliverables expected, strategies to ensure effective budget development and within budget/within scope/within schedule project delivery meeting all associated statutes, Executive Orders, directives and other associated criteria.

3. Scope and applicability. The scope of the handbook is to provide new policy and criteria defining an integrated cost management process that will be followed throughout the project planning and execution process at PBS, including cost management (cost planning and cost estimating) and schedule management (schedule planning, master scheduling), including risk analysis, claims analysis and value management across PBS. The criteria defines the policies, practices and processes to be used in managing the total life cycle cost throughout the planning, design, construction and maintenance phases within the entire PBS owned and leased portfolio. The overarching goal of the document is to ensure cohesive, seamless policies and procedures that must be followed in practicing cost and schedule management throughout the full life cycle of all PBS design, construction and construction-related building maintenance / repair projects and programs across PBS.

4. Modification of Order.

a. P120, Project Estimating Requirements – January 2007

(1) Significant changes:

i. Because the scope of requirements defined in the P120 have changed, the document is recommended to be titled “PBS Cost and Schedule Management Policy”

ii. Includes scheduling policy not previously addressed.

ii. Addresses cost and schedule management policy for all project phases, including planning through close-out.

iii. Addresses cost and schedule management policy for all project types, including owned and leased projects funded by the many applicable PBS budget activities.

iv. Provides deliverable requirements for all budget activities and project phases in more depth and detail.

v. Integrates quality assurance and quality control policy throughout the handbook and in more detail.

vi. Integrates project triage process policy throughout the handbook.

vii. Addresses adjunct practices related to cost and schedule management such as life cycle costing and risk analysis in more depth and detail.

viii. Addresses and aligns policy with GAO best practice guides for Cost Estimating (GAO-09-3SP) and Scheduling (GAO-16-89G).

ix. Includes policy for Value Engineering addressing OMB Circular A-131 requirements, December 2013. Specific value engineering procedures and techniques are deferred to technical entities such as ASTM and SAVE International.

x. Adjust the threshold for considering Value Engineering from $1 million to $5 million, though agency can implement lower threshold if deemed prudent.

xi. Value Engineering is now required for performance-based specification services, including design-build.

xii. Prior PBS Value Engineering policies PQ-250 and PQ-251, published in 1992 are outdated and recommended for cancellation.

5. Cancellation.

b. PQ250 - Value Engineering Program Guide for Design and Construction - Volume 1 – December, 1992

c. PQ251 - Value Engineering Program Guide for Design and Construction - Volume 2 – May, 1993

6. Policy**.** This document:

a. Defines the overall policies for implementing the practices of cost management, schedule management and value management throughout the full life cycle phase of an asset at PBS, including Capital, Non-Capital and Leasing Project Delivery.

b. Updates the PBS Value Management Policy and Requirements, in accordance with the OMB Directive A131, December 2013.

c. Defines Policy and Procedures for implementing Quality Assurance and Quality Control for the Cost, Schedule and Value Management Programs to be practiced throughout the PBS Organization.

d. Defines procedures for triaging projects as related to the life cycle cost impact of project cost, schedule, risk and uncertainty

7. Responsibilities. The Office of Design and Construction, Office of Project Delivery manages this guidance. If you have any questions, please contact William Hunt at William.Hunt@gsa.gov.

8. Signature.

/S/_____
NORMAN DONG
Commissioner
Public Buildings Service

P-120, Public Buildings Service Cost and Schedule Management Policy Requirements

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1. Preface.

Supporting all building construction programs within the U.S. General Services Administration (GSA), Public Buildings Service (PBS), this document defines the technical and administrative requirements for cost management and schedule management involved in a construction project's planning, execution and close-out phases.

The instructions and criteria in this document are applicable to planning, programming, design, construction, construction management and other professional-services contracts that involve cost-estimating, cost-management, value management, scheduling and schedule management services. The criteria for practices and documentation requirements apply to all professional services activities, whether provided through contract or by in-house GSA/PBS staff.

This document defines minimum requirements for cost, value and schedule management practices and standards across PBS. This document replaces the January 2007 issuance of GSA Handbook P120, Project Estimating Requirements, PQ250 - Value Engineering Program Guide for Design and Construction - Volume 1 – December, 1992 and PQ251 - Value Engineering Program Guide for Design and Construction - Volume 2 – May, 1993.

The cost, schedule and value management tasks deliverables addressed in this document must establish accurate project costs, reasonable schedules and ensure best value, ensure that they are based on programming requirements, keep cost and scope within authorized limits, enable the ability for PBS to respond effectively to all IG and GAO audit requests, and collect GSA cost data to refine business practices and future cost estimates and project schedules.

2. Document Organization. The document contains eight chapters and multiple appendices. Chapters 1 through 6 present material in a progressive fashion such that each chapter is important to understanding and applying the material in the following chapter. Chapters 7 and 8 contain policy information for Schedule and Value Management respectively.

a. Chapter 1 - PBS Cost and Schedule Management General Requirements and Principles - This chapter contains background information and overall expectations for Project Delivery Excellence and general policy expectations relating to quality assurance, cost management, schedule management and value management. Both capital and non-capital costs for owned and leased facilities are addressed. Key supporting documents are identified and best practices including those from GAO are summarized.

b. Chapter 2 - Foundations of Integrated Cost, Schedule and Value Management - Chapter 2 introduces common aspects of the PBS cost, schedule and value management approach and identifies the interfaces among cost, schedule and scope management. The fundamentals for creating the project work breakdown structure (WBS) and Cost Breakdown Structures is presented as is the class structure required for estimates. The chapter introduces Project Triage as a means of screening PBS projects for the effective use of management resources and presents Quality Assurance and Quality Control basic requirements.

c. Chapter 3 - General Cost Management Principles and Requirements - Chapter 3 identifies general principles, core principles and requirements of cost management and explains the basic purpose of cost management in the delivery of projects. Activity specific principles including Prospectus, Under Prospectus and leasing are discussed. General cost management requirements such as, scope, degree of detail, unit pricing, option, estimate reconciling, escalation, contingencies, allowances, benchmarking and historical data are presented. A summary of cost estimating submittal requirements is presented including components and specifics of capital, non-capital and leasing projects. Cost estimating tools and spreadsheets are summarized.

d. Chapter 4 - Adjunct Practices - This chapter defines the adjunct practices that support cost and schedule management. These include market studies, life cycle costing, risk analysis and sensitivity analysis. Requirements are related to Triage Tool scores

e. Chapter 5 - Cost Management Work Products / Deliverables - Chapter 5 describes the requirements for a specific Cost Management work product / deliverable and includes common requirements that apply across multiple project phases. Cost Management deliverable requirements for each project phase are presented along with estimates, analysis, and support requirements. Specific requirements are presented for professional fees, construction and reconciliation. The chapter provides detailed

requirements for all cost management deliverables and work products that may be produced over the life cycle of projects.

f. Chapter 6 - Cost Management Requirements for PBS - Chapter 6 combines specific requirements from Chapter 5 with the overarching requirements presented in Chapter 3 and Chapter 4 to define how to prepare the work products / deliverables. Any submission during the project phases will include some of the work products / deliverables discussed in Chapter 5. Summary of Requirements tables in Sections 6.2 to 6.6 provide what will typically be expected at each phase/sub-phase for various budget activities, Triage Ratings, project magnitude and delivery methods.

g. Chapter 7 - Schedule Management - This chapter defines the required scheduling effort and milestones by GSA to reflect establishing the goals for time, cost, scope and quality and their relationship to each other and to help plan the overall approach to the project, with the client, ultimately preparing the master schedule. Requirements are included for detailed construction schedules prepared for the projects by those responsible for construction.

h. Chapter 8 - Value Management - Chapter 8 defines the approach and deliverables associated with Value Management.

i. Appendices - Eight appendices are included to provide additional detail concerning supporting policies, procedures, standards and definitions.

Chapter 1: PBS Cost, Schedule and Value Management General Requirements and Policies

Section 1: Scope and Processes of Project Delivery Excellence

1. Scope.

a. Cost and Schedule Management is at the crux of Project Delivery Excellence for Public Building Service (PBS) projects. It relies on sound:

(1) Cost management practices, including cost planning, cost estimating, cost control, and value management. Producing cost estimates relies on many "practice areas" through the life cycle of the project.

(2) Schedule management practices, including schedule planning, control and monitoring.

(3) Quality assurance and quality control practices, which confirm adherence to the cost and schedule management processes and check cost and schedule management products for compliance.

b. The policy applies through the total life cycle – planning, design, procurement and award, construction and maintenance phases – within the entire PBS owned and leased portfolio. This policy establishes key cost and schedule management principles and basic processes that must be applied to all PBS projects, capital and non-capital costs.

c. This policy governs the preparation and reporting of both capital and non-capital costs for owned and leased facilities. This policy uses the term "cost estimates" to refer generally to future or past estimates of dollar costs or savings –regardless of budgetary impact –and performance measurement, including calculation and reporting of organizational performance through the Performance Management Process (PMP).

d. This policy considers aspects of scope management to assure coordination with the schedule and cost management interfaces.

e. This policy governs Value Management (VM) requirements for PBS. VM is mandated by OMB Circular A-131, and is required by statute. PBS shall incorporate VM principles into its business culture applying VM throughout the planning and design process. This policy uses the term "value management" to refer to the process applying the value methodology to improve the value of a project or process. The value methodology reviews and analyzes the requirements, functions and elements through value studies commonly known as value engineering / value analysis workshops. The VM program results are reported to OMB on an annual basis to satisfy Value Engineering (and related value activities) reporting requirements of A-131.

2. Processes of Cost, Schedule and Value Management.

a. The P-120 provides cohesive, seamless policies and procedures that must be followed in practicing cost management, schedule management and value management throughout the life of all planning, design, construction and construction related building maintenance / repair projects and programs across the PBS Business Lines.

b. 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. This integrated management approach joins the key management specializations with the realization that the interrelationships are fundamental to managing a project or program successfully. Coordinating requirements for cost, time and scope is the path to achieving their optimal balance.

c. PBS applies the GAO best practice guides for Cost Estimating (GAO-09-3SP) and Scheduling (GAO-16-89G) to its Cost and Schedule Management policy. Conceptually, Cost and Schedule Management aligns with the industry concept of Project Controls.

d. The P-120 is complementary to the PBS-P100 *Facilities Standards for the Public Buildings Service* by providing the definitive requirements for all Integrated Cost Management deliverables it references.

3. QA/QC Responsibilities. The primary responsibility of cost and schedule management is to assure that the projects are successfully delivered within the budget and time constraints. To accomplish this, cost and schedule management must be integrated with scope and quality management. Due diligence to this purpose throughout the project life cycle requires involvement from all levels of PBS.

Section 2: PBS Cost Management

1. Introduction. This policy will ensure that all cost estimate submittal packages prepared in PBS meet the four key requirements of any cost estimate as identified by the GAO:

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, not overly conservative or 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.

2. Iterative Process. Cost estimation is a continuous and iterative process that is repeated over the life of a project. The cost estimation process is structured as 12 cost estimating steps by the GAO. (Insert Figure reference) Careful execution of the 12 steps ensures that all PBS cost estimates are accurate, comprehensive, well documented, credible, and current.

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

Four Characteristics of a Reliable Estimate GAO Twelve Best Practices	Well Documented	Comprehensive	Accurate	Credible
1) Define the estimate's purpose	●			
2) Develop the estimating plan		●		
3) Define the program	●			
4) Determine the estimating approach.		●		
5) Identify ground rules and assumptions	●			
6) Obtain the data	●			
7) Develop the point 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. The Iterative Cost Estimating Process. The GAO twelve estimating steps can be considered in four areas. Within the progression of the project delivery, cost estimating must be considered as an iterative process with steps that may be accomplished in varying order or concurrently.

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 and more and better data becomes available, and the underlying assumptions change.

c. Cost Analysis. Cost Analysis steps help establish confidence in the estimate. It is crucial that decision-makers have accurate, comprehensive, credible and current estimates.

d. Presentation. Presentation is critical to making a cost estimating decision. A well-documented and presented estimate enables decision-makers.

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

(2) Appendix A.1: GSA and the GAO Cost Estimating Process has a detailed explanation of the 12 tasks and shows how the PBS process complies.

e. Overall Objectives of Cost Estimating.

(1) The overall objective of cost estimating changes as the subject project matures.

(2) Initial cost estimates form a baseline rationale for assessing the validity of a concept and for developing funding requests. They are the basis of a Cost Plan in support of project funding. Valid cost estimates increase the validity of requested dollars, which greatly improves the defensibility of a budget request. Quality, risk, and sensitivity analyses along with thorough documentation and a consistent briefing format are all important factors when defending an estimate.

(3) In later phases, estimates of cost, performance, and risks influence acquisition decisions and program or budget execution. Cost estimates support operational planning and tactical decision-making, as well as source selection for contracts.

(4) During program execution – or after deployment of a project or investment -- updated cost estimates ensure that benefits are being realized within projected costs. Cost estimating helps to identify variances from planned benefits and costs, and allows for the assessment and selection of potential mitigating actions.

Section 3: PBS Schedule Management

1. Introduction.

a. This policy will ensure that all schedule submittal packages prepared in PBS meet the four key requirements of any schedule as identified by the GAO:

(1) Comprehensive: A comprehensive schedule includes all activities for both the government and its contractors necessary to accomplish a project's objectives as defined in the project's work breakdown structure (WBS). It realistically reflects how long each activity will take and allows for discrete progress measurement.

(2) Well-constructed: A schedule is well constructed if all its activities are logically sequenced with straightforward logic. The schedule's critical path represents a true model of the activities that drive the project's earliest completion date

(3) Credible: A schedule is credible if it reflects the order of events necessary to achieve aggregated products or outcomes. Activities in varying levels of the schedule map to one another and key dates are in sync with the schedule. The level of necessary schedule contingency and high-priority risks and opportunities are identified by conducting a schedule risk analysis.

(4) Controlled: A schedule is controlled if it is updated periodically using actual progress and logic to realistically forecast dates for program activities. It is compared against a designated baseline schedule to measure, monitor, and report the project's progress.

Table 1-2. GAO Best Practices Related to Schedule Characteristics

Four Characteristics of a Reliable Schedule **GAO Ten Best Practices**	**Comprehensive**	**Well-Constructed**	**Credible**	**Controlled**
1) Capturing all activities	●			
2) Sequencing all activities		●		
3) Assigning resources to all activities	●			
4) Establishing the durations of all activities	●			
5) Verifying that the schedule is traceable horizontally and vertically			●	
6) Confirming that the critical path is valid		●		
7) Ensuring reasonable total float		●		
8) Conducting a schedule risk analysis Controlled, being			●	
9) Updating the schedule using actual progress and logic				●
10) Maintaining a baseline schedule				●

b. Appendix A.2: GSA and the GAO Scheduling Best Practices have a detailed explanation of the 10 tasks and shows how the PBS process complies.

2. On-Going Scheduling Process.

a. Planning and scheduling are continual processes throughout the life of the project. Project planning is the basis for controlling and managing project performance, including managing the relationship between cost and time. The schedule is essentially a model of the project plan.

b. Schedule management is a distinct process that involves developing, maintaining and communicating time tables for the project in the form of schedules. The schedule shows how the work will be accomplished within the constraints of time and resources. It evolves in detail as

3. Overall Objectives of Scheduling.

a. The overall objective of scheduling changes as the subject project matures.

(1) The Master Schedule (MS) forms the baseline documenting all work that must be accomplished, and the associated budget. It includes all work necessary from all parties for the successful execution from start to finish. It may comprise many different schedules representing portions of the program or project.

(2) A schedule is a fundamental management tool. It must be capable of supporting all levels of project management.

(3) As distinct phases of the effort progress, schedules comprising the MS become more detailed.

b. The scheduling effort by GSA must reflect the goals for time, cost, scope and quality and their relationship to each other and help plan the overall approach to the project, with the client, ultimately preparing the IPMS (Integrated Project Master Schedule).

c. The MS is a living tool that is developed early in the project, but can change dynamically as the project evolves, due to external and internal program/project revisions and change orders. When used actively, the schedule will guide a project to a successful completion.

d. GSA also has responsibility to set requirements for detailed schedules prepared at each phase of the project life cycle by those responsible for planning, design or construction including the degree of tasks defined, their logical relationship and external resources included. GSA also monitors any requirements for Earned Value Management (EVM) and monitoring the project during delivery.

Section 4: PBS Value Management

1. Introduction.

a. In PBS, Value Management is one of the fundamental areas of PBS Cost Management. The process follows the ASTM E 1699 standard and SAVE® International Value Methodology Standard. The essence of the work process is a pre-workshop preparatory period, a workshop bringing the value team together and a post-workshop period.

b. PBS shall conduct facilitated value studies at prescribed times during project planning and design phases. The focus of a value management program is to deliver projects and programs at the lowest life cycle cost while maintaining required functionality.

2. Overall Objectives of Value Management.

a. The primary objective of a value study is to amplify options for the customer / stakeholders to consider that improve the value received. The options formulated through a value study attempt to meet performance needs at a lower life cycle cost through evaluation of project functions. It is critical for PBS to efficiently use its resources not only for capital expenditures, but for ownership costs through the life of the investment. Value improvement can take many forms depending on the objectives and requirements of the project.

b. Value studies have secondary objectives of building consensus, inserting additional expertise and validating alignment of quality, performance, cost and schedule with project requirements.

3. Value Management Responsibilities.

a. The Office of Design and Construction is responsible for reporting PBS VM results to Office of Acquisition Management so that the results of the GSA VM program can be reported to OMB annually. The National Office uses the Value Management process as tool for cost and schedule management quality assurance.

b. The Regional Offices are responsible for ensuring that value management deliverables for a project or program are completed and submitted to the Regional Office Cost Advocate, who in turn must report results of the local VM program to PBS National Office.

Section 5: Key Cost, Schedule and Value Management Requirements Documents

1. Sources of Federal Requirements. Federal laws and policies affecting the way PBS conducts its business generally flow from:

a. The Federal Acquisition Regulation (FAR) is the source of Federal contract requirements for government estimates, cost and price analyses, and contract changes.

b. Office of Management and Budget (OMB) issues circulars for budgeting, discount rates for life cycle costing, and value engineering.

c. GAO Cost Estimating and Assessment Guide

d. GAO Schedule Assessment Guide

e. The Code of Federal Regulations (CFR) provides requirements for alternative considerations and life-cycle cost analyses.

f. Other Federal Laws

2. Cost Management Legislation and Policies. Congress has enacted legislation and Federal Agencies have promulgated policies to change the way Federal agencies address common cost management problems. Key legislation and policy framework for the practice of integrated cost management include:

a. GPRA Modernization Act of 2010, P.L. 111-352. Updated the Government Performance and Results Act (GPRA) of 1993 which established strategic planning, performance planning, and reporting as a framework for agencies to report progress in achieving their goals. It requires a return on investment that equals or exceeds those of alternatives. The update established reporting on a central website and a central program inventory.

b. Budget Enforcement Act of 1990. This act enforces the deficit reduction of the Omnibus Budget Reconciliation Act of 1990 and revises the budget control process.

c. **18 United States Code 1001, False Statements Act**. This code states, in part: *"…whoever, in any matter within the jurisdiction of the executive, legislative, or judicial branch of the Government of the United States, knowingly and willfully -*

1) *falsifies, conceals, or covers up by any trick, scheme, or device a material fact;*
2) *makes any materially false, fictitious, or fraudulent statement or representation; or*
3) *makes or uses any false writing or document knowing the same to contain any materially false, fictitious, or fraudulent statement or entry;*

shall be fined under this title, imprisoned not more than 5 years or, if the offense involves international or domestic terrorism (as defined in section 2331), imprisoned not more than 8 years, or both."

d. OMB Circular A-11, Preparation and Submission of Budget Estimates (Clinger-Cohen Act of 1996). Establishes the framework for Federal agencies to formulate a cost-benefit analysis for the budget submission for Federal agency projects and programs. *Part 7* establishes *"policy for planning, budgeting, acquisition and management of Federal capital assets."*

e. OMB Circular A-94, Guidelines and Discount Rates for Benefit-Cost Analysis of Federal Programs. The circular *"provides general guidance for conducting benefit-cost and cost-effectiveness analyses. It also provides specific guidance on the discount rates to be used in evaluating Federal programs whose benefits and costs are distributed over time."*

f. OMB Circular A-131 – Value Engineering. *"Provides guidance to support the sustained use of value engineering (VE) by Federal Departments and Agencies to reduce program and acquisition costs, improve performance, enhance quality, and foster the use of innovation."*

g. **10 CFR 436, Subpart A, Methodology and Procedures for Life-Cycle Cost Analyses.** *"Establishes a methodology and procedures for estimating and comparing the life cycle costs of Federal buildings, for determining the life cycle cost effectiveness of energy conservation measures and water conservation measures, and for rank ordering life cycle cost effective measures in order to design a new Federal building or to retrofit an existing Federal building. It also establishes the method by which efficiency shall be considered when entering into or renewing leases of Federal building space."*

h. FAR, Part 4.802 – Contract Files

i. FAR, Part 5.4 – Release of Information

j. FAR, Part 7.103 – Agency-Head Responsibilities.

k. FAR, Part 10.002 – Market Research, Procedures.

l. FAR, Part 15 – Contracting by Negotiation.

m. FAR, Part 16.104 – Factors in Selecting Contract Types.

n. FAR, Part 17.106 – Multi-year Contracting.

o. FAR, Part 19.807 – Estimating Fair Market Price.

p. FAR, Part 32.503 – Postaward Matters.

q. FAR, Part 35 – Research and Development Contracting.

r. FAR, Part 36 – Construction and Architect-Engineering Contracts.

s. FAR, Part 47.305 – Solicitation Provisions, Contract Clauses, and Transportation Factors.

t. FAR, Part 48 – Value Engineering.

u. FAR, Part 52 – Solicitation Provisions and Contract Clauses.

Chapter 2: Foundations of Integrated Cost, Schedule and Value Management

Section 1: Introduction

1. Chapter 2 introduces common aspects of the PBS cost, schedule and value management approach. The section introduces Project Triage as a means of screening PBS project for the effective use of management resources. The section includes an overview of the fundamentals for creating the project work breakdown structure (WBS) and introduces standard Cost Breakdown Structures. A key aspect of this section is the review of the interfaces among cost, schedule and scope management.

Section 2: Project Triage

1. Overview.

a. Project Triage is key for PBS to practice effective due diligence in applying cost and schedule management principles to the comprehensive scope of its program:

(1) All Budget Activities

(2) All phases of the life cycle

(3) All project sizes.

b. The Triage Tool for cost and schedule management is a simple process used to screen projects for appropriate oversight approach, cost and schedule approach and level of resources required. It establishes a uniform approach across all projects allowing PBS to set the level of effort for a project based on factors such as magnitude, complexity and risk.

2. The Triage Process.

a. PBS applies the Triage Process to all projects using a Triage Tool. The initial use of the Triage Tool is at project initiation. The initial rating will be reassessed at completion of the Project Planning and Development Phase to validate the initial Triage Tool rating and establish the appropriate cost management effort required during the Design Phase.

b. Each Budget Activity has a default rating. The BA-51 and BA-61 ratings are fixed. As Table 2-1. Triage Tool Ratings shows, the Triage Tool rating may increase or decrease requirements for some projects in other Budget Activities.

c. Project Type, project cost and other project considerations affecting risk are used to determine the Triage score. Use the Triage Tool workbook to assess BA-51, BA-53, BA-54, BA-55 and BA-80 projects.

Table 2-1. Triage Tool Ratings

		Triage Tool Score			
Budget Activities [1]	**Responsible**	**1**	**2**	**3**	**4**
BA-51 New Construction	QA			P	**D**
BA-53 Lease-Construct	QA or QC[2]		**D**	P	P
BA-54 Discretionary Non-Capital Repair and Alteration	QA or QC[2]		**D**	P	P
BA-55 Non-Discretionary, Line Item Capital Repair and Alteration	QA		P	P	**D**
BA-61 Building Maintenance / Repair	QC	**D**			
Notes: 1 Use other Budget Activity requirements for BA-80 RWA Funded projects appropriate for the Project Type and magnitude of the RWA funded project. 2 Determined by cost. QA rates all projects greater than Prospectus (or greater than 150,000 SF if lease).		**Legend:** **D** – Default P – Possible by adjustment only			

Section 3: Work Breakdown Structure (WBS)

1. **<u>Importance of Common Structures.</u>** 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.

a. A hierarchical WBS serves several critical functions:

(1) It defines the work that is needed ensuring that no portions of the project are omitted or duplicated. The definition should delineate clearly the boundaries of the elements.

(2) It provides for easy sharing of common information among various practices required to deliver the project.

(3) Providing consistent of data for comparative purposes.

b. 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 constant GSA project elements. The WBS is consistent throughout the project life cycle, modified only as project scope is adjusted. It

is consistently used by all parties to the project delivery. The WBS should remain fixed, unless the project is changed to add or deduct project elements.

2. WBS Overview. The WBS is the key organizing element of WBS. The WBS organization must be in accordance with the GSA pricing policy, requiring a separation between the building shell and core costs, tenant improvements for each tenant costs, and the amortized capital security costs (i.e., vehicular barriers, secure doors and locks, progressive collapse, blast mitigation and window glazing). GSA's pricing policy and the related modifications and clarifications are on the GSA external Web site.

a. Situations that influence a Work Breakdown Structure (WBS) include:

(1) Differing financial commitments of multiple tenants of a project, requiring separate contracts for each tenant's work.

(2) The need for separate contracts for buildings and their site work, such as at border stations.

(3) Phased renovation projects requiring swing space for a variety of tenants or departments.

(4) Projects to be funded over more than one year.

(5) Separation of a project into base-contract work and options or alternates.

b. Primary WBS organizing principles used by GSA are explained below. Any or all may be used depending on the program or project. The Project Manager (PM) in conjunction with the cost and schedule management technical leads will create a workable WBS for the program or project that meets these requirements. Appendix D shows examples of various WBSs.

3. New Construction and Major Renovation. It may be necessary to subdivide estimates for individual buildings and other components into new construction and major renovation.

4. Building Shell and Tenant Improvement (TI) Projects. GSA's pricing policy calls for a separate tenant-improvement breakdown of all tenant-space fit-out, identified by agency. This is a separate tenant improvement estimate for each tenant. The WBS must be organized for this requirement.

a. The agency housing and supporting floor plans must be used to organize the estimate detail by:

(1) Building Shell

(2) Tenant-agency fit-out

(3) Security upgrades

b. Report the associated professional services costs included in the occupancy agreement between tenants and GSA using this WBS.

5. Campus and Multi-structure Projects. Projects involving more than one structure require separate estimates for each structure (e.g., buildings, canopies, sitework). Separate site construction-cost estimates must be associated with the estimates for each structure involved. The A-E or a construction management (CM) firm hired by GSA must prepare a construction-cost analysis for each structure and site development after award of a multi-structure project.

6. Phased Projects. Used for project work divided into more than one construction phase. Separate cost estimates, accompanied by an overall project estimate summary, support each phase. For phased construction, the A-E or a construction management (CM) firm hired by GSA must prepare a post-award construction cost analysis for each phase. After contract award of the last construction phase, a combined post-award construction analysis for the composite project bid is prepared.

7. Mixed Funding Projects. When project funds are secured from different agencies or are provided as a dedicated allowance for a specific program goal, the WBS must allow for separate tracking of these elements. Funding allocated for such projects is tracked to confirm that expenditures are apportioned according to amounts authorized by each agency, so as not to exceed the dedicated allowance. The WBS for the project shall support the tracking of costs for the different agencies.

8. Work Items Project Structure Considerations.

a. A Work Breakdown Structure (WBS) for projects derived from Work Items uses the same principles discussed above, as they are applicable. The Inventory Reporting Information System (IRIS) codes rest beneath the lowest level created from these considerations. If Core and Shell and Tenant Fit-out are the appropriate higher level WBS, the WBS hierarchy tree would be:

(1) Core and Shell

(a) IRIS Code / Work Item Description

(2) Tenant fit-out – Agency A

(b) IRIS Code / Work Item Description

b. At the earliest project phases, the IRIS Codes are the CBS. As the project is defined, each IRIS Code will have greater cost detail. In the Design phases, add Objective Work and Enabling Work as WBS elements beneath the IRIS Code.

(1) Core and Shell

(a) IRIS Code / Work Item Description

1. Objective Work: CBS

2. Enabling Work: CBS

c. This applies to capital and non-capital work.

Section 4: Cost Breakdown Structure (CBS)

1. CBS Overview.

a. GSA uses standard Cost Breakdown Structures (CBSs) for cost estimating and cost management activities. A standard CBS:

(1) Ensures a uniform cost-control framework throughout the various stages of project development.

(2) Defines a proper level of detail to set expectations for the estimating effort.

(3) Serves as a checklist to ensure complete coverage of project scope.

(4) Provides for a standardized historical database or library.

b. A CBS must be pertinent to the project type and project stage. Primary CBSs used by GSA include:

(1) Uniformat II (by ASTM)

(2) MasterFormat (by CSI)

(3) IRIS Work Item

(4) Space type

(5) Project Cost Summaries

c. Any or all may be used depending on the program and project stage. Refer to Chapter 3.5: Using Cost Breakdown Structures for specifics on when a particular CBS may be used. As a general rule, early in the process Uniformat or IRIS depending on the Budget Activity is the primary estimate format, although CSI MasterFormat may be selected on a project-by-project basis. GSA usually requires Work Items on major renovation projects or when the project is to be separated into major components or sub-buildings. The Space-Type summary is usually required at specific project phases.

d. The tasks incorporated into schedules may be organized by an appropriate CBS.

2. WBS and Cost Breakdown Structure (CBS).

a. The WBS organizes for project elements. The Cost Breakdown Structure (CBS) sits below each lowest level WBS element. GSA uses several defined CBSs. Each one is fixed, but they may be interchanged during the life of a project. Is possible to use multiple CBSs at any phase of the project. The fixed CBS elements provide consistency for costs reported of each project element. The CBS must include non-construction costs.

b. Allocating costs from a detailed structure to a more conceptual structure in a database allows the data to be useful in early project estimates of future projects.

3. Uniformat II.

a. Uniformat estimating applies unit-cost data to building-system and component site elements. This “systems” approach uses a hierarchical structure of cost elements, beginning at Level 1 with basic systems, such as Substructure, Shell, and Interiors, and proceeding to successively more detailed subdivisions of these systems at Levels 2 through 4.

b. The resulting levels of detail not only serve to structure cost information, but also ensure cost estimates are aligned with the level of detail commensurate with whatever level of detail the design team can provide as the project is developed through the design submission phases. For example, by the final concept design phase, the design team and estimator may have Level 4 information on Substructure, but only Level 2 detail for Interiors.

c. Although the construction industry uses several variations on the Uniformat concept, GSA requires that cost estimators use the ASTM version, for consistency in use and maintenance of GSA’s cost databases.. The Uniformat estimating format is illustrated in Appendix C.1 ASTM Uniformat II

d. GSA recently developed an expanded version of Uniformat II that has as many as 12 levels, functional definitions and performance attributes, FACTS (Facility Asset Component Tracking System). It maps to building products and GSA Public Building Maintenance Standards. FACTS became the basis for ASTM E 3035.

4. MasterFormat. MasterFormat, a product of the Construction Specifications Institute (CSI), is the most widely used standard for organizing building-project specifications and detailed cost estimating data in the U.S. It is used particularly when drawings and specifications are sufficiently detailed to allow material and equipment quantity takeoffs, and it is typically aligned with a general contractor's approach to preparing a bid. Visit the Construction Specifications Institute Web site (www.csinet.org) for more information. The top level of MasterFormat is illustrated in Appendix C.2 CSI **MasterFormat (2004)**.

5. IRIS.

a. GSA Repair and Alterations (R&A) projects tend to utilize scope descriptions and project budget estimates organized by work items. Work items may vary significantly depending on the nature of the project, as defined by GSA program offices and condition of facility and associated building systems. R&A projects use the IRIS coding system initially as the Cost Breakdown Structure (CBS). As the project develops, IRIS becomes part of the Project Structure. Appendix C.3 GSA IRIS provides a listing of the IRIS Coding Structure.

b. R&A projects use the IRIS work-item basis. This allows the removal or addition of project scope to meet:

1) Condition of facility and systems, and

2) Budgetary limitations and allowances.

6. Functional Space Type. This format, used primarily throughout the planning phase for new construction and space alterations projects, applies functional space-type unit costs to planned space needs, resulting in a set of space-related construction costs. These costs may be adjusted by adding known costs for special requirements defined through other estimating formats. The sum of functional space-type costs and special-requirement costs equals an Estimated Construction Cost (ECC) for the project. Appendix C.4 GSA Space Type lists the standard GSA space types.

7. Job Order Contract (JOC) CBS Format. Projects of relatively low risk scope, with a Triage Score of 1 or 2, may be executed under line-item or Job Order Contracts (JOC), for which cost estimates are derived from assemblies in line-item databases. The JOC cost database structure is the acceptable CBS for these projects.

8. Scheduling and the WBS.

a. Work Breakdown Structures (WBS) support and help define necessary detail for schedules. In general WBSs are highly detailed at the lowest level and provide a hierarchy for roll up and summary at the higher levels.

b. For scheduling activities the WBS provides an appropriate level of detail for deliverables. Master Schedule activities are usually confined to levels I and II as defined

in Table 2-2. WBS Schedule Levels of Detail, sometimes expanding into Level III on complex and/or phased projects. Construction scheduling is performed at Level IV with the capacity to summarize to higher levels.

Table 2-2. WBS Schedule Levels of Detail

WBS	Title	Description
I	Major Phase	This level subdivides the project into major project phases (e.g., initiation, planning and development, design, procurement, construction, close-out). It includes key milestones (contract and project specific).
II	Work Package	This level subdivides each of the major project phases into work packages or components (e.g., for design - concept design, design development, construction documents). Construction phase is defined by major building components or work items. At this level, the integration of work throughout the project life-cycle is shown.
III	Major Work Item	This level subdivides each of the major work packages into major work components or deliverables (e.g. architectural design element, site development design, cost estimating, and other). For the construction phase major building components or work items would be subdivided into subcomponents. It is important to reflect interfaces and critical activities and this is the first level where CPM methods can be effective.
IV	Activity	This level subdivides each of the major work items into specific work activities for design (e.g., prepare and submit basis of design report, GSA review and comment on submittals, prepare estimate, and other related work activities) and for construction (usually associated with construction tasks and activities along with shop drawings, submittals and approval actions). It conveys production at the deliverable level and would be fully aligned with CPM.

c. Program schedules would introduce an additional level before Level I. Schedules for construction will have additional levels to show the task requirements for completing activities.

9. Overview of Common CBS Elements.

a. In preparing budgets and estimates for construction projects and programs it is necessary to include a provision for monies to cover unknown or unforeseen circumstances and risks. PBS cost management practices follow the guidance set forth in ASTM E2168 Standard Classification for Allowance, Contingency, and Reserve Sums in Building Construction Estimating. These terms are defined in **Error! Reference source not found.**. A few key principles are:

(1) Allowances are used for planned project items until they can be better defined. They are part of the construction estimate.

(2) Contingencies are used for unintended, not directly controllable project occurrences. They are part of the project estimate.

(3) Reserves are held by management for unforeseen changes in project requirements. They are part of the program estimate.

b. GSA specifies common CBS elements that are allowances or contingencies. They are standard regardless of the Cost Breakdown Structure applied. Some items in the following list are not applicable to all programs; the exceptions are noted.

(1) Phasing Allowance – Allowance for premium cost for multi-phase versus single phase work. To be included in the CBS when phasing is used.

(2) Design Contingency – Contingency covering costs that may result from incomplete design, unforeseen and unpredictable conditions, or uncertainties concerning project scope.

(3) General Conditions and Profit – The General Contractor's general conditions, bonds, insurance, and corporate overhead and profit.

(4) Escalation – The anticipated increase in the project's cost due to inflation between the time the estimate is prepared and when the project is finished, since inflation continues during project construction.

(5) Construction Contingency – This contingency is an allowance for cost growth that may occur during construction as a result of unexpected circumstances or incomplete design documents.

(6) Art-in-Architecture – The Art-In-Architecture allowance is for new construction and major modernization projects only.

c. See Section 0 2. Common Elements for the **CBS** for details on each common CBS element and how it is used.

Section 5: Quality Assurance and Quality Control

1. Cost and schedule management are two of the three interrelated control systems for project management. The third, scope management, is not addressed in this policy document. Successful project management integrates them with processes that establish on-going controls that permit the on-going balance among these elements of project delivery. The goal is to assure that the projects are successfully delivered within the budget and time constraints and to the specified scope.

2. Quality assurance (QA) and quality control (QC) practices assure proper due diligence throughout the project life cycle. The QA/QC efforts involve all levels of PBS.

a. The project team is responsible for completion of the cost, schedule and value management deliverables for projects, as required by policy. Each party producing a deliverable is responsible for quality control in the preparation of their deliverable.

b. The Regional Offices and Service Centers are responsible for quality control to ensure that the required cost, schedule and value management deliverables for projects are completed in accordance with policy requirements.

c. Quality assurance is the responsibility of the National Office. 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 undesirable project outcomes.

3. Value Management can be used as a tool to assist in the integration of cost, schedule, scope and quality. It may also support the QA/QC processes for cost and schedule.

Section 6: Scope, Cost and Schedule Interfaces

1. Overview.

a. Scope Management, Schedule Management and Cost Management are primary control systems for project management. There are adjunct tools, such as Risk Management and Value Management, which assist the project manager. These tools help set the proper frame of reference, permitting checks that they are followed through the project life-cycle. Each control system has remedial action procedures for deviations.

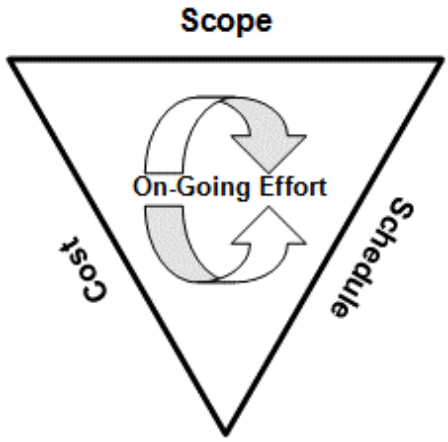
b. Proper application of this process to establish requirements and check that they are achieved at key points during the execution process is the foundation of due diligence. The balancing of scope, cost and schedule is an on-going effort through the project life-cycle.

c. Scope embodies not only defining quantity of components, but quality and performance attributes of the various scope components. An approved budget establishes the cost boundary or threshold for the project. User expectations or needs set the schedule requirement. Cost and schedule are typically managed using a project work breakdown structure. Scope, cost and schedule are interconnected. Differential changes to any aspect of one component will most likely affect the one or both of the other components, though not proportionally.

