CHAPTER

# 7 Financial statements

## Introduction

The purpose of financial statements is for the contractor to connect and communicate with all of its internal and external financial stakeholders, such as the contractor's bank, bonding company or surety, chief financial officer (CFO), other company officers, board of directors, and investors or equity partners.

There are three major ledgers used in construction cost accounting which include the general ledger, job cost ledger, and the equipment ledger. The general ledger is comprised of two important financial statements: the balance sheet and the income statement. Students of cost accounting and financial management and new project engineers (PEs) and project managers (PMs) will not be expected to create or even manage these documents. Management of corporate financial statements is definitely a senior management operation performed by the CFO, but the PM should know the differences between some of these documents and how they relate to jobsite financial management.

In addition to discussion of these financial statements, this chapter will also introduce some of the financial ratios which are created by comparing different line items and different reports. Journal entries are internal accounting operations which move money around, on paper (or in this case, in the computer), but do not affect the bottom line. There are other financial reports generated by the home office accounting department that are project related and utilized for cost control efforts that will also be discussed in upcoming chapters. All of these documents and systems assist the contractor with its short-term and long-term financial decision-making processes.

## Balance sheet

Like so many of these financial reports, the general ledger is for the entire company and is not job-based. The general ledger is comprised of two important financial statements, the balance sheet which is discussed in this section and the income statement which will be discussed in the next section. The general ledger utilizes a chart of accounts, which is similar to cost codes used in the original construction estimate and for cost control, but is slightly different from jobsite codes as it is not based on the Construction Specifications Institute divisions. The chart of accounts for the general ledger is usually just a three-digit code as reflected in the following list, but there are variations between factions of the construction industry and individual contractors. Similar to cost codes, there are not any rules per se as to exactly which numbers must be used. Our construction company certified public accountant (CPA) utilizes the following code system:

- 100–149: Current assets
- 150–199: Fixed assets
- 200–299: Liabilities
- 300–399: Net worth or owner's equity
- 400–499: Revenue
- 500–599: Jobsite expenditures
- 600–699: Home office expenses
- 700–799: Taxes

An abbreviated example balance sheet for Evergreen Construction Company (ECC) is reflected in Table 7.1. The balance sheet represents the company's net worth. This is a snap shot in time and answers the basic question that so many of the stakeholders mentioned earlier ask: "How much are we worth?" The balance sheet is dynamic, it is always changing and in a constant state of flux. It is a snapshot statement of a contractor's financial position. Every check written, and every check received, immediately affects the balance sheet. The balance sheet has three major sections, which comprise general ledger codes 100–399, and include: Assets, Liabilities, and Owner's equity, or Net worth.

*Assets* represent positive entries on the balance sheet and liabilities are negative. Assets reflect what a contractor 'has' and liabilities reflect what the contractor 'owes.' The total of all of the assets does not answer the 'worth' question earlier, as liabilities need to be deducted from the asset total. Worth is defined as what is left over, or in this case, the owner's equity. The owner's equity does not necessarily represent what was originally invested, but rather what that investment is worth at any given point of time. The key to the balance sheet is it must 'balance.' The sum of the assets will always exactly equal the sum of the liabilities plus owner's equity. If there is an increase on one side of the ledger, there must be a corresponding increase on the other. The balance sheet equation is reflected as:

Assets = Liabilities + Owner's equity, or
Assets – Liabilities = Owner's equity

**Table 7.1** Balance sheet

Evergreen Construction Company
**Balance Sheet**
Statement Date: December 31, 2020

| *Code* | *Category* | *Values* |
|---|---|---|
| | *Assets:* | |
| | *Current Assets:* | |
| 110 | Cash | $250,000 |
| 120 | Accounts Receivable | $9,575,000 |
| 130 | Inventory | $0 |
| 140 | Other Current Assets | $10,000 |
| | Total Current Assets: | $9,835,000 |
| | *Fixed Assets:* | |
| 150 | Land | $1,000,000 |
| 160 | Buildings | $2,800,000 |
| 170 | Construction Equipment | $435,450 |
| 180 | Office Equipment | $75,677 |
| 190 | Accumulated Depreciation | -$1,165,050 |
| 199 | Other Fixed Assets | $12,550 |
| | Total Fixed Assets: | $3,158,627 |
| | Total Assets: | $12,993,627 |
| | *Liabilities:* | |
| | *Current Liabilities:* | |
| 210 | Accounts Payable | $5,550,000 |
| 230 | Notes Payable | $75,000 |
| 240 | Accrued Expenses/Taxes | $85,000 |
| 270 | Other Current Liabilities | $15,550 |
| | Total Current Liabilities: | $5,725,550 |
| | *Long-Term Liabilities:* | |
| 289 | Long-Term Debt | $1,000,000 |
| 290 | Other Long-Term Liabilities | $18,077 |
| | Total Long-Term Liabilities: | $1,018,077 |
| | *Total Liabilities:* | $6,743,627 |
| 300 | Owner's Equity | $5,750,000 |
| | Retained Earnings | $500,000 |
| | Total Liabilities and Owner's Equity: | $12,993,627 |

Assets are categorized either as *current assets* (also known as short-term assets), versus *fixed assets* (also known as long-term assets). Current assets are those held for less than a year and include primarily cash or accounts receivables. Receivables for a construction company are defined as invoices processed but not yet received from its clients. Current assets are also considered liquid assets in that they can be converted to cash within a year or less. Fixed or long-term assets are those which are held for a year or longer and include buildings, furniture, and construction equipment. As will be discussed in upcoming Chapter 12, 'Equipment use and depreciation,' and Chapter 19, 'Developer's pro forma,' construction companies generally do not hold a substantial amount of fixed assets. Instead they organize separate independent companies which own and manage them as independent profit centers in addition to, but legally separate from, the construction company. These separate entities are known as limited liability companies (LLCs).

*Liabilities* are also split between *current* and *long-term liabilities*. The comparisons are very similar to assets, except they reflect negatively on the balance sheet instead of positively. Examples of current or short-term liabilities are those owed or payable within one year and classified as accounts payable. Accounts payable for a contractor includes money invoiced by subcontractors or suppliers but not yet paid, and time incurred by, and wages owed to, the contractor's employees. Loan payments owed on buildings and equipment are long-term liabilities.

The remainder, after liabilities are subtracted from assets, is the *owner's equity*, which is also known as net worth or stockholders' equity. The original owner's equity was the initial investment, in the form of cash or capital, made into the company by one or more partners. The current owner's equity reflects the value of the investment as of the date of the balance statement. The owner's equity is shown among the liabilities on the balance sheet as the company essentially owes that money to the owners. If the company would dissolve at any given point of time, the assets would be sold and used to pay off the liabilities and the remainder would be owed and distributed to the owners. There would not be anything left over after that; the assets and liabilities effectively balance out.

During a good year, after the owners have taken their dividends out of the after-tax net profit, some of the profit may remain in the company as retained earnings but still carried within the owner's equity portion of the balance sheet. Retained earnings can be used in the future in a variety of fashions including: company expansion into a new market or with additional office space, equipment purchases, or carry the retained earnings forward in case next year's profits are not as good as was this year's.

