

PMI PMBOK Guide

Definitions

Cost Baseline. The approved version of the time-phased project budget, excluding any **management reserves**, which can be changed only through formal change control procedures and is used as a basis for comparison to actual results.

Management Reserve. An amount of the project budget or project schedule held outside of the performance measurement baseline (PMB) for management control purposes, that is reserved for unforeseen work that is within scope of the project.

7.3 DETERMINE BUDGET

Determine Budget is the process of aggregating the estimated costs of individual activities or work packages to establish an authorized cost baseline. The key benefit of this process is that it determines the cost baseline against which project performance can be monitored and controlled. This process is performed once or at predefined points in the project. The inputs, tools and techniques, and outputs of this process are depicted in Figure 7-6. Figure 7-7 depicts the data flow diagram of the process.

A project budget includes all the funds authorized to execute the project. The cost baseline is the approved version of the time-phased project budget that includes contingency reserves, but excludes management reserves.

7.3.3.1 COST BASELINE

The cost baseline is the approved version of the time-phased project budget, excluding any management reserves, which can only be changed through formal change control procedures. It is used as a basis for comparison to actual results. The cost baseline is developed as a summation of the approved budgets for the different schedule activities.

Figure 7-8 illustrates the various components of the project budget and cost baseline. Cost estimates for the various project activities, along with any contingency reserves (see Section 7.2.2.6) for these activities, are aggregated into their associated work package costs. The work package cost estimates, along with any contingency reserves estimated for the work packages, are aggregated into control accounts. The summation of the control accounts make up the cost baseline. Since the cost estimates that make up the cost baseline are directly tied to the schedule activities, this enables a time-phased view of the cost baseline, which is typically displayed in the form of an S-curve, as is illustrated in Figure 7-9. For projects that use earned value management, the cost baseline is referred to as the performance measurement baseline.

Management reserves (Section 7.2.2.3) are added to the cost baseline to produce the project budget. As changes warranting the use of management reserves arise, the change control process is used to obtain approval to move the applicable management reserve funds into the cost baseline.