2. Guiding Principles.

a. Project scope is the work that must be performed to meet a client's program goals for space, function, features, impact, and level of quality. Scope management sets the boundaries for the project and is the foundation on which the other project elements are built. From the beginning it helps identify the work tasks and their requirements for completion. Most often, scope is the primary driver during planning. Cost and schedule respond to scope requirements, but may set some limits. Assuming they are properly aligned during the planning phase, the baseline scope, budget and schedule are achievable goals of project execution.

Figure 2-1. The Project Management Triangle



b. Effective scope management requires accurate definition of a client's requirements in the Planning and Development stage and a systematic process for monitoring and managing all the factors that may impact or change the program requirements throughout the project design and construction phases through delivery of the finished project.

c. *Scope management is the responsibility of the Project Manager.* Those controlling scope must recognize the interconnectedness of scope, cost and schedule. Deviations to any element may, and most often will, affect cost and schedule in some way. Most often, cost and schedule respond to scope requirements. Effective scope management is foundational for cost management and schedule management. Cost Management supports effective Scope Management with timely estimates of how a scope change impacts the project budget.

d. The consequences of change grow exponentially as the project progresses in the delivery timeline. Time and effort spent early defining the project requirements well reduce time, costs and claims. Likewise, the ability to make a change decreases exponentially as the project progresses.

3. <u>Project Definition.</u>

a. Scope definition is the level of detail to which a project is described. Scope starts with some basic functionality to meet a need and increases to the development of detailed plans and specifications that enable procuring the construction of the project.

b. The cost estimate classifications in ASTM Standard E2516 defines five classes of estimate definition based on a percentage of project definition. The classes recognize that an estimate accuracy is directly related to the level of scope definition.

Table 2-3. Classifications by Project Definition

Project Definition - Based Cost Estimate Classifications (From ASTM E2516) and Schedule Classification System (From AACE 27R-03)				
Estimate Class	**Degree Of Projection Definition[1]**	**Primary Project Life Cycle**	**Typical Purpose of Estimate**	**Schedule Methods Used**
Class 5	0% to 2%	Project Initiation	Screening or feasibility	Top down planning using high level milestones and key project events
Class 4	1% to 15%	Feasibility Studies PDS	Concept study or feasibility	As above, but semi-detailed
Class 3	10% to 40%	Concept Design Design Development	Budget authorization or control	"Package" top down planning using key events, semi-detailed
Class 2	30% to 70%	Design Development 75% Construction Documents	Control or bid/tender	Bottom up planning, detailed
Class 1	70% to 100%	Construction Documents	Check estimate or bid/tender	Bottom up planning, detailed
1 Expressed as percentage of complete definition				

c. The ASTM Standard E2516 project definition percentages do not provide further definition of expectations of project definition. PBS uses the PDRI (Project Definition Rating Index) for measuring how well a project is defined.

d. The deliverables for schedule and cost management work from the same information, degree of project definition. The deliverables from these activities should correlate in the level of detail provided.

e. Any proposed change to project scope is evaluated for its impact to cost and schedule. The evaluation must consider ancillary ramifications to the change. No change is approved without these evaluations and appropriate approvals. Process also should assure that any conflicting interests among stakeholders are raised and vetted.

4. <u>Scope Management Interfaces with Cost and Schedule Management.</u>

a. Good definition is only a part of the effort of good scope management. Stakeholder expectations and altering business needs must be managed. Business organizations with possibility of volatile needs may need more flexible use space and more contingency to accommodate changing business needs.

b. Scope creep is a natural occurrence unless scope is closely controlled. A formal approval process is essential to understanding the impacts of proposed changes and agreeing to their necessity before implementing and change. Cost and schedule impacts associated with a proposed scope change inform decision makers so that intelligent decisions are possible. PBS has a procedure to formally control scope changes during design for capital and non-capital projects.

c. Scope management is essential to successful project management. Any reasons for change to the project scope must be understood with the implications for cost and schedule considered. Scope controls are essential to decision making about expending resources. The Work Breakdown Structure (WBS) is an essential scope control element as it organizes and defines the total scope of the project.

d. Defining and refining the project requirements at the very earliest stages is the first step. This sets budget request and funding levels.

e. Scope control has essentially five components:

(1) Complete Request for Scope Change documenting the change, why it is necessary and why this was not included in the original program documents.

(2) Validate if the proposed change is necessary or a good idea.

(3) If valid change, prepare Scope Change Order and evaluate how the proposed scope change might affect cost (fees and construction), schedule and risk of the project.

(4) If there is an impact on cost, schedule or risk, obtain approvals for the change. If there is no impact on cost, schedule or risk, indicate on the Change Order that no approvals are required for the change.

(5) Modify the scope and other pertinent documents to implement the change.

5. **Categories of Scope Change.** Three basic scope change types are quantity, quality and performance. Notions of quality and performance are often difficult to separate and sometimes considered as expectations. The scope changes may be owner initiated or caused by external events. During construction the change categories expand to include incomplete documentation and errors and omissions.

a. **Quantity Changes.** Individual components of a project are usually quantified in a formal program requirements document. Any adjustment to the initial scope quantity of a component is a change. Any change must be evaluated for its cost impact before approval. If a scope component quantity changes, there is a high likelihood that cost will change, typically in the same direction, but not necessarily proportional.

(1) Exchanging the same quantity between scope components resulting in a net zero quantity change for the project is a quantity change.

(2) Building shape is an overlooked scope change type. A budget and baseline schedule are formed around some basic assumptions about building shape. If a formal planning exercise was completed, it provides some guidance as to their derivation. However, building shape is generally not very auditable and therefore overlooked as an element of scope control.

b. **Quality Changes.** Typically, a formal program of requirements references PBS quality requirements in standards or criteria. Any adjustment to the initial quality of a scope component is a change. Any change must be evaluated for its cost impact before approval. It is particularly critical to evaluate quality changes for their life cycle cost impacts.

c. **Performance Changes.** Similar to quality, the formal program requirements document typically references performance requirements from other sources. Any adjustment to the initial performance requirement of a scope component is a change. Any change must be evaluated for its cost impact before approval. It is particularly critical to evaluate performance changes for their life cycle cost impacts.

(1) Cost Related Requirements

(a) Scope change is one of the primary drivers of cost change. So, it is essential to consider how a scope change impacts with cost. When evaluating scope change it is critical to remember that project elements besides the one being changed are affected. This "ripple effect" is often subtle, but must be included in any scope change estimate.

(b) The Cost Management Lead supports the Project Manager in two major Cost Management activities:

1. Change Estimates, either Change Control (Design Phase) or Change Order (Construction Phase) estimating, providing estimates of cost and schedule impacts for proposed changes. See Section 5.5.1.c Design Period Scope Change Requests and Section 5.7.3.b Contract Modifications and Claims Analysis Support for information on these work products.

2. Cost Growth Report / Budget Analysis tracks changes in the project cost during design. The report highlights scope deviations at the component and the total project level, but it is reactive and not proactive approach to scope control, which is the responsibility of the Project Manager. See Section 5.5.1.b Cost Growth Report / *Budget Analysis* for more information.

(2) Schedule Related Requirements

(a) Schedule changes, like cost changes, are typically a response to scope changes, such as change in requirements for occupancy date. Schedule and Cost Management are interconnected. Time impacts for any proposed changes are part of Change Estimates. The Project Manager may rely on expertise from cost and schedule in the evaluation of Requests for Time Extension by assessing cost consequences to the project ensuing from the extension. Much of the guidance in Section 5.7.c **Cost Considerations** is relevant to assessing costs for Time Extension Requests.

(b) A few key categories focusing on schedule:

1. Duration is the primary issue. Changes that might compress the initial schedule or significantly increase the project scope without a commensurate change in duration typically result in significant cost changes since changes may require work intensity changes, overlap of work and / or other changes to means and methods.

2. Access. Access includes security change, available working hours, occupied / unoccupied, phasing requirements. Changes to access with or without adjustment to schedule result in additional costs.

(c) Directly related to the cost interaction, the major schedule issues are:

1. Duration

2. Intensity

3. Phasing

(d) The most important question regarding a schedule change is, "Does the change affect the critical path?" If it does, there basic options are:

1. Allow a schedule extension agreeing a new end date.

2. Require recovery to meet existing schedule.

3. Combination of extension and recovery.

(e) If the change does not affect the critical path, it can still affect site overhead costs.

(f) A comprehensive baseline schedule is essential to the managing the project costs. The Work Breakdown Structure must be comprehensive. It is essential to work with the Project Manager to assure a WBS that is not only comprehensive, but allows the project costs to be segregated appropriately.

(g) Using the baseline schedule, the Project Manager along with the Cost / Schedule Technical Leads will determine if the schedule is realistic and achievable. There will always be the necessity of aligning scope, schedule and cost during the design process to ensure that the project objectives can be achieved.

Section 7: Qualification and Ethics

1. Estimators

a. Requirements. Certification as a Certified Cost Professional (CCP) or a Certified Estimating Professional (CEP) by AACE International, or as a Certified Professional Estimator by the American Society of Professional Estimators (ASPE), is supporting evidence of an estimator's qualifications, although it is not required.

b. Internal Resources at PBS. For anyone internal to PBS, employee or contractor, they will be required to take OLU (On-Line University) training to gain certification for preparing estimates for GSA.

c. Ethics. The standards of practice described in the Canons of Ethics published by the AACE and the ASPE, and available on both their Web sites, apply to all estimating services defined in the P-120.

2. Schedulers

a. Requirements. A scheduling Certification by a recognized professional organization, such as Planning and Scheduling Professional (PSP) by AACE or PMI Scheduling Professional (PMI-SP)®, is supporting evidence of a scheduler's qualifications, although it is not required.

b. Ethics. The standards of practice described in the Canons of Ethics published by the AACE and the Code of Ethics and Professional Conduct published by PMI, and available on both their Web sites, apply to all scheduling services defined in the P-120.

3. Value Engineering Team Facilitators

a. Requirements. Certification as a Certified Value Specialist (CVS) as designated by SAVE International® or an equivalent certification by a recognized value analysis professional body is required to lead a value study.

b. Ethics.

(1) The Standards of Conduct available on the SAVE International® Web site applies to all value management services.

(2) Penalties: GSA contractors and employees are advised to be aware of 18 United States Code 1001, which deals with the False Statements Act.

Chapter 3: General Cost Management Principles and Requirements

Section 1: General Philosophy

1. Overview.

a. 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 life-stage must reflect costs that a prudent and experienced contractor would incur.

b. The P-120 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 established based on the prospectus in a Uniformat Level II, comparing cost growth and cost modifications for all Uniformat Level II elements through design, procurement, construction and project completion.

c. GSA requires a listing of known facts, construction tasks, and supplemental judgments that form the basis of the estimate at each stage of design. This documents that a realistic approach was used to calculate the estimate. It also serves to document the cost development history of project.

2. Understand the Purpose of the Cost Management Activity.

a. Cost Management as used in this document refers to a broad scope of activities that typically involve a costing activity. These exercises may support or be supported by other practice areas, such as schedule or value management.

b. The costing activity, typically a cost estimate, has different purposes:

(1) Screening, Selecting, Vetting – As GSA assesses various approaches high-level estimates support narrowing the possible approaches as costs and benefits of each option are evaluated. (Initiation Phase)

(2) Feasibility – Estimating supports the analysis of alternatives related to the selected approach. (Project Planning and Development Phase)

(3) Budget Authorization – Based on the selected alternative, prepare estimates to support budget requests and authorizations. The budget requested should be tightly aligned with the scope and schedule developed from the planning and development activities. The budget approved may be less than the budget requested.

(4) Control – Create a cost plan based on the approved budget. Estimating at key milestones provide checks against the budget and opportunity for corrective action. (Design Phase, Procurement Phase and Construction Phase)

c. It is important to understand the eventual consumers of the estimate. It must be structured and formatted to present clearly the key information for decisions that must be made.

Section 2: Universally Applicable Cost Management Core Principles

1. Design within Budget.

a. Unless otherwise specified in design-contract documents, the A-E must design the project so that construction costs will not exceed the funding limitations established as the Basis of Fee Negotiation. FAR 36.609-1 requires that the A-E redesign the project at the firm's own expense to ensure that a responsive construction bid amount will be within funding limitations.

b. The design within budget requirement puts cost on the same level as other design requirements. The use of Design-to-Cost Targets aid the design A-E team in achieving this requirement. Apportioning the budget at an appropriate level of the Work Breakdown Structure sets targets for the A-E firm that are more definitive.

2. A-E Coordination with Cost Consultants.

a. The architect-engineer (A-E) must work closely with their own estimator and any other cost consultants required by GSA to coordinate the estimates with design submissions and the scope of work, to review assumptions concerning exclusions and inclusions, and generally to ensure that the estimate reflects GSA's intent.

b. The A-E must provide all cost consultants required by the GSA with all required documentation to prepare acceptable cost management submittals as required for the particular program and project.

3. Cost Control Due Diligence.

a. GSA requires proper diligence in the preparation of estimates, which will grow steadily more detailed as the design progresses. This tracking of estimate progression, an essential element of cost control, uses the principles of a cost plan. It also recognizes the progressing detail through the project life-cycle. While the estimator may need to make many assumptions while preparing the concept design estimate, once the construction documents phase has begun, estimates will no longer contain major assumptions. The project team will designate one person to compare successive project estimates and prepare an orderly and comprehensive reconciliation.

b. A Cost Plan is a key first cost management step after receiving budget approval. However, if the requested budget was not funded fully, an exercise to align scope and schedule to the approved budget is required. The Cost Plan is the basis of the design-to-cost approach. It is essentially a series of Cost Plans for each lowest level Project Structure element that roll up to the project Cost Plan. A Cost Plan allocates the overall

budget to the various elements of the Work Breakdown Structure. For construction related elements, the Cost Plan will incorporate at least the top level of the appropriate Cost Breakdown Structure. (See Table 3-1. Estimate CBS and Detail Requirements – Prospectus Projects and Table 3-2. Estimate CBS ***and Detail Requirements – Non-Prospectus Projects*** for CBS requirements.)

(1) Cost Management requirements for each design submission establish a system that tracks the current estimate against the Cost Plan for each Project Structure element. This comparison to the budget and the last design submission estimate is the basis of the Cost Growth Report. It is required at all design submissions as it is an essential element of project Quality Control and Quality Assurance. Use the estimate tracking sheets (GSA Form 3474) for the Cost Plan and estimate tracking through design.

(2) All approved cost modifications are reflected in the Baseline Cost Plan. The Cost Plan continues to be updated throughout design, procurement, construction and project completion. The primary estimate CBS format may change as the project progresses and products have been defined.

(3) The space-type summary is usually required at various project phases as an element of scope control. For many small projects, space-type is not an appropriate scope control measure and other measures should be considered other than overall building areas.

(4) Internal estimate reviews, third party estimates and Independent Government Estimates are essential elements of the GSA project Quality Control. A final estimate is submitted after:

(a) GSA completes an internal review of the estimate

(b) Reconciling with a Third Party estimate

(c) Concluding a VE study

4. <u>Third Party Estimate.</u>

a. The Third Party Estimates (TPE) or Estimate Reviews are prepared by an independent professional cost estimator unaffiliated with the design firm and the Construction Manager as Constructor (CMc). A Third Party Estimate may be performed by the Construction Manager as Agent (CMa) for the Regional execution team.

b. To verify that the construction project's scope and cost are within budget, the Government requires:

(1) Third-Party Estimates for projects with Triage Tool rating of 4.

(2) Third Party Estimate Review of the A-E estimate for construction projects with Triage Tool rating of 3.

c. Central Office may perform **an additional** TPE on projects of more complex scope and higher risk and cost. The Central Office TPE must be completely independent of parties involved in the delivery of the project.

d. The Third Party estimator may perform a cost estimate review or a cost estimate.

(1) A cost review gives an expert opinion on the quality and accuracy of the A-E estimate. The focus of this quality control effort includes approach, completeness, assessing validity of assumptions and risk and reasonableness.

(2) A cost estimate must use the same WBS and estimate detail requirements of the A-E cost estimator. Its focus of this quality control effort is similar to the cost review, but has a greater focus on accuracy of the items quantified and priced.

e. The GSA Third Party estimators must have a thorough understanding of the marketplace in which the project is located, research market prices for general construction items and specialty items to prepare a cost review or cost estimate.

5. <u>Independent Government Estimate (IGE).</u>

a. The FAR requires that an Independent Government Estimate (IGE) be prepared for all contracts and requires a detailed IGE as defined in FAR Part 36 for all projects exceeding Simplified Acquisition Threshold.

b. An IGE is required prior to:

(1) Commitment of funds (for project funding)

(2) Contract Solicitation (for contract award).

c. FAR 36.203 requirements for the estimate used for construction contract award are:

(1) An independent Government estimate of construction costs shall be prepared and furnished to the contracting officer at the earliest practicable time for each proposed contract and for each contract modification anticipated to exceed the simplified acquisition threshold. <u>The contracting officer may require an estimate when the cost of required work is not anticipated to exceed the simplified acquisition threshold.</u> The estimate shall be prepared in as much detail as though the Government were competing for award.

(2) When two-step sealed bidding is used, the independent Government estimate shall be prepared when the contract requirements are definitized.

(3) Access to information concerning the Government estimate shall be limited to Government personnel whose official duties require knowledge of the estimate. An exception to this rule may be made during contract negotiations to allow the contracting officer to identify a specialized task and disclose the associated cost breakdown figures in the Government estimate, but only to the extent deemed necessary to arrive at a fair and reasonable price. The overall amount of the Government's estimate shall not be disclosed except as permitted by agency regulations.

d. The cost estimate submitted before planned construction contract action is used as the basis for the Independent Government Estimate (IGE), which the contracting officer uses to determine whether an offeror's proposed price is fair and reasonable and reflects an understanding of the project requirements. When a Third Party Estimate (TPE) is available, this may be deemed to be the IGE.

e. A qualified Government employee whose major responsibility (on fulltime basis) is creating or approving cost estimates for GSA **must sign and approve the IGE**, which serves as the basis for commitment of funds before the solicitation is issued.

6. Professional Services Fee Estimate Preparation.

a. The FAR 36.605 requires an Independent Government Estimate of the cost of architect-engineer services be furnished to the contracting officer.

b. All professional services cost proposals and Independent Government Estimates must use the GSA Forms 2630-14 and 2631-14. The reference instructions associated with 2630-14 and 2631-14 the forms must be followed.

7. Accurate Estimating.

a. Accurate estimating is essential to the success of GSA's cost management process, as well as an important decision-making tool for the design team in its selection of systems and materials.

Section 3: Activity Specific Principles

1. Prospectus Specific Core Principles.

a. In accordance with the Public Buildings Act of 1959 (PL 86-249), as amended, the United States Congress must authorize the scope and budget of each major capital construction project before design begins. Once Congress has approved a project's construction budget, it cannot be increased, so the design team must approach prospectus funding as an absolute limit.

b. Construction bids may be solicited only if the Estimated Cost of Construction (ECC) amount at final construction documents is within congressionally authorized prospectus limits. The ECC is equal to the sum of the ECCA, the Construction Contingency, and the allowance for Art-in-Architecture. The construction bids should no greater than the design to limit of the A-E contract (ECCA amount).

2. <u>Under Prospectus Specific Core Principles.</u>

a. Budget estimates shall be based on defined scope and include stipulated amount based on percentages directed by policy for design contingency and construction contingency. Budget estimates also include cost for professional services which may include design services, CMa services and commissioning services.

b. Control estimates are required during design phase to ensure projects are delivered within budget to agreed scope. Cost management submissions will be prepared meeting the requirements stipulated in this policy.

c. Construction bids may be solicited only if (1) the Estimated Total Project Cost (ETPC) is less than the prospectus level for any given year or (2) the IGE is less than or equal to the Design-to Cost budget. ETPC includes the ECC plus estimated design and review costs plus estimated management and inspection costs.

d. The independent government estimate for procurement must be in compliance with the applicable guidance found in the FAR.

3. <u>Leasing Specific Core Principles.</u>

a. The Lease Contracting Officer may use tools and information such as the Pricing Cost Planning Guide (PCPG), an IGE if available, and/ or pricing history to validate cost and pricing data. In the absence of competitive bids for TI work, the price analysis should be based on an IGE. IGEs for TI and, if applicable, BSAC work may be prepared by technical resources, either in-house or contracted, such as qualified estimators, or construction managers independent of acquisition. The Lease Contracting Officer uses the IGE to evaluate bids and negotiate their price, in the absence of competitive bids or reliable comparative cost and pricing data. The IGE is prepared following the procedures defined in this document. The Lessor’s bid is submitted via the TICS table format, to ensure a consistent basis for comparison. The Lease Contracting Officer analyzes the bid against the IGE to identify and reconcile major differences.

b. The lessor, at either the request or approval of the Lease Contracting officer, submits only one general contractor bid and one subcontractor bid for each trade. This approach may be considered only when competition is not available; or seeking further

competition would unduly slow the process; or seeking further competition is otherwise not in the best interests of the Government.

(1) However, in any of these cases, an IGE may nevertheless be prepared if the Lease Contracting Officer deems one needed.

(2) Lease Contracting Officer may request a proposal review by an estimator may also be conducted.

c. An oversight in the Lessor's preparation of TI pricing does not constitute a change in costs to the Government.

d. When a change is initiated by GSA, it is generally on behalf of the client agency and usually the result of a refinement of the agency's mission, or a change in requirements. The scope of the change must be clearly written and provided to the Lessor for pricing. It may be necessary to require the Lessor to provide drawings or other submittals sufficient for GSA to determine that a meeting of the minds has been achieved regarding the change desired.

e. A change order is a written order by a project owner directing the contractor to change contract amount, requirements, or time. Such changes must be within the scope of the contract and in accordance with the contract's changes clause to be legally implemented without the consent of the contractor.

f. Estimating efforts address the capital cost / equivalent capital cost as represented in the program of requirements. The estimates follow the Prospectus or Under Prospectus core principles as appropriate for project cost. The prospectus threshold for leasing projects is net annual rent equal to 50% of the prospectus threshold of owned projects.

g. In accordance with OMB Directive A-11, the Lease Scoring process is required for all leases to determine whether they are considered capital or operating leases. Conventional cost modeling efforts are applied in the scoring process to determine the fair market value of construction of the leased facility. The fair market value will be applied in the scoring process.

h. For additional procedural guidance, see the Leasing Desk Guide.

Section 4: General Cost Management Requirements

1. <u>Scope and Degree of Detail.</u> The estimate must include all elements of the proposed project work (including all professional services contract modifications, such as design), regardless of the phase. Where costs are included for details not indicated on the drawings and specifications, the estimator must include design assumptions to

complete the scope. The estimator must check all cost-estimate calculations for accuracy and completeness, including assessing whether estimates completely and accurately represent design features and quantities.

2. Unit Pricing.

a. GSA requires unit-price cost estimates unless otherwise stated. Unit-price cost estimates are developed by adding up the direct costs of materials and supplies, labor, and equipment for each individual task of work. The basis for these unit costs must be well documented and included in the supporting data of the estimate. For construction estimates, add applicable indirect costs, such as overhead and profit at a subcontractor level, to these direct costs to reflect the in-place construction cost per unit of work required.

(1) Lump-sum pricing is not acceptable without description and quantification.

(2) Lump sum pricing components summed together shall not equate more than 10% of the total estimated cost.

(3) For estimates prepared during Project Initiation and Project Planning and Development phases, it is acceptable to use unit prices combining labor, materials, and equipment costs in a single figure.

(4) For concept design and design development estimates, it is acceptable to use unit prices combining labor, materials, and equipment costs in a single figure.

(5) Other Design Phase estimates and Construction Phase estimates require separate labor, material, and equipment unit pricing.

b. Items that are a significant percentage of the total project's cost require the greatest estimating effort. For such items, indirect costs and other markups associated with each task or work item must be separately identified and considered. On a project-by-project basis, GSA requires quotes from suppliers or specialty contractors to document the costs of such major items, and the estimator must be prepared to discuss them with GSA.

c. Documentation of unit-price data for smaller items could include price quotes, audits, catalog cuts, and historical costs to clarify price bases and assumptions made when other information is not available. The estimator provides a general statement describing the sources of unit costs and quantities used for each cost division or category, but individual source references for each itemized cost element are not required.

3. Bid Options / Alternates. The A-E is required to proposed Bid Options / Alternates if the Design-to-Cost Limit (ECCA) is above budget limitation. The proposed Bid Options

/ Alternates must reduce the ECCA to 10 percent below the budget limitation. When Bid Options / Alternates are used in the project, separate cost estimates for the base bid and for each individual option or alternate are required. The estimates must follow the required project WBS.

4. Reviewing and Reconciling Estimates.

a. As for all submittal documents, GSA requires a thorough review and acceptance of the cost management submittal of an A-E deliverable as part of a quality control process. After GSA completes an internal review of the estimate, a final estimate addressing GSA comments is submitted.

b. When GSA requires the preparation of a Third Party Estimate, i.e. TPE, or an Independent Government Estimate, i.e. IGE, the A-E is responsible for designating a member of its team to reconcile the TPE or IGE with its own estimate in an orderly and comprehensive manner. A final estimate reflecting the reconciled estimate is submitted. If the policy and criteria defined in this document is followed, the multiple estimates will be prepared following the same order, breakdown and methodology.

5. Benchmarking. Benchmarking may be required to assess and verify the cost of a project by reference to established costs for similar facilities. GSA has access to a number of tools useful to estimators involved in benchmarking.

6. Historic Cost Database. GSA uses cost data collected for similar building types to develop space-type cost benchmark tools to improve budget development for future projects. Therefore, GSA's regional project manager provides cost estimates, reconciled estimates, bid analysis, and construction cost reconciling back to the bid estimate to the regional cost advocate or Central Office cost management staff to compile this data into GSA's cost database.

Section 5: Using Cost Breakdown Structures (CBS)

1. Using the Proper Cost Breakdown Structures (CBS).

a. PBS uses three primary Cost Breakdown Structures (CBS) for construction estimates.

(1) GSA IRIS

(2) ASTM Uniformat

(3) CSI MasterFormat

b. Each has its proper use and application. The project estimate may use one CBS and the estimate summary may use another. Table 3-1. Estimate CBS and Detail Requirements – Prospectus Projects or Table 3-2. Estimate CBS and Detail Requirements – Non-Prospectus Projects for details when each CBS type is used. Appendix C: Cost Breakdown Structures (CBS) defines the formats.

Table 3-1. Estimate CBS and Detail Requirements – Prospectus Projects (Owned and Leased)

Estimate CBS and Detail Requirements – Prospectus Projects (Owned and Leased)					
Project Phase	**Estimate CBS**	**Estimate Level**		**Estimate Basis**	**Notes**
		Detail	**Summary**		
Planning (Work Items, Studies)	IRIS	2	1	Parameter and Quantification Historical	3, 4
Feasibility Study – 50%, 90% & 100%	IRIS	2	1	Parameter and Quantification Historical	1, 3, 4
	Space types and Uniformat II	3	2		
Program Development Study – 50%, 90% & 100%	IRIS	2	1	Parameter and Quantification	1, 4
	Uniformat II	3	2		
Concept Design - Preliminary	IRIS	3	1	Parameter and Quantification	1, 4
	Uniformat II	3	2		
Concept Design – Draft Final & Final	IRIS	3	1	Parameter and Quantification	1, 4
	Uniformat II	4	2		
Concept Design - Field Investigation Report					
Design Development - Draft	IRIS	3	2	Parameter and Quantification	1, 2, 4, 6, 7, 8
	Uniformat II	5	3		
	MasterFormat	5	3		
Design Development - Final	IRIS	N/A	2	Quantification and Parameter	1, 2, 5, 6, 7, 8
	Uniformat II	5	3		
	MasterFormat	5	3		
DiD Submission					

75% CD	IRIS	N/A	2	Quantification	1, 2, 5, 6, 7, 9
	Uniformat II	N/A	3		
	MasterFormat	6	3		
90% & 100% CD	IRIS	N/A	2	Quantification	1, 2, 5, 6, 7, 9
	Uniformat II	N/A	3		
	MasterFormat	6	3		
Post-Award Bid Analysis	IRIS	2	1	Parameter	1, 10
	Uniformat II	3	2		

Note 1. Uniformat II refers to Uniformat II classification system in accordance with ASTM Standard E-1557-09. The ASTM standard classification only provides Levels 1 through 4. Refer to GSA FACTS for Levels required beyond Level 4.

Note 2: MasterFormat refers to the Construction Specifications Institute (CSI) classification system.

Note 3. Where alteration estimates are not appropriate, the Feasibility Study should cite cost-per-square-foot estimates (UNIFORMAT II, Level 3) or other reliable estimates based on prior studies (e.g., BERs, seismic, hazardous material studies).

Note 4. Unit prices labor, materials, and equipment costs combined in a single figure is acceptable.

Note 5. Unit prices are broken down into labor, materials, and equipment.

Note 6. If the detailed drawings and outline specifications are available, use CSI MasterFormat for detail estimate in lieu of Uniformat II.

Note 7. The summary of the cost estimate in CSI MasterFormat corresponds to Uniformat II Level 3.

Note 8: The minimum level of detail for the CSI MasterFormat cost estimate corresponds with GSA FACTS Level 5. Provide the MasterFormat cost estimate at the greatest detail that the drawings and specifications will support.

Note 9. The level of detail for the CSI MasterFormat cost estimate corresponds with GSA FACTS Level 6.

Note 10: Complete GSA Form 3472 with results of analysis and submit to the Regional and Central Office.

Table 3-2. Estimate CBS and Detail Requirements – Non-Prospectus Projects (Owned and Leased)

Estimate CBS and Detail Requirements – Non-Prospectus Projects (Owned and Leased)					
Project Phase	**Estimate CBS**	**Estimate Level**		**Estimate Basis**	**Notes**
		Detail	**Summary**		
Planning (Work Items, Studies)	IRIS	2	1	Parameter and Quantification Historical	3, 4
Feasibility Study – 50%, 90% & 100%					
Program Development Study – 50%, 90% & 100%					
Concept Design - Preliminary	IRIS	3	1	Parameter and Quantification	1, 4
	Uniformat II	3	2		
Concept Design – Draft Final & Final	Uniformat II	4	2	Parameter and Quantification	1, 4
Concept Design - Field Investigation Report	IRIS	3	2	Parameter and Quantification Historical	3, 4
Design Development - Draft	IRIS	3	2	Parameter and Quantification	1, 2, 4, 6, 7, 8
	Uniformat II	5	3		
	MasterFormat	5	3		
Design Development - Final	IRIS	N/A	2	Quantification and Parameter	1, 2, 5, 6, 7, 8
	Uniformat II	5	3		
	MasterFormat	5	3		
DiD Submission	IRIS	3	2	Quantification and Parameter	11
	Uniformat II	5	3		
	MasterFormat	5	3		

75% CD	IRIS	N/A	2	Quantification	1, 2, 5, 6, 7, 9
	Uniformat II	N/A	3		
	MasterFormat	6	3		
90% & 100% CD	IRIS	N/A	2	Quantification	1, 2, 5, 6, 7, 9
	Uniformat II	N/A	3		
	MasterFormat	6	3		
Post-Award Bid Analysis	IRIS	2	1	Parameter	1, 10
	Uniformat II	3	2		

Note 1. Uniformat II refers to Uniformat II classification system in accordance with ASTM Standard E-1557-09. The ASTM standard classification only provides Levels 1 through 4. Refer to GSA FACTS for Levels required beyond Level 4.

Note 2: MasterFormat refers to the Construction Specifications Institute (CSI) classification system.

Note 3. Where alteration estimates are not appropriate, the Feasibility Study should cite cost-per-square-foot estimates (UNIFORMAT II, Level 3) or other reliable estimates based on prior studies (e.g., BERs, seismic, hazardous material studies).

Note 4. Unit prices labor, materials, and equipment costs combined in a single figure is acceptable.

Note 5. Unit prices are broken down into labor, materials, and equipment.

Note 6. If the detailed drawings and outline specifications are available, use CSI MasterFormat for detail estimate in lieu of Uniformat II.

Note 7. The summary of the cost estimate in CSI MasterFormat corresponds to Uniformat II Level 3.

Note 8: The minimum level of detail for the CSI MasterFormat cost estimate corresponds with GSA FACTS Level 5. Provide the MasterFormat cost estimate at the greatest detail that the drawings and specifications will support.

Note 9. The level of detail for the CSI MasterFormat cost estimate corresponds with GSA FACTS Level 6.

Note 10: Complete GSA Form 3472 with results of analysis and submit to the Regional and Central Office.

Note 11: DiD Submission applies only to leases.

Table 3-3. Estimate Characteristics by Project Phase

Estimate Characteristics by Project Phase									
Project Life Cycle Phase (Notes 1, 2)	**Est. Class (Note 3)**	**Degree of Project Definition (Note 4)**		**Purpose of Estimate (Note 5)**	**Estimating Method (Note 6)**	**Expected Accuracy Range (Note 7)**			
						New Const.		**Repair & Alter.**	
		New Const	**Repair & Alter**			**Min.**	**Max.**	**Min.**	**Max.**
Pre-Planning/ Initiation Phase	5	1%	1%	Screening	Stochastic or Judgement	-15%	25%	-20%	30%
Planning/ Development									
Feasibility/ Annual Planning	5, 4	2%	2%	Screening, Feasibility, or Budget Authorization	Primarily Stochastic	-13%	22%	-17%	26%
PDS/ Planning	4	5%	4%	Feasibility or Budget Authorization	Primarily Stochastic	-11%	20%	-15%	24%
Design Phase									
Concept	4, 3	13%	10%	Control	Mixed, but Primarily Stochastic	-10%	18%	-13%	22%
Design Development	3	28%	25%	Control	Mixed	-8%	15%	-11%	18%
75% Construction	2	67%	65%	Control	Primarily Deterministic	-7%	11%	-9%	13%

Doc.									
90% Construction Doc.	1	82%	78%	Control	Deterministic	-6%	10%	-8%	12%
100% Construction Doc.	1	92%	89%	Control	Deterministic	-5%	9%	-7%	11%
Procurement Phase	1	93%	90%	Check Estimate	Deterministic	-3%	7%	-4%	9%
Construction / Close Out Phase	1	100%	100%	Check Estimate	Deterministic	-1%	2%	-2%	3%

Notes:

1) Life Cycle Phases Range from Pre-Project Planning to Project Close-Out
2) Phases based on all Construction Programs (BA 51, BA 53, BA 54, BA 55, BA 61 funded, BA 64, and BA 80)
3) Estimate Class based on ASTM E2516-11
   a. Based primarily on Degree of Project Definition Completion
   b. Based secondarily on the following:
      i. Estimate Purpose
      ii. Estimating Method
      iii. Expected Accuracy Range
4) Project Definition
   a. Inclusive of total project, from inception to construction close out
   b. Percentages are approximations, based on the following
      i. Project Magnitude
      ii. Project Complexity
      iii. Quality of project scope
      iv. Project uncertainties, including scoping, acquisition strategies, etc.

Notes (Continued)

5) Purpose of Estimate
   a. Screening - A systematic assessment done to detect projects w/ the most wanted attributes
   b. Feasibility - Determination of technical and economic viability of project
   c. Budget Authorization - Provided in order to obtain funding for project evaluated and scoped
   d. Control - Ensures project delivered successfully w/in scope and budget
   e. Check Estimate - Provides basis of contract negotiation and award
6) Estimating Methods
   a. Stochastic - Based on Cost-Estimating-Relationship Modeling programs such as the Project Cost Planning Guide (PCPG). Based on technical parameters and scope definition
   b. Deterministic - Based on straightforward counts or measures of units of items multiplied by known factors and/or unit costs. Requires better defined products within project documents
   c. Any combination of Stochastic and Deterministic methods may be found in any given estimate class
7) Accuracy Ranges based on the following, primarily:
   a. Project Magnitude and Complexity
   b. Acquisition Strategies
   c. Market Variabilities
   d. Quality of assumptions used in preparing the estimate
   e. Experience and skill level of the estimator

2. Common Elements for the CBS.

a. Allowances, Contingencies and Reserves.

(1) In preparing budgets and estimates for construction projects and programs it is necessary to include a provision for monies to cover unknown or unforeseen circumstances and risks. PBS cost management practices follow the guidance set forth in ASTM E2168 Standard Classification for Allowance, Contingency, and Reserve Sums in Building Construction Estimating. These terms are defined in **Error! Reference source not found.**. A few key principles are:

(a) Allowances are used for planned project items until they can be better defined. They are part of the construction estimate.

(b) Contingencies are used for unintended, not directly controllable project occurrences. They are part of the project estimate.

(c) Reserves are held by management for unforeseen changes in project requirements. They are part of the program estimate.

(2) GSA specifies common CBS elements that are allowances or contingencies. They are standard regardless of the Cost Breakdown Structure applied. Some items in the following list are not applicable to all programs; the exceptions are noted.

(a) Phasing Allowance – Allowance for premium cost for multi-phase versus single phase work. To be included in the CBS when phasing is used.

(b) Design Contingency – Contingency covering costs that may result from incomplete design, unforeseen and unpredictable conditions, or uncertainties concerning project scope.

(c) General Conditions and Profit – The General Contractor’s general conditions, bonds, insurance, and corporate overhead and profit.

(d) Escalation – The anticipated increase in the project’s cost due to inflation between the time the estimate is prepared and when the project is finished, since inflation continues during project construction.

(e) Construction Contingency – This contingency is an allowance for cost growth that may occur during construction as a result of unexpected circumstances or incomplete design documents.

(f) Art-in-Architecture – The Art-In-Architecture allowance is for new construction and major modernization projects only.

(3) GSA has a standard way to apply these common CBS elements to project costs summarized using the WBS, which is demonstrated in Table 3-4. Calculation of Common CBS Elements.