## Income statement

The income statement is a sum total of all of the business that the company did for a period of time, usually one fiscal year. It can also be prepared quarterly or monthly. The income statement combines revenue and cost and is also known as the profit and loss statement. The income statement reflects the differences between two balance sheets which were both snapshots in time. General ledger chart of accounts codes 400–699 are covered in this statement. Revenue is the money which came into the company or total volume of business. This is how much was 'earned.' Cost is the money which left the company, in the form of expenditures, or how much was 'spent.' The income statement does not reflect cash flow for most contractors, other than those small firms which use the cash accounting method, but rather committed costs and earned income. The income statement will not balance out to zero as the balance sheet did, at least the contractor hopes

it doesn't sum to zero. Rather the income statement should reflect how much profit the company made for the year or period reported. The income statement equation is reflected as:

Revenue = Cost + Profit, or
Revenue – Cost = Profit

Table 7.2 is an abbreviated example income statement for Evergreen Construction Company for the year ending December 31, 2019. The company had five projects that year and all are reflected on this one statement, including the totals. It is likely the contractor would share only the far right hand total column with many of its external stakeholders.

There are several sub equations which are derived from the revenue equation, which include:

Cost = Direct construction cost + Jobsite indirect cost + Home office overhead cost
Direct construction cost = Labor + Material + Equipment + Subcontractors
Fee = Home office overhead + Profit, or OH&P
Net profit = Gross profit – Taxes

Many of these equations are used in different chapters throughout this study on cost accounting and financial management. Some jobsite construction teams feel that their contract amount is how much they contributed to the bottom line; they built a $24.5 million hotel therefore they contributed $24.5 million. But as reflected by the series of formulas earlier – starting with revenue, or contract value, of $24.5 million – the amount which is left, after all costs are deducted, which contributes to the owner's bottom line in the form of additional owner's equity as discussed with balance sheet earlier, is very small. Even the profit is not pure profit. Gross profit, which is what is left after cost is deducted from revenue, is subject to taxes, which was changed for 2018 to a flat 21% for a construction company. After tax, profit is also known as net profit or pure profit.

## Financial ratios

Financial ratios are a mathematical means to analyze all of the different ledgers and financial statements produced by and available to the company. These ratios and formulas provide an insight to the contractor's financial health beyond just the statements discussed earlier. An entry of $500,000 in any line on any of the statements does not tell the whole story without comparing that figure with other entries, possibly from other statements. Often ratio averages or trends are developed from two or more statements. There are many formulas available for bookkeepers, CFOs, banks, and CPAs. Financial ratios are also very important to real estate developers seeking investor contributions or bank loans. Different stakeholders have interest in different ratios. Construction project managers again will not be using these ratios, but it is important that they have a general understanding that a) these financial ratios exist, and b) financial transactions at the jobsite level have some impact at the corporate level. Most of the ratios are based upon line-item entries in the balance sheet and income statement. Some ratios compare items within one statement and others compare items between the two statements.

**Table 7.2** Income statement

Evergreen Construction Company
**Income Statement**
Fiscal Year Ending December 31, 2020

| | | Job Number: | 109 | 114 | 332 | 410 | 422 | |
|---|---|---|---|---|---|---|---|---|
| | | Project Type: | Retail | Biotech | Medical | Spec/Shell | Olympic | 2020 |
| *Code* | *Category* | | *T.I.* | *Lab* | *Clinic* | *Office* | *Hotel* | *Total* |
| 400 | Revenue | | $2,491,171 | $18,698,787 | $61,024,000 | $5,000,010 | $9,812,006 | **$97,025,974** |
| | Jobsite Expenses: | | | | | | | |
| 510 | | Direct Labor | $125,153 | $3,110,050 | $5,099,110 | $51,060 | $651,829 | **$9,037,202** |
| 520 | | Direct Material | $221,918 | $3,202,777 | $7,123,888 | $95,023 | $1,329,382 | **$11,972,988** |
| 530 | | Equipment Rental | $30,483 | $362,800 | $950,545 | $101,009 | $242,991 | **$1,687,828** |
| 540 | | Subcontractors | $1,768,411 | $7,800,777 | $38,937,870 | $4,000,890 | $5,889,881 | **$58,397,829** |
| 550 | | Indirect Labor | $64,500 | $727,990 | $2,194,051 | $175,750 | $353,712 | **$3,516,003** |
| 560 | | Indirect Material | $35,050 | $406,005 | $2,422,168 | $235,789 | $226,626 | **$3,325,638** |
| 570 | | Labor Burden | $84,669 | $1,880,010 | $1,389,000 | $105,559 | $429,715 | **$3,888,953** |
| 580 | | State and Local Taxes | $20,321 | $143,316 | $470,211 | $45,679 | $67,891 | **$747,418** |
| 590 | | Liability Insurance | $24,912 | $182,846 | $437,541 | $43,213 | $86,640 | **$775,152** |
| | | Total Project Costs: | $2,375,417 | $17,816,571 | $59,024,384 | $4,853,972 | $9,278,667 | **$93,349,011** |
| | Project Fee | | $115,754 | $882,216 | $1,999,616 | $146,038 | $533,339 | **$3,676,963** |
| 600 | Home Office Overhead (see separate detailed spreadsheet) | | | | | | | **$1,781,921** |
| | Net Income: | | | | | | | **$1,895,042** |
| 700 | Income Taxes @ 21% Tax Rate | | | | | | | **$397,959** |
| | Net Income after Taxes: | | | | | | | **$1,497,083** |

Notes:
All projects were started and completed in 2020 except job 422 which started in 2019 and completed in 2020.
Only the 2020 proportion of revenue and expenses for job 422 are shown in the 2020 income statement.

As introduced early in this book, construction is a major contributor to the built environment industries and construction has several different sectors or sub-divisions which primarily include: residential, commercial, heavy-civil, and industrial. The gauge of where any individual financial ratio should fall will be different depending upon what sector the contractor specializes in. The answer for a heavy-civil contractor is not the same as a residential contractor and general contractors will differ from subcontractors or specialty contractors. In addition, one year and one ratio are not true indicators as they reflect a narrow perspective and are just from a snapshot in time. Analyzing several ratios over years to see if there is a trend is more beneficial. Many contractor and accounting associations and publications report preferred ranges of many of these financial ratios, including the Association of General Contractors (www.agc.org), the National Association of Home Builders (www.nahb.org), *Engineering News Record* (www.enr.com), and Construction Financial Management Association (CFMA.org).

Financial ratios are typically grouped into categories. Four of the most common include: liquidity, profitability, efficiency, and leverage. It would be a lengthy treatise to cover every financial ratio that exists, as there is essentially an unlimited list. Following are a few of the more important ratios for a construction company's financial stakeholders:

*Liquidity ratios* provide a short-term analysis and indicate the company's ability to pay its bills:

- Current ratio = Current assets/Current liabilities
  The result must be greater than 1.3, ideally in the 1.5 to 3.0 range
- Quick ratio = Quick assets (cash or near cash)/Current liabilities
  The result should be in the 1.25 to 2.0 range

*Profitability ratios*: Many of these are analyzed both before and after taxes are deducted and reflect a longer-term analysis:

- Return on equity (ROE) = Both pre- and post-tax profit/Owner's equity (OE).
  Answers range considerably depending on the industry sector and the size of the company, but generally pre-tax ROE should be greater than 15%. This is one of the most important financial indicators for the company investors.
- Return on investment (ROI), same as ROE.
- Return on assets (ROA) = Net profit/Total assets, ideally greater than 5%.
- Net profit to Net worth ratio, ideally 10–20%, same as ROE.
- Net profit to Volume ratio = After tax profit/Construction revenue, ideally 1–3%.
- Earnings per share (EPS) = Profit/Quantity of shares.
  EPS applies to a corporation and not a sole proprietorship. The EPS and ROI may also be reflected on the bottom of the annual income statement.
- Rate of return (ROR) = Profit/Revenue, same as Gross profit ratio.
- This is the percentage of net income and can be project- or company-based.
- Gross profit or Fee percentage ratio = Gross profit/Construction revenue.

