
COST ACCOUNTING FOR THE CONSTRUCTION FIRM

**BILL G. EPPES
DANIEL E. WHITEMAN**

A Wiley Series In

CONSTRUCTION MANAGEMENT AND ENGINEERING

COST ACCOUNTING FOR THE CONSTRUCTION FIRM

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SERIES PREFACE

Industry observers agree that most construction practitioners do not fully exploit the state of the art. We concur in this general observation. Further, we have acted by directing this series of works on Construction Management and Engineering to the continuing education and reference needs of today's practitioners.

Our design is inspired by the burgeoning technologies of systems engineering, modern management, information systems, and industrial engineering. We believe that the latest developments in these areas will serve to close the state of the art gap if they are astutely considered by management and knowledgeably applied in operations with personnel, equipment, and materials.

When considering the pressures and constraints of the world economic environment, we recognize an increasing trend toward large-scale operations and greater complexity in the construction product. To improve productivity and maintain acceptable performance standards, today's construction practitioner must broaden his concept of innovation and seek to achieve excellence through knowledgeable utilization of the resources. Therefore our focus is on skills and disciplines that support productivity, quality, and optimization in all aspects of the total facility acquisition process and at all levels of the management hierarchy.

We distinctly believe our perspective to be aligned with current trends and changes that portend the future of the construction industry. The books in this series should serve particularly well as textbooks at the graduate and senior undergraduate levels in a university construction curriculum or continuing education program.

JOHN F. PEEL BRAHTZ

*La Jolla California
February 1977*

PREFACE

The success of a general contracting company depends not only on quality construction but also on how well the company is able to control costs. Thin margins of profit, together with the numerous uncertainties involved in building construction, make it imperative to formulate a good system of cost control.

This book provides an effective system of cost accounting. This system presents a well-organized methodology for cost estimates, actual costs, cost forecasting, and reliable information for historical data.

The *cost estimate*, used to prepare a bid or negotiate a contract, serves as the initial instrument in a cost accounting system and is used to assure that all items of work have been reviewed.

All of the *actual costs* expended to construct a project must be recorded on a timely basis in a concise and well-ordered form. The cost accounting system used for each particular project must demonstrate how these actual costs to date relate to the estimated costs.

The cost accounting system provides a method to accomplish accurate *cost forecasting*. In the field of general contracting and construction management, the contracting organization is involved with very large sums of money, a very small percentage of which will become the contractor's fee for the project. For accurate information and assurance that a profitable operation is being conducted, a cost forecast must be projected throughout the course of the project, at any point in time during the project.

To establish probable future costs, a general contractor must rely on *historical data*—the contractor's past performance of similar work. This accumulation of data can establish a current (or future) cost estimate.

Information that serves as source material (input) for a cost accounting system must be accurate. One cannot expect to obtain reliable data on which to make value judgments, and one cannot expect these data to be any more accurate than the input. If costs are incorrectly distributed, they are of no value. In fact, they are quite misleading. Inaccurate data can cause errors which could prove very costly to a general contractor.

Everyone involved in the cost accounting system must be provided with written instructions explaining the system, and in particular the numerical breakdown which describes the activities and subactivities for each trade division. Reliable output is based on respect for the system and

on accurate entries. The Glossary at the back of the book provides definitions of all the terms used throughout the Cost Coding System. Abbreviations of terms begin on page xvii.

Chapters 1–11 address the reporting and recording procedures. These chapters provide, in the chronological order of the project, detailed procedures used in the cost accounting of a project from beginning to end.

Chapter 12 contains the Cost Coding System, which is based on a 16-division format for organizing construction specifications. This format was developed by the Construction Specification Institute (CSI) and is published in the *CSI Manual of Practice*, MP-2-1, MASTERFORMAT—Master List of Section titles and numbers. This 16-division CSI format is used by most architects and engineers in the preparation of their specifications for a project.

For each division of the work there are subdivisions for cost codes and descriptions. The CSI format utilizes a five-digit system. The first two digits identify the major trade division (e.g., 01 for Division 1—General Conditions). The remaining three digits provide 999 possible subdivision codes within each division.

The Key Word Index at the back of the book is an alphabetical listing of the cost code terms that will assist in finding the appropriate cost code for various items of work.