Table 3-4. Calculation of Common CBS Elements

Calculation of Common CBS Elements			
Code	**Construction Cost Elements**	**Element Calculation**	**Total Calculation**
A	**Subtotal Direct Costs**		
B	Contingency – Unknown Site/Design	A ($) x B (%)	
C	Subtotal		A + B
D	General Conditions & Profit	C ($) x D (%)	
E	Current Estimated Construction Contract Award		C + D
F	Escalation to Award Date	E ($) x F (%)	
G	**Estimated Construction Cost at Award (ECCA)**		E + F
H	Construction Contingency	G ($) x H (%)	
I	**Estimated Construction Cost (ECC')** 1		G + H
J	Art-in-Architecture	I ($) x J (%)	
K	**Estimated Construction Cost (ECC)** 2		I + J
L	EDRC	$	
M	EMIC	$	
N	Estimated Site Cost (ESC)	$	
O	**Estimated Total Project Cost (ETPC)**		K + L + M + N

b. <u>Site and Design Contingencies.</u>

(1) Contingencies are an integral part of the total estimated costs of a project and cover costs that may result from incomplete design, unforeseen and unpredictable conditions, or uncertainties concerning project scope. The amount of the contingency will depend on the status of design, procurement, and construction, as well as the complexity and uncertainties of the component parts of the project. Contingency is not to be used to avoid making an accurate assessment of expected cost. GSA may choose to set aside separate contingencies for major schedule changes, unknown design factors, unanticipated regulatory standards or changes, additions to project scope, force majeure situations, or congressional budget cuts.

(2) Allowances and Contingencies must always be separately identified so that the magnitude of a contingency's impact is clear. For example, the estimator may never add an allowance or contingency by concealing it within unit pricing or quantity estimates or takeoffs.

Table 3-5. Guidelines for Standard Site and Design Contingencies

Guidelines for Standard Site and Design Contingencies				
	Capital		Non- Capital	
Estimate Category	New Construction	R&A	Simple Projects	Complex Projects
Planning and Development	10%	10%	10%	15%
Concept Design	7.5% - 10%	10% - 15%	7.5% - 10%	10% - 15%
Design Development	5% - 7.5%	7.5% - 10%	5% - 7.5%	7.5% - 10%
75% Construction Documents	2% - 5%	3.5% - 7.5%	2% - 5%	5% - 7.5%
90% Construction Documents	1% - 3%	1.5% - 3.5%	1% - 3%	2.5% - 4.5%
Final Construction Documents	0%	0%	0%	0%

c. General Conditions and Profit. ASTM E2085 Standard Classification for Building Construction Field Requirement, and Overhead & Profit provides guidance for the common CBS elements typically referred to as General Conditions and Profit. Refer to Appendix C.1 ASTM Uniformat II. Estimate requirements for General Conditions and Profit vary by project life-cycle phase, but begin as single percentage allowance.

(1) Initiation Phase, Planning & Development Phase, and Concept Design of Design Phase. A percentage allowance – an overall percentage allowance for the General Contractor's general conditions, bonds, insurance, and corporate overhead and profit – is appropriate if the project involves no unusual coordination, site preparation, or specialized support services.

(2) Design Development and Construction Documents of Design Phase, Construction Phase and Close-Out Phase. It is appropriate to estimate these costs with two breakdowns:

(a) General Conditions: Comprised of itemized general requirements and job-site supervision.

(b) Mark-Ups: Comprised of general and administrative costs (including state and local taxes), profit, bonds, and insurance.

d. Escalation Allowance. Escalation allowance in the estimate is the anticipated increase in the project's cost due to inflation between the time the estimate is prepared and when the project is finished, since inflation continues during project construction. For simplicity, the estimator must assume that half of the work will occur before the midpoint of construction and half after. Therefore, escalate the estimate to the midpoint of construction to reflect the contractor's provision for inflation in its bid. The Market

Study prepared for the project estimate submission shall be a primary data source determining an appropriate escalation allowance.

(1) Initiation Phase and Planning & Development Phase. Use escalation rates are taken from the PCPG during these early project life-cycle phases.

(2) Design Phase. As the design progresses, the A-E and GSA must agree on an annual construction cost escalation compounding rate, based on a market study prepared by the A-E, for use in all design estimates and cost analyses. It is the responsibility of the design A-E to control the cost of the project so that when the ECCA budget is reduced by the forecasted escalation rate, the residual budget amount equals the current value of the project.

e. Construction Contingency. The construction contingency is an allowance for cost impact of changes that may occur during construction as a result of unexpected circumstances or incomplete design documents. Any cost impacts resulting from scope change must be accommodated by approved revisions to the project funding and not through the use of construction contingency. Table 3-6. Construction Contingency lists the construction contingency levels stipulated by this policy. The construction contingency is not included in the ECCA. The percentages stated in the table are applied to the ECCA to determine the appropriate construction contingency amount.

Table 3-6. Construction Contingency

Construction Contingency	Percent
New Capital Construction, Capital	7%
Modernization. Capital	10%
Limited Scope Repair and Alteration, Capital	10%
Complex Repair and Alteration, Non-Capital	10%
Simple Repair and Alteration, Non-Capital	10%

f. Art-in-Architecture. The Art-In-Architecture set aside amount is 0.5% of ECC for new construction and major modernization projects.

Section 6: Summary of Cost Estimate Submittal Requirements

1. Cost estimate reports provided at various stages of the planning and design process must include all the cost management activities required for the submittal. The requirements must be in compliance with GSA document P-120, PBS Cost and Schedule Management Policy and with technical clarification from the GSA Cost Management staff.

2. When the P-120 refers to a cost estimate report, it includes the following elements, unless specifically excluded, in the sequence shown:

a. Executive summary

b. Basis of estimate

c. GSA Report 3474 (Cost Plan)

d. GSA Report 3473 (Cost Summary)

e. Summary Reports (Cost estimate reports must be reported in an electronic spreadsheet format.)

f. Detailed line item cost reports (Cost estimate reports must be reported in an electronic spreadsheet format.)

g. Quantity Take Off / Calculation Report (Backup worksheets)

h. Prime Contractor Report (as Appendix)

i. Subcontractors Report (as Appendix)

j. GSA Form 3472 (Cost Growth) (as Appendix)

k. Design to Cost Requirements Report (as Appendix)

l. GSA Cost Estimating Workbook (as Appendix)

m. Market Study (as Appendix)

n. Sensitivity Analysis (as Appendix)

o. Risk Analysis Report (as Appendix)

p. Life-Cycle Cost Analysis Report (as Appendix)

3. Based upon project requirements, the Government requires cost management submissions as shown in Table 3-7. Overview of Cost Estimate Submission Requirements.

a. For the impacts of complexity, magnitude and delivery methods for various Budget Activities refer to specific requirements in Chapter 6.

b. The Government may require preparation of a cost estimate by one or more of the following entities: A-E Estimator, Third Party Estimator or in-house estimator.

Table 3-7. Overview of Cost Estimate Submission Requirements

Overview of Cost Estimate Submission Requirements		
Capital Projects	**Non-Capital Projects**	**Leasing Projects**
• Building Evaluation Reports (BER) • Special Studies • 50% Feasibility study • 90% Feasibility study • 100% Feasibility study • 50% Program Development Study • 90% Program Development Study • 100% Program Development Study • Preliminary concept design stage with multiple schemes of design • Concept design preceding VE Study • Final concept design • Design development documents preceding VE Study • Final design development documents • 75% Construction documents • 90% Construction documents • 100% Construction documents • Post-award bid analysis • RFIs & Change Orders	• Building Evaluation Reports (BER) • Special Studies • Annual Projects Work Plan • Field Investigation Report • Design development documents • 75% Construction documents • 90% Construction documents • 100% Construction documents • Post-award bid analysis • RFIs & Change Orders	• Client Requests • Feasibility Study for Lease Prospectus • Request for Lease Proposal • Preliminary concept design stage with multiple schemes of design • Final concept design • DiD or Final design development documents • 75% Construction documents • 90% Construction documents • 100% Construction documents • Post-award bid analysis • RFIs & Change Orders

4. Table 3-8 shows the components of a cost management deliverable for any submission during the pre-construction life-cycle of a project.

Table 3-8. Components of a Cost Management Deliverable

Components of a Cost Management Deliverable								
Legend: **R – Required** **O – Optional**	Initiation Phase	Feasibility Study	Program Development Study	Concept Design	Design Development	Construction Documents	Post Award Bid Analysis	RFIs / Change Orders
Executive Summary with budget analysis	R	R	R	R	R	R		R
Basis of Estimate (rationale, assumptions, etc.)	R	R	R	R	R	R		R
Summary Estimate Report	R	R	R	R	R	R		O
Detailed Estimate Report	R	R	R	R	R	R		R
Quantity Take Off / Calculation Report (Backup worksheets)	O	O	O	O	O	O		O
Prime Contractor Report		R	R	R	R	R		R
Subcontractors Report						R		R
Design to Cost Requirements Report				R	R	R		
GSA Form 3472 (Cost Growth)							R	
GSA Form 3473 (Cost Summary)				R	R	R	R	
GSA Form 3474 (Cost Plan)				R	R	R	R	
GSA Cost Estimating Workbook	R	R	R	R	R	R		
Market Study		R	R	R	R	R		O
Risk Analysis Report		R	R	R	R	R		O
Life-Cycle Cost Analysis Report		R	R	R	R	R		O
Sensitivity Analysis Report	R	R	R	R	R	R		O
Estimate review or Estimate Reconciliation				R	R	R		
Database information preparation							R	

Notes:
1. The Core components of a Cost Estimate include: Executive Summary, Basis of Estimate, Summary Estimate, and Detailed Estimate.
2. Historical cost database information preparation is required as part of the post-award bid analysis requirements.

5. In addition to cost estimating, cost management activities may include:

a. Estimating associated with value engineering studies.

b. Various analyses as requested during construction and close-out, i.e., Value engineering change proposal analysis (VECP).

Section 7: Cost Management Tools

1. Cost Estimating Systems. GSA PBS requires internal personnel and contract employees governed by GSA PBS IT policy to use approved internal national cost estimating applications. GSA encourages, but does not require, professional services contractors to use any specific computer-based estimating programs to prepare cost estimates for submission. However, cost management submittals require more than cost estimates and include other requirements stipulated elsewhere in this policy document.

2. GSA National Cost Management Toolbox

a. Overview.

(1) PBS has implemented a national initiative known as the National Cost Management Toolbox (NCMT) in order to serve as a standardization of tools, processes and procedures for Cost Management. The NCMT application includes, but is not limited to, the Project Cost Planning Guide, and Professional Services Fee Estimating Guide. In addition, the NCMT is intended to be of open design allowing for 1) an integrated historical design and construction cost database, 2) a planned future module for preparing detailed line-item cost estimates for professional services, and 3) a planned future module for preparing detailed line item cost estimates for construction projects and building operations and maintenance. The Project Cost Planning Guide (PCPG) and the Professional Services Fee Estimating Guide are each being converted from stand-alone Excel-based cost modeling systems to the National Cost Management Toolbox (a web-based application), and will serve as the primary source for PBS to apply for preparing design and construction budgets, preparing cost targets, as well as determining fair market values required for scoring leases, as well as other cost management-related functionalities. The NCMT will apply to new construction, repair, alteration and space renovation of the many types of owned and leased buildings, functional areas, common areas, sitework and work items considered in scoping, budgeting and executing design, construction and facility maintenance projects within the PBS organization.

(2) ODC is in need of a new consolidated cost management tool that would allow for PBS to develop cost plans and cost estimates throughout the lifecycle of a building asset. The system must include the following major phases for design and construction:

(a) Planning Phase

(b) Design Phase

(c) Construction Phase

(d) Building Operations Phase

(e) Maintenance and repair

(3) The scope of work is to include the automation and integration of two Microsoft Excel®-based systems currently in use through the cost planning process at PBS. The first is the Project Cost Planning Guide (PCPG), while the second is the Professional Services Fee Estimating Tool. Usernames and passwords for MS Excel models will be furnished upon request.

b. Cost Estimating Workbook (CEW). The CEW was designed for programming, pre-design and concept phase estimates. Applications may include BERs, feasibility and program development studies, and early design phase control estimates.

c. 2630-14 and 2631-14 Professional Services Fees. Forms required for estimating Professional Services Fees. 2630-14 is the detail estimate and 2631-14 is the summary.

d. Professional Services Fee Estimating Guide (PSFG) – PBS Specific. The PSFG is used internally by PBS for establishing budgets and preparing detailed cost estimates for professional services required during Pre-Design, Design, Construction and Post Construction Phases on all types of Design and Construction projects to be planned and executed at GSA, PBS. The PSFG is also used by professional services consultants (A-E, CMa, commissioning agent, etc.) for preparing and submitting detailed fee proposals.

e. Project Cost Planning Guide (PCPG). The Project Cost Planning Guide (PCPG) provides the process to be followed in establishing planning phase cost plans and cost evaluations for new construction, space renovation, repair, alteration and modernization projects throughout the GSA, PBS portfolio. It also provides a means for the PBS to conduct reviews of cost estimate submissions, as well as assessing various alignments of cost and project scope elements.

f. Network Applications for Detailed Cost Estimating. Network cost estimating applications provide the capabilities for preparing the detailed construction estimates

required for projects that are in the later design phases (final design development phase and construction documents phase), procurement phase and construction phase.

Chapter 4: Adjunct Practices

Section 1: General

1. A sound cost estimate relies on adjunct practices to inform the estimating team and help explain important cost related aspects to the project management team. Adjunct practices help ensure that estimates are credible and accurate.

2. The level of effort required for the adjunct practices that support the cost estimate is set by the Triage score. The triage score will not alter the basic requirement to prepare the cost estimate deliverable.

Section 2: Market Study

1. Guiding Principles. A market study is essential to provide a cost estimate that will reflect anticipated bids. It explores all factors influencing construction costs appropriate for the current design stage. It is the responsibility of the A-E to conduct the market study. The market study will:

a. Inform the project team of any project market related risks to consider in risk management.

b. Assist the cost estimator in understanding of market competition, availability of labor and materials, and site accessibility.

c. Assist the cost estimator in developing the cost escalation to use when preparing the estimate.

2. General Requirements.

a. GSA requires that the A-E prepare a market analysis for every project and for each submission as indicated in the Tasking Matrices (Table 5-1. Summary of Estimating Delivery Requirements - New Construction and Table 5-2. Summary of Estimating Delivery Requirements – Renovation, Alteration and Modernization). A Market Study Report will document the research, findings and recommendations of a market analysis.

b. The Market Study is fundamental to establishing appropriate escalation rates and understanding specific risks the project faces in the local market. Information collected may be useful for schedule management activities.

c. There are five Market Study Classes, corresponding with the five levels of cost estimates. The primary distinguishing characteristic between them is level of investigation and effort. Class distinctions allow tailoring the market study effort to the project stage, size and / or complexity. The Class 5 Market Study requires the least

effort and a Class 1 Market Study is the most intensive effort. The project Triage rating may alter requirements for a Market Study. The specific Market Study requirements for a project will be set by the GSA Project Manager prior to advertising for design services.

d. The final estimate must incorporate the conclusions of last Market Study. The estimate will reflect the current bidding climate, including information on the expected number of bidders for general and subcontractors, the amount of competition among contractors, and other conditions that may have an impact on the construction project.

e. GSA's Third Party Estimator must have a thorough understanding of the marketplace in which the project is located. The Market Study report is shared with the Third Party Estimator, who may elect to check and validate aspects of the report when using it.

3. Market Study Classes. A market study will use a variety of sources to collect pertinent data. The Class of the Market Study will influence the sources consulted for the market analysis. It is essential that the sources used have knowledge of construction in the area. It explores all factors influencing construction costs relevant to the current project stage as the Class may dictate.

a. Class 5 Market Study. The Class 5 Market Study is essentially an Internet search. A variety of on-line sources, such as CMD Heat Map, should be used to develop a supportable understanding of the existing market and expectations at the time of project bid.

b. Class 4 Market Study. The Class 4 Market Study begins telephone conversations (and email) with local sources that are information aggregators, such as code officials, bank loan officers Chamber of Commerce. Reassess information gathered from a Class 5 analysis. Use this deeper analysis to develop a better understanding of possible conditions at the time of project bid.

c. Class 3 Market Study. The Class 3 Market Study expands telephone contacts (and email) to industry information sources consulted to include sources such as designers, contractors, subcontractors, long-lead and key material suppliers. The effort includes revisiting some of the previous contacts assess if their views have changed. This analysis should more realistically discover and highlight any potential issues related to specific trade subcontractor interest, labor issues and material supply difficulties.

d. Class 2 Market Study. The Class 2 Market Study continues the telephone (and email) contacts, but broadens discussions to include material suppliers. It includes logistics considerations. It refreshes the information from previous Market Studies as appropriate.

e. Class 1 Market Study. For a Class 1 Market Study the survey process intensifies with site visits and in-person interviews. The Class 1 Market Study reports all pertinent data gathered from previous reports. The report clearly depicts the likely

bidding market, other projects likely to be on the market, and how hungry the market is likely to be at the scheduled time of bid. Note that at the time of the final Market Study required for the project, the CMa will be promoting the project within the construction industry to develop interest for good competition.

Table 4-1. Market Study Requirements by Triage Score

Market Study Requirements by Triage Score					
		Triage Tool Score			
Phase	**Sub-Phase**	**1**	**2**	**3**	**4**
Planning & Development	Annual Work Plan when less than Simplified Acquisition level	-	-	-	-
	All Others	5	5	5	5
Design	Concept – Preliminary	5	4	4	4
	Concept – All Others	5	4	4	3
	Design Development – Pre-VE	5	3	3	3
	Design Development – All Others	5	3	3	2
	Construction Documents – 75%	5	3	2	2
	Construction Documents – 90% & 100%	5	2	2	1
Procurement & Construction	All	5	2	2	2

4. <u>Market Study Documentation Expectations.</u>

a. The Market Study preparer gathers pertinent data as prescribed for the Class. In Classes using interviews of local firms, they must have knowledge of construction in the area. Particular emphasis must be placed on ascertaining the availability of mechanical and electrical subcontractors and the associated skilled labor trades.

b. The Market Study report is part of the complete estimate submission. Its summary gives a market assessment with specific recommendations. It must reflect recent and expected bidding conditions that may influence the cost of construction and list all sources of data. The Market Study includes documentation of all sources:

(1) Who was contacted (person, firm, phone, e-mail, web URL).

(2) Where they are located.

(3) When contact was made.

(4) Why they were contacted.

(5) What information was obtained.

c. Sources may include, but are not limited to:

(1) Publishers of construction market data, such as Construction Market Data (CMD Group)

(2) Builders-exchanges and construction-reporting firms

(3) Local government offices/officials for building permits, etc.

(4) Lending institutions (bankers and commercial mortgage firms)

(5) Economic development associations

(6) Builders' associations

(7) General contractors and subcontractors

(8) Architectural and engineering firms

Section 3: Life Cycle Costing (LCC)

1. Guiding Policies and Principles.

a. Federal facilities must be designed to achieve the lowest life-cycle cost. A project's design must comprehensively define reasonable scope and performance requirements within the authorized budget for design and construction. Consistent with these constraints, building systems and features must be analyzed and selected to achieve lowest life-cycle cost. Life cycle costing is an important element of the GAO best practices as it presents the cost in a more holistic manner by including operating and maintenance costs, "cradle to grave."

b. Life-cycle costing (LCC) is the method used to ascertain and demonstrate the life cycle cost performance of a facility. LCC is the development of all significant costs of acquiring, owning, and using an item, system, or service over a specified length of time. The time period used is the projected effective useful life of the facility, and its determination includes consideration of functional obsolescence of major components or systems. It is used to compare and evaluate the total costs of competing solutions based on the anticipated life of the facility or product to be acquired.

c. The value of an item includes not only consideration of the costs of acquiring it, but also the costs of using it or the cost of performance for as long as the user needs it. Costs of repairs, operations, preventive maintenance, logistic support utilities, depreciation, and replacement, in addition to capital cost, all contribute to the total cost of a product to a user.

2. General LCCA Requirements.

a. For Cost Management, LCC Analysis has a dual focus.

1) The estimator, with support of the designers, develops and updates through the planning and design process a comprehensive, high-level life cycle cost (LCC) model of the project when the Triage Rating is 3 or 4. The LCC Model represents the total costs of the project during the designated time period. In the early planning stages, the estimator prepares models for each alternative to support effective decision making.

2) The estimator supports the A-E in their design LCC requirements by providing cost inputs for the alternatives being analyzed. The Facilities Standards for the Public Buildings Service (PBS P100) establishes the LCC Analysis requirements of the A-E at various design submittals. The A-E uses LCC Analysis to evaluate the implications of decisions made during the design process. The results of these analyses will be incorporated into the overall LCC Model.

b. See Appendix B for LCC related Policies and Procedures. All PBS projects, regardless of Budget Activity area, are required to perform LCC as necessary to comply with regulations and statutes. The estimator may be requested to provide cost related support to the A-E for the LCC requirements. The Triage score will establish the LCC requirements for the project.

Table 4-2. LCC Requirements by Triage Score

	Triage Tool Score			
Condition	**1**	**2**	**3**	**4**
P-100 LCCA requirement satisfies LCCM as well	Yes[1]	Yes	No	No
P-100 LCCA requirements and LCCM required	No	No[2]	Yes	Yes
1 Only if required by P-100 2 If no P-100 LCCA requirement, use LCCA for repair/replace projects and LCCM for fit-out and modernization projects				

c. Table 4-2. LCC Requirements by Triage Score summarizes the LCC requirements.

(1) Projects below Simplified Acquisition level are exempted from the LCCM Best Practice. If the P-100 requires an LCCA for the project, it will be considered as satisfying the GAO Best Practice for a life cycle cost model.

(2) For small projects greater than the Simplified Acquisition level, satisfying any P-120 LCCA requirements mandated by regulations and laws will be considered as satisfying the GAO Best Practice for a life cycle cost model. The laws and regulations cover energy consuming components and other sustainable issues. Scope of the mandated LCCA will essentially be a LCCM for the project, although only prepared for the submission mandated in the P-100. If these P-100 mandated LCCA are not the focus of the small project, the estimator use either the LCCA or the LCCA approach. System repair / replacement projects will probably be better served using the LCCA

approach. Fit-out and modernization projects may be better served using the LCCM approach.

(3) The P-120 will require high-level LCCM for projects with at Triage Tool score of 3 or 4. The LCCM remains at a high-level as the project progresses through planning and design. Project definition will alter the elemental quantities and underlying expenditures. The P-100 mandated LCCA will provide inputs to the overall model as they are performed.

d. The PBS will review the Life Cycle Cost Reports for adequacy and compliance with the LCC policies.

3. Life Cycle Cost (LCC) Model Requirements.

a. The input parameters of the life cycle cost model may be at the:

(1) Facility level

(2) System level

(3) Component level

b. The project phase and Budget Activity will establish the appropriate level for the model. The LCC Model level shall be appropriate to the level of information available and the corresponding level of operational data available.

c. The LCC Model report shall include:

(1) Project definition: project scope of the project, objectives, schedule and constraints

(2) Summary of discounted costs, total and by year

(3) Financial and economic parameters: study period, discount rate, key dates, inflation, utility pricing, operational assumptions

(4) Cost data: capital, operating, maintenance, replacements and repairs, end-of life (residual or disposal), timing

(5) Computations and analyses: total costs for Initial, annual, cyclical, and end-of-life costs, sensitivity analysis

4. LCC Analysis Report Requirements.

a. The A-E prepares the list of subsystems or components to be analyzed and develops the alternative approaches for them. The cost estimator should assist the A-E in properly determining the scope of the analysis. The indirect cost implications of the

various subsystem or components on other building subsystems must be included in the analysis.

b. The cost estimator will support the A-E in the preparation of the LCC reports. Reports must document the effort to allow proper decision-making based on the analysis effort. The report shall include:

(1) Project description: general project information, focus and objective of analysis, constraints

(2) Alternatives evaluated: describe each alternative, rationale for selecting, non-monetary / intangible considerations

(3) Summary and Recommendations

(4) Financial and economic parameters: study period, discount rate, key dates, inflation, utility pricing, operational assumptions

(5) Cost data: capital, operating, maintenance, replacements and repairs, end-of life (residual or disposal), timing

(6) Computations and analyses: total costs for Initial, annual, cyclical, and end-of-life costs, sensitivity analysis

Section 4: Risk Analysis

1. Guiding Principles. Risk Management helps the project manager and team members proactively manage project risks over the life of the project. The Cost and Schedule Management program supports the overall risk management process at PBS by identifying and measuring cost and time related risks. The specific risk analysis requirements are scalable based on the Triage rating.

a. The Primary Objectives of Risk Analysis.

(1) Preparing a range estimate

(2) Identifying reasonable contingency levels.

(3) Establishing an opinion of probable cost.

b. Established Contingency Levels. The contingency levels identified in Table 3-6. Construction Contingency are based on an 80% level of confidence in the point estimate.

2. General Requirements. When a risk analysis is required, the cost estimator will perform a quantitative risk analysis using the current estimate. The Range Estimate Report is part of the primary cost management deliverable at various design submittals.

Range Estimating is an estimate specific risk related task. As required, range estimate will be prepared for the estimate. The range estimate process is used to establish a confidence interval around the point estimate.

a. Range Estimate Report Requirements.

(1) GSA requires that the cost estimator to prepare a range estimate as indicated in the Tasking Matrices. (See the various Tasking Matrices in Chapter 6: Cost Management Requirements for PBS for specific requirements.) The Range Estimate is strictly for the project scope as defined. Any uncertainties in scope should be reflected in the broader Risk Management efforts for the project. The range estimate shall consider information gathered from the Market Study.

(2) The cost estimator will produce the Range Estimate report. The process will include determining the cost impact of known risks, determining the probability that the actual cost will differ materially from the point estimate, performing qualitative and/or quantitative risk analysis, and applying results to the point estimate to determine the risk-adjusted total cost. The estimator shall use appropriate risk distributions and ensure that risks are correlated.

(3) The Triage Tool dictates the appropriate risk analysis technology used for the Range Estimate.

(a) Sensitivity Analysis. For Triage score 1, which will be small projects (BA-61 and less than Simplified Acquisition level). Use the Sensitivity Analysis to fulfill the Risk Analysis requirement.

(b) Qualitative Risk Analysis with Root Mean Squared. For Triage score 2, which is the default for BA 53 and BA-54 projects. Use a qualitative process with numerical results, reducing the time and effort required for a quantitative risk analysis.

(c) Quantitative Risk Analysis (Monte Carlo Simulation). For Triage scores 3 and 4, which is the default for BA-51 and BA-55 projects. Use an appropriate application to simultaneously evaluate all the cost risks.

(4) The range estimate is how PBS establishes the uncertainties of pricing and quantities for the estimate. The risk model used to prepare the range estimate will establish a confidence interval around the estimate value.

b. Risk Management Support Requirements. When a project requires formal Risk Management sessions, the estimator and scheduler may be required to support the sessions by providing expert advice on the risks identified.

Section 5: Sensitivity Analysis

1. Guiding Principles. GAO best practice uses sensitivity analysis to understand whether a small change in the factor studied yields a large change in overall cost. A sensitivity analysis aids decision makers in choosing alternatives by presenting a clear

picture of the impacts of changes to an assumption or cost driver. A sensitivity analysis is not a substitute for a risk analysis range estimate. It looks at the impact of any single factor on project cost.

2. General Requirements.

a. Estimate submissions shall include sensitivity analysis as part of the estimating effort. During Feasibility, Program Development and Concept Design, the estimator shall be aided by the designers in the selection of appropriate factors to study. As the design becomes more established, the estimator shall focus on factors highlighted by the Market Study.

b. The sensitivity analysis varies the factor considered by a minimum and maximum amount (worst and best case spread). A sensitivity analysis only varies the specific factor or scenario selected for analysis. It shows how one change will change the overall cost. In this way it differs from the Range Estimate that varies a project factors at once. The range inputs for a factor should be the same in both exercises.

c. Document the results of the sensitivity analysis in a Sensitivity Analysis Report, which is submitted as part of the estimate submittal. The report shall include:

(1) Summary – What factors were studied?, Summary of impact of each factor studied on overall cost.

(2) Narrative for each factor studied – Why the factor was selected?, Rationale for selecting maximum and minimum values,

d. Backup for the sensitivity cost estimates is not required for the submission, but should be available if requested.

Chapter 5: Cost Management Work Products / Deliverables

Section 1: Overview

1. Cost estimate is the general name applied to a product of a process that quantifies and costs the resources required to provide a defined scope of work. It is the fundamental tool of cost management. This predictive process has different purposes:

    a. Screening, Selecting, Vetting

    b. Feasibility

    c. Budget Authorization

    d. Control

2. At the GSA PBS, cost estimates include consultant services fee estimates and construction estimates. The estimates occur anywhere in the project life-cycle from Project Initiation to Project Close Out. The definition detail of the work scope increases during the project life-cycle. It is the level of detail available that drives the method used to prepare a cost estimate. Table 5-1 Summary of Estimating Requirements – New Construction and Table 5-2 Summary of Estimating Delivery Requirements – Renovation, Alteration and Modernization summarize the estimate level of detail and format requirements by type of estimate to be prepared at the various stages of the project life-cycle.

3. Chapter 5 describes the requirements for a specific Cost Management work product/ deliverable. It begins with a subsection for common requirements that apply across multiple project phases. Then, a subsection for each project phase discusses its Cost Management deliverable requirements. A project phase may further subdivided by basic kinds of deliverables: estimates, analysis, and support.

4. Combine the Chapter 5 specific requirements with the overarching requirements presented in Chapter 3 and Chapter 4 to understand how to prepare the work products / deliverables.

5. Chapter 6 Cost Management Requirements for PBS is a series of tables detailing what is required by Budget Activity for each phase in the project life cycle. The Work products / deliverables for Supporting Practices are detailed in Chapter 4.

Section 2: Common Requirements for Any Phase

1. <u>Professional Services Fee Estimates.</u>

a. Professional services, such as A-E and CMa, are elements of the Project Structure. Estimates for professional services are required throughout the project life-cycle. Cost estimates for professional services have a common format and process

based upon the Budget Activity and Delivery Method. Professional Services Estimates, which are provided only by in-house personnel, as based on the ECC.

(1) ECC + EDRC + EMIC = ETPC

b. Independent Government Estimates of the professional fees must adhere to the common requirements of FAR Part 36. Professional services cost proposals and Independent Government Estimates must use the GSA Forms 2630-14 and 2631-14 and comply with the instruction guidance published as part of the forms.

2. Construction Cost Estimates and Analyses.

a. The WBS organizes the estimate effort and the CBS organizes the estimate of each WBS element. Each of the lowest level WBS elements has a separate estimate. The WBS may be structured for phased work, multi-structures, and/or bid alternates or options with any addenda. An overall project ECCA estimate will also be prepared, incorporating all project elements, for analyses or studies specified in design-programming directives and design-criteria references.

b. Backup worksheets are required to support the detailed estimates, which represent all cost-sensitive project data and define all major assumptions. Backup estimating data and quantity-survey information may be in any format, must be grouped under appropriate format classification headings. The Estimate Tracking Sheet and Elemental Cost Summary forms must be submitted, including per-square-meter or square-foot calculations.

(1) Provide cost estimates for each scheme where more than one scheme is required, per Table 3-1. Estimate CBS and Detail Requirements – Prospectus Projects and Table 3-2. Estimate CBS and Detail Requirements – Non-Prospectus Projects.

(2) See Section 3.5.2.a for guidance on contingencies.

c. For projects involving tenants, the estimator must add to the ECCA prepared for each tenant agency the GSA-related cost elements identified in the Space Planning section of the GSA Pricing Desk Guide and in the Pricing Implementation for Project Managers Guide, Chapter II Project Development Phase.

3. Reconciling Estimates.

a. Cost and Price Analysis of Estimates and Contractor Proposals. A reconciliation of the A-E and Third Party Estimate (TPE) or Independent Government Estimate (IGE) is part of the PBS quality control process. When PBS requires the preparation of a TPE or an IGE, the A-E is responsible for designating a member of its team to reconcile the TPE or IGE with its own estimate in an orderly and comprehensive

manner. The A-E estimator prepares and submits a final estimate reflecting the reconciled estimate. Upon solicitation and award of a contract the contracting officer may require the estimator to determine fairness and reasonableness of cost. GSA's policy for determining fairness and reasonableness of cost is as follows:

(1) Less than Simplified Acquisition Threshold – +/-15%

(2) Simplified Acquisition Threshold to 50% of Prospectus Threshold – +/- 12.5%

(3) 50% of Prospectus Threshold to Prospectus Threshold - +/- 10%

(4) Prospectus Threshold to $100 million - +/- 7.5%

(5) $100 million to $500 million – +/- 5%

(6) Greater than $500 million – +/- 2.5%

b. QA/QC Review of Estimates.

(1) QC Review of Estimates. The QC review is a component of PBS cost management due diligence. The review may be used as an alternative to the Third Party Estimate if allowed by the Triage Tool rating. The review shall focus on certifying scope, cost, quality, and schedule alignment. It will serve as a transparent validation of the A-E estimate by the funding authority.

(2) QA Review of Estimates. The Third Party Estimator may perform QA Review of the estimate prepared by the A-E. The QA review is a component of PBS cost management due diligence. The review may be used as an alternative to the Third Party Estimate if allowed by the Triage Tool rating. The review shall focus on certifying scope, cost, quality, and schedule alignment. It will serve as a transparent validation of the A-E estimate by the funding authority.

c. Award and Final Cost Analysis.

(1) After Project Award. The A-E will adjust the pre-bid cost estimate Project Cost Summary (i.e., Form 3473) to complete the Project Cost Analysis (Form 3472). The A-E may use a simple factor to adjust the elemental costs based on a comparison of the total pre-bid estimate to the total award amount. The completed Form 3473 is an essential tool for collecting cost data for the Historical Database.

(2) At Project Close-Out. The PM will perform a similar exercise adjusting the Award Form 3473 data to reflect the actual close-out cost. The PM may use a simple factor to adjust the elemental costs from the award Form 3472 based on a comparison of the award total cost to the close-out total award amount. The completed Form 3473 is an essential tool for collecting cost data for the Historical Database.

d. Historic Database Information.

(1) Overview. GSA uses cost data collected for similar project types to develop parameter based cost focused database. The database will assist in the budget development for future projects. The GSA PM provides cost estimates, reconciled estimates, bid analysis, and final construction cost reconciled back to the bid estimate to the Regional Office and Central Office Cost Management Program to compile this data into GSA's cost database.

***(2)* Data Coverage and Required Items.**

(a) Basic identifier data (Project number, name, location)

(b) BA (and sub-types)

(c) Delivery Method

(d) Primary scope (space types, etc. as appropriate for project)

(e) Costs for budget, award and final

(f) Schedule (by major phase)

(g) Professional Fees

Table 5-1. Summary of Estimating Delivery Requirements - New Construction

Summary of Estimating Delivery Requirements – New Construction										
Submission Requirements	Anticipated Level of Project Definition	Estimate Level (Detail)	Cost Breakdown					Budget Activity (BA)	Accuracy Range
			Uniformat II	MasterFormat	Work Items	Space Types	Other		
Project Initiation Phase									
BER	0 - 5%	2						54, 55	50 - 65%
Client Request	0 - 5%	1	O			P		54, 55	50 - 65%
Asset Business Team	0 - 5%	1	O			P		54, 55	50 - 65%
Project Planning and Development Phase									
Request for Lease Proposal	2 - 10%	2	P			S	S	53	60 - 70%
Annual BA-54 Project Plan	2 - 10%	3						54	60 - 70%
Feasibility Study	2 - 10%	3	P			S		51,55	60 - 70%
Program Development Study	5 - 15%	4	P	O		O		51,55	65 - 75%
Design Phase									
Preliminary Concept	8 - 15%	3	P			O		51,55	70 - 80%
Field Investigation	10 - 20%	3						54, 55	72 - 85%
Final Concept	15 - 20%	4	P			O		51, 54, 55	75 - 85%
Design Development - Pre VE	25 - 30%	5	P	S		O		51, 54, 55	78 - 88%
Final Design Development	30 - 35%	5	P	S		O		51, 53, 54, 55	80 - 90%
75% CD	65 - 70%	6	S	P	O	O		54, 55	85 - 90%
90% CD	80 - 85%	6	S	P	O	O		51, 53, 54, 55	88 - 92%
100% CD	88 - 95%	6	S	P	O	O		51, 53, 54, 55	90 - 93%

Procurement Phase									
Pre-Bid	93 - 97%	6	S	P	O	O		51, 53, 54, 55	95%
Post Award	95 - 98%	3	P	S		O		51, 53, 54, 55	95%
Construction Phase									
Contract Modifications	98 - 100%	6	O	P				51, 53, 54, 55	97%
Project Close-Out Phase									
Punch List Analysis	100%	6	S	P	O	O		51, 53, 54, 55	98%
Claims Analysis	100%	6	S	P	O	O		51, 53, 54, 55	99%
Total Project Cost Summary	100%	3	P	S		O		51, 53, 54, 55	100%

KEY: P Primary Estimate and Summary S Summary (Required) O Optional	**NOTES:** Anticipated Level of Project Definition (Definition of Project Scope) = 100% at end of project Accuracy Range is dependent upon procurement method, market forces, market conditions, and level of project definition Any of the above requirements can apply to BA 80 funded projects.