*Efficiency indicators*:

- Average age of accounts receivable measures the collection period from clients. Slow payments are generally bad, especially greater than 45 days. Receipt of payment by the 10th of the following month is the goal set out in Chapter 14, 'Payment requests.'
- Average age of accounts payable measures how fast contractors are able to pay their subcontractors. In this case, fast is good, ideally ten days after payment from the client is received and no later than 30 days.

*Leverage indicators*:

- Debt to Equity ratio = Total liabilities/Total OE, goal is 1.0 to 2.0.
- General overhead, or Home office overhead ratio = Overhead/Revenue. This is highly dependent upon a contractor's volume and how much of their business they are able to job-cost. Ideally less than 10%.
- Fixed assets to Net worth (or OE) ratio, ideally about 0.5.
- Backlog = Future revenue, not yet billed. Without a sufficient current backlog a contractor may be subject to suffering financial difficulties.

## Journal entries

Financial transactions are *posted* to the *books* by cost accountants. Posting is defined as entering financial figures and the *books* are accounting statements or ledgers, some of which are discussed here. Journal entries are the method that cost accountants use to move money, by posting, at least on paper, between one account or cost code to another. The net effect of journal entries, without the addition of an approved change order, needs to be zero.

Some costs are entered into the job cost system by the home office accounting department, without processing invoices through the jobsite. These include items such as company-owned equipment, administrative labor such as project manager and superintendent, and each project's proportional share of markups to direct cost including home office overhead, labor burden, liability insurance, and excise taxes. Open-book clients occasionally struggle tracking home office journal entries during a final project audit. A cost shows up in March as one cost code and in August it is moved to another cost code. Or costs which were originally mis-coded to one project are transferred into another project. Journal entries are also performed by the jobsite team after they receive home office financial reports as discussed in the next section.

## Job cost financial reports

Some of the reports generated by the home office accounting department, which are not company-related but are job-focused, include the monthly job cost history report, weekly labor reports, and

an equipment ledger. There are many good and bad examples of cost accounting and financial management. It is said that more can be learned from our mistakes than from our successes. In this section there are three additional examples of contractor financial reporting that could have been improved upon.

## Job cost history report

The job cost history report is also known as the job cost ledger. This report tracks the cumulative costs which have been coded to a specific job number. The report comes out about the 10th of the month which incorporates all of the costs from the previous month. This report is the sum effect of all of the labor time sheets, material invoices, and subcontractor invoice cost coding performed by the jobsite financial team. The home office journal entries will also be reflected in the monthly job cost history report. Each month the jobsite cost accountant will review the home office generated job cost history report to check that costs from other projects were not accidently posted to this project and that the cost codes he or she entered last month on time sheets and invoices were correctly input by the home office accounts payable clerk. There will always be cost coding errors, and it is imperative that they be corrected quickly to have a true picture of project costs to date. This will later help with the monthly cost forecast and the as-built estimate input. The cost codes entered on time sheets and material and subcontractor invoices should be the same codes as used in the original budget estimate, schedule codes, and file codes and should be consistent throughout the company. These are not the same as the general ledger chart of account codes introduced earlier. Coding errors must be corrected promptly utilizing the journal entry process.

Example One: This large commercial general contractor had 20 project managers. The president of the company was very competitive and encouraged her employees to earn fees larger than the other PMs – she even posted the results for all to see. One unethical PM routinely would cost code his material invoices to other PMs' job numbers. After receipt of the monthly job cost history report, the other PMs would investigate these costs, if discovered, as many projects purchase similar materials from the same suppliers. If they found an incorrect entry, they would then try to journal entry it out of their job and into its rightful place. These types of unethical actions and confusing journal entry transactions make it difficult for certified public accountants to audit the books, especially on open-book negotiated projects.

## Weekly labor reports

The weekly labor reports are a subset of the job cost history report but focus just on direct and indirect jobsite labor. The general contractor does not track subcontractor labor. Because labor is the most variable and difficult cost category for a contractor to estimate and control, labor reports are generated more often than material and subcontractor cost reports. They are typically produced by the home office and issued to the field, likely on Tuesday of the following week costs were incurred. This is to allow the jobsite management team to make corrections or modifications to the field cost control system, if necessary, as will be discussed in the next chapter.

Example Two: This cost engineer was responsible for tracking and reporting labor costs on a large hydroelectric project. Her focus area was for the electrician and plumber trades, which amounted to 600 and 300 employees respectively. At the end of every shift, foremen would write, in hand, often with poor hand writing, the work each individual craftsman performed that day, along with their hours. A separate timekeeper working for the payroll clerk would translate these time sheets into cost codes which would be entered into the accounts payable system each evening. The next morning the cost engineer would be presented with an Exceptions Report which would kick out all of the cost coding errors. She would spend the first half of each day tracking down the foreman and timekeeper and inspecting the work on the site to rectify these mis-codes and then journal entry them into correct codes. And the next day's activities would be a repeat of this one.

## Equipment ledger

Contractors endeavor for all of their construction equipment to be job-costed and not charged or cost-coded to home office overhead. This includes company-owned equipment maintenance and repair expenses. Each piece of equipment is assigned a unique tracking number. A company equipment ledger may be created and managed by the home office accounting department. Heavy-civil contractors are more likely to own equipment than are commercial contractors. Many commercial contractors will form a separate company which owns and rents equipment to its jobs. These equipment companies are organized as partnerships or limited liability companies made up of the company executives. Taxes and liability issues of these companies are kept separate from the operations of the equipment company. But it is likely that one individual located in the home office accounting department is actually employed by the separate equipment company and manages the equipment ledger. Invoices may be sent out to the jobsite for cost coding by the site management team, or costs may simply be journal-entried into the job cost history report by the equipment clerk.

Example Three: This large residential contractor was also a developer and would build 1,000 homes each year on speculation of sale in several different tracts comprising 100 to 300 homes per tract. The four equity owners of the firm also owned a separate equipment rental company which rented equipment to the construction division. Each residential tract was set up as a separate LLC and had individual project managers and superintendents responsible for financial management affairs at the jobsite level. The company owners did not want any equipment sitting idle or cost-coded to home office overhead. The jobsite teams would routinely see equipment charged to their projects by the home office equipment clerk that was not necessarily on their project and were powerless to do anything about it.

CHAPTER

# 8 Cost control

## Introduction

As discussed earlier, construction is different from other industries. One way it is unique is that a contractor will not really know what a building will cost until it is 100% complete. The price is agreed to up front and the contractor contracts to that price, but has no guarantee they can build it for the amount agreed upon. This is one of the major reasons of having cost control. Some of the other reasons or purposes of cost control include:

- Requirement for an open-book construction contract;
- Preparing accounting statements including tax preparation;
- Monitoring employee performance;
- Tracking company assets such as construction equipment;
- Producing a profit for the company;
- Gauging what type of work the contractor does best and should specialize in; and
- Personal satisfaction.