Samples of each of the various forms, which are an integral part of this cost accounting system, are found in the appendix.

This book uses a general contracting company structure, as shown in Figure 1. Any contracting organization can identify its own structure, personnel, organization, and operations in accordance with the personnel in the chart and the description of the job and responsibilities listed below.

The president has overall responsibility for all of the operations of the company. This person usually signs contracts with owners and is responsible to the Board of Directors if the company is a corporation.

The division manager is assigned by the president to handle a specific group of projects. The president and division manager determine which projects the company will bid on or negotiate. The division manager assigns project managers to bid work and later to manage construction operations. The division manager supervises and works with his or her project managers during construction operations.

The project manager is responsible for estimating and bidding specific projects. The project manager, together with the division manager, assigns the superintendents to specific projects. This project manager has overall responsibility for the project and directs the activities of the superintendent. The project manager reviews the payroll and approves purchases and payments to subcontractors.

The superintendent is assigned to only one project at a time and is responsible for the day-to-day construction activities at the job site, supervising the activities of the various craft foremen, and scheduling and directing subcontractors' activities. The superintendent orders material to

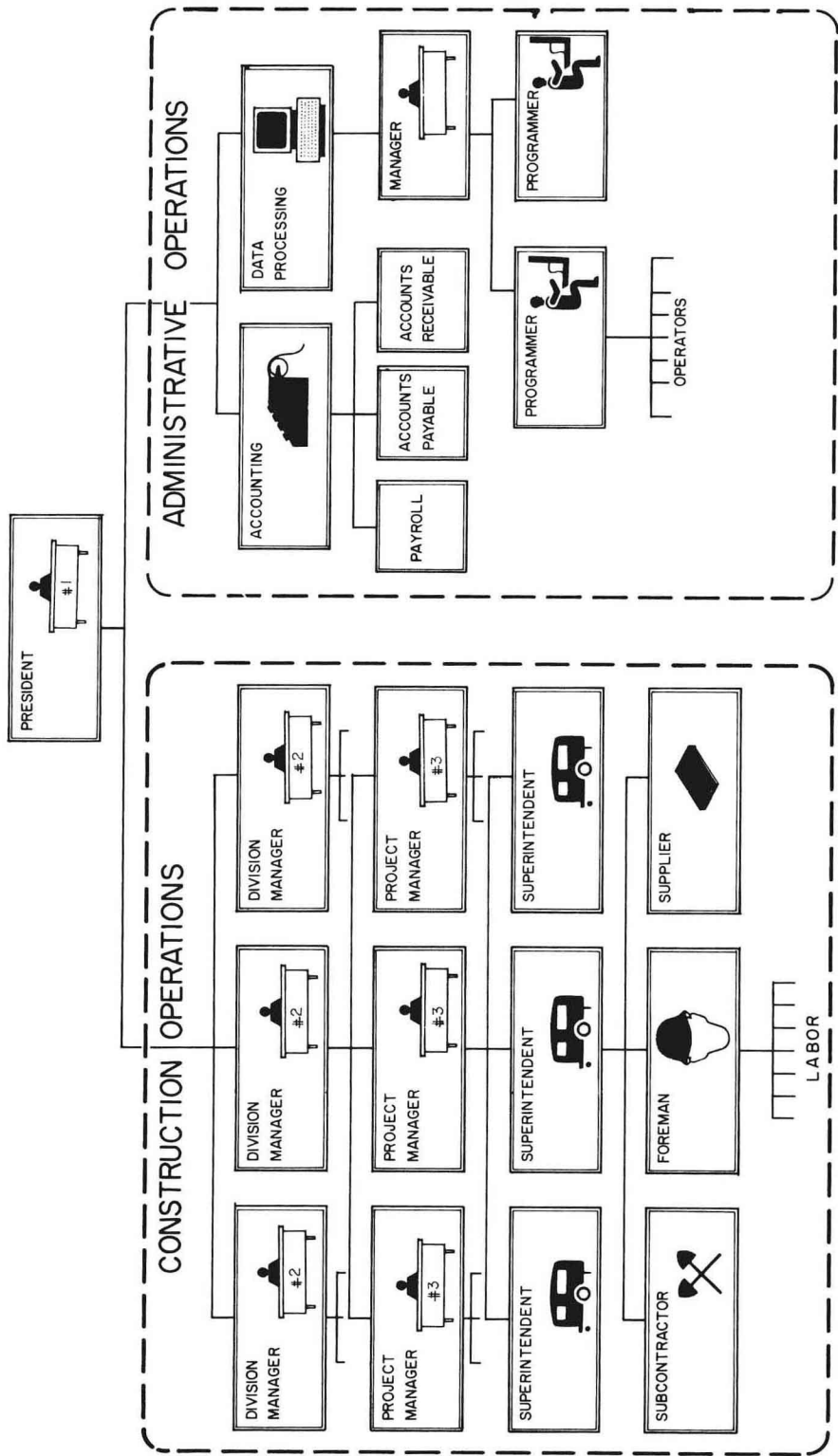


Figure 1. Organization chart of general contracting firm.

the job site that has been purchased by the project manager. The superintendent reviews time cards; completes the unit completion report for material quantities that have been placed; handles applications for employment, employee tax forms, and shipping invoices; and forwards these to the project manager.

The foreman directs the activities of the construction workers, prepares time cards, and enters cost code numbers on the time cards.

Accounting receives and codes various requests involving payment after they have been approved by the project manager. These include time cards, purchases, and subcontractor request for payment. In addition, Accounting is responsible for administering all overhead costs.

Data Processing receives its documents from Accounting and enters this information into the computer, where it is stored for future use.

The Cost Accounting System presented in this book addresses two basic areas for which accounting is vital:

1. Invoices
 - a. Subcontractor application for payment
 - b. Purchase orders