Table 5-2. Summary of Estimating Delivery Requirements – Renovation, Alteration and Modernization

Summary of Estimating Delivery Requirements – Renovation, Alteration, and Modernization									
Submission Requirements	Anticipated Level of Project Definition	Estimate Level (Detail)	Cost Breakdown					Budget Activity (BA)	Accuracy Range
			Uniformat II	MasterFormat	Work Items	Space Types	Other		
Project Initiation Phase									
BER	0 - 5%	2	O		P	O		54, 55	50 - 65%
Client Request	0 - 5%	1	O		O	P		54, 55	50 - 65%
Asset Business Team	0 - 5%	1	O		P	O		54, 55	50 - 65%
Project Planning and Development Phase									
Request for Lease Proposal	2 - 10%	2			P	O		53	60 - 70%
Annual BA-54 Project Plan	2 - 10%	3	O		P	O		54	60 - 70%
Feasibility Study	2 - 10%	3	O		P	O		51,55	60 - 70%
Program Development Study	5 - 15%	4	O		P	O		51,55	65 - 75%
Design Phase									
Preliminary Concept	8 - 15%	3	S	O	P	O		51,55	70 - 80%
Field Investigation	10 - 20%	3	S	O	P	O		54, 55	72 - 85%
Final Concept	15 - 20%	4	S	O	P	O		51, 54, 55	75 - 85%
Design Development - Pre VE	25 - 30%	5	S	O	P	O		51, 54, 55	78 - 88%
Final Design Development	30 - 35%	5	S	O	P	O		51, 53, 54, 55	80 - 90%
75% CD	65 - 70%	6	S	O	P	O		54, 55	85 - 90%

90% CD	80 - 85%	6	S	P	O	O		51, 53, 54, 55	88 - 92%
100% CD	88 - 95%	6	S	P	O	O		51, 53, 54, 55	90 - 93%
Procurement Phase									
Pre-Bid	93 - 97%	6	S	P	O	O		51, 53, 54, 55	95%
Post Award	95 - 98%	3	S	S	P	O		51, 53, 54, 55	95%
Construction Phase									
Contract Modifications	98 - 100%	6	O	P				51, 53, 54, 55	97%
Project Close-Out Phase									
Punch List Analysis	100%	6	S	P	O	O		51, 53, 54, 55	98%
Claims Analysis	100%	6	S	P	O	O		51, 53, 54, 55	99%
Total Project Cost Summary	100%	3	P	S	P	O		51, 53, 54, 55	100%
KEY: P Primary Estimate and Summary S Summary (Required) O Optional	**NOTES:** Anticipated Level of Project Definition (Definition of Project Scope) = 100% at end of project Accuracy Range is dependent upon procurement method, market forces, market conditions, and level of project definition Any of the above requirements can apply to BA 80 funded projects.								

Section 3: Project Initiation Phase Requirements

1. Common Requirements.

a. Estimates prepared during the Project Initiation Phase are primarily for selecting, vetting or feasibility.

b. There are a number of special and specific studies that may be required during Project Initiation Phase. The studies require estimates of associated costs to perform the work recommended by the study. Examples include:

(1) Client Requests

(2) Blast / Progressive Collapse Study

(3) Seismic Study

(4) NEPA Studies

(5) Master Plan

(6) BER

c. The various special focus studies make assessments of what may be required to satisfy regulations and policies. They propose a scope to accomplish the requirements. The studies require estimates of the associated costs for inclusion in site/design funding proposal.

d. The estimating requirements applying to any Initiation Phase estimate are:

(1) Clearly defined WBS and use of an appropriate PBS recognized CBS for the study subject.

(2) Unit prices representing total installed cost from the subcontractor are acceptable. The unit price combines labor, materials, and equipment costs.

Section 4: Project Planning & Development Phase Requirements

1. Common Requirements.

a. Project Planning & Development Phase estimating generally requires the preparation of estimates on three competing basic schemes/concepts, allowing GSA to select its preferred scheme. It has two primary sub-phases for major construction projects:

(1) Feasibility Study

(2) Program Development Study (PDS)

b. Annual BA-54 Project Plan is a major activity requiring support developing Work Item Estimates that are aligned with project scope. Estimates prepared follow the requirements for Project Initiation Phase Estimates.

c. The A-E submits estimates for Feasibility Studies and Program Development Studies (PDS) as specified in programming directives and/or criteria references, and a comparison sheet for multiple schemes. The level of cost estimate required of the Feasibility Study and PDS is one of their most significant differences. Requirements and estimating techniques also vary, depending on the type of project.

d. These estimating requirements apply to any Feasibility and PDS-level submission.

(1) If a project's design requires multiple concept submissions, each concept submission must be supported by estimates.

(2) For each scheme, the A-E's estimator prepares separate estimates for each element of the WBS so that elements summarize to the estimated total project costs (ETPC). The GSA Pricing Desk Guide requires separation of shell, TI, and security costs.

(3) Unit prices representing total installed cost from the subcontractor are acceptable. The unit price combines labor, materials, and equipment costs.

(4) A Third Party Estimator is a party who does not have a financial stake in the project's total cost and is independent of the A-E preparing the Feasibility Study or PDS.

e. A percentage allowance–an overall percentage allowance for the General Contractor's general conditions, bonds, insurance, and corporate overhead and profit – is appropriate if the project involves no unusual coordination, site preparation, or specialized support services.

2. <u>Feasibility Study.</u>

a. There are potentially three Feasibility Study submissions: 50%, 90% and 100%. The cost estimates for each submission must meet the latest Planning Call requirements. Each alternative requires estimated construction costs (ECC), estimated total project costs (ETPC), estimated customer relocation costs, and tenant improvement (TI) costs. (See Section 5.2.1 Professional Services Fee Estimates, which are provided in-house only, and based on the ECC. ECC + EDRC + EMIC = ETPC.

b. The estimates are based on the most recent Project Cost Planning Guide (PCPG) or other standards. Benchmark or parametric-level cost analyzes (using gross-square-foot costs) may be used to prepare cost estimates as follows:

(1) **<u>New Construction.</u>**

(a) Project Cost Planning Guide (PCPG) provides data and calculation procedures.

(b) Use applicable programming and pricing models for new courthouse projects.

(c) Identify unique project/site conditions and related costs. For new courthouse construction, there is project-specific construction benchmarks and models to develop construction costs.

(2) **Renovation and Alteration (R&A).**

(a) Where alteration estimates are not appropriate, cite parametric estimates (UNIFORMAT II, Level 3) or other reliable estimates based on prior studies (e.g., BERs, seismic, hazardous material studies).

(b) Derive cost estimates for existing buildings from prior-study cost information (e.g., BER, BPP, blast, seismic, hazardous materials), TI cost estimates, First Impressions program activities, charrettes, and detailed cost estimates where other cost information is not available. The Cost Estimating Workbook (CEW) (Uniformat II and IRIS Work Item) should be used for R&A estimates of existing buildings.

(3) **Tenant Improvement (TI).**

(a) To determine the TI cost, the estimator can:

1. Use an established national benchmarks (if available), or

2. Obtain a TI cost estimate for functional space based upon the POR.

(b) No-market comparable costs (such as security, special use space that alters the building shell that are amortized in the rent and design criteria that are above typical commercial office space) should be denoted separately from TI costs.

(c) Estimates are also required for joint-use space to complete the project's budget.

c. The cost estimates are used to perform a financial analysis for each alternative. In general, GSA's financial analysis requires a pro forma and a 30-year present value analysis for each alternative (e.g., The Automated Prospectus System, or TAPS, analysis) and an Asset Business Plan (ABP) for each affected GSA property.

d. The Feasibility Study process ends with the submission of the Prospectus package for site and design funding. It establishes site acquisition and design budgets and preliminary shell, TI, and security budgets for the project. Although the Feasibility

Study prepares a significant portion of this effort, the Program Development Study (PDS) is the final step to refine and confirm the estimates.

3. Program Development Study (PDS).

a. The first estimating activity for the PDS is validating the scope of the Feasibility Study Cost Estimate. The activity revalidates and refines the estimates based on further definition of scope for specific build-outs and systems that affect shell, TI, and security costs. However, the firewall between shell and TI based on Pricing Policy during the Feasibility Study shall continue to be based on Pricing Policy.

b. Special considerations for the estimating effort:

(1) Incorporate knowledge gained by destructive testing/investigations.

(2) Apply applicable programming and pricing models.

(3) Use Building Preservation Plans to prepare cost estimates for projects that affect historic buildings and districts.

(4) Revalidate and refine shell, TI, and security budgets.

(5) Use an effective WBS to properly segregate costs to meet GSA cost and schedule management requirements:

(a) Shell improvements

(b) Each tenant's TI

(c) Security improvement (e.g., progressive collapse, blast mitigation, glass fragmentation)

(d) Customer relocation

(6) Use the appropriate Cost Breakdown Structure to meet GSA cost estimating requirements:

(a) Based on the CEW

(b) Work Item IRIS for small projects

(c) Estimated construction costs (ECC)

(d) Estimated total project costs (ETPC)

c. Providing an estimate for each option defined in the PDS is critical to developing a Financial Analysis. Sound estimates for construction cost and implementation analysis are required to compare the preferred alternative to other viable alternatives.

d. The PDS must propose design directives that have sound budgets, including additional costs for phasing, swing moves, relocation and site conditions, as well as standard construction costs. Properly prepared estimates ensure that the construction funding request is sufficient.

e. The estimate will include refined construction or site preparation costs, as needed, to provide a sound funding request for the shell, security requirements, and TIs.

Section 5: Design Phase Requirements

1. Common Requirements.

a. Cost Estimates.

(1) The Design Phase has three primary sub-phases:

(a) Concept Design

(b) Design Development

(c) Construction Documents

(2) Common cost management requirements during Design Phase include:

(a) Third Party cost estimates must be prepared by an independent professional cost estimator unaffiliated with the design firm or the Construction Manager as Constructor (CMc). A Third Party Estimate for the Regional execution team may be performed by the Construction Manager as Agent (CMa).

(b) The A-E is required to provide all parties preparing cost estimates advance copies of all plans and documentation early enough to allow for the preparation of required estimates as part of the design submission.

(c) Provide cost estimates per Table 3-1. Estimate CBS and Detail Requirements – Prospectus Projects (New and Owned) and Table 3-2. Estimate CBS and Detail Requirements – Non-Prospectus Projects (Owned and Leased) requirements.

(d) Refer to Table 5-1. Summary of Estimating Delivery Requirements – New Construction or Table 5-2. Summary of Estimating Delivery Requirements – Renovation, Alteration and Modernization for the required Cost Breakdown Structure (CBS) for the estimate and the summary. The tables indicate the level of estimate detail

required and estimate accuracy range expected. Refer to Appendix C: Cost Breakdown Structures (CBS) for further information on the various CBSs used by PBS.

(e) See Table 3-4. Guidelines for Standard Site and Design Contingencies and Table 3-6. Construction Contingency for guidance on contingencies.

(3) Common requirements for estimates at all Design Phase submissions include:

(a) Executive Summary with budget analysis

(b) Basis of Estimate (rationale, assumptions, etc.)

(c) Market Study – See Section 4.2 for details.

(d) Risk analysis (elements of risk) – See Section 4.4: Risk Analysis for details

(e) Summary Estimate Report – See Table 5-1. Summary of Estimating Delivery Requirements – New Construction or Table 5-2. Summary of Estimating Delivery Requirements – Renovation, Alteration and Modernization for appropriate CBS.

(f) Detailed Estimate Report – See Table 5-1. Summary of Estimating Delivery Requirements – New Construction or Table 5-2. Summary of Estimating Delivery Requirements – Renovation, Alteration and Modernization for appropriate CBS.

(g) Allowances for design contingencies, general conditions and profit, bonds, and construction escalation are included to calculate the ECCA amount. Submission requirements from design development through construction require itemized general conditions and overhead costs.

(h) Design to Cost Requirements Report – The Design A-E team must submit a list of cost saving items that collectively would reduce the project's cost to approximately 10 percent below Design-to-Cost Limit to ensure that the project is developing within-budget and scope. The cost estimator will prepare an itemized cost estimate for each cost-saving item at a level of detail commensurate with the primary cost estimate. This applies at all design submissions. See Section 3.2.2: Design Within Budget.

1. The estimator prepares an ECCA estimate for the base bid and separate estimates for each of the options or bid alternates. An overall project ECCA estimate will also be prepared, incorporating all project segments, for analyses or studies specified in design-programming directives and design-criteria references.

2. The verification of the cost saving measures by preparing an estimate of savings for each of the A-E's proposed measures shall be done by a party unaffiliated with the design team.

(i) Form 3474 – All estimate submittals are required to include Form 3474 using the primary CBS of the project (i.e., Uniformat II or IRIS Work Item), representing all project and estimate data. Each Form 3474 must compare the design cost breakdown with any budget cost values escalated to the midpoint of construction, including per-square-meter or square-foot calculations of overall project cost. See Section 5.5.1.b **Cost Growth Report / Budget Analysis** for more information.

(j) Form 3473 – All estimate submittals are required to include Form 3473 using the primary CBS of the project (i.e., Uniformat II or IRIS Work Item), representing all project and estimate data. Each Form 3473 must compare costs and assigned design parameters of current submittal versus prior submittal. See Section 5.5.1.b **Cost Growth Report / Budget Analysis** for more information.

b. Cost Growth Report / Budget Analysis.

(1) An ECCA summary is prepared at each milestone during design, using the Form 3474, to compare the current design-cost breakdown with the previous submission's costs or the budget, with all values escalated to the current submission date. The summary must include allowances for design contingencies, general conditions and profit, and construction escalation and yield an overall project cost per square meter or square foot. It is required at all submissions during the Design Phase.

(2) GSA uses the Budget Analysis as a Cost Growth Report (CGR) to track cost growth at each design phase by comparison with the project budget. The comparison is done by comparing the prior submission's Uniformat Level 2 costs for each cost element with the current submission's Level 2 costs, and identifying the cause of large variances. The A-E's estimator prepares this report for each design-phase submission, using GSA Form 3474, Project Cost Comparison Summary.

c. Design Period Scope Change Requests. An order of magnitude estimate is required for the approval of any proposed scope change during design. The estimate format will be appropriate for the design sub-phase at the time of the requested scope change. The estimate will be used by the Project Manager and stakeholders to determine if the requested change is possible as they manage the project budget, particularly focusing on design contingencies. It is also helpful in deciding whether the requested change is worth any potential cost increase.

2. Concept Design.

a. Cost Estimates.

(1) The A-E submits cost estimates for concept design analyses/studies as specified in design-programming directives and/or design criteria references. These estimating requirements apply to any concept-level submission:

(a) If a project's design requires multiple concept submissions, each concept submission must be supported by the estimates.

(b) Unit prices, inclusive of labor, materials, and equipment costs in a single figure is acceptable.

(2) The *Preliminary Concept* submission requires multiple (generally three) competing basic schemes/concepts, allowing GSA to select its preferred scheme. For each scheme, the estimator prepares separate estimates as per the Project Structure (e.g., phased work, multi-structures, and or bid alternates/options) and a comparison sheet for multiple concepts/schemes.

(3) Estimators must calculate quantities for appropriate systems or apply parameters to appropriate building areas. Applied unit costs may be based on combined material and labor costs. Following protocol's defined in this policy, concept estimates will match the estimate format of the budget estimate to facilitate cost-breakdown comparisons.

(4) A percentage allowance–an overall percentage allowance for the General Contractor's general conditions, bonds, insurance, and corporate overhead and profit–is appropriate if the project involves no unusual coordination, site preparation, or specialized support services.

(5) During Concept submittals, the A-E is required to provide all parties preparing cost estimates advance copies of all plans and documentation early enough to allow for the preparation of required estimates as part of the design submission. Documentation includes, but is not limited to:

(a) A statement on the conceptual approach and general features for each major building system, including an itemized listing of anticipated types and approximate capacities/sizes. Block loads for structural, mechanical, and electrical systems.

(b) Quality levels of major materials and systems to be used, including any special design programming or code requirements relating to fire protection, HVAC, plumbing, electrical, and structural components.

(c) A copy of the design program to ensure that the estimator understands goals, objectives, and design directives that may not yet be reflected in concept design submission documents.

b. <u>Cost Plan.</u>

(1) New Construction and Modernization. Translate the approved budget into a parameter driven Uniformat Level 2 Cost Plan to be used as a basis of comparison and control throughout the project lifecycle. The Cost Plan (Form 3474) is the baseline for future Cost Growth Reports prepared as part of the budget analysis at each estimate submission.

(2) Renovation. Translate the approved project into a parameter driven, but scope aligned Cost Plan using the IRIS Work Item Codes of the project. The Cost Plan (Form 3474) is the baseline for future Cost Growth Reports prepared as part of the budget analysis at each estimate submission.

c. Cost Growth Report / Budget Analysis. Prepare an ECCA summary at each Concept Design milestone to compare the current design-cost breakdown with the previous submission's costs or the budget, with all values escalated to the current submission date. Use GSA Form 3474, Project Cost Comparison Summary for the Cost Growth Report (CGR).

(1) Preliminary Concept Design

(a) Each design concept considered during this submission must be within the project's overall construction budget. The A-E will be required to redesign any concept design scheme not within the budget to bring it within budget constraints at its own expense.

(b) For each concept scheme, the A-E's estimator lists cost-saving ideas that collectively would reduce the project's cost to approximately 10 percent below Design-to-Cost Limit to ensure that the project is developing within-budget and scope. The Independent Government Estimator validates these cost-saving measures by preparing an order of magnitude estimate of savings for each of the A-E's proposed measures.

(2) Final Concept Design. If the estimate for the Final Concept Design submission exceeds the project budget, the A-E is required, at its own expense, to propose cost-saving measures to bring the project within budget. Just as described above for the Preliminary Concept Design's CGR, the A-E summarizes the final concept design estimate on GSA Form 3474 and compares it to the project budget. This report is supported with cost estimates for each proposed cost-saving item. The Third Party Estimator validates these cost saving measures as outlined in the paragraph above for the preliminary concept design phase.

d. Functional Space Type Cost Analysis. As part of a new construction-project cost estimate submission, the estimator prepares construction costs estimates by space types that:

(1) Identifies all project space types, considering at least those categories listed in the Project Cost Planning Guide (PCPG).

(2) Separately itemizes special costs outside normal requirements of listed space types, addressing at least those listed in the estimate Appendix as Special Costs Excluded.

3. Design Development: Cost Estimates. Estimating requirements given here apply to all required Design Development submissions, unless otherwise specified:

a. Unit prices representing total installed cost from the subcontractor are acceptable. The unit price combines labor, materials, and equipment costs.

b. Measure quantities for systems that are adequately delineated in the drawings. Calculate quantities or apply appropriate parameters for systems lacking adequate system definition.

4. Cost Growth Report / Budget Analysis.

a. Prepare an ECCA summary at each Concept Design milestone to compare the current design-cost breakdown with the previous submission's costs or the budget, with all values escalated to the current submission date. Use GSA Form 3474, Project Cost Comparison Summary.

b. If the estimates for the design development submissions exceed the project budget, the A-E is required, at its own expense, to propose cost-saving measures to bring the project within budget. Just as described above for the preliminary concept design's CGR, the A-E summarizes the final concept design estimate on GSA Form 3474 and compares it to the project budget. This report is supported with cost estimates for each proposed cost-saving item. The independent government estimator validates these cost saving measures as outlined in the paragraph above for the preliminary concept design phase.

5. Construction Documents.

a. Estimating Requirements. Estimating requirements given here apply to all required Construction Document submissions – 75%, 90%, and 100% CDs – unless specified as applicable only to a specific construction documents submission.

(1) Unit prices separately representing labor, material, and equipment will be used and reported accordingly. Cost-element lump-sum estimating for any CBS may be used only by permission of GSA. If cost elements are transferred from previous submission levels, quantity values must be verified and unit costs adjusted to reflect escalation to the construction documents submission date.

(2) The 90% and 100% Construction Document estimates are prepared at the same level as required for the contractor performing the construction work, in accordance with the FAR.

b. Cost Growth Report / Budget Analysis.

(1) Prepare an ECCA summary at each Concept Design milestone to compare the current design-cost breakdown with the previous submission's costs or the budget, with all values escalated to the current submission date. Use GSA Form 3474, Project Cost Comparison Summary.

(2) If the estimate for the 75% Construction Documents submission exceed the project budget, the A-E is required, at its own expense, to propose cost-saving measures to bring the project within budget. Just as described above for the preliminary concept design's CGR, the A-E summarizes the final concept design estimate on GSA Form 3474 and compares it to the project budget. This report is supported with cost estimates for each proposed cost-saving item. The Third Party Estimator validates these cost saving measures as outlined in the paragraph above for the preliminary concept design phase.

(3) If the estimate for 90% Construction Documents submission exceeds the project budget, the A-E is required to propose cost reductions, at its own expense, in the form of bid alternates sufficient to ensure receipt of bids within budget on the scheduled bid date. The Independent Government Estimator validates these cost-saving measures, as indicated in the paragraph above, for the concept design and design development submissions.

Section 6: Procurement Requirements

1. Cost Estimates.

a. CMc Guaranteed Maximum Price Support. The Independent Government Estimator will support the PBS procurement by preparing an IGE for the project. The CMc shall not prepare the IGE for the project.

b. Contract Award Package.

(1) All contract award actions require Independent Government Estimates (IGE). The IGE prepares an ECCA estimate for the base bid per the Project Structure, and/or options / bid alternates with any addenda. An overall project ECCA estimate is also prepared, incorporating all project segments, for analyses or studies, as specified in design-programming directives and design-criteria references.

(a) Refer to Table 5-1. Summary of Estimating Delivery Requirements - New Construction or Table 5-2. Summary of Estimating Delivery Requirements – Renovation, Alteration and Modernization for the required Cost Breakdown Structure (CBS) for the estimate and the summary. The tables indicate the level of estimate detail required and estimate accuracy range expected. Refer to Appendix C: Cost Breakdown Structures (CBS) for further information on the various CBSs used by PBS.

(2) The IGE marks all estimates “FOR OFFICIAL USE ONLY” to preserve balance during negotiation and award. The overall amount must not be disclosed under any circumstances prior to award.

c. Contract Amendment Cost Estimate. An Amendment Cost Estimate is prepared similarly to estimates for the Contract Award Package. The Government estimate must be prepared before the Amendment request is sent to the proposing contractors. The IGE must be provided the same documents concerning the proposed modification that the contractors will be provided.

d. RFI Cost Estimate. The RFI Estimate is prepared similarly to estimates for the Contract Award Package. The Government estimate must be prepared before the Amendment request is sent to the proposing contractors. The IGE must be provided the same documents concerning the proposed modification that the contractors will be provided.

2. Bid Submission Documents.
Procurement officials ensure that the bid packages include a lump-sum bid requirement for each bid option, alternate, and unit-pricing item.

3. Cost Analyses.

a. Construction-Award Bid Analysis.

(1) After the construction contract is awarded, GSA will provide the A-E the following data:

(a) The abstract of bids received for the procurement with an indication of the award amount and the bids offered by all contractors.

(b) Any breakdown or verification of contractor or subcontractor prices in the course of contract award.

(2) The A-E must:

(a) Perform an analysis of the bid data, using all available cost data.

(b) Review the independent cost estimate, which reflects the design upon which the construction award is based.

(c) Revise the Project Cost Summary (Form 3473) to align with the actual bid price.

1. A simple adjustment of the elemental costs by a single factor derived from the ratio of the independent cost estimate total cost and the award total cost is acceptable.

2. This is the preferred approach should the contractor provided cost data not be easily aligned with the Cost Breakdown Structure of the Project Cost Summary.

3. The adjusted cost data is provided in the appropriate GSA formats; Uniformat II and if applicable IRIS Work Item.

4. The A-E may utilize the Independent Government Estimator in the analysis if desired.

(d) Based upon the above cost post award bid analysis, complete the GSA Form 3472 and submit the form to the GSA Regional Office and Central Office.

1. The GSA Form 3472 must report the construction cost, as awarded, and parameters based on the primary CBS of the project (i.e., Uniformat II and if applicable IRIS Work Item). Each Form 3472 must compare costs and assigned design parameters.

2. The data contributes to the GSA, PBS Construction Cost Database.

Section 7: Construction & Close-Out Requirements

1. Cost Estimates.

a. RFI / Change Order. An RFI / Change Order Estimate is prepared in Section 5.7.3.b **Contract Modifications and Claims Analysis Support**. It is an independent estimate for contract modification estimate. The Government estimate must be prepared before the modification request is sent to the contractor. The Independent Government Estimator (IGE) must be provided the same documents concerning the proposed modification that the contractor will be provided.

b. Note. The IGE marks all estimates “FOR OFFICIAL USE ONLY” to preserve balance during negotiations. The overall amount must not be disclosed under any circumstances prior to award.

2. Cost Analyses.

a. Final Cost Analysis. At the end of Close-Out, the GSA PM is required to submit an updated GSA Form 3472 to the Regional Office and Central Office Cost Management Program. The Final Cost Analysis captures historic cost data to populate the national database. The PM may use a simple factor of the Final Cost divided by the original Award Amount to adjust the individual cost elements.

b. Further Information. Refer to Section 5.6.3.a **Construction-Award Bid Analysis** and Section 4.2.3.c **Award and Final Cost Analysis** for further information.

3. Cost Support.

a. Contract Negotiations Support. After the IGE for the modification has been completed, approved, and delivered to the Contracting Officer, the Independent Government Estimator continues to support the negotiations, as directed by the negotiator. The estimator must become thoroughly familiar with negotiating requirements and techniques before participating as part of a negotiating team. The IGE marks all estimates “FOR OFFICIAL USE ONLY” to preserve balance during negotiations. The overall amount must not be disclosed under any circumstances prior to award.

b. Contract Modifications and Claims Analysis Support.

(1) During Construction and Close-Out, the Project Manager may require cost management support analyzing costs for contract modifications and claims. This section provides information, procedures, and guidance for estimating and processing construction contract modifications. Contract modifications include change orders, contractor claims, formal resolution of constructive changes, the impact on unchanged work, suspension of work, and time extension. (See Section 2.6.4: Scope Management Interfaces with Cost and Schedule Management on scope interface for impact cost considerations.)

(2) An independent estimate for contract modifications requested by the Government must be prepared before the proposal request is sent to the contractor. The Independent Government Estimator (IGE) must be provided the same documents concerning the proposed modification that the contractor will be provided, or have access to them.

(3) The IGE prepared in response to a contractor-initiated proposal must be prepared to the same level of detail as the contractor’s proposal and be based on the scope of the modification. A copy of the contractor’s proposal with the costs deleted can be used.

(4) Regulations require an IGE for any procurement of $25,000 or more. The Contracting Officer may require estimates of lesser amounts if he or she determines it is necessary. In contract modifications, the $25,000 trigger amount is the sum of the absolute values of decreases and increases. For example, a modification resulting in decreases of $10,000 and increases of $16,000 would sum to the absolute value of $26,000, requiring an IGE. Adjustments in methods or formats for the prime purpose of escaping this requirement are prohibited.

(5) For all negotiated procurements, including contract modifications, regulations state that award must not be made unless:

(a) The final IGE equals or exceeds the negotiated price, or

(b) In the case of reductions, which must be considered separately from increases, the negotiated credit is equal to or exceeds the final IGE, and

(c) The correct final IGE is included in the contract file, supplemented by a complete statement justifying the award at a cost different from the estimate, and adequate for subsequent review.

(6) The overall objective of a contract modification negotiation is to reach an agreement with the contractor that is in the best interest of the Government. The lowest possible price does not always meet this objective nor would a “generous” price, if that price offers more payment than necessary to include sufficient incentive. The negotiation team strives for some intermediate point, which is generally regarded as the lowest reasonable price – the amount at the bottom of the price range that the negotiator considers to be fair and reasonable.

(7) To arrive at this price the negotiator must at least partially rely upon an IGE based on a detailed analysis of the change in requirements and existing job conditions. For the most part, the estimate must be similar to, and take into account, those same conditions and elements occurring in the contract, as each applies to the change order scope. In lieu of better data, the IGE for bid evaluation may be used for assistance. The Independent Government Estimator must understand the scope of the change and prepare an accurate quantity takeoff for each direct item of change, using labor, material, and equipment costs and sequentially applying appropriate overhead, profit, and bond costs. Since this formal, approved IGE is used to evaluate the reasonableness of the contractor’s proposal, it must be prepared on a comparable and realistic basis by an estimator familiar with the modification and claim processes. The estimator must review the costs presented in the contractor’s proposal for accuracy, reasonableness, and allowableness. Of those costs found allowable (see FAR 31.2), each must be further reviewed for applicability to the requested modification.

(8) The Independent Government Estimator must:

(a) Review the change documents and become familiar with the requirements of the changed work.

(b) Determine the status of construction and how the changed work will fit into the construction schedule.

(c) Use methods, capabilities, and labor rates matching those of the contractor performing the work.

(d) Price each item at rates in effect at the time the changed work will be done.

(e) Attempt to agree with the contractor on scope and estimate structure before preparing the IGE.

(f) Unless otherwise agreed, use MasterFormat with a level of detail used in the contract documents.

(g) Use the same level of detail the Government would use if it were competing for the award.

(h) Compute the net cost or credit by subtracting the total of the original work from the total of the revised work.

(i) Clearly and adequately describe and identify schedule-related and impact-related costs as a separate part of each estimate.

(j) Prepare the estimate in a timely manner.

c. <u>Impact Cost Considerations.</u>

(1) When a modification is directed, settlement includes not only the cost and time change of the work directly affected, but also the cost and time impact on the unmodified work. Generally the contractor first presents impact costs as part of the proposal's "claimed" impact costs. The Independent Government Estimator looks for offsetting costs to reduce the impact to the Government. The contractor is required to submit documentation to support the claimed cost, such as narrative calculations and planned rescheduling. To determine the extent of the impact, the approved cost and resource-loaded schedule furnished by the contractor must be developed to reflect actual construction as accurately as possible. The modification work is superimposed on the original schedule so as to minimize delay under the given requirements. GSA reviews and accepts, or requests modifications to, the revised schedule.

(2) The Independent Government Estimator classifies each impact cost claimed as either factual or judgmental. Factual costs are fixed and established and can be determined directly from records, such as rental or wage rate agreements or purchase documents.

(3) Once the item has been determined valid as a factual impact, the item cost may be directly calculated. The amount of cost change is either stated on the certification document or can be determined from the scheduled time change of the construction progress plan.

(4) Examples of factual impact costs are:

(a) Escalation of material prices.

(b) Escalation of labor wage rates.

(c) Change in equipment rates.

(d) Increase for extending the storage period for materials and equipment.

(e) Increase for extending the contract for labor and subsistence.

(f) Increase for a longer period of direct onsite overhead personnel, materials, and utilities.

(g) Increase for a longer period of overhead and project office services.

(5) The Independent Government Estimator identifies judgmental impact costs, which include those that are dependent on variable factors such as performance, efficiency, or methodology and cannot be stated factually prior to actual accomplishment. The contractor's proposal must provide clear and credible support for all judgmental impact costs.

(6) Examples of judgmental impact costs are:

(a) Change of efficiency resulting from rescheduling.

(b) Loss of labor efficiency resulting from longer work hours.

(c) Loss of efficiency caused by disruption of existing orderly processes and procedures.

(d) Loss of efficiency during rescheduling of manpower.

(e) Inefficiency incurred from resubmittal of shop drawings, sample materials, etc.

(7) The Independent Government Estimator weighs any premium costs allowed in the base contract change proposal against any additional impact costs requested. For example, the Mechanical Contractors Association's productivity rates can be higher than those used in competitively bid work. The estimator must avoid including the contractor's questionable impact costs in the initial Government estimate unless each has been deemed justifiable. Any offsets to impact costs from deleted work may increase the contractor's efficiency and productivity, resulting in a credit to GSA.

d. Requests for Equitable Adjustment Assistance. The estimator will assist the GSA PM in the review of request for Equitable Adjustment submitted by the contractor.

e. Monthly Pay Request Support. The GSA PM may request support for review of monthly pay requests from the GSA estimator. This support is solely to provide a second opinion on the request relating to completion status using the Schedule of Values.

f. Punch List Analysis Support. The estimator will assist the GSA PM during Close-Out as requested by reviewing the Punch List for potential Change Orders.

Chapter 6: Cost Management Requirements for PBS

Section 1: Overview and Summary of Cost Management Requirements Tables

1. Overview. This chapter shows the cost management requirements for a project throughout its life-cycle, Project Initiation to Project Close-Out Phases. Any submission during the project phases will include some of the work products / deliverables discussed in Chapter 5. The Summary of Requirements tables in Sections 6.2 to 6.6 provide a summary of what will typically be expected at each sub-phase. Specific project attributes may generate a triage rating altering the requirements listed.

2. Summary Cost Management Requirements Tables. The series of tables that follow give clear guidance regarding specific cost management activities that are required, conditional required or not required by creating a matrix of project types and cost management activities.

a. R. An R in a table cell indicates the activity is required.

b. Number. A number in the table cell indicates the activity is conditionally required. The number relates to a note at the end of the table giving specific instructions. Typically, this condition is size of the project.

c. Shaded Cell. A shaded table cell indicates the activity is not required.

3. Structure of Tables.

a. Primary Structure. The Budget Activity (BA) is the primary structure for the table columns. Each Budget Activity is a separate table/section. Each Budget Activity (BA) is organized by Project Types, which are unique for the BA.

(1) BA-51 New Construction

(2) BA-53 Lease-Contract

(3) BA-54 Discretionary Non-Capital Repair and Alteration

(4) BA-55 Non-discretionary Line Item Capital Repair and Alteration

(5) BA-61 Building Maintenance / Repair

(6) BA-80 Reimbursable Work Authorization (RWA) Funded are dependent on the Project Type and magnitude of the project funded via RWA. See other Budget Activity requirements.

b. Delivery Method Structure. Each Project Type further organizes into applicable Delivery Methods. Delivery Methods may include:

(1) Design-Bid-Build (D-B-B)

(2) Construction Manager as Agent (CMa)

(3) Design-Build Bridging (D-B Bridging)

(4) Design-Build Performance (D-B Performance)

(5) Job Order Costing (JOC)

c. Table Row Structure. The project phase is a primary structure for the table rows. They do not appear as column headings in the table, but as individual tables creating a series of tables/subsections for each BA. However, the Procurement, Construction, and Closeout phases are combined as one table/subsection using header rows to separate the phases.

(1) Initiation

(2) Planning and Development

(3) Design

(4) Procurement

(5) Construction

(6) Closeout

d. Sub-phase. Each phase has standard sub-phases listed in the table column. The potential cost management activities for the phase are the final matrix organizational column for indicating requirements.

e. Notes. There is a standard set of numbered notes for all the tables that follow. Only the notes applicable to the table are shown following the table. The standards notes are:

(1) Not required if estimated project value is less than or equal to $50 M.

(2) Not required if estimated project value is less than or equal to Lease Prospectus.

(3) Not required if the cost is less than or equal to Simplified Acquisition Threshold.

(4) Not required if the cost is less than $1 M.

(5) A VE Workshop is required for projects with value greater than $5 million.

(6) A VE Workshop is required for projects with value greater than $25 million.

(7) Estimating to support TI and tenant related shell costs

(8) NEPA Studies may occur following the Project Initiation Phase.

(9) Special studies, such as, Blast / Progressive Collapse Study, Seismic Study, and Master Plan.

(10) Special studies, such as, Blast / Progressive Collapse Study, Seismic Study, and Master Plan. Blast / Progressive Collapse Study and Seismic Study are not required if the cost is less than or equal to Simplified Acquisition Threshold.

(11) Required for non-JOC items procured through the JOC contract.

(12) Not required if Planning & Development submission is not required.

(13) For Triple Net Lease

(14) Only use if project is greater than $1 M.

(15) BA-80 RWA Funded (New and Repair and Alteration) - Reimbursable Work Authorizations are dependent on the Project Type and magnitude of the Project Funded via RWA. See Requirements of other Budget Activities.

Section 2: BA-51 New Construction

Table 6-1. BA-51 New Construction Project Initiation						
	Program Areas (15)	**BA-51 New Construction**				
	Project Type	**New Construction - Gov't Owned**				
	Delivery Methods	D-B-B	CMc	D-B Bridging	D-B Perform.	
Sub-Phase	**Cost Mgt. Activity**					
Scope Definition	Client Request Cost Estimate	R	R	R	R	
	Asset Business Plan Cost Estimate	R	R	R	R	
	NEPA Studies Cost Estimate	8	8	8	8	
	Special Studies Cost Estimate	9	9	9	9	
Quality Assurance	Project Triage Tool	R	R	R	R	
Services Acquisition	Feasibility Study Professional Services Fee Estimates	R	R	R	R	

Notes

8. NEPA Studies may occur following the Project Initiation Phase.
9. Such as, Blast / Progressive Collapse Study, Seismic Study, and Master Plan.
15. BA-80 RWA Funded (New and Repair and Alteration) - Reimbursable Work Authorizations are dependent on the Project Type and magnitude of the Project Funded via RWA. See Requirements of other Budget Activities.

Table 6-2. BA-51 New Construction Project Planning & Development						
	Program Areas (15)	**BA-51 New Construction**				
	Project Type	**New Construction - Gov't Owned**				
	Delivery Methods	D-B-B	CMc	D-B Bridging	D-B Performance	
Sub-Phase	**Cost Mgt. Activity**					
Feasibility Study - 50%	Cost Estimate	R	R	R	R	
	Supporting Analyses (Market, LCC, Risk, Sensitivity)	R	R	R	R	
Feasibility Study - 90%	Cost Estimate	R	R	R	R	
	Supporting Analyses (Market, LCC, Risk, Sensitivity)	R	R	R	R	
Quality Assurance	QA Submittal Review	R	R	R	R	
Feasibility Study - 100%	Cost Estimates	R	R	R	R	
	Supporting Analyses (Market, LCC, Risk, Sensitivity)	R	R	R	R	
Quality Assurance	QA Submittal Review / Approval	R	R	R	R	
	Project Triage Tool	R	R	R	R	
Services Acquisition	PDS Professional Services Fee Estimates	R	R	R	R	
Program Development Study (PDS) - 50%	Cost Estimates	R	R	R	R	
	Supporting Analyses (Market, LCC, Risk, Sensitivity)	R	R	R	R	
Program Development Study (PDS) - 90%	Prepare Cost Estimate	R	R	R	R	
	Supporting Analyses (Market, LCC, Risk, Sensitivity)	R	R	R	R	
Quality Assurance	QA Submittal Review	R	R	R	R	
Program Development Study (PDS) - 100%	Prepare Cost Estimate	R	R	R	R	
	Supporting Analyses (Market, LCC, Risk, Sensitivity)	R	R	R	R	
Vendor Acquisition	Independent Government Estimate				R	
Quality Assurance	QA Submittal Review / Approval	R	R	R	R	
	Project Triage Tool	R	R	R	R	

Notes

15. BA-80 RWA Funded (New and Repair and Alteration) - Reimbursable Work Authorizations are dependent on the Project Type and magnitude of the Project Funded via RWA. See Requirements of other Budget Activities.