This chapter discusses the cost cycle, beginning with development of the estimate and completing with input to the estimating database. The focus is again on the jobsite cost control efforts more so than the home office, but always relating what the project management team does at the jobsite to home office requirements. Buyout of subcontractors is included as a critical element of the second phase of cost control. The amount the general contractor (GC) contracts with subcontractors is not always exactly what the GC bids to the client or what the subcontractors bid to the GC. Work packages are a way to communicate the estimate and schedule and gather the tools and materials necessary to allow the foremen and craftsmen to efficiently build an element of the project. During construction, all expenditures for labor, materials, equipment rental, and subcontractor invoices need to be cost coded properly; otherwise the jobsite team will not really have a true picture of the cost of the work compared to how it was estimated. The project manager

(PM) and jobsite cost accountant input to the home office for all construction management (CM) control functions, including cost control, with a variety of reports. The monthly fee forecast is a tool that the chief financial officer (CFO) and chief executive officer (CEO) use to update corporate financial statements and communicate with external stakeholders such as bonding and banking strategic partners.

## Cost control cycle and connection with accounting processes

There are five phases of cost control in a typical contractor's cost control cycle. These include *setup* or estimate preparation, *correct* or adjust the estimate after buyout and input to the cost control and accounting system, *record* or monitor costs including cost coding, *modifying* the system if costs are not being achieved, and preparation of an *as-built* estimate and input back into the company database for use in the next estimate.

The first phase begins with an accurate estimate and schedule. Only if the contractor is successful in its bid or proposal to the client will it move beyond phase one. If notified by the client of success, the first thing the contractor must do is validate the accuracy of the estimate, correct it as necessary through a variety of methods, and then enter it into the corporate cost control system. The home office accounting department will assign a unique job number once the contract has been signed. These first two phases of cost control are discussed in the next section of this chapter. A useful cost planning tool is the development of foreman work packages. During the course of construction, actual costs are recorded during phase three and entered into the accounting system,

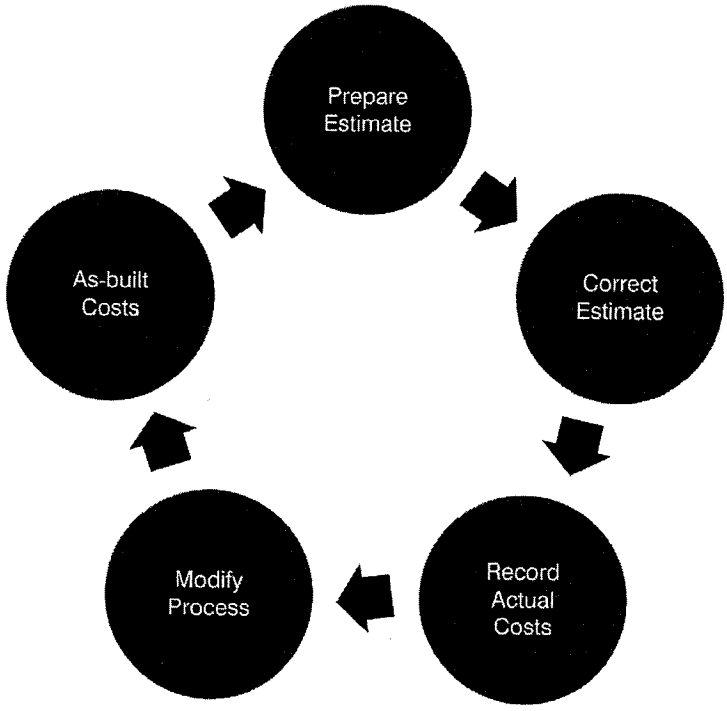


**Figure 8.1** Cost control cycle

many as accounts payable. Phase four is a combination of discovering if there are problems with the project cost control systems, making adjustments as necessary, and reporting progress to the home office. Change orders must also be incorporated into the project plan and cost control and accounting systems. Phases three and four are also discussed in this chapter. The fifth and last phase of cost control involves development of the as-built estimate, which will be discussed in Chapter 16, 'Financial close-out of the construction project.' All five of the cost control phases are depicted in the cost control cycle in Figure 8.1. This same cost control figure will be discussed throughout this book on cost accounting and financial management.

## Establishment of the cost base, including buyout

As discussed in detail in Chapter 4, the *estimate* is an assembly of measured material quantities, competitive market-rate material unit prices, historical direct labor productivity rates, current direct labor wage rages, competitive subcontract quotes, and a series of markups and fees. In order to better prepare the jobsite management team for cost control, the original estimate should be assembled by work packages and every line item in the estimate assigned an individual cost code.

No estimate or schedule is ever perfect. After the contractor receives notice of award of its bid or proposal, the estimate must be *corrected* with actual subcontract and purchase order buyout values and input into the company's cost control system. If the estimator made any mistakes, these must be corrected now, with potential journal entry modifications to contingency funds or fees. The superintendent and jobsite team cannot begin construction and affective cost control efforts with an incorrect estimate.

A major element of the estimate correction process, before it is input to the cost control system, is the buyout of subcontractors and suppliers. The buyout process begins first with detailed requests for proposals and/or quotations (RFPs and RFQs) issued from the general contractor to potential subcontractors. Subcontractors should be 'vetted' in that only qualified firms should be invited to bid. Once bids are received, then they should be compared beyond just the bottom-line price. Subcontractors should be invited to the GC's office, or the GC should visit the subcontractor's place of business, and the drawings and specifications should be reviewed in detail. Any potential bid qualifications or exclusions should be agreed upon now, rather than debate over potential gaps in scope months from now when the project is under construction. Subcontract agreements and purchase orders should only be awarded to 'best-value' companies, those with complete prices, scopes, and quality and safety and schedule plans that meet the GC's expectations.

## Foreman work packages

The major categories of any estimate include:

- Direct labor,
- Direct material,
- Subcontractors and major material suppliers,
- Jobsite administration or general conditions, and
- Percentage markups including fee, excise tax, contingency, and insurance.

The markups, including home office overhead, are beyond the control of the jobsite team and are the focus of the CEO and CFO. If subcontractors and suppliers were bought out diligently, and tight agreements written, then there is little to 'control' with respect to their costs. Direct materials should have been accurately measured and competitive prices applied to those quantities. The superintendent cannot install less concrete in the footings to save money than was drawn, so cost exposure is limited for materials as well. Most of the items within the jobsite general conditions estimate can be managed, but the biggest variable there is time – if the project lasts longer, jobsite general conditions will run over. Construction equipment should be cost-coded to direct work and not general conditions wherever possible. Efficient management of equipment is necessary and is discussed in Chapter 12, 'Equipment use and depreciation.' *Direct labor is the most difficult variable* for the estimator to forecast and is the most difficult for the superintendent to 'control' and therefore deserves the majority of focus of any discussion on construction cost control.

Control or management of direct craft labor and equipment rental cost is the responsibility of the superintendent, often with the assistance of a field accountant or jobsite cost engineer. The key to getting the foremen and superintendents involved in cost control is to get their personal commitment to the process. One successful way for the general contractor to do this is to have the superintendent actively involved in developing the original estimate. If the superintendent said it will take five carpenters working three days to form the spot footings, he or she will endeavor to see to it that the task is completed within that time.

Some construction executives believe that superintendents should not be told the true budgeted value of each work package. This is a poor practice, because the foremen and superintendents are key members of the project team and have critical roles in achieving project financial success. These men and women are regarded as the last planners and should be provided the actual budgeted cost for installation, both in materials and man-hours (MHs), as well as the scheduled time for installation for each work package.