 - c. Material (no purchase order issued)
2. Payroll for labor

The reporting and recording procedures in this book are presented in relative chronological order as they relate to each individual project. This will provide a uniform method to demonstrate the use of the Cost Accounting System by all personnel involved in the course of project accountability.

Individual sections may overlap in the discussion. This is not intended to be repetitious, but rather to demonstrate the interrelationships of the various sections involved in these procedures.

Most of the sections consist of two basic functions. These functions are often referred to as input and output. The input function is performed by the project manager in furnishing data to Accounting and Data Processing for implementing the various systems. The output function consists of the resultant forms and reports which are furnished by Accounting and Data Processing for use by the project manager in keeping track of costs related to the project. Output is also used to provide cost data for future negotiation and bid work.

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ABBREVIATIONS

AC	Acre
AVG	Average
BF	Board feet
CC	Cost code
CF	Cubic feet
CUM	Cumulative
CY	Cubic yard
EA	Each
EST	Estimate
HP	Horsepower
HRS	Hours
HVAC	Heating, ventilating, and air conditioning
ID	Inch diameter
LF	Linear feet
LH	Labor hour
LH/U	Labor hours per unit of measure
LS	Lump sum
MAT	Material
MO	Month
N/C	No charge
NO	Number
PC	Piece
P&L	Profit and loss
PO	Purchase order
PROD	Production
QTY	Quantity
RETAIN	Retainage
SF	Square feet
SQ	Square; equals 100 square feet
SUB	Subcontract

SY	Square yard
TN	Ton
U/LH	Units per labor hour
UM	Unit of measure
WIP	Work in process
WKLY	Weekly
YR	Year

CHAPTER 1

ESTIMATE LISTING

One of the first functions performed by a project manager on a newly acquired project is to provide Accounting with the input data required to account for the costs of the project as estimated. A flow chart illustrating the interactions among the various areas of Accounting and Project Management is provided in Figure 1.1. It explains the responsibilities and duties of key personnel and/or departments within a construction organization.

These data are submitted to Accounting on the Estimate Listing and Maintenance Form shown in Figure 1.2. This form serves a dual purpose. When it is used for estimate listing, the word *maintenance* is crossed out of the title on the form. Uses for the maintenance form will be discussed in Chapter 8.

The information to be put into the estimate listing is the cost “estimate” of the project. This is the original estimated cost of the total project. The estimate listing must total the exact cost of the estimate. The difference between contract amount and cost will then represent the gross profit on the project.