Table 6-3. BA-51 New Construction Design					
	Program Areas (15)	**BA-51 New Construction**			
	Project Type	**New Construction - Gov't Owned**			
	Delivery Methods	D-B-B	CMc	D-B Bridging	D-B Perform.
Sub-Phase	**Cost Mgt. Activity**				
Services Acquisition	Design Professional Services Fee Estimates	R	R	R	
Quality Assurance	Professional Services Fee Database Update	R	R	R	
Concept Design - Preliminary	Cost Estimate	R	R	R	
	Supporting Analyses (Market, LCC, Risk, Sensitivity)	R	R	R	
	Cost Plan	R	R	R	
	QC Review A-E Estimate	R	R	R	
Concept Design - Draft Final	Cost Estimate	1	1	1	
	Supporting Analyses (Market, LCC, Risk, Sensitivity)	1	1	1	
	Cost Plan Update	1	1	1	
	QC Review A-E Estimate	1	1	1	
Quality Assurance	QA Submittal Review	1	1	1	
Concept Design - VM Study	VM Study	6	6	6	
	VM Study Results Report	6	6	6	
	VM Study Final Report	6	6	6	
Concept Design - Final	Cost Estimate	R	R	R	
	Space Type Cost Analysis	R	R	R	
	Supporting Analyses (Market, LCC, Risk, Sensitivity)	R	R	R	
	Cost Plan Update	R	R	R	
	Third Party Estimate	R	R	R	
	VM Report Implementation Validation	6	6	6	
	Reconcile A-E / Third Party Estimates	R	R	R	
	QC Review of Estimates	R	R	R	

Table 6-3. BA-51 New Construction Design						
	Program Areas (15)	**BA-51 New Construction**				
	Project Type	**New Construction - Gov't Owned**				
	Delivery Methods	D-B-B	CMc	D-B Bridging	D-B Perform.	
Sub-Phase	**Cost Mgt. Activity**					
Quality Assurance	QA Submittal Review	R	R	R		
Design Development - Pre-VE	Cost Estimate	R	R	R		
	Supporting Analyses (Market, LCC, Risk, Sensitivity)	R	R	R		
	Cost Plan Update	R	R	R		
	QC Review A-E Estimate	R	R	R		
Design Development - VM Study	VM Study	5	5	5		
	VM Study Results Report	5	5	5		
	VM Study Final Report	5	5	5		
Design Development - Final	Cost Estimate	R	R	R		
	Supporting Analyses (Market, LCC, Risk, Sensitivity)	R	R	R		
	Cost Plan Update	R	R	R		
	Third Party Estimate	R	R	R		
	VM Report Implementation Validation	5	5	5		
	Reconcile A-E / Third Party Estimates	R	R	R		
	QC Review of Estimates	R	R	R		
Quality Assurance	QA Submittal Review / Approval	R	R	R		
Vendor Acquisition	Independent Government Estimate			R		
Construction Documents - 75% CD	Cost Estimate	R	R			
	Supporting Analyses (Market, LCC, Risk, Sensitivity)	R	R			
	Cost Plan Update	R	R			
	QC Review A-E Estimate	R	R			
	CMc Guaranteed Maximum Price		R			

Table 6-3. BA-51 New Construction Design					
	Program Areas (15)	**BA-51 New Construction**			
	Project Type	**New Construction - Gov't Owned**			
	Delivery Methods	D-B-B	CMc	D-B Bridging	D-B Perform.
Sub-Phase	**Cost Mgt. Activity**				
Construction Documents - 90% CD	Cost Estimate	R	R		
	Supporting Analyses (Market, LCC, Risk, Sensitivity)	R	R		
	Cost Plan Update	R	R		
	Third Party Estimate	R	R		
	VM Report Implementation Validation	5	5		
	Reconcile A-E / Third Party Estimates	R	R		
	QC Review of Estimates	R	R		
Quality Assurance	QA Submittal Review / Approval	R	R		
Construction Documents - 100% CD	Cost Estimate	R	R		
	Supporting Analyses (Market, LCC, Risk, Sensitivity)	R	R		
	Cost Plan Update	R	R		
	Independent Government Estimate	R	R		
	Reconcile A-E / Independent Government Estimates	R	R		
	QC Review of Estimates	R	R		

Notes

1. Not required if estimated project value is less than or equal to $50,000,000.
5. A VE Workshop is required for projects with value greater than $5 million. VE Workshops require cost estimating.
6. A VE Workshop is required for projects with value greater than $25 million.
15. BA-80 RWA Funded (New and Repair and Alteration) - Reimbursable Work Authorizations are dependent on the Project Type and magnitude of the Project Funded via RWA. See Requirements of other Budget Activities.

Table 6-4. BA-51 New Construction Procurement, Construction and Project Close-Out							
	Program Areas (15)	**BA-51 New Construction**					
	Project Type	**New Construction - Gov't Owned**					
	Delivery Methods	D-B-B	CMc	D-B	Bridging	D-B	Perform.
Sub-Phase	**Cost Mgt. Activity**						
Procurement							
Pre-Bid	Amendment Cost Estimates	R	R	R		R	
	RFI Cost Estimates	R	R	R		R	
Post Award	Bid Analysis	R	R	R		R	
	Contract negotiations support	R	R	R		R	
Quality Assurance	Prepare information for database	R	R	R		R	
Construction							
Progress Payment Management	Monthly Pay request review support	R	R	R		R	
Construction Modification Management	Requests for Equitable Adjustments assistance	R	R	R		R	
	VECP cost estimates review	R	R	R		R	
	Requests for Time Extensions assistance	R	R	R		R	
Quality Assurance	Database Update	R	R	R		R	
Project Close-Out							
Administrative Close-Out	Punch List analysis for potential change orders	R	R	R		R	
Financial Close-Out	Claims analysis support	R	R	R		R	
	Final Cost Analysis	R	R	R		R	
Quality Assurance	Database Update	R	R	R		R	

Notes

15. BA-80 RWA Funded (New and Repair and Alteration) - Reimbursable Work Authorizations are dependent on the Project Type and magnitude of the Project Funded via RWA. See Requirements of other Budget Activities.

Section 3: BA-53 Lease-Contract

Table 6-5. BA-53 Lease-Contract Project Initiation					
	Program Areas (15)	**BA-53 Leasing**			
	Project Type	**Tenant Fit-Out**		**Build-to-Suit**	
	Delivery Methods	D-B Bridging	D-B Perform.	D-B Bridging	D-B Perform.
Sub-Phase	**Cost Mgt. Activity**				
Building Evaluation Reports	Work Item Cost Estimates	13	13	13	13
Scope Definition	Client Request Cost Estimate	R	R	R	R
	Asset Business Plan Cost Estimate	R	R	R	R
	NEPA Studies Cost Estimate	8	R	8	R
	Special Studies Cost Estimate	9	9	9	9
Quality Assurance	Project Triage Tool	R	R	R	R
Services Acquisition	Feasibility Study Professional Services Fee Estimates	R		R	

Notes

8. NEPA Studies may occur following the Project Initiation Phase.
9. Such as, Blast / Progressive Collapse Study, Seismic Study, and Master Plan.
13. For Triple Net Lease
15. BA-80 RWA Funded (New and Repair and Alteration) - Reimbursable Work Authorizations are dependent on the Project Type and magnitude of the Project Funded via RWA. See Requirements of other Budget Activities.

Table 6-6. BA-53 Lease-Contract Project Planning & Development					
	Program Areas (15)	**BA-53 Lease-Contract**			
	Project Type	**Tenant Fit-Out**		**Build-to-Suit Lease**	
	Delivery Methods	D-B Bridging	D-B Perform.	D-B Bridging	D-B Perform.
Sub-Phase	**Cost Mgt. Activity**				
Feasibility Study - 50%	Cost Estimate	R		R	
	Supporting Analyses (Market, LCC, Risk, Sensitivity)	R		R	
Feasibility Study - 90%	Cost Estimate	2		2	
	Supporting Analyses (Market, LCC, Risk, Sensitivity)	2		2	
Quality Assurance	QA Submittal Review	R		R	
Feasibility Study - 100%	Cost Estimates	R		R	
	Supporting Analyses (Market, LCC, Risk, Sensitivity)	R		R	
Quality Assurance	QA Submittal Review / Approval	R		R	
	Project Triage Tool	R		R	
Services Acquisition	PDS Professional Services Fee Estimates	2		2	
Program Development Study (PDS) - 50%	Cost Estimates	2		2	
	Supporting Analyses (Market, LCC, Risk, Sensitivity)	2		2	
Program Development Study (PDS) - 90%	Prepare Cost Estimate	2		2	
	Supporting Analyses (Market, LCC, Risk, Sensitivity)	2		2	
Quality Assurance	QA Submittal Review	2		2	
Program Development Study (PDS) - 100%	Prepare Cost Estimate	2		2	
	Supporting Analyses (Market, LCC, Risk, Sensitivity)	2		2	
Vendor Acquisition	Independent Government Estimate	R		R	
Quality Assurance	QA Submittal Review / Approval	R		R	
	Project Triage Tool	R		R	

Table 6-6. BA-53 Lease-Contract Project Planning & Development						
	Program Areas (15)	**BA-53 Lease-Contract**				
	Project Type	**Tenant Fit-Out**		**Build-to-Suit Lease**		
	Delivery Methods	D-B Bridging	D-B Perform.	D-B Bridging	D-B Perform.	
Sub-Phase	**Cost Mgt. Activity**					
Request for Lease Proposals	Independent Government Estimate	R	R	R	R	

Notes

2. Not required if estimated project value is less than or equal to Lease Prospectus.
15. BA-80 RWA Funded (New and Repair and Alteration) - Reimbursable Work Authorizations are dependent on the Project Type and magnitude of the Project Funded via RWA. See Requirements of other Budget Activities.

Table 6-7. BA-53 Lease-Contract Design						
	Program Areas (15)	**BA-53 Lease-Contract**				
	Project Type	**Tenant Fit-Out**		**Build-to-Suit Lease**		
	Delivery Methods	D-B Bridging	D-B Perform.	D-B Bridging	D-B Perform.	
Sub-Phase	**Cost Mgt. Activity**					
Services Acquisition	Design Professional Services Fee Estimates	2,7	7	2,7	7	
Quality Assurance	Professional Services Fee Database Update	2,7	7	2,7	7	
Concept Design - Preliminary	Cost Estimate	2		2		
	Supporting Analyses (Market, LCC, Risk, Sensitivity)	2		2		
	Cost Plan	2		2		
	QC Review A-E Estimate	2		2		
Concept Design - Draft Final	Cost Estimate	2		2		
	Supporting Analyses (Market, LCC, Risk, Sensitivity)	2		2		
	Cost Plan Update	2		2		
	QC Review A-E Estimate	2		2		
Quality Assurance	QA Submittal Review	2		2		
Concept Design - VM Study	VM Study	5		5		
	VM Study Results Report	5		5		
	VM Study Final Report	5		5		
Concept Design - Final	Cost Estimate	2		2		
	Space Type Cost Analysis	2		2		
	Supporting Analyses (Market, LCC, Risk, Sensitivity)	2		2		
	Cost Plan Update	2		2		
	Third Party Estimate	2		2		
	VM Report Implementation Validation	5		5		
	Reconcile A-E / Third Party Estimates	2		2		
	QC Review of Estimates	2		2		

Table 6-7. BA-53 Lease-Contract Design						
	Program Areas (15)	**BA-53 Lease-Contract**				
	Project Type	**Tenant Fit-Out**		**Build-to-Suit Lease**		
	Delivery Methods	D-B Bridging	D-B Perform.	D-B Bridging	D-B Perform.	
Sub-Phase	**Cost Mgt. Activity**					
Quality Assurance	QA Submittal Review	2		2		
DiD Submission	Cost Estimate	2	7	2	7	
	Supporting Analyses (Market, LCC, Risk, Sensitivity)	2	7	2	7	
	Cost Plan Update	2	7	2	7	
	QC Review A-E Estimate	2	7	2	7	
Design Development - Final	Cost Estimate	2		2		
	Supporting Analyses (Market, LCC, Risk, Sensitivity)	2		2		
	Cost Plan Update	2		2		
	Third Party Estimate	2		2		
	VM Report Implementation Validation	5		5		
	Reconcile A-E / Third Party Estimates	2		2		
	QC Review of Estimates	2		2		
Quality Assurance	QA Submittal Review / Approval	2		2		
Vendor Acquisition	Independent Government Estimate	R		R		

Notes

2. Not required if estimated project value is less than or equal to Lease Prospectus.
5. A VE Workshop is required for projects with value greater than $5 million. VE Workshops require cost estimating.
7. Estimating to support TI and tenant related shell costs
15. BA-80 RWA Funded (New and Repair and Alteration) - Reimbursable Work Authorizations are dependent on the Project Type and magnitude of the Project Funded via RWA. See Requirements of other Budget Activities.

Table 6-8. BA-53 Lease- Contract Procurement, Construction and Project Close-Out					
	Program Areas (15)	**BA-53 Lease-Contract**			
	Project Type	**Tenant Fit-Out**		**Build-to-Suit Lease**	
	Delivery Methods	D-B Bridging	D-B Perform.	D-B Bridging	D-B Perform.
Sub-Phase	**Cost Mgt. Activity**				
Procurement					
Post Award	Bid Analysis	R	R	R	R
	Contract negotiations support	R	R	R	R
Quality Assurance	Prepare information for database	R	R	R	R
Construction					
Progress Payment Management	Monthly Pay request review support	R	R	R	R
Construction Modification Management	Requests for Equitable Adjustments assistance	R	R	R	R
	VECP cost estimates review	R	R	R	R
	Requests for Time Extensions assistance	R	R	R	R
Quality Assurance	Database Update	R	R	R	R
Project Close-Out					
Administrative Close-Out	Punch List analysis for potential change orders	R	R	R	R
Financial Close-Out	Claims analysis support	R	R	R	R
	Final Cost Analysis	R	R	R	R
Quality Assurance	Database Update	R	R	R	R

Notes

15. BA-80 RWA Funded (New and Repair and Alteration) - Reimbursable Work Authorizations are dependent on the Project Type and magnitude of the Project Funded via RWA. See Requirements of other Budget Activities.

Section 4: BA-54 Discretionary Non-Capital Repair and Alteration

Table 6-9. BA-54 Discretionary Non-Capital Repair and Alteration Project Initiation														
	Program Areas (15)	**BA-54 Discretionary Non-Capital Repair and Alteration**												
	Project Type	**Single Bldg System Repair / Replacement**				**Multi-Bldg System Repair / Replacement**					**Tenant Space Renovation / Space Fit-Out**			
	Delivery Methods	D-B-B	D-B Bridging	D-B Perform.	JOC	D-B-B	CMc (14)	D-B Bridging	D-B Perform.	JOC	D-B-B	D-B Bridging	D-B Perform.	JOC
Sub-Phase	**Cost Mgt. Activity**													
Building Evaluation Reports	Work Item Cost Estimates	R	R	R	R	R	R	R	R	R	R	R	R	R
Scope Definition	Client Request Cost Estimate	R	R	R	R	R	R	R	R	R	R	R	R	R
	Asset Business Plan Cost Estimate	R	R	R	R	R	R	R	R	R	R	R	R	R
	NEPA Studies Cost Estimate	8	8	8	8	8	8	8	8	8	8	8	8	8
	Special Studies Cost Estimate	10	10	10	10	10	10	10	10	10	9	9	9	9
Quality Assurance	Project Triage Tool	R	R	R	R	R	R	R	R	R	R	R	R	R
Services Acquisition	Feasibility Study Professional Services Fee Estimates	R	R	R		R	R	R	R		R	R	R	

Notes

8. NEPA Studies may occur following the Project Initiation Phase.
9. Such as, Blast / Progressive Collapse Study, Seismic Study, and Master Plan.
10. Blast / Progressive Collapse Study and Seismic Study are not required if the cost is less than or equal to Simplified Acquisition Threshold.
14. Only use if project is greater than $1 M.
15. BA-80 RWA Funded (New and Repair and Alteration) - Reimbursable Work Authorizations are dependent on the Project Type and magnitude of the Project Funded via RWA. See Requirements of other Budget Activities.

Table 6-10. BA-54 Discretionary Non-Capital Repair and Alteration Project Planning & Development																
	Program Areas (15)	**BA-54 Discretionary Non-Capital Repair and Alteration**														
	Project Type	**Single Bldg System Repair / Replacement**				**Multi-Bldg System Repair / Replacement**					**Tenant Space Renovation / Space Fit-Out**					
	Delivery Methods	D-B-B	D-B Bridging	D-B Perform.	JOC	D-B-B	CMc (14)	D-B Bridging	D-B Perform.	JOC	D-B-B	D-B Bridging	D-B Perform.	JOC		
Sub-Phase	**Cost Mgt. Activity**															
Program of Requirements	Independent Government Estimate			R					R				R			
Annual Work Plan	Cost Estimate	R	R	R	R	R		R	R	R	R	R	R	R		

Notes

14. Only use if project is greater than $1 M.

15. BA-80 RWA Funded (New and Repair and Alteration) - Reimbursable Work Authorizations are dependent on the Project Type and magnitude of the Project Funded via RWA. See Requirements of other Budget Activities.

Table 6-11. BA-54 Discretionary Non-Capital Repair and Alteration Design

Table 6-11. BA-54 Discretionary Non-Capital Repair and Alteration Design																
	Program Areas (15)	**BA-54 Discretionary Non-Capital Repair and Alteration**														
	Project Type	**Single Bldg System Repair / Replacement**					**Multi-Bldg System Repair / Replacement**					**Tenant Space Renovation / Space Fit-Out**				
	Delivery Methods	D-B-B	D-B Bridging	D-B Perform.	JOC		D-B-B	CMc (14)	D-B Bridging	D-B Perform.	JOC		D-B-B	D-B Bridging	D-B Perform.	JOC
Sub-Phase	**Cost Mgt. Activity**															
Services Acquisition	Design Professional Services Fee Estimates	R	R	R	R		R	R	R	R	R		R	R	R	R
Quality Assurance	Professional Services Fee Database Update	R	R	R	R		R	R	R	R	R		R	R	R	R
Concept Design - Preliminary	Cost Estimate												4	4		4
	Supporting Analyses (Market, LCC, Risk, Sensitivity)												4	4		4
	Cost Plan												4	4		4
	QC Review A-E Estimate												4	4		4
Concept Design - Field Investigation Report	Verify cost estimate alignments with scope	R	R	R	R		R	R	R	R	R					
Concept Design - VM Study	VM Study	5	5				5	5	5				5	5		
	VM Study Results Report	5	5				5	5	5				5	5		
	VM Study Final Report	5	5				5	5	5				5	5		

Table 6-11. BA-54 Discretionary Non-Capital Repair and Alteration Design																	
	Program Areas (15)	**BA-54 Discretionary Non-Capital Repair and Alteration**															
	Project Type	**Single Bldg System Repair / Replacement**					**Multi-Bldg System Repair / Replacement**						**Tenant Space Renovation / Space Fit-Out**				
	Delivery Methods	D-B-B	D-B Bridging	D-B Perform.	JOC		D-B-B	CMc (14)	D-B Bridging	D-B Perform.	JOC		D-B-B	D-B Bridging	D-B Perform.	JOC	
Sub-Phase	**Cost Mgt. Activity**																
Concept Design - Final	Cost Estimate												3	3		3	
	Space Type Cost Analysis												3	3		3	
	Supporting Analyses (Market, LCC, Risk, Sensitivity)												3	3		3	
	Cost Plan Update												3	3		3	
	Third Party Estimate												3	3		3	
	VM Report Implementation Validation																
	Reconcile A-E / Third Party Estimates												3	3		3	
	QC Review of Estimates												3	3		3	
Quality Assurance	QA Submittal Review												3	3			
DiD Submission	Cost Estimate	4	4		4		R	R	R		R		R	R		R	
	Supporting Analyses (Market, LCC, Risk, Sensitivity)	4	4		4		R	R	R		R		R	R		R	
	Cost Plan Update	4	4		4		R	R	R		R		R	R		R	
	QC Review A-E Estimate	4	4		4		R	R	R		R		R	R		R	

Table 6-11. BA-54 Discretionary Non-Capital Repair and Alteration Design																
	Program Areas (15)	**BA-54 Discretionary Non-Capital Repair and Alteration**														
	Project Type	**Single Bldg System Repair / Replacement**					**Multi-Bldg System Repair / Replacement**						**Tenant Space Renovation / Space Fit-Out**				
	Delivery Methods	D-B-B	D-B Bridging	D-B Perform.	JOC		D-B-B	CMc (14)	D-B Bridging	D-B Perform.	JOC		D-B-B	D-B Bridging	D-B Perform.	JOC	
Sub-Phase	**Cost Mgt. Activity**																
Design Development - VM Study	VM Study												5	5			
	VM Study Results Report												5	5			
	VM Study Final Report												5	5			
Design Development - Final	Cost Estimate	3	3		3		3		3		3		4	4		4	
	Supporting Analyses (Market, LCC, Risk, Sensitivity)	3	3		3		3		3		3		4	4		4	
	Cost Plan Update	3	3		3		3		3		3		4	4		4	
	Third Party Estimate	3	3		3		3		3		3		4	4		4	
	VM Report Implementation Validation	5	5				5	5	5				5	5			
	Reconcile A-E / Third Party Estimates	3	3		3		3		3		3		4	4		4	
	QC Review of Estimates	3	3		3		3		3		3		4	4		4	
Quality Assurance	QA Submittal Review / Approval	3	3				3		3				4	4			
Vendor Acquisition	Independent Government Estimate	R	R		R		R		R		R		R	R		R	

Table 6-11. BA-54 Discretionary Non-Capital Repair and Alteration Design																
	Program Areas (15)	**BA-54 Discretionary Non-Capital Repair and Alteration**														
	Project Type	**Single Bldg System Repair / Replacement**					**Multi-Bldg System Repair / Replacement**						**Tenant Space Renovation / Space Fit-Out**				
	Delivery Methods	D-B-B	D-B Bridging	D-B Perform.	JOC		D-B-B	CMc (14)	D-B Bridging	D-B Perform.	JOC		D-B-B	D-B Bridging	D-B Perform.	JOC	
Sub-Phase	**Cost Mgt. Activity**															
Construction Documents - 75% CD	Cost Estimate	4					4	R					4				
	Supporting Analyses (Market, LCC, Risk, Sensitivity)	4					4	R					4				
	Cost Plan Update	4					4	R					4				
	QC Review A-E Estimate	4					4	R					4				
	CMc Guaranteed Maximum Price							R									
Construction Documents - 90% CD	Cost Estimate	3					3	R					3				
	Supporting Analyses (Market, LCC, Risk, Sensitivity)	3					3	R					3				
	Cost Plan Update	3					3	R					3				
	Third Party Estimate	3					3	R					3				
	VM Report Implementation Validation	5					5	5					5				
	Reconcile A-E / Third Party Estimates	3					3	R					3				
	QC Review of Estimates	3					3	R					3				
Quality Assurance	QA Submittal Review / Approval	3					3	R					3				

Table 6-11. BA-54 Discretionary Non-Capital Repair and Alteration Design																
	Program Areas (15)	**BA-54 Discretionary Non-Capital Repair and Alteration**														
	Project Type	**Single Bldg System Repair / Replacement**					**Multi-Bldg System Repair / Replacement**						**Tenant Space Renovation / Space Fit-Out**				
	Delivery Methods	D-B-B	D-B Bridging	D-B Perform.	JOC		D-B-B	CMc (14)	D-B Bridging	D-B Perform.	JOC		D-B-B	D-B Bridging	D-B Perform.	JOC	
Sub-Phase	**Cost Mgt. Activity**															
Construction Documents - 100% CD	Cost Estimate	R					R	R					R				
	Supporting Analyses (Market, LCC, Risk, Sensitivity)	R					R	R					R				
	Cost Plan Update	R					R	R					R				
	Independent Government Estimate	R					R	R					R				
	Reconcile A-E / Independent Government Estimates	R					R	R					R				
	QC Review of Estimates	R					R	R					R				

Notes

3. Not required if the cost is less than or equal to Simplified Acquisition Threshold.
4. Not required if the cost is less than $1 million.
14. Only use if project is greater than $1 M.
15. BA-80 RWA Funded (New and Repair and Alteration) - Reimbursable Work Authorizations are dependent on the Project Type and magnitude of the Project Funded via RWA. See Requirements of other Budget Activities.

Table 6-12. BA-54 Discretionary Non-Capital Repair and Alteration Procurement, Construction and Project Close-Out

Table 6-12. BA-54 Discretionary Non-Capital Repair and Alteration Procurement, Construction and Project Close-Out														
	Program Areas (15)	**BA-54 Discretionary Non-Capital Repair and Alteration**												
	Project Type	**Single Bldg System Repair / Replacement**				**Multi-Bldg System Repair / Replacement**					**Tenant Space Renovation / Space Fit-Out**			
	Delivery Methods	D-B-B	D-B Bridging	D-B Perform.	JOC	D-B-B	CMc (14)	D-B Bridging	D-B Perform.	JOC	D-B-B	D-B Bridging	D-B Perform.	JOC
Sub-Phase	**Cost Mgt. Activity**													
Procurement														
Pre-Bid	Amendment Cost Estimates	R	R	R	11	R	R	R	R	11	R	R	R	11
	RFI Cost Estimates	R	R	R	11	R	R	R	R	11	R	R	R	11
Post Award	Bid Analysis	R	R	R	11	R	R	R	R	11	R	R	R	11
	Contract negotiations support	R	R	R	11	R	R	R	R	11	R	R	R	11
Quality Assurance	Prepare information for database	R	R	R	R	R	R	R	R	R	R	R	R	R
Construction														
Progress Payment Management	Monthly Pay request review support	R	R	R	R	R	R	R	R	R	R	R	R	R
Construction Modification Management	Requests for Equitable Adjustments assistance	R	R	R	R	R	R	R	R	R	R	R	R	R
	VECP cost estimates review	R	R	R	R	R	R	R	R	R	R	R	R	R
	Requests for Time Extensions assistance	R	R	R	R	R	R	R	R	R	R	R	R	R

Table 6-12. BA-54 Discretionary Non-Capital Repair and Alteration Procurement, Construction and Project Close-Out														
	Program Areas (15)	**BA-54 Discretionary Non-Capital Repair and Alteration**												
	Project Type	**Single Bldg System Repair / Replacement**					**Multi-Bldg System Repair / Replacement**					**Tenant Space Renovation / Space Fit-Out**				
	Delivery Methods	D-B-B	D-B Bridging	D-B Perform.	JOC		D-B-B	CMc (14)	D-B Bridging	D-B Perform.	JOC	D-B-B	D-B Bridging	D-B Perform.	JOC	
Sub-Phase	**Cost Mgt. Activity**															
Quality Assurance	Database Update	R	R	R	R		R	R	R	R	R	R	R	R	R	
Project Close-Out																
Administrative Close-Out	Punch List analysis for potential change orders	R	R	R	R		R	R	R	R	R	R	R	R	R	
Financial Close-Out	Claims analysis support	R	R	R	R		R	R	R	R	R	R	R	R	R	
	Final Cost Analysis	R	R	R	R		R	R	R	R	R	R	R	R	R	
Quality Assurance	Database Update	R	R	R	R		R	R	R	R	R	R	R	R	R	

Notes:
11. Required for non-JOC items procured through the JOC contract.
14. Only use if project is greater than $1 M.
15. BA-80 RWA Funded (New and Repair and Alteration) - Reimbursable Work Authorizations are dependent on the Project Type and magnitude of the Project Funded via RWA. See Requirements of other Budget Activities.

Section 5: BA-55 Non-Discretionary, Line Item Capital Repair and Alteration

Table 6-13. BA-55 Non-Discretionary, Line Item Capital Repair and Alteration Project Initiation

	Program Areas (15)	**BA-55 Non-discretionary Line Item Capital Repair and Alteration**											
	Project Type	**Single Item Repair**				**Multi-System Repair & Alteration**				**Modernization**			
	Delivery Methods	D-B-B	D-B Bridging	D-B Perform.	JOC	D-B-B	CMc	D-B Bridging	D-B Perform	D-B-B	CMc	D-B Bridging	D-B Perform.
Sub-Phase	**Cost Mgt. Activity**												
Building Evaluation Reports	Work Item Cost Estimates	R	R	R	R	R	R	R	R	R	R	R	R
Scope Definition	Client Request Cost Estimate	R	R	R	R	R	R	R	R	R	R	R	R
	Asset Business Plan Cost Estimate	R	R	R	R	R	R	R	R	R	R	R	R
	NEPA Studies Cost Estimate	8	8	8	8	8	8	8	8	8	8	8	8
	Special Studies Cost Estimate	9	9	9	9	9	9	9	9	9	9	9	9
Quality Assurance	Project Triage Tool	R	R	R	R	R	R	R	R	R	R	R	R
Services Acquisition	Feasibility Study Professional Services Fee Estimates	R	R	R		R	R	R	R	R	R	R	R

Notes

8. NEPA Studies may occur following the Project Initiation Phase.
9. Such as, Blast / Progressive Collapse Study, Seismic Study, and Master Plan. Required as appropriate for project scope.
15. BA-80 RWA Funded (New and Repair and Alteration) - Reimbursable Work Authorizations are dependent on the Project Type and magnitude of the Project Funded via RWA. See Requirements of other Budget Activities.

Table 6-14. BA-55 Non-Discretionary Line Item Capital Repair and Alteration Project Planning & Development

	Program Areas (15)	BA-55 Non-discretionary Line Item Capital Repair and Alteration											
	Project Type	Single Item Repair				Multi-System Repair & Alteration				Modernization			
	Delivery Methods	D-B-B	D-B Bridging	D-B Perform.	JOC	D-B-B	CMc	D-B Bridging	D-B Perform	D-B-B	CMc	D-B Bridging	D-B Perform.
Sub-Phase	**Cost Mgt. Activity**												
Feasibility Study - 50%	Cost Estimate					12	12	12	12	12	12	12	12
	Supporting Analyses (Market, LCC, Risk, Sensitivity)					12	12	12	12	12	12	12	12
Feasibility Study - 90%	Cost Estimate					12	12	12	12	12	12	12	12
	Supporting Analyses (Market, LCC, Risk, Sensitivity)					12	12	12	12	12	12	12	12
Quality Assurance	QA Submittal Review					12	12	12	12	12	12	12	12
Feasibility Study - 100%	Cost Estimates	R	R		R	R	R	R		R	R	R	
	Supporting Analyses (Market, LCC, Risk, Sensitivity)	R	R		R	R	R	R		R	R	R	
Quality Assurance	QA Submittal Review / Approval					R	R	R		R	R	R	
	Project Triage Tool					R	R	R		R	R	R	
Services Acquisition	PDS Professional Services Fee Estimates	R	R			R	R	R		R	R	R	

Table 6-14. BA-55 Non-Discretionary Line Item Capital Repair and Alteration Project Planning & Development															
	Program Areas (15)	**BA-55 Non-discretionary Line Item Capital Repair and Alteration**													
	Project Type	**Single Item Repair**				**Multi-System Repair & Alteration**				**Modernization**					
	Delivery Methods	D-B-B	D-B Bridging	D-B Perform.	JOC	D-B-B	CMc	D-B Bridging	D-B Perform	D-B-B	CMc	D-B Bridging	D-B Perform.		
Sub-Phase	**Cost Mgt. Activity**														
Program Development Study (PDS) - 50%	Cost Estimates					R	R	R		R	R	R			
	Supporting Analyses (Market, LCC, Risk, Sensitivity)					R	R	R		R	R	R			
Program Development Study (PDS) - 90%	Prepare Cost Estimate					R	R	R		R	R	R			
	Supporting Analyses (Market, LCC, Risk, Sensitivity)					R	R	R		R	R	R			
Quality Assurance	QA Submittal Review					R	R	R		R	R	R			
Program Development Study (PDS) - 100%	Prepare Cost Estimate	R	R		R	R	R	R		R	R	R			
	Supporting Analyses (Market, LCC, Risk, Sensitivity)	R	R		R										
Vendor Acquisition	Independent Government Estimate	R	R		R										
Quality Assurance	QA Submittal Review / Approval	R	R			R	R	R		R	R	R			
	Project Triage Tool	R	R		R	R	R	R		R	R	R			
Request for Lease Proposals	Independent Government Estimate			R					R				R		

Notes

12. Not required if Planning & Development submission is not required.

15. BA-80 RWA Funded (New and Repair and Alteration) - Reimbursable Work Authorizations are dependent on the Project Type and magnitude of the Project Funded via RWA. See Requirements of other Budget Activities.

Table 6-15. BA-55 Non-Discretionary Line Item Capital Repair and Alteration Design														
	Program Areas (15)	**BA-55 Non-discretionary Line Item Capital Repair and Alteration**												
	Project Type	**Single Item Repair**				**Multi-System Repair & Alteration**				**Modernization**				
	Delivery Methods	D-B-B	D-B Bridging	D-B Perform.	JOC	D-B-B	CMc	D-B Bridging	D-B Perform	D-B-B	CMc	D-B Bridging	D-B Perform.	
Sub-Phase	**Cost Mgt. Activity**													
Services Acquisition	Design Professional Services Fee Estimates	R	R	R	R	R	R	R	R	R	R	R	R	
Quality Assurance	Professional Services Fee Database Update	R	R	R	R	R	R	R	R	R	R	R	R	
Concept Design - Field Investigation Report	Verify cost estimate alignments with scope	R	R		R	R	R	R		R	R	R		
Concept Design - VM Study	VM Study	5	5			5	5	5		5	5	5		
	VM Study Results Report	5	5			5	5	5		5	5	5		
	VM Study Final Report	5	5			5	5	5		5	5	5		

Table 6-15. BA-55 Non-Discretionary Line Item Capital Repair and Alteration Design																
	Program Areas (15)	**BA-55 Non-discretionary Line Item Capital Repair and Alteration**														
	Project Type	**Single Item Repair**				**Multi-System Repair & Alteration**				**Modernization**						
	Delivery Methods	D-B-B	D-B Bridging	D-B Perform.	JOC	D-B-B	CMc	D-B Bridging	D-B Perform	D-B-B	CMc	D-B Bridging	D-B Perform.			
Sub-Phase	**Cost Mgt. Activity**															
Concept Design - Final	Cost Estimate									R	R	R				
	Space Type Cost Analysis									R	R	R				
	Supporting Analyses (Market, LCC, Risk, Sensitivity)									R	R	R				
	Cost Plan Update									R	R	R				
	Third Party Estimate									R	R	R				
	VM Report Implementation Validation									5	5	5				
	Reconcile A-E / Third Party Estimates									R	R	R				
	QC Review of Estimates									R	R	R				
Quality Assurance	QA Submittal Review									R	R	R				
Design Development - Pre-VE	Cost Estimate					R	R	R		R	R	R				
	Supporting Analyses (Market, LCC, Risk, Sensitivity)					R	R	R		R	R	R				
	Cost Plan Update					R	R	R		R	R	R				
	QC Review A-E Estimate					R	R	R		R	R	R				

Table 6-15. BA-55 Non-Discretionary Line Item Capital Repair and Alteration Design															
	Program Areas (15)	**BA-55 Non-discretionary Line Item Capital Repair and Alteration**													
	Project Type	**Single Item Repair**				**Multi-System Repair & Alteration**				**Modernization**					
	Delivery Methods	D-B-B	D-B Bridging	D-B Perform.	JOC	D-B-B	CMc	D-B Bridging	D-B Perform	D-B-B	CMc	D-B Bridging	D-B Perform.		
Sub-Phase	**Cost Mgt. Activity**														
Design Development - VM Study	VM Study					5	5	5		5	5	5			
	VM Study Results Report					5	5	5		5	5	5			
	VM Study Final Report					5	5	5		5	5	5			
Design Development - Final	Cost Estimate	R	R		R	R	R	R		R	R	R			
	Supporting Analyses (Market, LCC, Risk, Sensitivity)	R	R		R	R	R	R		R	R	R			
	Cost Plan Update	R	R		R	R	R	R		R	R	R			
	Third Party Estimate	R	R		R	R	R	R		R	R	R			
	VM Report Implementation Validation	5	5			5	5	5		5	5	5			
	Reconcile A-E / Third Party Estimates	R	R		R	R	R	R		R	R	R			
	QC Review of Estimates	R	R		R	R	R	R		R	R	R			
Quality Assurance	QA Submittal Review / Approval	R	R			R	R	R		R	R	R			
Vendor Acquisition	Independent Government Estimate	R	R		R	R	R	R		R	R	R			

Table 6-15. BA-55 Non-Discretionary Line Item Capital Repair and Alteration Design															
	Program Areas (15)	**BA-55 Non-discretionary Line Item Capital Repair and Alteration**													
	Project Type	**Single Item Repair**				**Multi-System Repair & Alteration**				**Modernization**			
	Delivery Methods	D-B-B	D-B Bridging	D-B Perform.	JOC	D-B-B	CMc	D-B Bridging	D-B Perform	D-B-B	CMc	D-B Bridging	D-B Perform.
Sub-Phase	**Cost Mgt. Activity**												
Construction Documents - 75% CD	Cost Estimate	R				R	R			R	R		
	Supporting Analyses (Market, LCC, Risk, Sensitivity)	R				R	R			R	R		
	Cost Plan Update	R				R	R			R	R		
	QC Review A-E Estimate	R				R	R			R	R		
	CMc Guaranteed Maximum Price						R				R		
Construction Documents - 90% CD	Cost Estimate	R				R	R			R	R		
	Supporting Analyses (Market, LCC, Risk, Sensitivity)	R				R	R			R	R		
	Cost Plan Update	R				R	R			R	R		
	Third Party Estimate	R				R	R			R	R		
	VM Report Implementation Validation	5				5	5			5	5		
	Reconcile A-E / Third Party Estimates	R				R	R			R	R		
	QC Review of Estimates	R				R	R			R	R		
Quality Assurance	QA Submittal Review / Approval	R				R	R			R	R		

Table 6-15. BA-55 Non-Discretionary Line Item Capital Repair and Alteration Design															
	Program Areas (15)	**BA-55 Non-discretionary Line Item Capital Repair and Alteration**													
	Project Type	**Single Item Repair**				**Multi-System Repair & Alteration**				**Modernization**			
	Delivery Methods	D-B-B	D-B Bridging	D-B Perform.	JOC	D-B-B	CMc	D-B Bridging	D-B Perform	D-B-B	CMc	D-B Bridging	D-B Perform.
Sub-Phase	**Cost Mgt. Activity**												
Construction Documents - 100% CD	Cost Estimate	R				R	R			R	R		
	Supporting Analyses (Market, LCC, Risk, Sensitivity)	R				R	R			R	R		
	Cost Plan Update	R				R	R			R	R		
	Independent Government Estimate	R				R	R			R	R		
	Reconcile A-E / Independent Government Estimates	R				R	R			R	R		
	QC Review of Estimates	R				R	R			R	R		

Notes

5. A VE Workshop is required for projects with value greater than $5 million.

15. BA-80 RWA Funded (New and Repair and Alteration) - Reimbursable Work Authorizations are dependent on the Project Type and magnitude of the Project Funded via RWA. See Requirements of other Budget Activities.