One very broad technique for monitoring project cost is to develop a whole project direct work labor curve similar to the one shown in Figure 8.2 for the Olympic Hotel case study. For

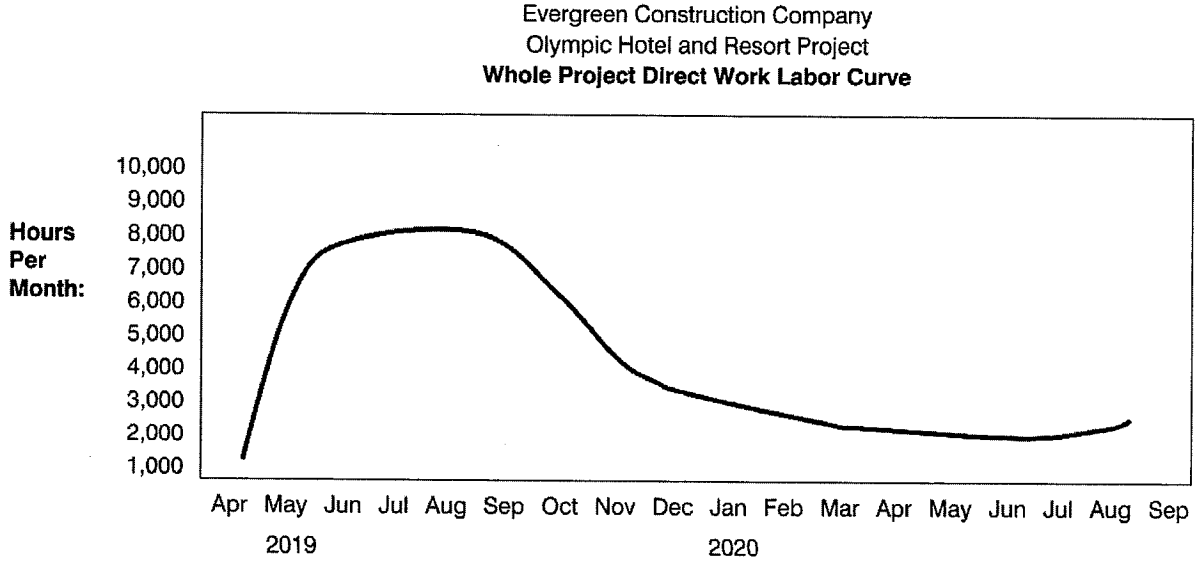


**Figure 8.2** Whole project direct work labor curve

this example, all of the direct work has been combined into one curve; it is not separated by craft or work package as will be discussed later. It is important to have the superintendent or foremen record the actual hours incurred weekly and chart them against the estimate; the jobsite cost engineer can help with this. If the actual labor used is under the curve it is assumed the foremen and their crews are either beating the estimate or behind schedule. The opposite is true if the hours are above the curve. This simple method of recording the man-hours provides immediate and positive feedback to the project team, but it has its limitations as will be discussed in the next chapter on earned value. It is better to use hours and not dollars when monitoring direct labor. This is one advantage of estimating with MHs over unit prices for labor. Foremen and superintendents think in terms of crew size and duration. They do not think in terms of $100 per each to install bath mirrors, rather they have scheduled one carpenter to work three hours on the task.

Many in the construction industry, especially consultants such as estimators, think in terms of contract document organization according to strict Construction Specifications Institute (CSI) format. CSI division 03 is for concrete, and all cast-in-place (CIP) concrete is lumped together and not formatted in the estimate according to systems or assemblies. Therefore all concrete foundations, slabs-on-grade (SOGs), columns, elevated decks, and walls are grouped together. This may even include grouping off-site precast concrete with on-site CIP or tilt-up concrete. Conversely, any work which may be specified in another CSI division, such as structural excavation and backfill or footing drains or structural steel embeds, will not be grouped with the concrete work, even though these activities are performed with the CIP concrete.

Preparation of the original estimate, schedule, and supporting work breakdown structure (WBS) are more efficiently done by work packages or assembles than a pure CSI approach. Work packages are a method of breaking down the estimate into distinct packages or assemblies or systems that match measurable work activities. For example, concrete footings, including formwork, reinforcing steel, and concrete placement could be a work package. The work is planned according to the amount of hours in the estimate and monitored for feedback. When the footings are complete, the superintendent and the management team will have immediate cost control feedback.

This advantage of planning construction by assembly or work packages, in lieu of CSI, is evident in other areas of direct work as well. When an assembly such as wood framing is complete, which is part of CSI 06, the contractor will have immediate feedback as to how the original budget and schedule look. If all of CSI 06 was grouped together, including rough carpentry, blocking and backing, finish millwork, and cabinetry, the contractor would not necessarily know how the original budget was looking until the entire project was complete.

Which items should the project team track? The 80-20 rule applies here and elsewhere in cost accounting and financial management. With 80% of the cost and risk lying with 20% of the activities, it is those activities that deserve the most cost control attention. The jobsite project team should evaluate and mitigate the largest risks. The estimate should be reviewed to identify those items or systems that have the most direct work labor hours. Work packages should be prepared for those items the cost control team believe are worthy of tracking and monitoring. Each work package should be developed by the foreman who is responsible for accomplishing the work, maybe with the assistance from the cost engineer. Some examples of simple straight-forward assemblies that warrant work packages on the hotel case study include:

- Spot or continuous footings,
- Cast-in-place concrete elevator pit,

- Garage slabs-on-grade,
- Elevated garage and first-floor lobby concrete decks,
- Doors/frames/hardware,
- Toilet accessories, including mirrors,
- Kitchenette cabinets and appliances,
- Exercise room equipment, and others.

Contractors think of work in terms of 'assemblies' or 'systems.' The concept of work packages involves grouping all items of work in one assembly, regardless of specification division, supplier, or craft performing the installation. In this way the contractor knows what that assembly costs and where it fits into the project schedule. The means and methods of construction belong to the contractor and particularly to the superintendent. The superintendent also efficiently assembles all of the materials, labor, and equipment necessary to construct the work. A work package for installing the hotel guest room door frames, hanging the doors, and installation of door hardware and door signage is used here as an example. In this scenario, the superintendent is meeting with Joe, his carpenter foreman, to plan the work and hand over the work package for assembly. Some of their discussion and considerations for an affective operation would include:

1. A list of suppliers and their points of contact, including phone numbers and email addresses, is shared with the foreman.
2. Supplier delivery dates are noted.
3. Approved submittals for all materials should be available in the job trailer.
4. Hollow-metal hallway door frames are to be grouted and an assembly area for each floor needs to be set up. They do not want to move grouted frames vertically in the building. These will be heavy, and the crew will be educated on safety precautions.
5. Fire rated frames and door leafs must be factory labeled.
6. The GC will set up a locked and controlled door hardware room in the shelled first-floor restaurant. Only carpenter foreman Joe and Roger, Evergreen Construction Company's superintendent, will have access.
7. Joe is told they have estimated 432 hours and three weeks for this work package.
8. There will be a crew of three carpenters installing this work and one additional laborer helping grout the frames, stage materials, and cleanup.
9. There are not any door relites to worry about in the hotel rooms but there are in some of the first-floor common areas.
10. Cost codes and estimated hours and schedule milestones are shared with the foreman.
11. The foreman will charge his time 100% to the work and will split his efforts between logistics for his crew and installing doors with his tool bag on.
12. There will be one toolbox for the crew located on the floor they are working on and locked up each evening.
13. One carpenter will move off the floor one day before the crew is complete and begin layout on the next floor.
14. The team will hold off on door signage until one week prior to punch list to avoid damage. Cardboard room numbers will be used as temporary signs. Twenty hours will be set aside from this work package for signage.