Column 1 on the estimate listing is for the cost code, which is obtained from the Cost Coding System in Chapter 12 and should be used as a checklist in the preparation of the estimate listing. As shown in Figure 1.2, there is a cost code entry #03322. The number 03, taken from the Cost Coding System in Chapter 12, refers to the construction code for Division 3, which is concrete. The last three numbers of the cost code (322) refer to a subitem in the major division of concrete, in this case slabs on grade. These printed cost codes are the only permanent cost codes that are included within the system. Upon approval, the permanent cost codes may be modified to a nonstandard cost code for a particular project.

Column 2, document type and number, contains four basic types of documents:

- 1. Subcontract
- 2. Purchase order
- 3. Material
- 4. Labor

The various types of documents should be in the order listed above. The document type and number of subcontracts and purchase orders in this column will take one of two forms: first, when a source document has been prepared; and second, when the source document may not have been prepared at the time of the estimate listing.

In the first case, the document type and the document number should be included. For example, subcontract agreement 0627 would be shown on the form as S-0627, and purchase order 2890 would show the document type and number as P-2890.

In the second instance, as in the case shown in Figure 1.2, the document type and number for subcontracts and purchase orders should be shown only as SUB-1, OR PO-1, respectively. If more than one subcontract or purchase order are anticipated in a cost code, the estimated cost for each is

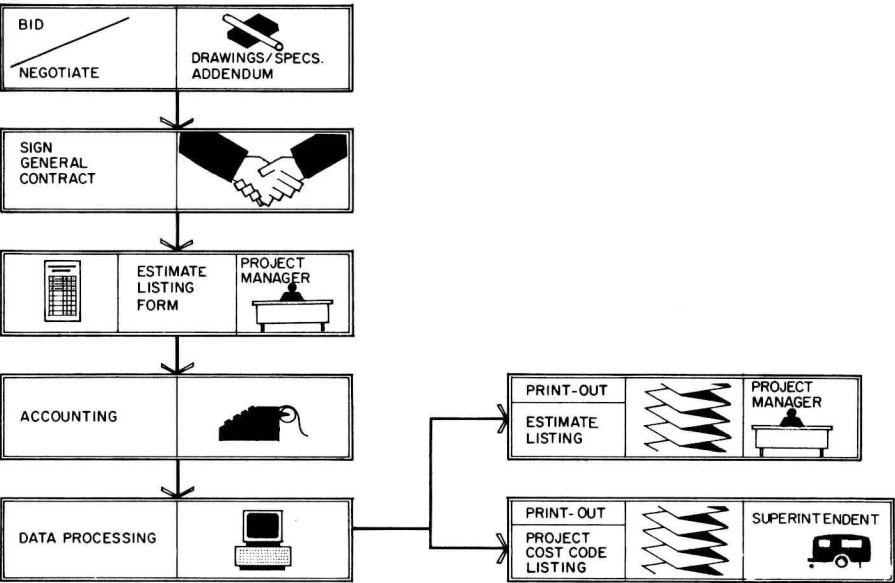


Figure 1.1. Accounting and construction management flow chart. As soon as the contract is signed, the project manager provides Accounting with the necessary data to initiate the new project into the Cost Accounting System.

ESTIMATE LISTING & MAINTENANCE FORM

NAME _____ SAMPLE _____ JOB NO. _____ XXXX _____ MAINTENANCE FORM NO. _____
CHANGE ORDER NO. _____

COST CODE	DOCUMENT TYPE #	ESTIMATED QUANTITY	U/M	ESTIMATED TOTAL MH	ESTIMATED TOTAL COST	PROJECTED FINAL QUANTITY
03322	SUB-1	200			600	
03322	MAT	200			10,000	
01802	LABOR	200		25	100	
01802	LABOR				20	
TOTALS					10,720	

Submitted by: XXXX Date: _____
 Processed by (Accounting): _____ Date: _____ PAGE ____ OF ____
 Processed by (Data Process.): _____ Date: _____

Figure 1.2. Estimate listing form (input source). The project manager provides project information to Accounting, which is important for effective cost management of the project.

to be shown as SUB-1, SUB-2, and so on, or PO-1, PO-2, and so on, on the estimate listing. In the cases where SUB-1 is used, the change to the subcontract number must be shown on the upper right-hand corner of the document.