Table 6-16. BA-55 Non-Discretionary Line Item Capital Repair and Alteration Procurement, Construction and Project Close-Out														
	Program Areas (15)	**BA-55 Non-discretionary Line Item Capital Repair and Alteration**												
	Project Type	**Single Item Repair**				**Multi-System Repair & Alteration**				**Modernization**				
	Delivery Methods	D-B-B	D-B Bridging	D-B Perform.	JOC	D-B-B	CMc	D-B Bridging	D-B Perform	D-B-B	CMc	D-B Bridging	D-B Perform.	
Sub-Phase	**Cost Mgt. Activity**													
Procurement														
Pre-Bid	Amendment Cost Estimates	R	R	R	11	R	R	R	R	R	R	R	R	
	RFI Cost Estimates	R	R	R	11	R	R	R	R	R	R	R	R	
Post Award	Bid Analysis	R	R	R	11	R	R	R	R	R	R	R	R	
	Contract negotiations support	R	R	R	11	R	R	R	R	R	R	R	R	
Quality Assurance	Prepare information for database	R	R	R	R	R	R	R	R	R	R	R	R	
Construction														
Progress Payment Management	Monthly Pay request review support	R	R	R	R	R	R	R	R	R	R	R	R	
Construction Modification Management	Requests for Equitable Adjustments assistance	R	R	R	R	R	R	R	R	R	R	R	R	
	VECP cost estimates review	R	R	R	R	R	R	R	R	R	R	R	R	
	Requests for Time Extensions assistance	R	R	R	R	R	R	R	R	R	R	R	R	
Quality Assurance	Database Update	R	R	R	R	R	R	R	R	R	R	R	R	
Project Close-Out														

Table 6-16. BA-55 Non-Discretionary Line Item Capital Repair and Alteration Procurement, Construction and Project Close-Out															
	Program Areas (15)	**BA-55 Non-discretionary Line Item Capital Repair and Alteration**													
	Project Type	**Single Item Repair**				**Multi-System Repair & Alteration**				**Modernization**					
	Delivery Methods	D-B-B	D-B Bridging	D-B Perform.	JOC	D-B-B	CMc	D-B Bridging	D-B Perform	D-B-B	CMc	D-B Bridging	D-B Perform.		
Sub-Phase	**Cost Mgt. Activity**														
Administrative Close-Out	Punch List analysis for potential change orders	R	R	R	R	R	R	R	R	R	R	R	R		
Financial Close-Out	Claims analysis support	R	R	R	R	R	R	R	R	R	R	R	R		
	Final Cost Analysis	R	R	R	R	R	R	R	R	R	R	R	R		
Quality Assurance	Database Update	R	R	R	R	R	R	R	R	R	R	R	R		

Note

11. Required for non-JOC items procured through the JOC contract.

15. BA-80 RWA Funded (New and Repair and Alteration) - Reimbursable Work Authorizations are dependent on the Project Type and magnitude of the Project Funded via RWA. See Requirements of other Budget Activities.

Section 6: BA-61 Building Maintenance / Repair

Table 6-17. BA-61 Building Maintenance / Repair Project Initiation								
	Program Areas (15)	**BA-61 Building Maintenance / Repair**						
	Project Type	**Single Item R / R**		**Multi-System R /R**		**Tenant Fit-Out Alter.**		
	Delivery Methods	D-B-B	JOC	D-B-B	JOC	D-B-B	JOC	
Sub-Phase	**Cost Mgt. Activity**							
Building Evaluation Reports	Work Item Cost Estimates	R	R	R	R	R	R	
Scope Definition	Client Request Cost Estimate	R	R	R	R	R	R	
	Asset Business Plan Cost Estimate	R	R	R	R	R	R	
Quality Assurance	Project Triage Tool	R	R	R	R	R	R	
Services Acquisition	Feasibility Study Professional Services Fee Estimates	R		R		R		

Notes
15. BA-80 RWA Funded (New and Repair and Alteration) - Reimbursable Work Authorizations are dependent on the Project Type and magnitude of the Project Funded via RWA. See Requirements of other Budget Activities.

Table 6-18. BA-61 Building Maintenance / Repair Project Planning & Development								
	Program Areas (15)	**BA-61 Building Maintenance / Repair**						
	Project Type	**Single Item R / R**		**Multi-System R /R**		**Tenant Fit-Out Alter.**		
	Delivery Methods	D-B-B	JOC	D-B-B	JOC	D-B-B	JOC	
Sub-Phase	**Cost Mgt. Activity**							
Annual Work Planning	Cost Estimate	R	R	R	R	R	R	

Notes

15. BA-80 RWA Funded (New and Repair and Alteration) - Reimbursable Work Authorizations are dependent on the Project Type and magnitude of the Project Funded via RWA. See Requirements of other Budget Activities.

Table 6-19. BA-61 Building Maintenance / Repair Design									
	Program Areas	**BA-61 Building Maintenance / Repair**							
	Project Type	**Single Item R / R**		**Multi-System R /R**		**Tenant Fit-Out Alter.**			
	Delivery Methods	D-B-B	JOC	D-B-B	JOC	D-B-B		JOC	
Sub-Phase	**Cost Mgt. Activity**								
Services Acquisition	Design Professional Services Fee Estimates	R	R	R	R	R		R	
Quality Assurance	Professional Services Fee Database Update	R	R	R	R	R		R	
Concept Design - Field Investigation Report	Verify cost estimate alignments with scope	R	R	R	R	R		R	
DiD Submission	Cost Estimate					R			
	Supporting Analyses (Market, LCC, Risk, Sensitivity)					R			
	Cost Plan Update					R			
	QC Review A-E Estimate					R			

Table 6-19. BA-61 Building Maintenance / Repair Design

	Program Areas	BA-61 Building Maintenance / Repair					
	Project Type	Single Item R / R		Multi-System R /R		Tenant Fit-Out Alter.	
	Delivery Methods	D-B-B	JOC	D-B-B	JOC	D-B-B	JOC
Sub-Phase	**Cost Mgt. Activity**						
Construction Documents - 100% CD	Cost Estimate	R		R		R	
	Supporting Analyses (Market, LCC, Risk, Sensitivity)	R		R		R	
	Cost Plan Update	R		R		R	
	Independent Government Estimate	R		R		R	
	Reconcile A-E / Independent Government Estimates	R		R		R	
	QC Review of Estimates	R		R		R	

Table 6-20. BA-61 Building Maintenance / Repair Construction, Procurement and Project Close-Out

	Program Areas	BA-61 Building Maintenance / Repair					
	Project Type	**Single Item R / R**		**Multi-System R /R**		**Tenant Fit-Out Alter.**	
	Delivery Methods	D-B-B	JOC	D-B-B	JOC	D-B-B	JOC
Sub-Phase	**Cost Mgt. Activity**						
Procurement							
Pre-Bid	Amendment Cost Estimates	R	11	R	11	R	11
	RFI Cost Estimates	R	11	R	11	R	11
Post Award	Bid Analysis	R	11	R	11	R	11
	Contract negotiations support	R	11	R	11	R	11
Quality Assurance	Prepare information for database	R	R	R	R	R	R
Construction							
Progress Payment Management	Monthly Pay request review support	R	R	R	R	R	R
Construction Modification Management	Requests for Equitable Adjustments assistance	R	R	R	R	R	R
	VECP cost estimates review	R	R	R	R	R	R
	Requests for Time Extensions assistance	R	R	R	R	R	R
Quality Assurance	Database Update	R	R	R	R	R	R
Project Close-Out							
Administrative Close-Out	Punch List analysis for potential change orders	R	R	R	R	R	R

Table 6-20. BA-61 Building Maintenance / Repair Construction, Procurement and Project Close-Out							
	Program Areas	**BA-61 Building Maintenance / Repair**					
	Project Type	**Single Item R / R**		**Multi-System R /R**		**Tenant Fit-Out Alter.**	
	Delivery Methods	D-B-B	JOC	D-B-B	JOC	D-B-B	JOC
Sub-Phase	**Cost Mgt. Activity**						
Financial Close-Out	Claims analysis support	R	R	R	R	R	R
	Final Cost Analysis	R	R	R	R	R	R
Quality Assurance	Database Update	R	R	R	R	R	R

Notes

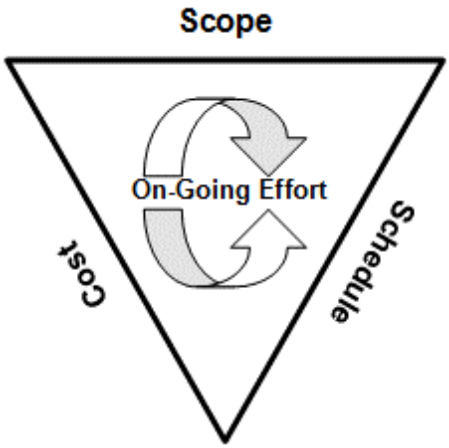
11. Required for non-JOC items procured through the JOC contract.

15. BA-80 RWA Funded (New and Repair and Alteration) - Reimbursable Work Authorizations are dependent on the Project Type and magnitude of the Project Funded via RWA. See Requirements of other Budget Activities.

Chapter 7: Schedule Management

Section 1: Guiding Principles

Figure 7-1. The Project Management Triangle



1. Introduction. In order to assure successful project delivery it is essential to establish an appropriate balance between cost, time, quality and scope, all consistent with the client's goals. All components are interconnected, influencing each other. The policies and procedures in this chapter deal with key aspects of the time component.

2. Schedule Management Policies. Schedule Management Policies have been prepared to provide GSA project teams and the industry at large with general guidelines on successful management of the "time" component of projects. The focus is the appropriate use and application of scheduling tools in successful schedule management, beyond the purely technical aspects of "scheduling", to address the management of time in context with the overall management and delivery of projects.

4. GAO-16-89G, December 2015. The schedule management procedures are reflective of industry best practices and the GAO Schedule Assessment Guide - Best Practices for Project Schedules, GAO-16-89G, December 2015.

5. Master Schedule. This document is intended to provide guidance to the delivery team in the development of a project schedules generally and specifically for a Master Schedule (MS), also referred to as an Master Schedule (MS) for new facilities, additions, renovations projects, leases and for large and small projects that the GSA oversees. A project schedule is a tool, which is used to help manage time, resources, tasks and budget on a project. GSA's primary responsibility is centered on preparing a Master Schedule (MS) for the project at the planning stages and maintaining the schedule over time to allow for reasonable, prudent and dependable delivery of the project. The MS must incorporate all of the tasks and components that make up the project, including planning, design, procurement, construction and commissioning, as well as representing client requirements and issues, outside entities and overall project risks.

6. Challenges. One of GSA's biggest challenges is delivering projects on time.

a. Often customer schedules have the least amount of flexibility

b. Schedule issues are one of the main reasons for conflict on projects

c. Accurate, initial schedule development and continued ongoing maintenance is critical to providing a solid basis for quantifying time impacts and avoiding claims

d. The schedule and any variations in the schedule can have substantial impacts on project costs.

Section 2: Scheduling Policy Overview

1. Overview.

a. The scheduling effort by GSA must reflect establishing the goals for time, cost, scope and quality and their relationship to each other and to help plan the overall approach to the project, with the client, ultimately preparing the MS.

b. The schedule is a living tool that is developed early in the project, but can change dynamically as the project evolves, due to external and internal program/project revisions and change orders. When used actively, the schedule will guide a project to a successful completion.

c. GSA also has responsibility to set requirements for detailed construction schedules prepared for the projects by those responsible for construction including the degree of tasks defined, their logical relationship and external resources included. GSA also monitors any requirements for Earned Value Management (EVM) and monitoring the project during project delivery.

2. Basic Principles.

a. The delivery team needs to determine the appropriate scheduling approaches, systems and procedures for developing and monitoring the schedule, starting at project inception. In making this determination, the following attributes need to be taken into consideration:

(1) Size of the project

(2) Type of project (new construction or renovation)

(3) Complexity of the project

(4) Risks facing the project

(5) Project timeframe

(6) Client’s needs

(7) Project resources available

(8) Project delivery method

b. Decisions need to be made related to the master schedule as well as requirements for design and construction schedules. The development and maintenance of all schedules need to be considered in defining the following:

(1) Form of the schedule (critical path method (CPM) or bar chart),

(2) Extent of the detail (number of activities)

(3) Responsible team member for the schedule development and updates (GSA project manager, CMa, design professional, contractor, suppliers).

c. Smaller and simpler projects generally need simpler schedules. While bar charts may suffice for master schedules and design schedules for such projects, true CPM schedules with a limited number of activities should also be considered. The user friendliness of current-day software makes CPM schedules accessible to most team members. The advantage of a CPM schedule, even for simple schedules, is that, during updates, the impacts of any delays to early activities on project completion can be easily seen and addressed.

d. An essential aspect the GSA scheduling policy is enforcing the ability to crosswalk between the detailed schedules developed by entities performing contract deliverables (i.e., A-E, CMa, contractor) and the GSA Master Schedule.

3. <u>Recommended Practices.</u>

a. GSA's role in the schedule management process is as follows:

(1) Developing the initial project master schedule

(2) Coordinating planning and design-phase activities to maintain schedule.

(3) Development of contract language related to time management.

(4) Development of General and Special Conditions for time management to reflect specific project requirements.

(5) Development of provider (i.e., A-E, CMa, Contractor) time and milestone requirements.

(6) Monitoring of the provider schedules.

(7) Updating the master schedule.

b. Generally, the GSA will be in a lead role directing and managing the total process as well as coordinating support roles (such as CMa activities).

c. GSA's policies are in accordance with industry best practices and specifically GAO recommended practices. The following table presents a summary of these practices. Refer to Appendix A.2 for more detail.

Table 7-1. Applicability of GAO Scheduling Best Practices by Project Phase

	Level of Application H – High M – Moderate L – Low GSA Scheduling Best Practices	**Planning**	**Design**	**Procurement**	**Construction**	**Commissioning**
1	**Capturing all activities.**	**H**	**H**	**H**	**H**	**H**
	The schedule should reflect all activities as defined in the project's work breakdown structure (WBS), which defines in detail the work necessary to accomplish a project's objectives, including activities both the owner and contractors are to perform.					
2	**Sequencing all activities.**	**H**	**H**	**H**	**H**	**H**
	The schedule should be planned so that critical project dates can be met. To do this, activities need to be logically sequenced-that is, listed in the order in which they are to be carried out. In particular, activities that must be completed before other activities can begin (predecessor activities), as well as activities that cannot begin until other activities are completed (successor activities), should be identified. Date constraints and lags should be minimized and justified. This helps ensure that the interdependence of activities that collectively lead to the completion of events or milestones can be established and used to guide work and measure progress.					
3	**Assigning Resources to All Activities**	**L**	**L**	**L**	**H**	**M**
	The schedule should reflect the resources (labor, materials, overhead) needed to do the work, whether they will be available when needed, and any funding or time constraints.					
4	**Establishing Durations for All Activities**	**H**	**H**	**H**	**H**	**H**
	The schedule should realistically reflect how long each activity will take. When the duration of each activity is determined, the same rationale, historical data, and assumptions used for cost estimating should be used. Durations should be reasonably short and meaningful and allow for discrete progress measurement. Schedules that contain planning and summary planning packages as activities will normally reflect longer durations until broken into work packages or specific activities.					
5	**Verifying that the schedule can be traced horizontally and vertically.**	**L**	**L**	**L**	**H**	**M**
	The detailed schedule should be horizontally traceable, meaning that it should link products and outcomes associated with other sequenced activities. These links are commonly referred to as "hand-offs" and serve to verify that activities are arranged in the right order for achieving aggregated products or outcomes.					

Table 7-1. Applicability of GAO Scheduling Best Practices by Project Phase

	Level of Application H – High M – Moderate L – Low GSA Scheduling Best Practices	Planning	Design	Procurement	Construction	Commissioning
	The integrated master schedule (IMS) should also be vertically traceable—that is, varying levels of activities and supporting sub-activities can be traced. Such mapping or alignment of levels enables different groups to work to the same master schedule.					
6	**Confirming that the critical path is valid.**	**L**	**M**	**M**	**H**	**M**
	The schedule should identify the program critical path—the path of longest duration through the sequence of activities. Establishing a valid critical path is necessary for examining the effects of any activity's slipping along this path. The program critical path determines the program's earliest completion date and focuses the team's energy and management's attention on the activities that will lead to the project's success.					
7	**Ensuring reasonable total float.**	**L**	**L**	**L**	**H**	**M**
	The schedule should identify reasonable float (or slack)—the amount of time by which a predecessor activity can slip before the delay affects the program's estimated finish date—so that the schedule's flexibility can be determined. Large total float on an activity or path indicates that the activity or path can be delayed without jeopardizing the finish date. The length of delay that can be accommodated without the finish date's slipping depends on a variety of factors, including the number of date constraints within the schedule and the amount of uncertainty in the duration estimates, but the activity's total float provides a reasonable estimate of this value. As a general rule, activities along the critical path have the least float.					
8	**Conducting a schedule risk analysis**	**M**	**M**	**H**	**H**	**M**
	A schedule risk analysis uses a good critical path method (CPM) schedule and data about project schedule risks and opportunities as well as statistical simulation to predict the level of confidence in meeting a program's completion date, determine the time contingency needed for a level of confidence, and identify high-priority risks and opportunities. As a result, the baseline schedule should include a buffer or reserve of extra time.					
9	**Updating the schedule using actual progress and logic**	**L**	**L**	**L**	**H**	**H**
	Progress updates and logic provide a realistic forecast of start and completion dates for program activities. Maintaining the integrity of the schedule logic at regular intervals is necessary to reflect the true status of the program. To ensure that the schedule is properly updated, people responsible for the updating should be trained in critical path method scheduling.					
10	**Maintaining a baseline schedule**	**M**	**M**	**M**	**H**	**H**

Table 7-1. Applicability of GAO Scheduling Best Practices by Project Phase

	Level of Application **H – High** **M – Moderate** **L – Low** **GSA Scheduling Best Practices**	**Planning**	**Design**	**Procurement**	**Construction**	**Commissioning**
	A baseline schedule is the basis for managing the project scope, the time period for accomplishing it, and the required resources. The baseline schedule is designated the target schedule, subject to a configuration management control process, against which project performance can be measured, monitored, and reported. The schedule should be continually monitored so as to reveal when forecasted completion dates differ from planned dates and whether schedule variances will affect downstream work. A corresponding baseline document explains the overall approach to the project, defines custom fields in the schedule file, details ground rules and assumptions used in developing the schedule, and justifies constraints, lags, long activity durations, and any other unique features of the schedule.					

d. Specific scheduling level requirements include: (Refer to Table 2-2. WBS Schedule Levels of Detail level definition.

Table 7-2. Scheduling Requirements

Project Type	BA	Triage Score	Standard Milestones	WBS		Dependencies	Long Lead Items	Risk Events	Earned Value Reporting
				Master Schedule	Construction				
Capital - Customer and Asset Driven	51	4	Yes	2	4	Yes	Yes	Yes	Yes
Construction, Alteration or RWA ($150K - Prospectus)	54	2	Yes	2	3	Yes	Yes	—	—
Construction, Alteration or RWA ($30 - $150K)	54	2	Yes	2	2	Yes	Yes	—	—
Construction, Alteration or RWA ($0 -$30K)	54	2	Yes	2	2 or 3	—	—	—	—
Lease - High Risk (e.g., Above Prospectus)	53	4	Yes	2	4	Yes	Yes	Yes	Yes
Lease - Medium Risk (e.g., SLAT to Prospectus)	53	3	Yes	2	3	Yes	Yes	—	—
Lease - Low Risk (e.g., Below SLAT)	53	2	Yes	2	2	Yes	Yes	—	—
Complex Non-space	55	3	Yes	2	3	Yes	Yes		—
Standard Non-space	55	2	Yes	2	2	Yes	Yes	—	—
Simple Non-Space	55	2	Yes	2	2 or 3	—	—	—	—

e. Specific scheduling milestone requirements that require a schedule submission or Mater Schedule update include:

Table 7-3. Project Milestones

Capital Projects	Lease Projects	Small Project w/ Design	Small Project w/o Design
BA-51, 55	BA-53	BA-54	BA-54, 61
Tier 4	Tier 3,4	Tier 2,3	Tier 1,2
Need Identified - Planning Initiated	Customer Request	Customer Request	Customer Request
Feasibility Study / Other Studies Complete	Requirements Finalized	Requirements Finalized	Requirements Finalized
Project budget Cost Estimate	Issue project estimate summary	Issue project estimate summary	Issue project estimate summary
Obtain client funding commitment (OA/RWA)	Obtained funding commitment	Obtained funding commitment	Obtain funding commitment
Design Prospectus Submission (if split funding)	Lease Award	Design Award	
Design Funding Authorization/Appropriation (if split funding)			
Design Start Guidance (from OCA)	Design Start	Design Start	
Design Acquisition Announcement Published in FedBizOpps			
Design Award			
Concept Design Approved			
Construction Prospectus Submission - Construction (if split funding)			
Construction Funding Authorization & Appropriation (if split funding)			

Table 7-3. Project Milestones

Construction Acquisition Announcement Published in FedBizOpps			
Construction Drawings Complete	Design Complete	Design Complete	
Construction Award	TI Costs Approved/NTP	Construction Contract Award	Construction Contract Award
Construction Start / Notice to Proceed	Construction Start	Construction Start/NTP	Construction Start/NTP
Substantial Completion		Substantial Completion	Substantial Completion
Rent Start	Substantial Completion/Rent Start	Construction Complete	Construction Complete
Project Closeout Complete	Project Closeout	Project Closeout	Project closeout

Section 3: Interfaces

1. Schedule changes are often a response to scope changes or a change in requirements for occupancy or other key milestones. Key categories focusing on schedule would include:

a. Duration is the primary issue. Changes that might compress the initial schedule or significantly increase the project scope without a commensurate change in duration typically result in significant cost changes since changes may require changes in work intensity, overlap of work and / or other changes to means and methods.

b. Access. Access includes: security change, available working hours, occupied / unoccupied, phasing requirements. Changes to access with or without adjustment to schedule result in additional costs.

2. Schedule and cost are strongly intertwined in both obvious and subtle ways. However, there are many subtle ways. Schedule issues directly related to the cost interaction, are:

a. Duration

b. Intensity

c. Phasing

3. The most important question regarding a schedule change is, "Does the change affect the critical path?" If so, the basic options are:

a. Allow a schedule extension agreeing a new end date.

b. Require recovery to meet existing schedule.

c. Combination of extension and recovery.

4. If the change does not affect the critical path, it can still affect site overhead costs.

5. There are few industry standards governing the scheduling / cost interface. The typical concern is a cost loaded schedule. This is not really helpful for the interaction between cost and schedule. EVM has a standard for EVM systems.

Section 4: Deliverables

1. Deliverables associated with scheduling are provided in the following table. Note that all items through the Program Schedule are part of the Master Schedule and are GSA's responsibility.

Table 7-4. Schedule Deliverables

Deliverable	Responsibility	BA	Comments
Master Schedule	GSA	All	
Acquisition Schedule	GSA	All [1]	
Customer Schedule	GSA	All [1]	
Vendor Schedule	Vendor	All [1]	
Program Schedule	GSA		If project is part of a program
Construction Schedule	Construction Contractor	All [1]	
Earned Value Management	Construction Contractor		As determined applicable
a. For BA-61 may be part of Master Schedule			

Section 5: Earned Value Management

1. <u>Earned Value Management.</u> Earned Value Management (EVM) is a project performance measure that integrates the scope, schedule, and cost. As an aggregated performance measure, EVM forecasts final cost and schedule outcomes. The forecasts aids in projecting and mitigating cost and/or schedule overruns. EVM is that the value of a work component is equal to the amount budgeted to complete it. Project progress is always measured against the defined value plan (Integrated Baseline).

2. <u>GSAM Subpart 534.2 – Earned Value Management Systems.</u> FAR and GSAM policy require EVM for major acquisitions. GSAM Subpart 534.2 – Earned Value Management Systems.

a. Applicability. It is GSA policy to define major acquisition for the purposes of EVMS as follows:

(1) GSA acquisitions valued at $20 million or more. Cost-reimbursement or incentive contracts and orders (see FAR subparts 16.3 and 16.4) shall require a formally validated EVMS (in accordance with ANSI/EIA-748-A Earned Value Management System Acceptance Guide (see 534.201(d) below)). EVMS requirements shall be included in commercial and non-commercial contracts, MAS orders, and GWAC orders when the requirements entail developmental or modernization work, as defined by OMB's definition of Developmental/Modernization/Enhancement in A-11, Part 7. Firm-fixed price, time-and-materials, and labor hour contracts and orders that are solely for commercial items or services, as defined at FAR 2.101, should not normally include EVMS.

(2) GSA acquisitions valued at less than $20 million. EVMS requirements apply for contracts and orders of any type valued at less than $20 million if the program manager and contracting officer determine that EVMS is needed in that instance. This rationale shall be documented in the acquisition plan for the procurement.

3. <u>EVM Standard for EVM Systems.</u> American National Standards Institute / Electronics Industries Alliance (ANSI/EIA) Standard-748, Earned Value Management Systems

Chapter 8: Value Management

Section 1: Guiding Principles

1. Value Management.

a. Value Management (VM) refers to the overall PBS program that complies with various policies and regulations for Value Engineering (VE) and Value Engineering Change Proposal (VECP). Numerous terms (value engineering, value analysis, value management, value planning, etc.) are used when referring to VM studies. While there are subtle differences among these terms they all refer to the same process. PBS will uniformly use the term value management (VM) to refer to the application of the VM Job Plan in value study. Value Management is defined in the OMB A131 Circular as:

(1) A systematic process of reviewing and analyzing the requirements, functions and elements of systems, project, equipment, facilities, services, and supplies for the purpose of achieving the essential functions at the lowest life-cycle cost consistent with required levels of performance, reliability, quality, or safety. The process is generally performed in a workshop environment by a multidisciplinary team of contractor and/or in-house agency personnel (such as an IPT).

b. The focus is on improving value by identifying the most resource-efficient way to reliably accomplish a function that meets performance expectations. The VM process uses a variety of techniques to arrive at alternative approaches that offer improved value.

c. The PBS Value Management program shall use ASTM and SAVE International references as guidance for the methodology and standard practices of value management. These include, but are not limited to:

(1) ASTM E 1699 Standard Practice for Performing Value Engineering (VE) / Value Analysis (VA) of Projects, Projects and Processes

(2) ASTM E 2013 Practice for Constructing FAST Diagrams and Performing Function Analysis During a Value Analysis Study

(3) SAVE International Value Methodology Standard

d. The basic philosophy of the PBS VM program is to enhance the value received per dollar spent over the life-cycle of constructed assets. The program is centered on several major overall objectives:

1) The VM program is an integral part of the overall project delivery process and is not a separate entity designed to “second-guess” PBS management, the design A-E or the CM. The application of VM will be planned and scheduled on projects to promote timely, efficient and effective delivery of services to PBS customer agencies.

2) For maximum effect without undue impact on project schedules, VM focus must begin early in the design process.

3) Primary emphasis is placed on obtaining maximum life-cycle value for first-cost dollars expended within project budgets. Improved value can be represented in a number of different ways depending upon specific project needs. This would include improved function, flexibility, expandability, maintainability and/or aesthetics, as well as reduced life-cycle cost (LCC).

4) Secondary emphasis is placed on first-cost reductions derived from the program. First-cost reductions achieved to bring a project within approved budget are not considered nor reported as “savings”. First cost savings to be reported are only those dollars withdrawn from approved budgets and reallocated to other uses, all as a result of VM. This will occur when required project functions and features can be delivered at a reduced project budget. VM is not to be applied as a simple cost cutting mechanism at the expense of required functions or features.

5) First cost budget increases will be considered when justified based on life-cycle cost reductions. This will be a priority use for funds accumulated as a result of budget revisions described above.

6) Estimated life-cycle cost reductions will be considered and reported as savings only when supported by a full economic analysis. Acceptance and implementation of VM ideas based on projected life-cycle cost reductions are encouraged, whether or not the cost reductions meet the criteria to be counted as savings.

7) Regions will have broad flexibility in determining the level of VM effort allocated to each project, based on a reasonable expected return on investment relative to project size, complexity and status.

Section 2: General Requirements

1. <u>Independent VM Facilitator and Multi-disciplinary Team.</u>

a. GSA policy is to have an independent VM consultant facilitate a value management study using an independent VM team. GSA contracts with the VM consultant directly, rather than through the A-E. However, the design A-E team and CM must be part of the effort. The minimal expectation for workshop participation is through the Information and Function Analysis Phases. The preference is that they participate throughout the study. The A-E’s cost estimator must be available to answer the VM consultant’s questions concerning the origin of A-E design estimate unit costs and interpretation of work-element descriptions.

b. Following the workshop, the A-E reviews VM proposals to address project feasibility and adherence to design programming requirements. They must incorporate

the VM consultant's recommendations that were approved by GSA into the design as part of the scope of work.

c. While total independence from the A-E design team and the CM may be impracticable, maximum independence of the VM consultant and the multi-disciplinary team from the design A-E is required. In some instances, it may be appropriate for Contracting Officers to exclude A-E's or VM consultants from consideration for contracts due to conflict of interest. (See the Federal Acquisition Regulations, Subpart 9.5).

d. Brooks Architect-Engineer Services Act (PL92-582) procurement procedures will be used.

2. Timing of VM Activities.

a. Value Management workshops occur as specified in the requirements matrices (Table 2 1 and Table 2 2). GSA may elect to conduct additional VM studies on a project-by-project basis. Specific considerations for additional studies include:

(1) During the Program Development Study (PDS) some more complex or larger projects would benefit from a VM study applying the VM principles as for value planning. *Any project using the Design-Build Performance delivery method should have a VM study during PDS.*

(2) Projects using a Design-Build Performance delivery method may have a VM study applying the VM principles for value review, particularly for more complex or larger projects. The VM study should occur during an early Design-Build design review submission.

(3) During the 75% and 90% construction documents phases, and for 100% construction documents if deemed necessary due to technical or budgetary constraints.

b. A single study may be appropriate on smaller, less complex projects.

c. Construction contracts exceeding the Simplified Acquisition Threshold must include provision for Value Engineering Change Proposal (VECP). VECPs may require preparation of an IGE. Since a VECP will be supported by contractor pricing, the estimator prepares the IGE in a manner similar for b. Contract Modifications and Claims *Analysis Support* in Section 0.

d. For projects requiring value studies, the Master Schedule and design schedule will include the activities with appropriate time for all the activities.

3. Applicability.

a. Project Cost. OMB Circular A-131 sets a project cost threshold for which value management is required. The threshold for new projects and programs is $5 million. All projects $5 million or greater require value management. Waivers for the requirement may be requested from PBS Value Management Program Office.

b. Scalable VM Effort. The requirement for VM studies is based on factors such as cost or complexity of the project. GSA uses a triage system to aid in determining the appropriate aspects of the Integrated Cost Management system to apply to the project. The triage rating determines the level of VM effort for the project. The Triage rating may require some projects below the $5 million threshold to have a Value Management study. It may trigger a waiver request for other projects.

c. Delivery Method. Delivery method for a PBS project may dictate timing and methods used to for value studies should value management be required. The tables in Chapter 6 establish the required value management studies for various delivery methods. The primary emphasis for the VM program as defined in this guide is on the traditional delivery process. An option is provided for Design-Build Performance, but generally VM is implemented in the design-build process through contractor incentive provisions (VECP).

d. Bundling Projects. Most projects undertaken by PBS are under the $5 million threshold required by OMB Circular A-131. PBS managers shall consider ways of effectively applying the value methodology to the projects.

(1) Consider bundling smaller projects of a similar type together for a VM Workshop.

(2) Consider limited effort study involving an independent VM facilitator with the project team.

e. Monitoring and Reporting Results. Each regional D&C Division Director is expected to monitor the effectiveness of regional D&C VM program activity for annual reporting to OMB. Reporting requirements to the Central Office are the minimum to comply with OMB reporting requirements. There are no set numeric goals. Central Office monitoring of regional VM program implementation will be conducted on a periodic “audit” basis only and as a part of overall cost and schedule management quality assurance. Internal PBS VM reporting requirements are based on realistic measures of effectiveness - first and life cycle cost savings, cost avoidance and VM expenditures. Regional emphasis will be on implementing VM studies on individual projects and reporting results achieved. The Central Office will be responsible for program level analysis and reporting of resources budgeted and return on investment.

Section 3: Value Management Deliverables / Work Products

1. Overview. The Tasking Matrices (Table 5-1. Summary of Estimating Delivery Requirements - New Construction and Table 5-2. Summary of Estimating Delivery Requirements – Renovation, Alteration and Modernization in Chapter 5) show the minimum requirements for conducting value management studies; during concept design and design development phases. VM studies explore cost saving/value-

enhancing options before selecting final design features. The basic approach is to consider macro level issues at concept design and more micro level issues at design development. VM studies use the project Cost Plan developed as a referential to determine current design performance against budget targets. The Cost Plan is the basis for comparison and control throughout the project life cycle.

2. Value Management Report.

a. The Value Management workshop will have two major deliverables; the Value Management Study Results Report and the Value Management Study Final Report. The Results Report includes all the Alternatives from the workshop and the Final Report identifies the Alternatives selected for implementation.

b. In general, decisions made as a result of the first study will not be reconsidered in the second study unless significant new information is available. Furthermore, design changes implemented as a result of the studies will generally be considered within the bounds of the normal design process. Exceptions to this will be considered on a case-by-case basis.

c. The A-E participates in and reviews VM proposals to address project feasibility and adherence to design programming requirements. The A-E's cost estimator must be available to answer the VM consultant's questions concerning the origin of A-E concept design estimate unit costs and interpretation of work-element descriptions. Once GSA determines what VM consultant's recommendations are to be used, the design A-E must incorporate these recommendations into design documents as part of the scope of work.

d. At the conclusion of the VM study a final estimate for the design submittal is submitted.

3. Value Management Implementation Validation. The A-E will produce a report to include with the design submission following the VM Study indicating how each of the agreed VM alternatives were implemented. If an agreed alternative was not implemented, the report will explain why implementation was not possible. A revised and compiled VM Implementation Validation report will be part of the 90% Construction Documents submittal.

4. VECP Cost Estimate Review. A Value Engineering Change Proposal (VECP) submitted by a contractor must be supported by contractor pricing. There is an independent review (IGE) of the cost savings, initial and life cycle, presented in the proposal. The manner is similar to Contract Modifications and Claims Analysis Support.

5. VM Program Metrics. Metrics required for reporting to OMB annually will be collected. The VM statement of work will include details of what is expected to be included in the Final Report for each VM study to help collect the data needed for OMB reporting.

Section 4: Value Management Workshops

1. Available Procedures.

a. The procedures of organizing and holding a VM workshop are available in other sources, specifically:

(1) SAVE International Body of Knowledge

(2) SAVE International Value Methodology Standard

b. Consultants selected to facilitate VM workshops should be thoroughly familiar with the procedures and processes. The intent of this section is to establish the essential approach for any VM workshop.

2. Overall Constraints. No specific constraints are set against the VM program except as overall funding may limit and specific procedures of this policy may apply.

a. Technical Criteria and Standards. Technical considerations should be set on a project-by-project basis and should not limit the reasonable application of VM. GSA and other governing criteria are considered to be open to challenge and reconsideration when significant benefits can be obtained. Applicability of criteria and requirements for justifying deviations from these criteria are generally provided in the issuing documents. Only criteria that are governed by law or by codes must be followed without exception. Cases may arise where criteria deviations appear to have wide applicability and potential benefit beyond the specific project involved in a VM study. These cases should be brought to the attention of the Central Office through the reporting process. Criteria will be reviewed and charged when and as appropriate, in response to regional recommendations.

b. Programmatic Requirements. Concept stage VM studies may also include consideration and challenge of a project's program of requirements, if there are apparent inefficiencies in the program. The primary focus in this area should be on whether the program most efficiently accommodates the basic spatial and functional needs and desired features. With regard to program review, what is and is not VM needs to again be emphasized. Simply paring down the program to reduce cost is not VM. Restructuring the program to achieve the same basic end objectives more fully or efficiently is a legitimate and desired VM activity. Attention in this area can typically focus on support space requirements, with emphasis on redundant or otherwise unnecessary program elements. Program revisions may require intervention by PBS management to authorize reviews and reconsideration of the program as developed.

2. VM Focus at Design Stages.

a. For new construction projects, the first study at concept design is intended to review basic design decisions that pertain to areas such as:

(1) Siting and building orientation

(2) Building form, shape, and massing

(3) Layout

(4) Proportion of usable area to gross area

(5) Design criteria

(6) Building systems selection options

(7) Space program options

(8) Building space/volume parameters

(9) Vertical and horizontal circulation

(10) Major mechanical-electrical-plumbing (MEP) considerations

(11) Overall energy considerations

(12) Site access/egress

(13) Overall phasing/scheduling plans

(14) Subsoil conditions and geological data

(15) Utility availability

b. The second study at Design Development will focus on more detailed design decisions including (as applicable):

(1) Specific building system design

(2) Specification and performance requirements

(3) Proposed design details

(4) Layout options within overall building geometry

(5) Specific MEP system selections

(6) Site paving, grading and utilities

(7) Phasing and scheduling plans

(8) Major constructability issues

Section 5: Value Engineering Change Proposal (VECP)

1. The VECP program is an incentive based procedure. The VECP clause is mandated in all contracts when the contract amount is estimated to exceed the simplified acquisition threshold, unless an incentive contract is contemplated. The contracting officer may include the clause in contracts of lesser value if the contracting officer sees a potential for significant savings. The incentive based procedure allows the contractor to initiate proposals of value engineering based changes to the project. VECP are evaluated on the same basis for the overall VM program.