Project: Olympic Hotel and Resort
System/Area: Doors, Frames, and Hardware

Foreman: Joe Wallace
Date Developed: 11/20/19

| Work Days: | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | Totals: |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Estimated Crew Size: | 3 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 3 | 0 | 0 | |
| Estimated Daily Hours: | 24 | 24 | 24 | 24 | 24 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 24 | 0 | 0 | |
| Accumulated Hours: | 24 | 48 | 72 | 96 | 120 | 152 | 184 | 216 | 248 | 280 | 312 | 344 | 376 | 408 | 432 | 432 | 432 | 432 |
| Actual Crew Size: | 2 | 2 | 2 | 3 | 3 | 3 | 4 | 4 | 4 | 5 | 5 | 5 | 5 | 2 | 2 | 1 | 1 | |
| Actual Daily Hours | 16 | 16 | 16 | 24 | 24 | 24 | 32 | 32 | 32 | 40 | 40 | 40 | 40 | 16 | 16 | 8 | 8 | |
| Accumulated Hours: | 16 | 32 | 48 | 72 | 96 | 120 | 152 | 184 | 216 | 256 | 296 | 336 | 376 | 392 | 408 | 416 | 424 | 424 |

Manpower Curve:
Hours:

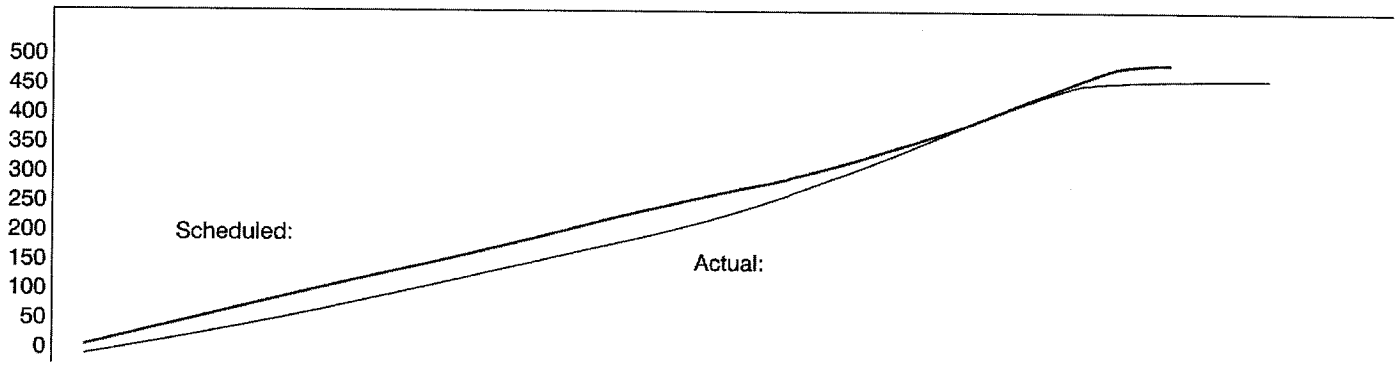


**Figure 8.3** Foreman's cost control work package

There are likely additional details and information the foreman will need, but this is just an example of many of the elements that might go into one simple work package. Work packages for systems such as elevated concrete decks, structural steel, wood framing, siding, or roofing would be even more involved – but this process is all necessary to prepare a thorough work package to assure a successful construction operation. Figure 8.3 shows an example foreman's cost control work package. The detailed estimate for this system was included earlier.

## Direct labor and material and subcontract cost coding

Cost control begins with assigning cost codes to the elements of work identified during the work breakdown phase of the cost estimate. Creation of the WBS is one of the first steps in estimate development. These cost codes allow the project manager, the cost engineer, and the superintendent to monitor actual costs and compare them to estimated costs. The objective is not that the team has to rigidly keep the cost of each element of work under its estimated value, but rather to ensure that the total cost of the completed project is under the estimated cost. Some uses of actual cost data include:

- Monitor project costs, identify any problem areas, and select mitigation measures;
- Identify additional costs incurred as a result of changes and process change order proposals;
- Identify costs for completing work that was the responsibility of a subcontractor and process associated back charges;
- Provide the project client with a cost report, which may be an open-book contract requirement;
- Evaluate the effectiveness of the jobsite project management team; and
- Develop a database of historical cost data that can be used in estimating the cost of future projects.

## Cost codes

To be able to control costs, they must be tracked accurately and compared against the corrected estimate. The first step is to record the actual costs incurred and input the information into a cost control database. Cost codes are used to allow comparison of actual cost data with the estimated values. There are several types of cost codes used in the industry. The key to choosing a cost coding system is first to make sure that all projects within the company use the same codes, so that actual costs may be compared upon project completion and input into a usable estimating database. The cost code system should also be the same as other codes including file codes, subcontract and purchase order codes, and estimating and scheduling codes. An example of a cost coding system would include elements of the specific job number, a designator of labor versus material versus subcontractor cost, and the specification number. Some contractors will use RS Means cost codes, which are similar to Construction Specifications Institute codes.

Depending upon the size of the construction firm, the type of work, and the type of client and contract agreement, the general contractor may perform job cost accounting in either the home office or in the field. Generally, the smaller the firm and the smaller the contract value, the more likely all accounting functions will be performed in the home office. On larger projects, the project team may have a jobsite cost accountant. The type of contract and how it addresses reimbursable

costs may also have some effect on where the construction firm performs cost accounting. Two different examples follow.

Example One: This project is a $100 million downtown office building that has a negotiated guaranteed maximum price contract that allows for all on-site accounting to be reimbursed. The project is only four blocks from the GC's home office and it may be more cost effective to perform accounting out of the home office with the assistance of an accounting department, but according to the terms of the contract, the client will not pay for activities conducted off the project site, therefore the accountant is in the jobsite trailer.

Example Two: This is a $50 million competitively bid lump sum school project located ten miles out of town. Since this project is closed-book, any costs not expended on the project site transfer into increased fees and ultimately increased profits for the construction company. Therefore any accounting activity that can be accomplished more effectively in the home office is done so there.

Regardless of where the cost data is collected and where the checks are prepared, most of the accounting functions on a project are the same. The process begins with a corrected estimate. Then actual costs are incurred, either in the form of direct labor, material purchase, or subcontract invoice. Cost codes (those matching the estimate) are recorded on the time sheets and invoices. Often this process begins with the cost engineer. The coded time sheets and invoices are then passed to the superintendent and the project manager for approval. Sometimes the officer-in-charge or maybe the client (on cost-plus projects) may also want to initial approval on each invoice. After the time sheets and invoices are coded and approved, the cost data is input into the cost control system.

One important aspect of this phase of cost recording is the accurate coding of actual costs. If costs are accidentally or intentionally coded incorrectly, the project team will not really know how they are doing on that specific item of work. Some superintendents may have their cost engineers intentionally code costs against items where there is money remaining, not necessarily against the correct work activity, thereby hiding over-runs. The jobsite staff will not be able to monitor and correct construction processes if coding errors occur. All costs should be coded correctly to provide the project team an accurate accounting of expenditures. These next two examples reinforce the need for accurate cost coding.