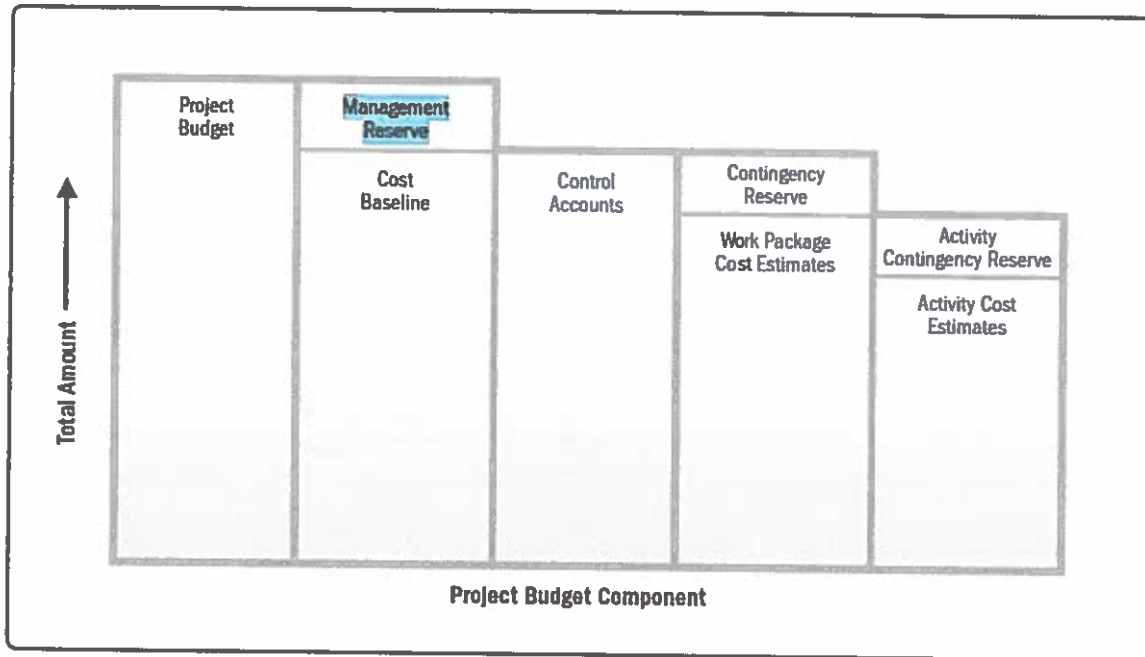


Figure 7-8. Project Budget Components

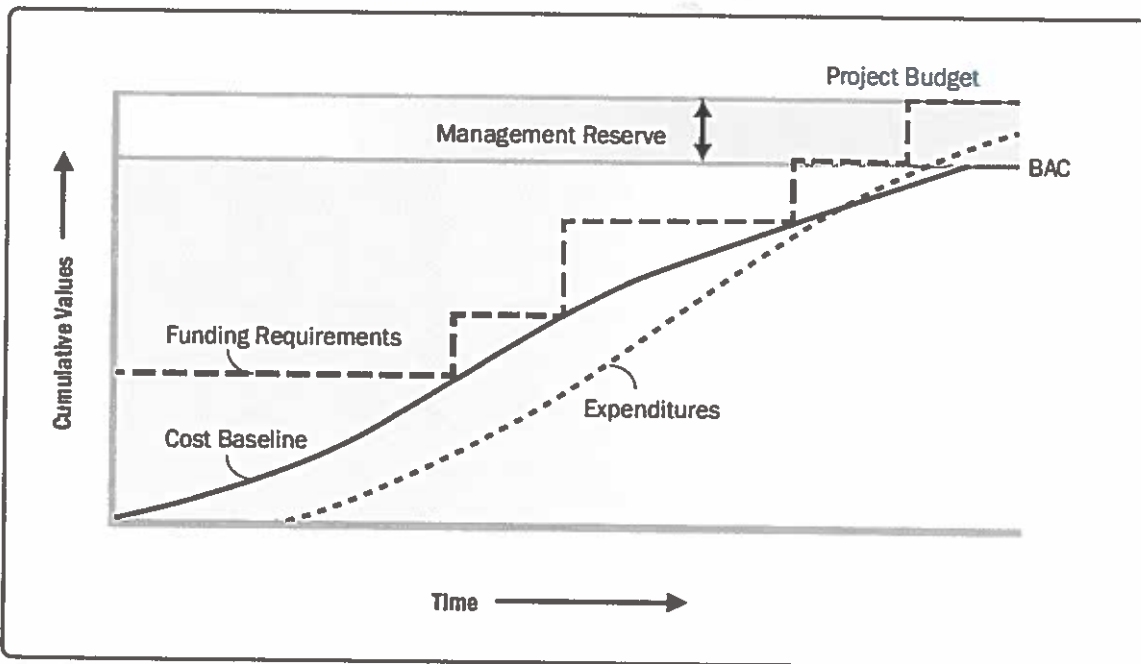


Figure 7-9. Cost Baseline, Expenditures, and Funding Requirements

- ◆ **Reserve analysis.** Reserve analysis is used to determine the amount of contingency and management reserve needed for the project. Duration estimates may include contingency reserves, sometimes referred to as schedule reserves, to account for schedule uncertainty. Contingency reserves are the estimated duration within the schedule baseline, which is allocated for identified risks that are accepted. Contingency reserves are associated with the known-unknowns, which may be estimated to account for this unknown amount of rework. The contingency reserve may be a percentage of the estimated activity duration or a fixed number of work periods. Contingency reserves may be separated from the individual activities and aggregated. As more precise information about the project becomes available, the contingency reserve may be used, reduced, or eliminated. Contingency should be clearly identified in the schedule documentation.

Estimates may also be produced for the amount of management reserve of schedule for the project. Management reserves are a specified amount of the project budget withheld for management control purposes and are reserved for unforeseen work that is within scope of the project. Management reserves are intended to address the unknown-unknowns that can affect a project. Management reserve is not included in the schedule baseline, but it is part of the overall project duration requirements. Depending on contract terms, use of management reserves may require a change to the schedule baseline.

As Extracted from the Construction Extension of PMBOK Guide

7.2.3 Allowances, Contingency, and Management Reserve

How the terms *allowances* and *contingency* are used on a construction project can vary. Typically, *allowances* refer to a specific discipline or component of work, whereas *contingency* refers to the total project cost or an aggregated control account.

The quantity of the allowance depends on the phase of the project and scope definition. For conceptual estimates when the scope is preliminary, a higher allowance should be added. On the other hand, for a project in a detailed design phase, a lower allowance is needed. Generally, allowances are based on historical data and vary from organization to organization.

Cost estimates include contingency to account for cost uncertainty. Contingency is the category within the cost baseline that is allocated for identified risks. For example, rework for some project deliverables could be anticipated, while the amount of this rework is unknown. The amount of contingency may be a percentage of the estimated project costs or developed by using quantitative risk analysis techniques such as Monte Carlo.

Contingency is part of the cost baseline and the overall funding requirements for the project and should be clearly identified and documented. *Management reserve*, on the other hand, is not included in the cost baseline but is part of the overall project budget and funding requirements.

7.2.7.2 Cost Baseline

Figure 7-3 illustrates the various components of a project budget and cost baseline.

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7 - PROJECT COST MANAGEMENT

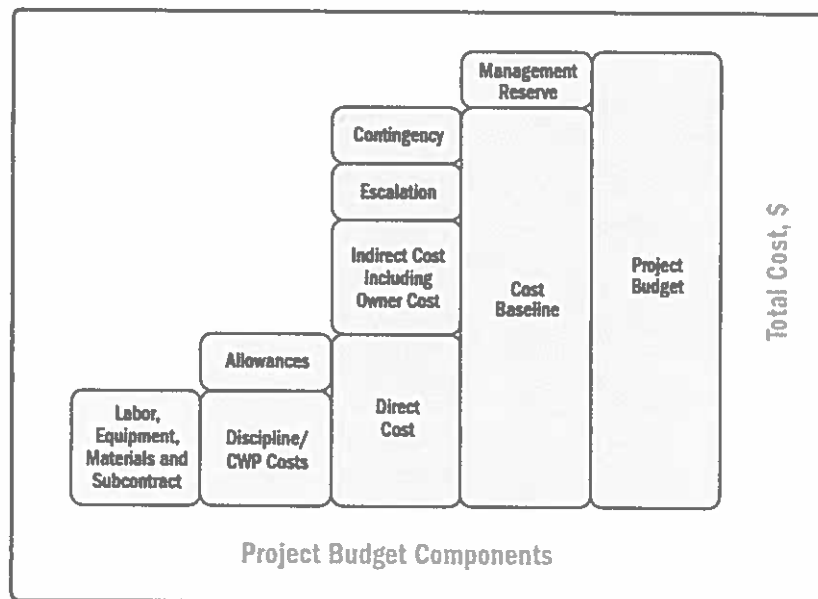


Figure 7-3. EPC Project Budget Components

Each control account is assigned a unique code or account number(s) that links directly to the performing organization's accounting system. A cost breakdown structure (CBS) is sometimes developed as a mapping tool between the project WBS and the organization's designated code of accounts to aid in reporting costs.