Appendix A.1: GSA and the GAO Cost Estimating Process

Twelve Steps of the PBS Cost Estimating Process

The steps below are from the GAO Cost Estimating and Assessment Guide. GAO defines an estimate as "the summation of individual cost elements, using established methods and valid data, to estimate the future costs of a program, based on what is known today." The cost estimating process covers the life of a project, and must be repeated for each project at the project initiation, planning and development, design, construction, operations and maintenance, and disposal phases.

- Step 1: Define the estimate’s purpose
- Step 2: Develop estimating plan
- Step 3: Determine program characteristics
- Step 4: Determine estimating structure
- Step 5: Identify Ground Rules and Assumptions
- Step 6: Obtain data
- Task 7: Develop Point Estimate and Compare it to an Independent Cost Estimate
- Step 8: Conduct sensitivity analysis
- Step 9: Conduct a Risk and Uncertainty Analysis.
- Step 10: Document the Estimate
- Step 11: Present Estimate to Management for Approval
- Task 12: Update the Cost Estimate to Reflect Actual Costs and Changes

GAO Twelve Step Process Interface with GSA Policy and Execution						
Step		**How Addressed During Execution**				
Key: P = Policy, S = Selection, R = Reviews, A = Approves, C = Conducts	**Relevant GSA Policy**	**Affected by Scale &/or Complexity**	**Central / Zone QA**	**Regional QC**	**Project Team**
1 Define Estimate's Purpose					
Determine estimate's purpose, required level of detail, and overall scope	P-120 P-100		R	R	C
Determine who will receive the estimate	P-120			R	C
2 Develop Estimating Plan					
Determine the cost estimating team and develop its master schedule	P-120	S	A	A (1)	C
Determine who will do the independent cost estimate	P-120	S	C (2)	R	R
Outline the cost estimating approach	P-120	S		R	C
Develop the estimate timeline	P-120	S	R	R (3)	C
3 Define Program Characteristics					
In a technical baseline description document, identify the program's purpose and its system and performance characteristics and all system configurations	P-120 P-100		R	R	C
Any technology implications	P-100	S	R	R (4)	C
Its program acquisition schedule and acquisition strategy	P-120	S	R	R	C
Its relationship to other existing systems, including predecessor or similar legacy systems	P-100	S	R	R	C
Support (manpower, training, etc.) and security needs and risk items	P-120 P-100	S		R	C

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Step		**How Addressed During Execution**			
Key: P = Policy, S = Selection, R = Reviews, A = Approves, C = Conducts	**Relevant GSA Policy**	**Affected by Scale &/or Complexity**	**Central / Zone QA**	**Regional QC**	**Project Team**
System quantities for development, test, and production	P-120				C
Deployment and maintenance plans	P-120			R	C
4 Determine Estimating Structure					
Define a work breakdown structure (WBS) and describe each element in a WBS dictionary	P-120	S		R (5)	C
Choose the best estimating method for each WBS element	P-120			R	C
Identify potential cross-checks for likely cost and schedule drivers	P-120	S	R	R	C
Develop a cost estimating checklist	P-120			R	C
5 Identify Ground Rules and Assumptions					
Clearly define what the estimate includes and excludes	P-120			R	C
Identify global and program-specific assumptions, such as the estimate's base year, including time-phasing and life cycle	P-120	S	R	R (3)	C
Identify program schedule information by phase and program acquisition strategy	P-120	S	R	R (6)	C
Identify any schedule or budget constraints, inflation assumptions, and travel costs	P-120	S	R	R	C
Specify equipment the government is to furnish as well as the use of existing facilities or new modification or development	P-120 P-100	S	R	R	C
Identify prime contractor and major subcontractors	P-120	S	R	R	C

GAO Twelve Step Process Interface with GSA Policy and Execution					
Step		**How Addressed During Execution**			
Key: P = Policy, S = Selection, R = Reviews, A = Approves, C = Conducts	**Relevant GSA Policy**	**Affected by Scale &/or Complexity**	**Central / Zone QA**	**Regional QC**	**Project Team**
Determine technology refresh cycles, technology assumptions, and new technology to be developed	P-120	S		R (4)	C
Define commonality with legacy systems and assumed heritage savings	P-120	S	R		C
Describe effects of new ways of doing business	P-100	S	R	R	C
6 Obtain Data					
Create a data collection plan with emphasis on collecting current and relevant technical, programmatic, cost, and risk data	P-120		R	R	C
Investigate possible data sou1es	P-120		R	R	C
Collect data and normalize them for cost accounting, inflation, learning, and quantity adjustments	P-120		R	R	C (3)
Analyze the data for cost drivers, trends, and outliers and compare results against rules of thumb and standard factors derived from historical data	P-120	S	R	R	C
Interview data sources and document all pertinent information, including an assessment of data reliability and accuracy	P-120	S	R	R	C
Store data for future estimates	P-120			C	R
7 Develop Point Estimate and Compare It To An Independent Cost Estimate					
Develop the cost model, estimating each WBS element, using the best methodology from the data collected, and including all estimating assumptions	P-120	S	R	R	C
Express costs in constant year dollars	P-120	S	R	R	C

GAO Twelve Step Process Interface with GSA Policy and Execution					
Step		**How Addressed During Execution**			
Key: P = Policy, S = Selection, R = Reviews, A = Approves, C = Conducts	**Relevant GSA Policy**	**Affected by Scale &/or Complexity**	**Central / Zone QA**	**Regional QC**	**Project Team**
Time-phase the results by spreading costs in the years they are expected to occur, based on the program schedule	P-120			R	C
Sum the WBS elements to develop the overall point estimate	P-120				C
Validate the estimate by looking for errors like double counting and omitted costs	P-120	S	R	C	R
Compare estimate against the independent cost estimate and examine where and why there are differences	P-120	S	C	R	R
Perform cross-checks on cost drivers to see if results are similar	P-120		R (2)	C	R
Update the model as more data become available or as changes occur and compare results against previous estimates	P-120				C
8 Conduct Sensitivity Analysis					
Test the sensitivity of cost elements to changes in estimating input values and key assumptions	P-120	S	R	R	C
Identify effects on the overall estimate of changing the program schedule or quantities	P-120	S	R	R	C
Determine which assumptions are key cost drivers and which cost elements are affected most by changes	P-120	S	R	R	C
9 Conduct Risk and Uncertainty Analysis					

GAO Twelve Step Process Interface with GSA Policy and Execution					
Step		**How Addressed During Execution**			
Key: P = Policy, S = Selection, R = Reviews, A = Approves, C = Conducts	**Relevant GSA Policy**	**Affected by Scale &/or Complexity**	**Central / Zone QA**	**Regional QC**	**Project Team**
Determine and discuss with technical experts the level of cost, schedule, and technical risk associated with each WBS element	P-120	S	R	C (7)	R
Analyze each risk for its severity and probability	P-120	S	R	C	R
Develop minimum, most likely, and maximum ranges for each risk element	P-120	S	R	C	R
Determine type of risk distributions and reason for their use	P-120	S	R	C	R
Ensure that risks are correlated	P-120	S	R	C	R
Use an acceptable statistical analysis method (e.g., Monte Carlo simulation) to develop a confidence interval around the point estimate	P-120	S	R	C	R
Identify the confidence level of the point estimate	P-120	S	R	C	R
Identify the amount of contingency funding and add this to the point estimate to determine the risk-adjusted cost estimate	P-120	S	R	C	R
Recommend that the project or program office develop a risk management plan to track and mitigate risks	P-120	S	C		
10 Document the Estimate					
Document all steps used to develop the estimate so that a cost analyst unfamiliar with the program can recreate it quickly and produce the same result	P-120	S	R	R (8)	C
Document the purpose of the estimate, the team that prepared it, and who approved the estimate and on what date	P-120	S			C

GAO Twelve Step Process Interface with GSA Policy and Execution					
Step		**How Addressed During Execution**			
Key: P = Policy, S = Selection, R = Reviews, A = Approves, C = Conducts	**Relevant GSA Policy**	**Affected by Scale &/or Complexity**	**Central / Zone QA**	**Regional QC**	**Project Team**
Describe the program, its schedule, and the technical baseline used to create the estimate	P-120	S			C
Present the program's time-phased life-cycle cost	P-120	S		R	C
Discuss all ground rules and assumptions	P-120	S		R	C
Include auditable and traceable data sources for each cost element and document for all data sources how the data were normalized	P-120	S	R	C	R
Describe in detail the estimating methodology and rationale used to derive each WBS element's cost (prefer more detail over less)	P-120	S			C
Describe the results of the risk, uncertainty, and sensitivity analyses and whether any contingency funds were identified	P-120	S	R	C (8)	R
Document how the estimate compares to the funding profile	P-120	S		R	C
Track how this estimate compares to any previous estimates	P-120	S	R	C	R
11 Present Estimate To Management For Approval					
Develop a briefing that presents the documented life-cycle cost estimate	P-120	S		R (7)	C
Include an explanation of the technical and programmatic baseline and any uncertainties;	P-120	S		R	C
Compare the estimate to an independent cost estimate (ICE) and explain any differences	P-120	S	C (2)	R	R

GAO Twelve Step Process Interface with GSA Policy and Execution					
Step		**How Addressed During Execution**			
Key: P = Policy, S = Selection, R = Reviews, A = Approves, C = Conducts	**Relevant GSA Policy**	**Affected by Scale &/or Complexity**	**Central / Zone QA**	**Regional QC**	**Project Team**
Compare the estimate (life-cycle cost estimate (LCCE)) or independent cost estimate to the budget with enough detail to easily defend it by showing how it is accurate, complete, and high in quality	P-120	S		C (8)	R
Focus in a logical manner on the largest cost elements and cost drivers	P-120	S			C
Make the content clear and complete so that those who are unfamiliar with it can easily comprehend the competence that underlies the estimate results	P-120	S			C
Make backup slides available for more probing questions	P-120	S			C
Act on and document feedback from management	P-120	S	R	R	C
Request acceptance of the estimate	P-120	S			C
12 Update The Estimate To Reflect Actual Costs And Changes					
Update the estimate to reflect changes in technical or program assumptions or keep it current as the program passes through new phases or milestones;	P-120	S		R (8)	C
Replace estimates with EVM EAC and independent estimate at completion (EAC) from the integrated EVM system;	P-120	S			C
Report progress on meeting cost and schedule estimates;	P-120				C
Perform a post mortem and document lessons learned for elements whose actual costs or schedules differ from the estimate;	P-120	S	R	C	R

GAO Twelve Step Process Interface with GSA Policy and Execution					
Step		**How Addressed During Execution**			
Key: P = Policy, S = Selection, R = Reviews, A = Approves, C = Conducts	**Relevant GSA Policy**	**Affected by Scale &/or Complexity**	**Central / Zone QA**	**Regional QC**	**Project Team**
Document all changes to the program and how they affect the cost estimate	P-120			R	C
Notes / Comments (1) More complex/risky projects require higher level approval (2) Independent estimates to be determined at Central/Zone level (3) More complex/risky projects require higher level input (4) Technology implications may require central approval (5) Complex renovation projects may require special work breakdown. (6) Program Acquisition Strategy may require higher level approval. (7) More complex/risky projects require higher level input and Regional action (8) More complex/risky projects require higher level input and Regional and Central/Zonal action					

Appendix A.2: GSA and the GAO Scheduling Best Practices

The accompanying tables give the GAO checklist for each of the ten best practices.

	Applicability	
1. Capturing all activities	**P = Primary S = Secondary**	
The schedule should reflect all activities as defined in the project's work breakdown structure (WBS), which defines in detail the work necessary to accomplish a project's objectives, including activities both the owner and contractors are to perform.	**Master Schedule**	**Provider Schedule**
• The WBS is the basis of the project schedule. Its elements are linked to one another with logical relationships and lead to the end product or final delivery. The schedule clearly reflects the WBS and defines the activities necessary to produce and deliver each product.	P	P
• The schedule reflects all effort (steps, events, work required, and outcomes) to accomplish the deliverables described in the program's WBS.	P	P
• The Integrated Master Schedule (IMS) includes planning for all activities that have to be accomplished for the entire duration of the program, including all blocks, increments, phases, and so on.	P	S
• The IMS includes the summary and intermediate and all detailed schedules. The same schedule serves as the summary, intermediate, and detailed schedule by simply rolling up lower levels of effort into summary activities or higher-level WBS elements.	P	S
• The detailed schedule includes all activities the government, its contractors, and others must perform to complete the work, including government-furnished equipment or information, deliverables, or services from other projects.	P	P
• The schedule contains primarily detail activities and includes milestones only to reflect major events or deliverables.	S	P
• If the government program management office and its contractor use different scheduling software packages, a process is defined to preserve integrity between the different schedule formats, and the converted data are verified and validated when the schedules are updated.	P	S
• Effort that has no measurable output and cannot be associated with a physical product or defined deliverable is represented by level of effort (LOE) activities	P	P

• Activity names are descriptive and clear enough to identify their associated product without the need to review high-level summary or predecessor activity names.	P	P
• Activities within the schedule are easily traced to key documents and other information through activity or task codes.	P	P

	Applicability	
2. Sequencing All Activities	**P = Primary S = Secondary**	
The schedule should be planned so that critical project dates can be met. To do this, activities need to be logically sequenced-that is, listed in the order in which they are to be carried out. In particular, activities that must be completed before other activities can begin (predecessor activities), as well as activities that cannot begin until other activities are completed (successor activities), should be identified. Date constraints and lags should be minimized and justified.	**Master Schedule**	**Provider Schedule**
• The schedule contains complete network logic between all activities so that it can correctly forecast the start and end dates of activities within the plan.	S	P
• The majority of relationships within the detailed schedule are finish-to start.	S	P
• Except for the start and finish milestones, every activity within the schedule has at least one predecessor and at least one successor.	P	P
• Any activity that is missing predecessor or successor logic—besides the start and finish milestones—is clearly justified in the schedule documentation.	P	P
• The schedule contains no dangling logic. That is,		
o Each activity (except the start milestone) has an F–S or S–S predecessor that drives its start date.	P	P
o Each activity (except the finish milestone and deliverables that leave the project without subsequent effect on the project) has an F–S or F–F successor that it drives.	P	P
• The schedule does not contain start-to-finish logic relationships.	P	P
• Summary activities do not have logic relationships because the logic is specified for activities that are at the lowest level of detail in the schedule.	P	P
• Instead of SNET constraints, conditions of supply by an outside vendor or contractor are represented as actual activities in the schedule.	P	P
• Date constraints are thoroughly justified in the schedule documentation. Unavoidable hard constraints are used judiciously and are fully justified in reference to some controlling event outside the schedule.	P	P
• Lags are used in the schedule only to denote the passage of time between two activities.	P	P

• Instead of lags and leads, every effort is made to break activities into smaller tasks to identify realistic predecessors and successors so that logic interfaces are clearly available for needed dependency assignments.	S	P
• If included in the schedule, lags and leads are used judiciously and are justified by compelling reasons outside the schedule in the schedule documentation.	P	P
• The schedule is assessed for path convergence. That is, activities with many predecessors have been examined to see whether they are needed and whether alternative logic can be used to link some predecessors to other activities.	P	P

	Applicability	
3. Assigning Resources to All Activities	**P = Primary S = Secondary**	
The schedule should reflect the resources (labor, materials, overhead) needed to do the work, whether they will be available when needed, and any funding or time constraints.	**Master Schedule**	**Provider Schedule**
• The amount of available resources, whether labor or non-labor, affects estimates of work and its duration, as well as the availability of resources for subsequent activities.	S	P
• The schedule should realistically reflect the resources that are needed to do the work and—compared to total available resources—should determine whether all required resources will be available when they are needed.	P	P
• Resources are either labor or non-labor, where labor refers to humans and non-labor can refer to subcontracts, consumable material, machines, and other purchased equipment. Resources are identified as fixed or variable.	S	P
• Significant material and equipment resources are captured within the schedule along with other equipment resources that facilitate the project.	S	P
• Budgets for direct labor, overhead, and material are assigned to both work and planning packages so that total costs to complete the program are identified at the outset.	S	P
• If EVM is used to monitor the program, the fully loaded schedule, including materials, equipment, direct labor, overhead, and LOE activities, is the basis for the PMB.	S	P
• Activity owners are able to explain the logic behind their resource estimates.	S	P
• The same assumptions that formed resource estimates for the LCCE are applied to the estimated resources loaded into the schedule and are documented in the BOE. Underlying resource assumptions for the entire estimated scope of work are documented in the schedule baseline document at an appropriate level of detail.	P	P
• Resource information is stored in the schedule in the form of assignments. If resource management is performed outside the schedule, a documented process feeds resource assignments back into the schedule so that it reflects the resolution of resource issues conducted separately.	P	P

• Once the schedule is resource loaded, total resources in the schedule are crosschecked with the program budget and contractual cost constraints.	P	P
• Resource peaks are examined for the feasibility of the available budget, the availability of resources, and the timeliness of the peaks.	S	P
• If the cumulative overlay of resources against major milestones shows resource peaks just beyond major milestone points, resources may have to be reallocated.	S	P
• Managers and planners have assessed whether bow waves exist in the high-level resource allocation profile.	P	P
• Resource leveling has been performed—that is, the scheduled time of activities or the assignment of resources has been adjusted to account for the availability of resources.	S	P
• In general, activities that are delayed through resource leveling have the greatest free float available and the least amount of resources assigned.	S	P
• If critical resources delay the entire project, changes to resolve the resource conflicts are thoroughly documented in the schedule narrative and understood by all.	P	P
• Planners and managers carefully examine and temper or adjust where necessary.	P	S
• Resource leveling occurs only on detail schedules that include detailed resource estimates supported by historical data and sound estimating methodologies.	S	P

	Applicability	
4. Establishing Durations for All Activities	**P = Primary S = Secondary**	
The schedule should realistically reflect how long each activity will take. When the duration of each activity is determined, the same rationale, historical data, and assumptions used for cost estimating should be used. Durations should be reasonably short and meaningful and allow for discrete progress measurement. Schedules that contain planning and summary planning packages as activities will normally reflect longer durations until broken into work packages or specific activities.	**Master Schedule**	**Provider Schedule**
• Activity durations are directly related to the assigned resources and estimated work required.	S	P

• In general, estimated detailed activity durations are shorter than 2 working months, or approximately 44 working days. Durations are as short as possible, to a point, to facilitate the objective measurement of accomplished effort.	S	P
• Long durations should be broken into shorter activities if logical breaks can be identified in the work being performed. If it is not practical to divide the work into smaller activities or insert intermediate milestones, justification for long durations is provided in the schedule baseline document.	S	P
• Very short durations, such as 1 day or less, may imply a schedule that is too detailed and will require more-frequent updates to schedule duration and logic than is otherwise necessary.	S	P
• LOE activities are clearly marked in the schedule and do not appear on a critical path. They are scheduled as hammock or summary activities, so that their durations are derived from other discrete activities.	S	P
• All activity durations within the schedule are defined by the same time unit (hours, days, weeks). Days are preferred. · Planning packages representing undefined future work should be integrated into network logic.	P	P
• Activity durations are estimated under normal conditions, not optimal or “success-oriented” conditions or padded durations. That is, “normal conditions” for estimated durations implies that duration estimates do not contain padding or buffer for risk. They should also not be unrealistically short or arbitrarily reduced by management to meet a project challenge.	P	P
• All assumptions related to activity duration estimates are documented at an appropriate level of detail, such as the methodology used to create the estimate (for example, parametric analysis of historic data or opinion of a subject matter expert) and all supporting historic or analogous data. Activity duration estimates for a WBS element in a schedule should clearly map to and correspond with the basis of the cost estimate for the same WBS element.	P	P
• Activity duration estimates for a WBS element in a schedule should clearly map to and correspond with the basis of the cost estimate for the same WBS element.	S	P
• Calendars are used to specify valid working times for resources and activities.	P	P

	Applicability	
5.Verifying That the Schedule Can Be Traced Horizontally and Vertically	**P = Primary S = Secondary**	
The detailed schedule should be horizontally traceable, meaning that it should link products and outcomes associated with other sequenced activities. These links are commonly referred to as "hand-offs" and serve to verify that activities are arranged in the right order for achieving aggregated products or outcomes. The integrated master schedule (IMS) should also be vertically traceable—that is, varying levels of activities and supporting sub-activities can be traced. Such mapping or alignment of levels enables different groups to work to the same master schedule.	**Master Schedule**	**Provider Schedule**
• The schedule is horizontally traceable. That is, the schedule:		
o depicts logical relationships between different program elements and product hand-offs and clearly shows when major deliverables and hand-offs are expected;	S	P
o includes complete logic from program start to program finish and fully integrates the entire scope of work from all involved in the program;	S	P
o includes milestones representing key decisions or deliverables with traced and validated predecessor activities to ensure that they are directly related to completing the milestone;	P	P
o clearly identifies and logically links "giver/receiver" milestones between schedules that are defined in the schedule baseline document;	S	P
o dynamically reforecasts the date of a key milestone through network logic if activities related to accomplishing the milestone are delayed;	S	P
o is affected by activities whose durations are extended by hundreds of days;	P	P
o includes giver/receiver milestones that are defined in the schedule baseline document	S	P
• The schedule is vertically traceable. That is, it:		
o demonstrates that data are consistent between summary, intermediate, and detailed levels of the schedule, including dates that are frequently validated through a documented process;	P	P
o allows activity owners to trace activities to higher-level milestones with intermediate and summary schedules;	P	P
o allows lower-level schedules to be rolled up into the overall program schedule, which includes government activities, other contractor schedules, and interfaces with external parties.	P	P

	Applicability	
6. Confirming That the Critical Path Is Valid	**P = Primary S = Secondary**	
The schedule should identify the program critical path—the path of longest duration through the sequence of activities. Establishing a valid critical path is necessary for examining the effects of any activity's slipping along this path. The program critical path determines the program's earliest completion date and focuses the team's energy and management's attention on the activities that will lead to the project's success.	**Master Schedule**	**Provider Schedule**
• The schedule's critical path is valid. That is, the critical path or longest path in the presence of late-date constraints		
o does not include LOE activities, summary activities, or other unusually long activities;	P	P
o is a continuous path from the status date to the major completion milestones;	S	P
o does not include constraints so that other activities are unimportant in driving the milestone date;	S	P
o is not driven in any way by lags or leads;	S	P
o is derived in summary schedules by vertical integration of lower level detailed schedules, not preselected activities that management has presupposed are important.	P	P
• If backward-pass date constraints are present on activities other than the finish milestone, both the critical path and the longest path have been identified. With a number of constraints, activities with zero or negative total float may outnumber activities that are actually driving the key project completion milestone.	S	P
• The critical path, or longest path in the presence of late-date constraints, is used as a tool for managing the program. That is, management:		
o has vetted and justified the current critical path as calculated by the software;	S	P
o uses the critical path to focus on activities that will be detrimental to the key project milestones and deliveries if they slip;	P	P
o examines and mitigates risk in activities on the critical path that can potentially delay key program deliveries and milestones;	P	P
o has reviewed and analyzed near-critical paths because these activities are likely to overtake the existing critical path and drive the schedule;	S	P
o recognizes not only activities with the lowest float but also activities that are truly driving the finish date of key milestones;	S	P
o evaluates the critical path before the schedule is baselined and after every status update to ensure that it is valid.	S	P

	Applicability	
7. Ensuring Reasonable Total Float	**P = Primary S = Secondary**	
The schedule should identify reasonable float (or slack)—the amount of time by which a predecessor activity can slip before the delay affects the program's estimated finish date—so that the schedule's flexibility can be determined. Large total float on an activity or path indicates that the activity or path can be delayed without jeopardizing the finish date. The length of delay that can be accommodated without the finish date's slipping depends on a variety of factors, including the number of date constraints within the schedule and the amount of uncertainty in the duration estimates, but the activity's total float provides a reasonable estimate of this value. As a general rule, activities along the critical path have the least float.	**Master Schedule**	**Provider Schedule**
• The total float values calculated by the scheduling software are reasonable and accurately reflect true schedule flexibility.	S	P
• The project really has the amount of schedule flexibility indicated by the levels of float.	S	P
• Remaining activities in the schedule are sorted by total float and assessed for reasonableness. Any activities that appear to have a great deal of float are examined for missing or incomplete logic.	S	P
• Total float values that appear to be excessive are documented to show that the project team has performed the assessment and agreed that the logic and float are consistent with the plan.	S	P
• Total float is calculated to the main deliveries and milestones as well as to the project completion.	P	P
• Total and free float inform management as to which activities can be reassigned resources in order to mitigate slips in other activities.	S	P
• Management balances the use of float with the fact that total float is shared along a path of activities.	S	P
• Periodic reports routinely show the amount of float consumed in a period and remaining on the critical and near-critical paths.	P	P
• Date constraints causing negative float have been justified. If delay is significant, plans to recover the implied schedule slip have been evaluated and implemented, if so decided.	S	P

	Applicability	
8. Conducting a Schedule Risk Analysis	**P = Primary S = Secondary**	
A schedule risk analysis uses a good critical path method (CPM) schedule and data about project schedule risks and opportunities as well as statistical simulation to predict the level of confidence in meeting a program's completion date, determine the time contingency needed for a level of confidence, and identify high-priority risks and opportunities. As a result, the baseline schedule should include a buffer or reserve of extra time.	Master Schedule	Provider Schedule
• A schedule risk analysis was conducted to determine:		
o the likelihood that the project completion date will occur,	P	P
o how much schedule risk contingency is needed to provide an acceptable level of certainty for completion by a specific date,	P	P
o risks most likely to delay the project,	P	P
o how much contingency reserve each risk requires, and	P	P
o the paths or activities that are most likely to delay the project.	P	P
• The schedule was assessed against best practices before the simulation was conducted. The schedule network clearly identifies work to be done and the relationships between detailed activities and is based on a minimum number of justified date constraints.	S	P
• The SRA has low, most likely, and high duration data fields.	P	P
• The SRA accounts for correlation in the uncertainty of activity durations.	S	P
• Risks are prioritized by probability and magnitude of impact.	P	P
• The risk register was used in identifying the risk factors potentially driving the schedule before the SRA was conducted.	P	P
• The SRA data and methodology are available and documented.	P	P
• The SRA identifies the activities in the simulation that most often ended up on the critical path, so that near-critical path activities can be closely monitored.	S	P
• The risk inputs have been validated. The ranges are reasonable and based on information gathered from knowledgeable sources, and there is no evidence of bias in the risk data.	S	P
• The baseline schedule includes schedule contingency to account for the occurrence of risks. Schedule contingency is calculated by performing an SRA and comparing the schedule date with that of the simulation result at a desired level of certainty.	P	P
• Schedule contingency is held by the project manager and allocated to contractors, subcontractors, partners, and others as necessary for their scope of work.	P	S

• Contingency is allocated according to the prioritized risk list because the risks that will actually occur and the magnitudes of their effects are not known in advance.	P	P
• The program documents the derivation and amount of contingency set aside by management for risk mitigation and unforeseen problems. An assessment of schedule risk is performed to determine whether the contingency is sufficient.	P	P
• An SRA is performed on the schedule periodically as the schedule is updated to reflect actual progress on activity durations and sequences. A contractor performs an SRA during the formulation of the performance measurement baseline to provide the basis for contractor schedule reserve at the desired confidence level.	P	P

	Applicability	
9. Updating the Schedule Using Actual Progress and Logic	**P = Primary S = Secondary**	
Progress updates and logic provide a realistic forecast of start and completion dates for program activities. Maintaining the integrity of the schedule logic at regular intervals is necessary to reflect the true status of the program. To ensure that the schedule is properly updated, people responsible for the updating should be trained in critical path method scheduling.	**Master Schedule**	**Provider Schedule**
• Schedule progress is recorded periodically and the schedule has been updated recently. Schedule status is updated with actual and remaining progress.	P	P
• Schedule status is based on progress records for the current time period; they include pertinent activity information such as name, unique ID, original and remaining durations, planned and actual start and finish dates, and float.	S	P
• The status date (or data date) denoting the date of the latest update to the schedule is recorded.	P	P
• At least one in-progress activity is critical.	P	P
• No activities precede the status date without actual start or finish dates and actual effort up to the status date. No activities beyond the status date have actual start or finish dates or actual effort.	P	P
• Activities that are behind schedule by the status date have a remaining duration estimate and the delay's effect has been assessed.		
o If the delay is significant, plans to recover the implied schedule slip have been evaluated and implemented, if so decided.	P	P
o Resources are reviewed and may be reassigned, depending on schedule progress.	S	P
• When possible, LOE activities are linked to the physical percentage complete of the work they support.	S	P
• When possible, actual work progress is tracked rather than simply updating durations.	P	P
• Responsibility for changing or statusing the schedule is assigned to someone who has the proper training and experience in CPM scheduling.	P	P
• Changes that were made to the schedule during the update have been documented.	P	P
• New activities are reviewed for completeness of predecessor and successor logic, resource assignments, and effects on the critical path and float calculations.	S	P

• Activities that have started or completed out of sequence have been addressed using either retained logic or progress override to reflect the order in which the activities were actually carried out.	S	P
• Management reviews schedule updates and verifies and assesses effects on the plan. Significant variances between planned and actual performance, as well as actual and planned logic, are documented and understood.	P	P
• The schedule structure is examined after each update to ensure that logic is not missing or broken, all date constraints are necessary, and no artifacts impede the ability of the schedule to dynamically forecast dates.	S	P
• The current schedule, once management approves it, is assigned a version number and archived.	P	P
• A schedule narrative accompanies each status update and includes:		
o the status of key milestone dates, including the program finish date;	P	P
o the status of key hand-offs or giver/receiver dates;	P	P
o explanations for any changes in key dates; o changes in network logic, including lags, date constraints, and relationship logic and their effect on the schedule;	S	P
o a description of the critical paths, near-critical paths, and longest paths along with a comparison to the previous period's paths; and	S	P
o any significant scheduling software options that have changed between update periods, such as the criticality threshold for total float; progress override versus retained logic; or whether resource assignments progress with duration.	S	P

Appendix B: Policies, Procedures and Standards

Policy documents are statements of governing principles or rules that guide business actions. Most are issued by the General Services Administration (GSA) or and the Executive Branch (i.e., Office of Management and Budget (OMB) Circulars).

Laws and regulations (i.e., United States Code, Federal Acquisition Regulations) while not technically considered policy documents are listed here.

	Cost Management	Value Mgt.	Life Cycle Cost	Cost / Schedule	Risk Analysis	Market Analysis	Cost / Scope Mgt.
B.1 Legal Documents							
OMB Circular A-94 Guidelines and Discount Rates for Benefit-Cost Analysis of Federal Programs and its annual update to Appendix C			●				
OMB Circular A-11, Part 7, Planning, Budgeting, Acquisition and Management of Capital Assets	●				●		
OMB Circular A-131 – Value Engineering		●	●				
OMB Circular A-11 Appendix B	●				●		
18 United States Code 1001, False Statements Act	●	●	●	●	●	●	●
41 United States Code 1711 - Value engineering (PL 111–350, 124 Stat. 3718)		●					
10 CFR 436, Part A, Methodology and Procedures for Life-Cycle Cost Analysis			●				
Public Buildings Act of 1959 (PL 86-249)	●						
PBS Brooks Act of 1972, Selection of Architects and Engineers	●						
41 USC 1711 (updated January 7, 2011) requiring every Federal agency to maintain a VE program		●					
Federal Acquisition Regulations (FAR)							

	Cost Management	Value Mgt.	Life Cycle Cost	Cost / Schedule	Risk Analysis	Market Analysis	Cost / Scope Mgt.
FAR 7, Acquisition Planning	●						
FAR 10, Market Research						●	
FAR 14, Sealed Bidding	●			●			●
FAR 15.4, Contract Pricing	●			●		●	●
FAR 36.203, Government estimate of construction costs	●						
FAR 36.6, Architect-Engineer Services	●						
FAR 48 Value Engineering (deals with VECPs)		●					
FAR 52.248.1 Value Engineering (clause to insert in contract per 48.201)		●					
FAR 52.248.2 Value Engineering – Architect-Engineer		●					
FAR 52.248.2 Value Engineering – Construction		●					
B.2 GSA Policies and Guides							
GSA Acquisition Manual (GSAM)							
GSA National Business Space Assignment Policy	●						●
GSA Project Planning Guide	●					●	●
GSA P-100 Facilities Standards for the Public Buildings Service	●	●	●	●	●	●	●
GSA PBS CMc Acquisition Policy	●	●		●		●	●
4210.1 CFO P Cost Estimation Policy Handbook	●						
PBS Procurement Instructional Bulletin PIB 13-04	●						
Pricing Desk Guide	●						
PBS Leasing Desk Guide	●						

	Cost Management	Value Mgt.	Life Cycle Cost	Cost / Schedule	Risk Analysis	Market Analysis	Cost / Scope Mgt.
GSA Art In Architecture Policies and Procedures	●						●
B.3 Federal Guides							
GAO-09-3SP - GAO Cost Estimating and Assessment Guide	●			●			
GAO-16-89G – GAO Schedule Assessment Guide				●			
Federal Customer Guide to Reimbursable Work Authorizations	●						●
Whole Building Design Guide web site (http://www.wbdg.org/)	●	●	●	●	●	●	●
NIST Handbook 135 Life Cycle Costing Manual for the Federal Energy Management Program and its Annual Supplements			●				
B.4 ASTM Standards							
ASTM E 1557 Classification for Building Elements and Related Sitework – UNIFORMAT II	●	●	●	●	●		
ASTM E 2083 Classification for Building Construction Field Requirements, and Office Overhead and Profit	●						
ASTM E 2168 Classification for Allowance, Contingency, and Reserve Sums in Buildings	●						
ASTM E 2516 Standard Classification for Cost Estimate Classification System	●						
ASTM E 1699 Standard Practice for Performing Value Engineering (VE) / Value Analysis (VA) of Projects, Projects and Processes		●					

	Cost Management	Value Mgt.	Life Cycle Cost	Cost / Schedule	Risk Analysis	Market Analysis	Cost / Scope Mgt.
ASTM E 2013 Practice for Constructing FAST Diagrams and Performing Function Analysis During a Value Analysis Study		●					
ASTM E 917 Standard Practice for Measuring Life-Cycle Costs of Buildings and Building Systems		●	●				
ASTM E 1185 Guide for Selecting Economic Methods for Evaluating Investments in Buildings and Building Systems			●				
ASTM E 1057 Practice for Measuring Internal Rate of Return and Adjusted Internal Rate of Return for Investments in Buildings and Building Systems			●				
ASTM E 964 Practice for Measuring Benefit-to-Cost and Savings-to-Investment Ratios for Buildings and Building Systems			●				
ASTM E 1074 Practice for Measuring Net Benefits for Investments in Buildings and Building Systems			●				
ASTM E 1121 Practice for Measuring Payback for Investments in Buildings and Building Systems		●	●				
ASTM E 2204 Standard Guide for Summarizing the Economic Impacts of Building-Related Projects			●				
ASTM E 3035 Standard Classification for Facility Asset Component Tracking System (FACTS)	●	●	●				
B.5 Other Standards							
Whole Building Design Guide, Life-Cycle Cost Analysis (LCCA)			●				

	Cost Management	Value Mgt.	Life Cycle Cost	Cost / Schedule	Risk Analysis	Market Analysis	Cost / Scope Mgt.
SAVE International Value Methodology Standard, June 2007		●					
SAVE International Body of Knowledge (Value Methodology Pocket Guide, published by GOAL/QPC)		●					

Appendix C: Cost Breakdown Structures (CBS)

C.1 ASTM Uniformat II

ASTM has several standards related to classification systems for the built environment. Three are particularly pertinent to GSA.

- ASTM E 1557 Classification for Building Elements and Related Sitework – UNIFORMAT II
- ASTM E 2083 Classification for Building Construction Field Requirements, and Office Overhead and Profit
- ASTM E 2168 Classification for Allowance, Contingency, and Reserve Sums in Buildings

This appendix section has tables for the ASTM E-1557 listing, followed by the ASTM E-2083 listing. They show the classifications to level 3.

Use of the Uniformat II classification system is required for many GSA estimate submittals (See Table 3-1. Estimate CBS and Detail Requirements – Prospectus Projects and Table 3-2. Estimate CBS and Detail Requirements – Non-Prospectus Projects in Section 0 Section 5: Using Cost Breakdown Structures. The tables provide a summary the Uniformat II structure. The ASTM standard E 1557 has a recommended level 4 that may be used. ASTM E 3035 (FACTS) provides further levels of detail for the Uniformat structure. These may be useful when preparing cost estimates in the Uniformat system.