Example Three: This cost engineer was required to review time sheets daily for 1,000 pipe fitters on a very large power plant project. One particular pipe hanger seemed to have 300 or so man-hours charged to it daily. On further inspection by the cost engineer, that hanger was discovered right above the door exiting the turbine building. The pipe and hanger had been there for years and had cobwebs on them. But what was very clear for all of the foremen looking for an easy cost code as they finished their work day and exited the building was this one pipe hanger number.

Example Four: This medical facility suffered a devastating fire when it was nearly 70% complete. Creation of the cost estimate for recovery was very complicated. The estimator had insurance agents and the client and his bosses and all of their attorneys looking over his shoulder during estimate preparation. All parties were concerned about mixing the hard-cost, which had not been expended for the original contract, with the costs for remediation. A separate jobsite cost accountant was brought in once the estimate was finished to cost code only those costs for repair. The accountant's wages were added to the insurance claim, which increased that price, but all parties felt more comfortable that the accounting books would be kept separate.

Cost recording is the largest and most time-consuming phase in the cost control process. Recording actual costs is a function most-often performed by project engineers and jobsite cost accountants if available. Some of the ways the cost engineer is involved in recording costs include:

- Assist foremen and superintendents with development of work packages;
- Enter direct labor cost codes on time sheets;
- Enter cost codes on short- and long-form purchase orders and subcontract agreements;
- Verify that supplier and subcontractor monthly invoice amounts match their contract values;
- Enter cost codes on supplier and subcontractor invoices; and
- Assist the project manager with monthly fee forecast development.

## Monthly project management forecasting to the home office

The degree of autonomy any jobsite project team has from the home office varies depending upon the culture of the construction company, the complexity and size of the project, contract terms, and the individual team members involved. In the hotel case study, the distance the jobsite was from the home office also played a major role, especially with respect to jobsite cost accounting. Regardless, there will always be input and guidance from the home office to the jobsite as well as reporting accountability from the jobsite back to the CEO and CFO.

As stated, there is rarely a 'perfect estimate'; many construction projects will not proceed 'exactly' according to the original plan and schedule, despite management's good intentions. Continually comparing actual costs recorded against the estimate will discover *variances which warrant attention* and potential adjustment by the project team. The contractor cannot wait until the project is finished to find out if it made money. At that time there is nothing that can be done to fix the problem. Costs may exceed the estimate for a variety of reasons, including:

- The estimate was in error,
- Cost coding or data entry errors,
- The project team is not implementing construction management processes according to the original plan,
- Subcontractors or suppliers may not be performing,
- Direct craft field foremen may not be performing,

- Project management team members, including the PM and superintendent, may not be performing,
- The general contractor is installing work which was the responsibility of a subcontractor or the client,
- The client or designer may have added work,
- Inclement weather,
- Unforeseen conditions are discovered,
- The project is behind schedule, or
- Excessive overtime used to maintain the schedule.

Once the reason for the cost over-run is understood, the plan or process may need to be *adjusted or modified* by the jobsite team and hopefully the cause was discovered soon enough to implement an adjustment. Some of the corrective actions, or 'fixes,' might include:

- Utilize different means and methods or equipment,
- Enforce subcontract agreements,
- Back charging subcontractors,
- Change in-house general contractor personnel,
- Change subcontractors (this is difficult to do),
- Change order the client,
- Expedite the schedule, or
- Selective use of overtime – sometimes spending money can save money.

The project manager is responsible for developing a *monthly forecast* for the project that will be shared with the superintendent and the officer-in-charge. This should be prepared with the assistance of the project cost engineer and field foremen and superintendents. The contractor's bonding and banking stakeholders may also have an interest in the monthly forecast. The client may be copied in with the monthly forecast in the case of a negotiated cost-plus contract. This forecast includes line items for all areas of the estimate, cost to date, and estimated cost to complete. Each of the major areas of work receives a separate forecast page, and each of those broken down for all categories of work. As stated, the major categories of the estimate include direct labor, material, equipment, subcontractors, and jobsite general conditions.

The process in developing the cost forecast is a series of mathematical calculations and each one provides a more accurate projection of what the costs will be at construction completion compared to the original estimate before the project started. The forecast spreadsheet utilizes a simple series of Excel rows and columns and follows the format shown later in Table 8.2. Development of the monthly project management cost forecast includes the following steps:

1. Start with the original or contracted estimate. The sum total at the bottom of this column should exactly equal the original contract value.
2. The next column incorporates approved change orders only. Unapproved change orders or change orders which are in process should not be reflected here as there is no guarantee that they will be incorporated into the contract value.
3. The fifth column sums columns three and four and totals the current contract value.
4. The sixth column provides actual costs to date as reported from the monthly job cost history report.

5. The next column is the most difficult. All of the previous columns have been simple cut and paste or forwarding from other accounting reports and routine math calculations. The seventh column is the 'forecast' column where the project team must make an educated prediction of how much money is left to be spent. The optional ways to develop the forecast include:
   a. Simply inserting the amount of money contracted but not yet spent such that the individual line item will total out perfect and there will be a variance at the end of $0.00. This can be done by setting up the columns to automatically compute the to-go cost. For example, if the original estimate was $2,500, and $2,200 has been spent, then there is $300 to go.
   b. Using a trend analysis such that if the team has spent $500 per cubic yard (CY) of concrete on the first 1,000 CY, and they have 500 CY to go, then they have 500 CY at $500/CY or $25,000 left to spend. This can also simply be created using math formulas.
   c. Utilize the initial productivity rate times the quantity to go, assuming that there was some good thought put into that original rate. If 14 man-hours (MH) per 1,000 board feet (MBF) were estimated for 100 MBF of rough framing, but 16 MH/MBF have been incurred on 80 MBF thus far, then 14 MH/MBF, the original productivity rate, is multiplied times the to-go quantity of 20 MBF with no consideration given to the rate trended.
   d. The most accurate way to compute costs to go is to understand what the quantity is to go and make an educated assessment for the productivity needed to finish that activity with input from the foremen and superintendent. This should be done on a line by line basis.
6. The first three of these methods are easy to do, but they all are invalid to some degree. There may have been learning curve issues. There may be cost code errors. There may be changed conditions. Some forecasting methods may be used on some line items and others in other locations. Examples of all of these forecasting options, for structural steel beam installation for the Olympic Hotel, including over- and under-running the estimate scenarios, are shown in Table 8.1.

**Table 8.1** Forecasting options

| *Forecasting* | | *Estimated* | | *To-date* | | | *To-go* | | | *Total* | *Variance* |
|---|---|---|---|---|---|---|---|---|---|---|---|
| *Option* | *Qty* | *UMH* | *MH* | *Qty* | *UMH* | *MH* | *Qty* | *UMH* | *MH* | *MH* | *+/–* |
| *Steel beam over-run scenario:* | | | | | | | | | | | |
| A | 24 | 2 | 48 | 18 | 2.5 | 45 | 6 | 0.5 | 3 | 48 | 0 |
| B | 24 | 2 | 48 | 18 | 2.5 | 45 | 6 | 2.5 | 15 | 60 | –12 |
| C | 24 | 2 | 48 | 18 | 2.5 | 45 | 6 | 2 | 12 | 57 | –9 |
| *Steel beam under-run scenario:* | | | | | | | | | | | |
| A | 24 | 2 | 48 | 6 | 1 | 6 | 18 | 2.3 | 42 | 48 | 0 |
| B | 24 | 2 | 48 | 6 | 1 | 6 | 18 | 1 | 18 | 24 | 24 |
| C | 24 | 2 | 48 | 6 | 1 | 6 | 18 | 2 | 36 | 42 | 6 |

Notes:
Forecasting option 'A' forecasts the original total estimate.
Forecasting option 'B' forecasts the current productivity trend.
Forecasting option 'C' forecasts the original productivity rate.
A variance of - MHs indicates an over-run in cost and a + MH indicates an under-run in cost.

7. The eighth column is the total forecast which adds column six, cost to date, with column seven, cost to go. The total at the bottom of the total forecast column reflects what the project team estimates the project will cost when complete, given the updated information they now have. Each month this forecast becomes progressively more accurate.
8. The last column is a variance column. It subtracts the total forecast from the approved and revised contract values. A positive figure represents the contractor is under-running the estimate and will improve its fee position; a negative number (often red) indicates a projected cost over-run.
9. The final calculation in the forecast is to project the contractor's fee based upon the compilation of all of the individual line item variances from column nine. The home office tasks the project team to bring in the fee that they originally bid, if not improve upon it.

Two additional columns could have been added to the forecast worksheet between columns three and four to incorporate estimate correction journal entries and subcontractor buyout but were omitted from this example for simplicity as the total of journal entries would have been zero.

Table 8.2 illustrates the monthly forecast summary page for the hotel case study project. The complete forecast is often as long as the original detailed estimate; possibly 10–20 pages and hundreds of line items. It is a good practice to include a narrative with the monthly forecast explaining the significant differences from the previous month's forecast, as well as a work plan for continuing or improving performance throughout the remainder of the project. One important rule of construction cost accounting is that the financial reports must be consistent to allow the home office a clear picture of project progress as well as for them to develop confidence in the jobsite team. The management team cannot afford to wait until the project is complete to measure and report the overall project cost. It is not only too late to take corrective action, but it is also too late to accurately determine why the team deviated from the plan. The following example is from an overly pessimistic project manager.

> Example Five: This project manager had been a project engineer for about seven years, had managed a couple of small projects as a PM, and was now managing a high-risk lump sum bid $15 million aerospace project with an estimated 3% or $500,000 fee. He was 'chicken-little' with a 'sky-is-falling' attitude throughout the whole project. His fee forecasts varied each month from $0 to $200,000 in the black, to $200,000 in the red. The result was the home office had a senior PM, and an additional staff superintendent, visit the site once weekly for the final three months. He had been overly pessimistic with his forecasts and thought himself quite the hero when the project settled on a $1 million fee. He was terminated shortly after final close-out.

There can be several other management reports either generated by the jobsite team or the home office accounting department according to the construction firm's practices and the requirements of any specific client or project. Typical cost accounting and financial management reports include the weekly labor report, monthly job cost history report, equipment log or ledger, and accounts payable report. Most of the reports are computer generated and are accurate to the degree that the information regarding actual costs was accurately input. They can occur weekly or monthly, but,

**Table 8.2** Monthly forecast summary

Evergreen Construction Company

**MONTHLY FORECAST SUMMARY PAGE**

| *Project:* | *Olympic Hotel* | *Job No.:* | *422* | *PM:* | *Chris Anderson* | | *Date:* | *1/1/2020* |
|---|---|---|---|---|---|---|---|---|
| *Col. 1* | *2* | *3* | *4* | *5* | *6* | *7* | *8* | *9* |
| *CSI* | | *Estimate* | *Change* | *Current* | *Cost* | *Cost* | *Forecast* | *Variance* |
| *Division* | *Description* | *Totals* | *Orders (2)* | *Contract* | *To Date* | *To Go* | *Cost* | *+/–* |
| 1 | General Conditions | $1,662,783 | | $1,662,783 | $845,450 | $831,000 | $1,676,450 | –$13,667 |
| 3 | Concrete | $4,826,612 | $68,853 | $4,895,465 | $4,545,450 | $180,005 | $4,725,455 | $170,010 |
| 4 | Masonry | $150,000 | | $150,000 | $0 | $150,000 | $150,000 | $0 |
| 5 | Structural Steel | $411,103 | | $411,103 | $405,045 | $2,500 | $407,545 | $3,558 |
| 6 | Carpentry | $3,119,193 | | $3,119,193 | $2,316,000 | $896,000 | $3,212,000 | –$92,807 |
| 7 | Waterproofing and Roof | $1,394,814 | $20,000 | $1,414,814 | $315,000 | $1,089,814 | $1,404,814 | $10,000 |
| 8 | Doors and Windows | $1,284,940 | | $1,284,940 | $425,000 | $859,940 | $1,284,940 | $0 |
| 9 | Finishes | $2,337,066 | $50,000 | $2,387,066 | $0 | $2,387,066 | $2,387,066 | $0 |
| 10 | Specialties | $157,085 | | $157,085 | $0 | $157,085 | $157,085 | $0 |
| 11 | Equipment | $258,550 | | $258,550 | $0 | $258,550 | $258,550 | $0 |
| 12 | Furnishings | $96,687 | | $96,687 | $0 | $96,687 | $96,687 | $0 |
| 13 | Special Construction | $0 | | $0 | $0 | $0 | $0 | $0 |
| 14 | Elevators | $435,000 | | $435,000 | $125,000 | $330,000 | $455,000 | –$20,000 |
| 21 | Fire Protection | $442,700 | | $442,700 | $90,000 | $352,700 | $442,700 | $0 |
| 22 | Plumbing | $1,211,379 | | $1,211,379 | $375,000 | $826,990 | $1,201,990 | $9,389 |
| 23 | HVAC | $720,629 | | $720,629 | $115,000 | $610,050 | $725,050 | –$4,421 |
| 26 | Electrical | $1,286,702 | | $1,286,702 | $725,000 | $599,000 | $1,324,000 | –$37,298 |
| 27 | Low Voltage | $332,500 | | $332,500 | $0 | $332,500 | $332,500 | $0 |
| 31 | Site Work | $1,428,311 | $37,564 | $1,465,875 | $650,000 | $750,000 | $1,400,000 | $65,875 |
| | **Total Cost:** | $21,556,054 | $176,417 | $21,732,471 | $10,931,945 | $10,709,887 | $21,641,832 | $90,639 |
| | **Labor Burden:** | $1,074,287 | $0 | $1,074,287 | $750,000 | $315,000 | $1,065,000 | $9,287 |
| | **Fee @ 5%** | 1,150,833 | $8,821 | $1,159,654 | $584,097 | $551,244 | $1,135,342 | $0 |
| | **Other Markups** | $748,841 | $7,057 | $755,898 | $380,247 | $358,860 | $739,107 | $0 |
| | **Total Contract:** | $24,530,015 | $192,295 | $24,722,310 | $12,646,290 | $11,934,991 | $24,581,281 | **$99,926** |
| | Forecast Loss: | | | $0 | | | | |
| | Forecast Savings: | | | $99,926 | | | | |
| | GMP Savings Split: 80% Client, 20% GC = | | | $19,985 | | | | |
| | Current Contract Fee: | | | $1,159,654 | | | | |
| | **Forecast Final Fee:** | | | **$1,179,639** | | | | |