ASTM E 1557 Classification for Building Elements and Related Sitework – UNIFORMAT II [1]		
Level 1 Major Group Elements	**Level 2 Group Elements**	**Level 3 Individual Elements**
A SUBSTRUCTURE	A10 Foundations	A1010 Standard Foundations
		A1020 Special Foundations
		A1030 Slab on Grade
	A20 Basement Construction	A2010 Basement Excavation
		A2020 Basement Walls
B SHELL	B10 Superstructure	B1010 Floor Construction
		B1020 Roof Construction
	B20 Exterior Closure	B2010 Exterior Walls
		B2020 Exterior Windows
		B2030 Exterior Doors
	B30 Roofing	B3010 Roof Coverings
		B3020 Roof Openings

ASTM E 1557 Classification for Building Elements and Related Sitework – UNIFORMAT II [1]		
Level 1 Major Group Elements	**Level 2 Group Elements**	**Level 3 Individual Elements**
C INTERIORS	C10 Interior Construction	C1010 Partitions
		C1020 Interior Doors
		C1030 Fittings
	C20 Stairs	C2010 Stair Construction
		C2020 Stair Finishes
	C30 Interior Finishes	C3010 Wall Finishes
		C3020 Floor Finishes
		C3030 Ceiling Finishes
D SERVICES	D10 Conveying	D1010 Elevators & Lifts
		D1020 Escalators & Moving Walks
		D1090 Other Conveying Systems
	D20 Plumbing	D2010 Plumbing Fixtures
		D2020 Domestic Water Distribution
		D2030 Sanitary Waste
		D2040 Rain Water Drainage
		D2090 Other Plumbing Systems
	D20 HVAC	D3010 Energy Supply
		D3020 Heat Generating Systems
		D3030 Cooling Generating Systems
		D3040 Distribution Systems
		D3050 Terminal & Package Units
		D3060 Controls & Instrumentation
		D3070 Systems Testing & Balancing
		D3090 Other HVAC Systems & Equipment
	D30 Fire Protection	D4010 Sprinklers
		D4020 Standpipes
		D4030 Fire Protection Specialties
		D4090 Other Fire Protection Systems
	D40 Electrical	D5010 Electrical Service & Distribution
		D5020 Lighting & Branch Wiring

ASTM E 1557 Classification for Building Elements and Related Sitework – UNIFORMAT II [1]		
Level 1 Major Group Elements	**Level 2 Group Elements**	**Level 3 Individual Elements**
		D5030 Communication & Security
		D5090 Other Electrical Systems
E EQUIPMENT & FURNISHINGS	E10 Equipment	E1010 Commercial Equipment
		E1020 Institutional Equipment
		E1030 Vehicular Equipment
		E1090 Other Equipment
	E20 Furnishings	E2010 Fixed Furnishings
		E2020 Movable Furnishings
F SPECIAL CONSTRUCTION & DEMOLITION	F10 Special Construction	F1010 Special Structures
		F1020 Integrated Construction
		F1030 Special Construction Systems
		F1040 Special Facilities
		F1050 Special Controls & Instrumentation
	F20 Selective Building Demolition	F2010 Building Elements Demolition
		F2020 Hazardous Components Abatement
BUILDING SITEWORK	G10 Site Preparation	G1010 Site Clearing
		G1020 Site Demolition & Relocation
		G1030 Site Earthwork
		G1040 Hazardous Waste Remediation
	G20 Site Improvements	G2010 Roadways
		G2020 Parking Lots
		G2030 Pedestrian Paving
		G2040 Site Development
		G2050 Landscaping
	G30 Site Mechanical Systems	G3010 Water Supply
		G3020 Sanitary Sewer
		G3030 Storm Sewer
		G3040 Heating Distribution

ASTM E 1557 Classification for Building Elements and Related Sitework – UNIFORMAT II [1]		
Level 1 Major Group Elements	**Level 2 Group Elements**	**Level 3 Individual Elements**
		G3050 Cooling Distribution
		G3060 Fuel Distribution
		G3090 Other Site Mechanical Utilities
	G40 Site Electrical Utilities	G4010 Electrical Distribution
		G4020 Site Lighting
		G4030 Site Communications & Security
		G4090 Other Site Electrical Utilities
	G90 Other Site Construction	G9010 Service & Pedestrian Tunnels
		G9090 Other Site Systems & Equipment

[1] Table elements are based on ASTM E1557 Standard Classification for Building Elements and Related Sitework-UNIFORMAT II. The designation structure is retained from ASTM E1557-09.

ASTM E 2083 Classification for Building Construction Field Requirements, and Office Overhead and Profit [1]		
Level 1 Major Group Elements	**Level 2 Group Elements**	**Level 3 Individual Elements**
X FIELD REQUIREMENTS AND OVERHEAD & PROFIT	X10 Field Requirements	X1005 Bond, Permits, Fees & Insurance
		X1010 Field/Site Set-Up & Accommodation
		X1015 Management, Supervision & Field Engineering
		X1020 Personnel Travel & Lodging
		X1025 Safety & Protection
		X1030 Construction Aids, Equipment & Tools
		X1035 Temporary Construction
		X1040 Climactic & Environmental Requirements

ASTM E 2083 Classification for Building Construction Field Requirements, and Office Overhead and Profit [1]		
Level 1 Major Group Elements	**Level 2 Group Elements**	**Level 3 Individual Elements**
		X1045 Quality Control, Inspection & Testing
		X1050 Maintenance & Housekeeping
		X1090 Other Contractual Requirements
	X20 Office Overhead & Profit	X2010 Home Office Overhead
		X2020 Profit

[1] Table elements are based on ASTM E2085 Standard Classification for Building Construction Field Requirements, and Office Overhead & Profit.

The ASTM levels of Uniformat II focus mostly on the costs associated with the construction elements of a project. There are other cost elements that a comprehensive Cost Breakdown Structure for a project must include. The initial 1975 version of Uniformat developed for GSA included placeholders for these cost elements.

The table below includes the level 1 elements of the previous Uniformat classifications and introduces the ASTM E 2168 Classification for Allowance, Contingency, and Reserve Sums in Buildings concepts. There is an initial attempt to create a CBS for other elements at a level 1. These elements will be used as guidance for preparing and reporting total project costs.

UNIFORMAT Levels 0 and 1			
	Level 0 - Major Elements		**Level 1 - Group Elements**
	CONSTRUCTION	A	Substructure
		B	Shell
		C	Interiors
		D	Services
		E	Equipment & Furnishings
		F	Special Construction & Demolition
		G	Building Sitework
		X	Field Requirements and Overhead & Profit
	FURNITURE & EQUIPMENT		Furniture & Furnishings
			Administration Equipment
			Production Equipment
	DESIGN & MANAGEMENT		Architecture & Engineering
			Special Consultants

UNIFORMAT Levels 0 and 1			
	Level 0 - Major Elements		**Level 1 - Group Elements**
			Construction & Project Management
			Testing & Inspection
			Market Studies
			Owner's Administration Expenses
	SITE ACQUISITION		Land Costs
			Legal Fees
			Surveys
			Appraisal Fees
	LEASING/OCCUPANCY		Moving Expenses
			Leasing Commissions
			Tenant Inducements
			Taxes During Construction
	FINANCING		Interim Financing
			Permanent Financing
	ALLOWANCES, CONTINGENCIES AND RESERVES[1]		Allowances
			Contingencies
			Reserves

[1] Alternatively, Allowances, Contingencies and Reserves may be distributed separately to individual Level 0 accounts.

Appendix C.2 CSI MasterFormat (2004)

The Division levels of MasterFormat (2004) are the top level summary for cost estimates prepared in the MasterFormat cost breakdown structure.

Specifications Group

- General requirements group
- Division 01 General Requirements

Facility Construction Group

- Division 02 Existing Conditions
- Division 03 Concrete
- Division 04 Masonry
- Division 05 Metals
- Division 06 Wood, Plastics, and Composites
- Division 07 Thermal and Moisture Protection
- Division 08 Openings
- Division 09 Finishes
- Division 10 Specialties
- Division 11 Equipment
- Division 12 Furnishings
- Division 13 Special Construction
- Division 14 Conveying Equipment
- Division 15 Reserved
- Division 16 Reserved
- Division 17 Reserved
- Division 18 Reserved
- Division 19 Reserved

Facility Services Subgroup

- Division 20 Reserved
- Division 21 Fire Suppression
- Division 22 Plumbing
- Division 23 Heating, Ventilation, A/C
- Division 24 Reserve
- Division 25 Integrated Automation
- Division 26 Electrical
- Division 27 Communications
- Division 28 Electronic Safety and Security
- Division 29 Reserved

Site and Infrastructure Subgroup

- Division 49 Reserved
- Division 30 Reserved
- Division 31 Earthwork
- Division 32 Exterior Improvements
- Division 33 Utilities
- Division 34 Transportation
- Division 35 Waterway and Marine Construction
- Division 36 Reserved
- Division 37 Reserved
- Division 38 Reserved
- Division 39 Reserved

Process Equipment Subgroup

- Division 40 Process Integration
- Division 41 Material Processing and Handling Equipment
- Division 42 Process Heating, Cooling, and Drying Equipment
- Division 43 Process Gas and Liquid Handling, Purification, and Storage Equipment
- Division 44 Pollution Control Equipment
- Division 45 Industry-Specific Manufacturing Equipment
- Division 46 Reserved
- Division 47 Reserved
- Division 48 Electrical Power Generation
- Division 49 Reserved

Appendix C.3 GSA IRIS

Work Category		Comments
Code	**Description**	
150	Financed Energy Work	Non-capitalized interest cost on time-financed energy use reduction work.
200	Studies and/or Designs for Expensed Projects	Studies used to define and develop requirements for a proposed construction or R&A project that does not meet PBS' criteria of a capitalized project.
255	Building Commissioning and Retro-Commissioning	Work related to commissioning and retro-commissioning of a building that may include minor repairs and maintenance that do not increase the life expectancy or efficiency of an asset.
300	General Maintenance Repairs	General maintenance necessary to maintain building operations. Routine, minor, or emergency repairs or maintenance that do not increase the life expectancy or efficiency of an asset. Includes interior and exterior cleaning, painting, and carpeting.
310	Maintaining Land	Repairs and patchwork related to roadways, driveways, paving, sidewalks, curbs, landscaping, plazas, lawn sprinklers, site utilities, underground tanks. Also remediation of soil contamination incurred while GSA owned the property.
320	Roofing Repairs	Roofing related work that does not enhance the asset beyond its original condition or increase the life expectancy of the asset, does not improve the asset's original capabilities. Often involves repairs. Includes roofing, flashing, drains.
325	Energy Generating Asset Repairs	Work conducted to energy generating assets or systems that does not enhance the asset beyond its original condition or increase the life expectancy of asset or improve the asset's original capabilities or efficiencies. Often involves repairs.
330	Building Structural Repairs	Work related to a building's foundational structure that does not increase the life expectancy or efficiency of the asset. Often involves maintenance, minor repairs, or patchwork. Includes work on beams, columns, slabs, walls, foundations.
335	Security Assets Repairs	Work conducted to security assets or systems that does not enhance the asset beyond its original condition or increase the life expectancy of asset, does not improve the asset's original capabilities or efficiencies. Often involves repairs.

Work Category		Comments
Code	Description	
340	Electrical Systems Repairs	Electrical system work that does not enhance the asset beyond its original condition or increase its life expectancy. Repairs to power supply dist. sys., transformers, circuit brkrs, lighting, public address sys., electrical controls, telecom. equip.
345	Fire Protection Systems Repairs	Fire protection systems work that does not enhance the asset beyond its original condition or increase its life expectancy. Does not improve the asset's original capabilities. Includes fire sprinklers, standpipes and other fire safety items.
350	Demolition Not Related to New Construction	Demolition and removal work not conducted for capital or R&A improvements. Includes demolition for safety or cosmetic reasons, or as a means of building disposal (i.e., Portfolio Restructuring Efforts)
355	Conveying Systems Repairs	Elevator, escalators, and other conveying systems work that does not enhance the asset beyond its original condition or increase its life expectancy, as it does not improve the asset's original capabilities. Maintenance, repairs, or patchwork.
360	HVAC Systems, Heating and Chilling Plants Repairs	HVAC Systems and Heating and Chilling Plants work that does not enhance the asset beyond its original condition or increase life expect. Boilers, chillers, cooling towers, hyd. pipe, plumb, cent. stat. air handling equip, fan coil, air-induct, ducts, or ground sou1e heat pumps.
365	Plumbing System Repairs	Plumbing systems work that does not enhance the asset beyond its original condition or increase its life expectancy. Includes domestic water, irrigation, storm sewer, sanitary sewer, other specialized plumbing systems not related to HVAC or fire protect.
370	Exterior Enclosure Repairs	Work conducted to a building's exterior or facade that does not enhance the asset beyond its original condition or increase the life expectancy of the asset, as it does not improve the asset's original capabilities or efficiencies.
380	Repairs to Interior Construction and Finishes (Courts and Non-Courts)	Interior alterations related work that does not enhance the asset beyond its original condition or increase its life expectancy, as it does not improve the asset's original capabilities or efficiencies for both Federal Courts and Non-Courts space.

Work Category		Comments
Code	Description	
385	Restoring Environmental Condition	Removing, containing, or neutralizing (i.e., cleaning up) environmental contamination incurred while GSA owned the property (excluding soil remediation).
390	Artwork Cleaning	Cleaning and restoring of artwork and murals that bring the asset back to its original condition.
400	Land Acquisition	Acquisition of land including activities necessary for the site acquisition, such as appraisals, surveys, title research, relocation, costs to raze an old building on land purchased, and incidental expenses.
405	Building Acquisition	Acquisition of a building including activities necessary for the site acquisition, such as appraisals, surveys, title research, relocation, costs to raze an old building on land purchased, and incidental expenses.
410	Land Improvements	Installation, replacements, additions, or betterments to roadways, driveways, paving, sidewalks, curbs, landscaping, plazas, lawn sprinklers, site utilities, underground storage tanks, and similar land improvements.
41	Soil Remediation	Soil remediation resulting from soil contamination caused by a previous owner, a means to prevent future soil contamination, or preparation to sale the property.
415	Demolition for Construction	Demolition and removal of a freestanding structure in order to construct a new structure. Primarily for new construction projects (PG51).
420	Demolition for R&A	Demolition and removal of an asset or portion of an asset attached to a structure in order to improve or increase the life expectancy or efficiency of the structure. Primarily for R&A projects (PG55 and PG54).
450	Studies and/or Design for Capitalized Projects	Studies funded through PBS funds (not PG80) used to define and develop requirements for a proposed capitalized construction or R&A project.
455	Building Commissioning and Retro-Commissioning	Building commissioning and retro-commissioning that leads to the installation and/or replacement of an asset that extends the life expectancy of the building by either replacing or enhancing a substantial portion of the asset or increasing the asset's capabilities or efficiency.

Work Category		Comments
Code	**Description**	
510	Interior Construction and Finishes (Non-Courts)	Interior alterations related work for tenants other than Federal Courts that extends the life expectancy of the asset by either replacing or enhancing a substantial portion of the asset or increasing the asset's capabilities or efficiency.
515	Interior Construction and Finishes (Courts)	Interior alterations related work projects for Federal Courts that extends the life expectancy of the asset by either replacing or enhancing a substantial portion of the asset or increasing the asset's capabilities or efficiency.
520	Roofing Replacements	Roofing related work that that extends the life expectancy of the asset by either replacing or enhancing a substantial portion of the asset or increasing the asset's capabilities or efficiency.
530	Building Structural Replacements	Work related to a building's foundational structure that that extends its life expectancy (building's structure or foundation) by either replacing or enhancing a substantial portion of the asset or increasing the asset's capabilities or efficiency.
540	Electrical Systems Replacements	Electrical system enhancements, such as replacements, additions, or betterments that extend the life expectancy of the asset by either replacing or enhancing a substantial portion of the asset or increasing the asset's capabilities or efficiency.
550	Conveying Systems Replacements	Improvements related to elevators, escalators and other conveying systems that extend the life expectancy of the asset by either replacing or enhancing a substantial portion of the asset or increasing the asset's capabilities or efficiency.
560	HVAC Systems, Heating and Chilling Plants Replacements	HVAC Systems and Heating and Chilling Plants, including ground sou1e heat pumps, and related work that extends the life expectancy of the asset by either replacing or enhancing a substantial portion of the asset or increasing the asset's capabilities or efficiency.
565	Plumbing System Replacements	Plumbing systems related work that that extends the life expectancy of the asset by either replacing or enhancing a substantial portion of the asset or increasing the asset's capabilities or efficiency.

Work Category		Comments
Code	Description	
570	Exterior Enclosure Replacements	Enhancing a significant portion of a building's exterior or facade that that extends its life expectancy buildings structure or foundation), by either replacing or enhancing a substantial portion of the asset or increasing the asset's capabilities.
575	New Construction Projects (PG51)	Prospectus level new construction projects funded through Budget Activity 51 for the acquisition of new facilities, extension of existing facilities, and/or conversion of older facilities through direct Federal construction.
600	ISAs	Interior alterations and finishes for offices, corridors, lobbies and restrooms. Includes partitions, ceilings, walls, and etc.
700	Court Alterations	Court Alterations
710	Vacant Space Recapture	Vacant Space Recapture
800	Fire Protection Systems Replacements	Fire protection systems related work that that extends life expectancy of asset by either replacing or enhancing a substantial portion of the asset or increasing its capabilities. Includes fire sprinklers, standpipes and other fire safety items.
850	Improving Environmental Condition	Removing, containing, or neutralizing (i.e., cleaning up) environmental contamination that existed prior to GSAs ownership (with the exception of soil remediation).
860	Permanent Security Assets	Security assets or systems that are permanently attached to or customarily transferred with a structure or land, including land, land improvements, and security related buildings.
865	Permanent Energy Generating Assets	Energy generating assets or systems that are permanently attached to or customarily transferred with a structure or land. Includes cogeneration power plants, photovoltaic systems, solar thermal systems, wind power installations, and biomass systems.
870	Artwork Acquisition	Acquisition and installation of artwork, including murals, tapestries, sculptures, fountains, plaques, and similar assets.

Appendix C.4 GSA Space Type

To be furnished later.

Appendix D: Sample Work Breakdown Structures (WBSs)

1. Sample Modernization Project, single phase WBS

a. Core & Shell

(1) Structural Repairs and Improvements

(2) Exterior Closure Repairs and Improvements

(3) Roofing Repairs and Improvement

(4) Interior Construction Repairs

(5) Interior Construction Fit-Out

(a) Entry Lobby Upgrades

(b) Secondary Lobby and Circulation Upgrades

(c) Restroom Upgrades

(d) Demolition / Core & Shell Prep

(6) Building Security / Blast Improvements

(7) Conveying System Repair and Improvements

(8) Plumbing System Repair and Improvements

(9) HVAC System Repair and Improvements

(10) Fire Protection / Life Safety System Repair and Improvements

(11) Hazardous Abatement

b. Fit-Out Tenant Improvements

(1) Tenant A

(2) Tenant B

(3) Tenant C

(4) Tenant D

2. Sample Modernization Project, two phase WBS

a. Phase 1

(1) Core & Shell

(a) Structural Repairs and Improvements

(b) Exterior Closure Repairs and Improvements

(c) Roofing Repairs and Improvement

(d) Hazardous Abatement

(e) Building Security / Blast Improvements

(f) Plumbing System Repair and Improvements

(g) HVAC System Repair and Improvements

(h) Electrical System Repair and Improvements

(i) Fire Protection / Life Safety System Repair and Improvements

(j) Grounds and Approaches / Land Maintenance Improvements

b. Phase 2

(1) Core & Shell

(a) Interior Construction Repairs

(b) Interior Construction Fit-Out

1. Entry Lobby Upgrades

2. Secondary Lobby and Circulation Upgrades

3. Restroom Upgrades

4. Demolition / Core & Shell Prep

(c) Conveying System Repair and Improvements

(2) Fit-Out Tenant Improvements

(a) Tenant A

(b) Tenant B

(c) Tenant C

(d) Tenant D

Appendix E: Standard Forms and Tools

	Cost Management	Value Mgt.	Life Cycle Cost
E.1 List of GSA Forms and Tools			
There are a variety of official forms and suggested tools available to available supporting Integrated Cost Management.			
GSA 2630 Architect-Engineer Cost Estimate	●		
GSA 2631 Architect-Engineer Cost Estimate Summary (Design and Maintenance/Inspection Services)	●		
GSA 3472 Building Cost Analysis	●		
GSA 3473 Uniformat Cost Summary Sheet	●		
GSA 3474 Estimate Tracking Sheet	●		
OMB Annual VE Report		●	
- Building Life Cycle Cost (BLCC) Program		●	●
- Design-Estimate Application of the 6% Fee Limitation	●		

Appendix F. Glossary and Acronyms

F.1 - Glossary

1. Adjunct Practices. Practices performed in addition to other primary tasks as a supplementary rather than an essential part

2. Allowance. A sum of money that is intended to be spent on the planned scope of work. Used in the absence of precise knowledge, and estimated, to the best of one's abilities, to ensure a full and complete estimate. Allowances cover events and activities that are normally internal and so are directly controllable within the project plan. (ASTM definition)

3. Approval and Funding. Central Office reviews and evaluates PDS's and Prospectus's for inclusion in the annual GSA fiscal budget request for the entire agency. OMB will evaluate all the various Executive Branch agencies' requests for funds to create a final budget and Congress decides which initiatives will be approved (authorized) and funded (appropriated).

4. Art-in-Architecture. Program that commissions publicly scaled artworks that are integral parts of the architectural fabric or surrounding landscapes of new or substantially expanded federal buildings through allocation of 0.5 percent of the estimated construction cost.

5. BA-51 New Construction. This is a no-year activity which provides facilities to house Federal agencies through direct construction of new buildings, acquisition of Postal Service properties, and purchase of commercial buildings from the private sector. New Construction – Government Owned is the only project type.

6. BA-53 Lease-Contract. BA 53 funding is granted on an annual basis. It provides funding for the acquisition, by lease, of real property for use by Federal agencies. Project types are:

a. Tenant Fit-Out

b. Build-to-Suit Lease

7. BA-54 Discretionary Non-Capital Repair and Alteration. The BA 54 funding covers work larger than the BA-61 cap on minor repair work, but below prospectus levels. Repairs incidental to work are performed as part of a prospectus project should be included in the prospectus and funded as part of the project under BA 51 or BA 55 funding. The funding is a no-year funding used for repair and alteration projects that are not part of a line item. Project types are:

a. Tenant Space Renovation / Space Fit-Out

b. Single Building System Repair / Replacement

c. Multi-Building System Repair / Replacement

8. BA-55 Non-discretionary, Line Item Capital Repair and Alteration. The BA 55 funding covers work major repairs and alterations estimated to cost more than the prospectus level. Prospectus-level Repair and Alteration projects may not be split into below-prospectus-level projects in order to avoid the prospectus requirement. Project types are:

a. Single Item Repair

b. Multi- System Repair / Alteration

c. Modernization

9. BA-61 Building Maintenance / Repair. The BA 61 funding covers minor repair and operation cost with a budget under $25,000. Project types are:

a. Single Item Repair / Replace

b. Multi- System Repair / Replace

c. Tenant Fit-Out Alteration

d. BA 61 also provides for the operation of GSA controlled, owned and leased facilities, and covers funding for PBS overhead.

10. BA-80 RWA Funded (New and Repair and Alteration). Budget Activity 80 is a reimbursable activity used to fund reimbursable, annual and no-year, non-recurring reimbursable work requests. The BA 80 funding may be used to cover items such as, but not limited to: 1) alterations requested by tenants for tenant purposes, and 2) above standard level of service provided to tenants in GSA-operated buildings. GSA is reimbursed for these services through reimbursable work authorizations (RWAs).

11. Benchmarking. A process applied to assess, establish and/or verify the cost and scope of a project by reference to established costs / scope for similar facilities. Applied through a variety of estimating tools in place at PBS.

12. Building Evaluation Report (BER). A formal report that provides a current analysis of the conditions of a building's overall structure and operating systems and a preliminary scope of work with budget estimates to correct the deficiencies of the building.

13. Charette. Is an intensive workshop in which various stakeholders and experts are brought together to address a particular design issue, from a single building to an entire campus, installation, or park. The term can also be applied to shorter, focused project team meetings, project planning meetings, brainstorming sessions, and extensive community visioning events.

14. Construction Manager as Agent (CMa). A form of Construction Management where the Construction Manager acts as the owner's principal agent in execution of the project.

15. Construction Manager as Contractor (CMc). An at-risk form of Construction Management where the General Contractor acts as the Construction Manager. A Guaranteed Maximum Price construction contract is awarded at some point during the design process. The CMc will act more as an agent until the award of the GMP, then shifts to a vendor relationship acting as a General Contractor.

16. Contingency, Construction. An amount of money identified to cover unforeseen within scope changes in the project plan. Its purpose is to ensure that a project is delivered within budget.

17. Contingency, Design. Contingency covering costs that may result from incomplete design, unforeseen and unpredictable conditions, or uncertainties concerning project scope. Contingency decreases as the level of project definition increases.

18. Cost Breakdown Structure (CBS). A hierarchical and incremental cost classification system applied to a project component. Each descending level represents an increasingly detailed definition of a project component. The cost structure is a comprehensive, yet mutually exclusive tree structure of elements. It is repetitively added to each project component in the Work Breakdown Structure to allow consistent more granular cost management for a project.

19. Cost Estimate. The general term “cost estimate” refers to any officially prepared projection of required investment, throughout an asset life cycle, whether planning, design, construction, operations or disposal.

20. Cost Planning. Establishing an overall budget based on known or defined design parameters, project scope, and tenant space requirements, meeting all required quality levels and design standards, within the planned execution schedule. The Cost Plan typically serves as the budget baseline, schedule baseline and scope baseline.

21. Cost Management. Is a series of activities for estimating, allocating, and controlling costs within the project. It allows determining and approving budget for the project and controlling spending.

22. Cost Modeling. Cost estimation models are mathematical algorithms or parametric equations used to estimate the costs of a product or project.

23. Critical Path. The longest continuous sequence of activities in a schedule. Defines the program's or project's earliest completion date or minimum duration

24. Delivery Method.

a. Design-Bid-Build (D-B-B). This is referred to as the traditional method of project delivery. The architect-engineer completes full working drawings and specifications, which are then competitively bid and constructed by a General Contractor.

b. Design-Build Bridging (D-B Bridging). A project delivery method in which the architect-engineer establishes the project's requirements and develops a design and specification (bridging documents). The degree of detail for the bridging documents can be as little as concept design or as detailed as design development. A design-builder, selected through a competitive process using the bridging documents, completes the design and acts as the construction contractor under a fixed price.

c. Design-Build Performance (D-B Performance). A project delivery method in which the architect-engineer and construction contractor are hired together as a team (design-builder), often in conjunction with a developer. The Government prepares a Request for Proposal (RFP) that defines program and performance requirements and will often identify a maximum price. The selection procedure requires competing teams to prepare a conceptual solution based on the RFP and a selection is made on the basis of Best Value.

25. Disposal Costs. Costs incurred when leasing, selling, or otherwise disposing of Government-owned property.

26. Earned Value Management. EVM is designed to integrate cost estimation, schedule development, system development oversight, and risk management. It compares the value of work accomplished in a given period with the value of the work planned for that period. It serves as a means of analyzing cost and schedule performance. By knowing what the planned cost is at any time and comparing that value to the planned cost of completed work and to the actual cost incurred, analysts can measure a program's cost and schedule status.

27. Earned Value Reporting. Regular production of a report that measures project performance and progress.

28. Enabling Work. The ancillary work that must be completed to accomplish the primary (objective) work, typically used for maintenance / repair / alteration projects.

The work must be done to accomplish the objective work, but may not always be identified as part of the project scope.

29. Escalation. The anticipated increase in the project's cost due to inflation between the time the estimate is prepared and when the project is finished, since inflation continues during project construction.

30. Estimated Cost of Construction (ECC). The total cost of construction anticipated through the completion of construction process and includes the construction contract award amount, construction contingency amount, and reservation amount.

31. Estimated Cost of Construction at Award (ECCA). The expected construction award amount. This figure excludes construction contingency and Reservation Cost.

32. Estimated Design Build Contract Award Amount (EDBCA). Estimated Design-Build Contract Award Amount includes al ECCA costs plus Design Build Cost Advantage, Developer CM Fee, Developer A/E Fee, Developer Overhead and Profit.

33. Estimated Design Build Contract Cost (EDBCC). Estimated Design-Build Contract Cost. Includes EDBCA costs plus contingencies

34. Estimated Total Project Cost.(ETPC) Includes all construction related costs as well as costs associated with site funding, professional services, management services and any associated move / relocation costs, furniture and IT costs.

35. FACTS – Facility Asset Component Tracking System (ASTM E3035). This classification system defines building elements as major assemblies, components, and attributes common to real property assets and sitework. Elements perform given functions, regardless of the design specification, construction method, materials or products used. The classification will lead to more effective life cycle management of the operation, maintenance and cost of the asset by linking activities and participants in an asset's full life-cycle, from initial planning through construction, operations, maintenance, repair, modernization, and disposal

36. Feasibility Study (FS). The FS defines the project, establishes project requirements, identifies key technical factors (such as zoning, sustainability, engineering), and presents financial data for evaluation of all viable cost options. The FS addresses strategic-scale issues and macro-level data.

37. Float – Total. The amount of time by which a predecessor activity can slip before the delay affects the project's or program's estimated finish date—so that the schedule's flexibility can be determined.

38. Float – Free. The amount of time by which a predecessor activity can slip before the delay affects the finish date of a specific network of activities

39. Fragnet. A fragmentary, or subordinate, network that represents a sequence of activities typically related to repetitive effort. Subordinate networks can be inserted into larger networks as a related group of activities

40. Indefinite Delivery Indefinite Quantity (IDIQ) Contracting. See Job Order Contracting (JOC)

41. Independent Government Estimate (IGE). The formal, approved estimate prepared to support a contract/task order award or modification. The IGE shall be used in conjunction with other techniques/tools identified in FAR 15.404, Proposal Analysis, to ensure the final agreed price is fair and reasonable.

42. Inventory Reporting Information System (IRIS). Inventory Reporting Information System. An application used by PBS to help manage R&A Projects, safety assessment surveys and conditions, and work authorization tracking.

43. Job Order Contracting (JOC). A type of IDIQ contract, used for project delivery of small projects using agreed line-item databases as the basis for pricing project scopes. Also known as “Partition Contract”

44. Life-Cycle Costing. Life-cycle costing (LCC) is the method used to ascertain and demonstrate the life cycle cost performance of a facility. LCC is the development of all significant costs of acquiring, owning, and using an item, system, or service over a specified length of time. The time period used is the projected effective useful life of the facility, and its determination includes consideration of functional obsolescence of major components or systems. It is used to compare and evaluate the total costs of competing solutions based on the anticipated life of the facility or product to be acquired.

45. Long Lead Items. Tasks that require significant advance planning (e.g., ordering furniture, requesting an inspection).

46. Market Study. Explores all factors influencing construction costs appropriate for the current design stage. It informs the project team of any project market related risks to consider in risk management, assists the cost estimator in understanding of market competition, availability of labor and materials, and site accessibility, and assists the cost estimator in developing the cost escalation to use when preparing the estimate.

47. MasterFormat®. A product oriented hierarchical tree work item structure for construction projects developed and published by the Construction Specifications Institute.

48. Milestones. An activity/event, with no duration, that is typically used to represent the beginning or end of the project or its interim stages.

49. Modification Estimate. A Government estimate prepared for a specific contract change order, incorporating specific scope, methodology, and circumstances. In addition to cost of the changed work, the modification estimate must also include any cost, which the contractor incurs from impact on the unchanged work. This estimate is used to assist negotiations and to protect the government's interests toward a fair price settlement.

50. No-Market Comparable Costs. Cost elements that are, by nature, not comparable to the private sector market. Typically representative of specialized requirements defined in the GSA P100 and other Government requirements, ie blast, security. No-market-comparable costs are generally, but not always a significant factor in determining the cost of construction in a leased market.

51. Objective Work. The primary work generating a scope of work, typically used for maintenance / repair / alteration projects. The full scope work to accomplish the project includes enabling work, which may not be defined fully in the initial project scope.

52. Project Definition Rating Index. A tool developed by the Construction Industry Institute's (CII) to identify weak areas as action items creating a risk list.

53. Prospectus Document. A funding plan that describes a project, its location, agencies affected by the project, a justification statement, estimated maximum cost of the project, and a description of any prior funding associated with the project.

54. Prospectus Limitation. An annually adjusted threshold amount based on an index of construction costs. A Prospectus must be submitted to Congress for proposed projects in which estimated costs exceed the Prospectus limitation.

55. Repair And Alteration (R&A) Program. See BA-54 definition.

56. Reservation Costs. A term referring to a limit on the price of a good or a service. On the demand side, it is the highest price that a buyer is willing to pay; on the supply side, it is the smallest price at which a seller is willing to sell a good or service.

57. Reserve. A sum, usually held by management (client) to be disbursed only when project requirements are changed. It is used to provide insurance against a project or program failing to complete on budget or for the revision of a budget in the case of changed management or program direction and requirement.

58. Risk Analysis. A systematic methodology and ongoing process of identifying, quantifying, modeling managing, and monitoring occurrences that may substantially affect the end product.

59. Reconciliation. The action required to come to agreement of the values associated with specific work items or elements making up two or more differing cost estimates for any given project at any given time.

60. Risk Events. Any event that threatens the completion of the project within the defined constraints. May affect any area of the project

61. Sensitivity Analysis. A test key assumptions of a project estimate. The process examines the effect of an input on the estimated cost of a project by varying its value.

62. Task Dependencies. The relationship between two or more tasks in a project. The 4 dependencies are Finish-to-Start (FS), Start-to-Finish (SF), Start-to-Start (SS), ad Finish-to-Finish (FF)

63. Task Level Tracking. Tracking specific tasks in addition to the milestones. This includes tracking start and finish dates

64. Uniformat II®. A systems oriented hierarchical classification structure for construction projects.

65. Uncertainty. The indefiniteness about the outcome of a situation. It is assessed in cost estimate models to estimate the risk (or probability) that a specific funding level will be exceeded.

66. Value Management. A systematic process of reviewing and analyzing the requirements, functions and elements of systems, project, equipment, facilities, services, and supplies for the purpose of achieving the essential functions at the lowest life-cycle cost consistent with required levels of performance, reliability, quality, or safety. The process is generally performed in a workshop environment by a multidisciplinary team of contractor and/or in-house agency personnel (such as an IPT).

67. Work Breakdown Structure. A hierarchical and incremental organization system used to define and organize the total scope for a project. Each descending level represents an increasingly detailed definition of a project component. The high-level comprehensive, yet mutually exclusive tree structure organizes the scope based on specific requirements, such as phasing, funding or tenants.

F.2 Acronyms

A-E – Architect-Engineer

BER – Building Evaluation Report.

BLCC – Building Life Cycle Cost

CBS – Cost Breakdown Structure.

CCP – Certified Cost Professional.

CD – Construction Drawings.

CEP – Certified Estimating Professional.

CEW – Cost Estimate Workbook

CFR – Code of Federal Regulations.

CGR – Cost Growth Report.

CII – Construction Industry Institute.

CM – Construction Manager.

CMa – Construction Manager as Agent.

CMc – Construction Manager as Contractor.

CPE – Certified Professional Estimator.

CPM – Critical Path Method.

CSI – Construction Specifications Institute.

CVS – Certified Value Specialist.

DD – Design Development.

ECC –Estimated Cost of Construction.

ECCA – Estimated Cost of Construction at Award.

EISA 2007 – Energy Independence and Security Act 2007.

EPAct 2005 – Energy Policy Act 2005

ETPC –Estimated Total Project Cost

FAR – Federal Acquisition Regulation.

FBF – Federal Buildings Fund.

GAO – Government Accountability Office.

GC – General Contractor.

GMP – Guaranteed Maximum Price.

GSA – General Services Administration.

IGE – Independent Government Estimate.

IRIS – Inventory Reporting Information System

LCC – Life Cycle Cost.

LCCA – Life Cycle Cost Analysis.

NEPA – National Environmental Protection Act.

NIST – National Institute of Standards and Technology.

OMB – Office of Management and Budget.

P100 – Public Buildings Service PBS 100.

PBS – Public Buildings Service.

PCE – Project Cost Estimate.

PDRI – Project Development Rating Index.

PDS – Program Development Study.

PL – Public Law.

PM – Project Manager.

QA – Quality Assurance.

QC – Quality Control.

R&A – Repair and Alteration.

RFI – Request For Information.

RWA – Reimbursable Work Authority

S1I – Space Related Cost Impacts.

TI – Tenant Improvements.

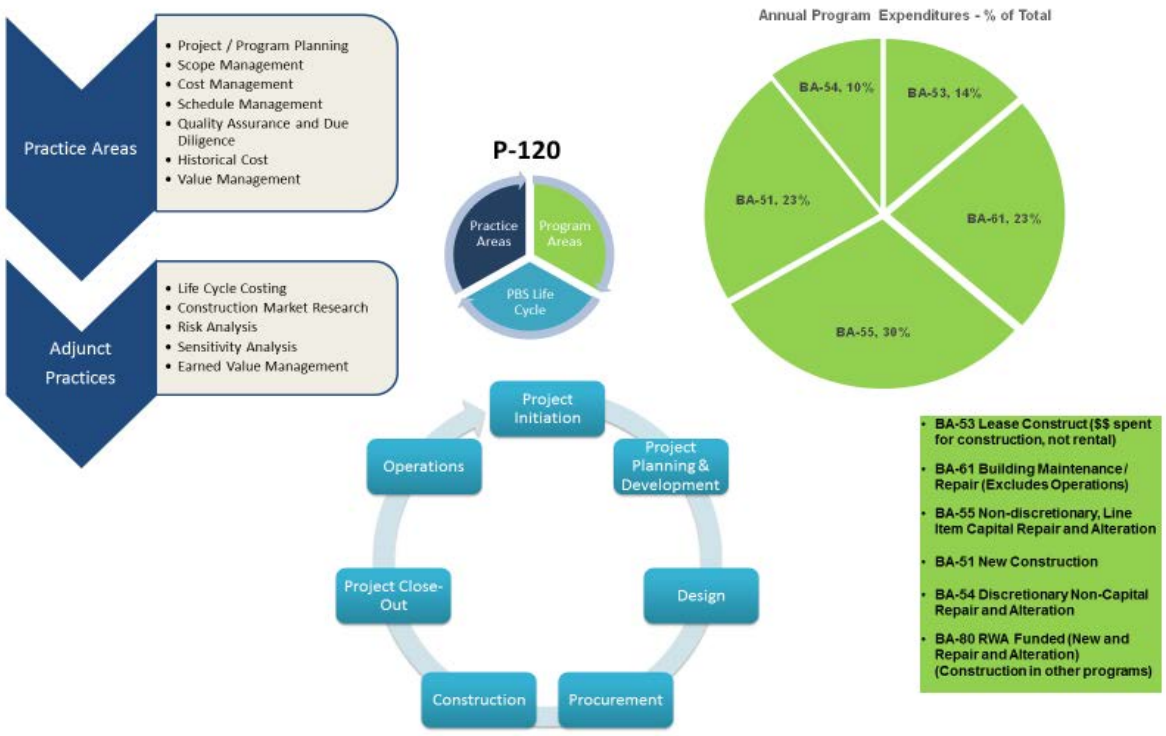
VE – Value Engineering.

VECP – Value Engineering Change Proposal.

WBS – Work Breakdown Structure.

Appendix G: The P-120 Scope

Figure G-1 - The P-120 Scope



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