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8 EIGHTH EDITION

# CONSTRUCTION CONTRACTING

## A PRACTICAL GUIDE TO COMPANY MANAGEMENT

WILEY

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**Eighth Edition**

A Practical Guide to Company Management

**Richard H. Clough**
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# Chapter 1

# The Construction Industry

## 1.1 INTRODUCTION

The construction industry is very large by any standard, and it can be described and defined in a number of different ways. This chapter will begin to characterize the industry in terms of its size and economic impact, and will proceed to define by name and by function some of the practitioners who perform their professional work in the industry. Also to be examined are terminology relative to types of contracts, public and private; single and separate contracts; competitive bid and negotiated contract formation; different project delivery methods; different types of construction contractors; and various types or categories of construction projects. All of these are vantage points from which the construction industry can be observed, and all of these terms provide descriptors for various aspects of the professional practice of construction contracting in the industry.

## 1.2 THE CONSTRUCTION PROJECT

Humans are compulsive builders who have demonstrated throughout the ages a remarkable and continually improving talent for construction. As knowledge and experience have increased, the ability of humankind to build structures of increasing size and complexity has expanded enormously. In the modern world, everyday life is maintained and enhanced by an impressive array of construction of all kinds, awesome in its diversity of form and function. Buildings, highways, tunnels, pipelines, dams, docks, canals, bridges, airports, and a myriad of other structures are designed and constructed so as to provide us with the goods and services we require. As long as there are people on earth, structures will be built to serve them.

Construction projects are complex and time-consuming undertakings. The structure to be built must be designed in accordance with applicable codes and standards, culminating in working drawings and specifications that describe the work in sufficient detail for its accomplishment in the field. The building of a structure of even modest proportions involves many skills, numerous materials, and literally hundreds of different operations. The assembly process must follow a certain order of events that constitutes a complicated pattern of individual time requirements and sequential relationships among the various segments of the structure.

Each construction project is unique in its own way, and no two are ever quite alike. Each structure is tailored to suit its environment, designed and built to satisfy the needs of its owner, arranged to perform its own particular function, and designed to reflect personal tastes and preferences. The vagaries of construction sites and the infinite possibilities for creative and utilitarian variation of the structure, even when the building product seems to be standardized, combine to make each construction project a new and unique experience. The designer produces a design for each project to meet the needs of

the owner within the constraints of the owner's budget. The contractor sets up a production operation on the construction site and, to a large extent, custom-builds each project.

The construction process is subject to the influence of numerous highly variable and often unpredictable factors. The construction team, which includes various combinations of contractors, owners, architects, engineers, consultants, subcontractors, vendors, craft and management workers, sureties, lending agencies, governmental bodies, insurance companies, and others, changes from one project to the next. All of the complexities inherent in different construction sites, such as subsoil conditions, surface topography, weather, transportation, material supply, utilities and services, local subcontractors, and local labor conditions, are an innate part of the construction project.

As a consequence of the circumstances noted above, construction projects are typified by their complexity and diversity, and by the nonstandardized nature of their design and construction. Despite the use of prefabricated units in certain applications, it seems unlikely that field construction can ever completely adapt itself to the standardized methods and the product uniformity of assembly-line production.

## 1.3 ECONOMIC IMPORTANCE

For a number of years, construction has been the largest single production industry in the American economy. It is not surprising, therefore, that the construction industry has a great influence on the state of this nation's economic health. In fact, construction is commonly regarded as the country's bellwether industry. Times of prosperity are accompanied by a high national level of construction expenditure. During periods of recession, construction is depressed, and the building of publicly financed projects is often one of the first governmental actions taken to stimulate the general economy. When the construction industry is prospering, new jobs are created, both in direct employment in construction, as well as in related industries, such as materials and equipment manufacturing and supply. A high level of construction activity and periods of national prosperity are simultaneous phenomena; each is a natural result of the other.

Some facts and figures pertaining to construction in the United States are useful in gaining insight into the tremendous dimensions of this vital industry. The total annual volume of new construction in this country at the present time is approximately $1.75 trillion. The annual expenditure for construction normally accounts for about 10 percent of the dollar value of our gross domestic product. Approximately 80 percent of construction is privately financed, and 20 percent is paid for by various public agencies. The U.S. Department of Labor presently indicates that construction contractors directly employ more than 7 million workers during a typical year. If the production, transportation, and distribution of construction materials and equipment are taken into account, construction creates, directly or indirectly, about 12 percent of the total gainful employment in the United States.

## 1.4 THE PEOPLE INVOLVED ON A CONSTRUCTION PROJECT

Construction projects are designed and built through the combined efforts of a number of people. Each has a defined role and a set of accompanying responsibilities in the total effort. These roles, as well as the rights and responsibilities of those who participate in the process, are defined in contracts that are formed between the various participants.

While the construction industry is often described in terms of materials, such as concrete, steel, masonry, and many others, or in terms of project delivery systems and contracting methods, it can also be typified in terms of the people who interact in the process which results in a completed project.

It is the people who are involvd in the design and construction of a project who bring the project to fruition. Construction contracting can therefore best be characterized as a people-oriented business and profession.

### 1.4.1 Owner

The owner is the central figure in any construction project. The owner can be defined most directly as the person who will own—literally will have title to—the project upon its completion. The owner is also the person who will pay for the design and construction of the project.

It is the owner who initiates all that will follow in the design and construction processes. The inception of any construction project begins with the owner's recognition of a need for a constructed project, whether it be a new building or an expanded or renovated building or a facility such as a highway, industrial plant, or airport. Most owners perceive this need and refine its ramifications over a period of time, until at some point the decision is made to move forward with the idea.

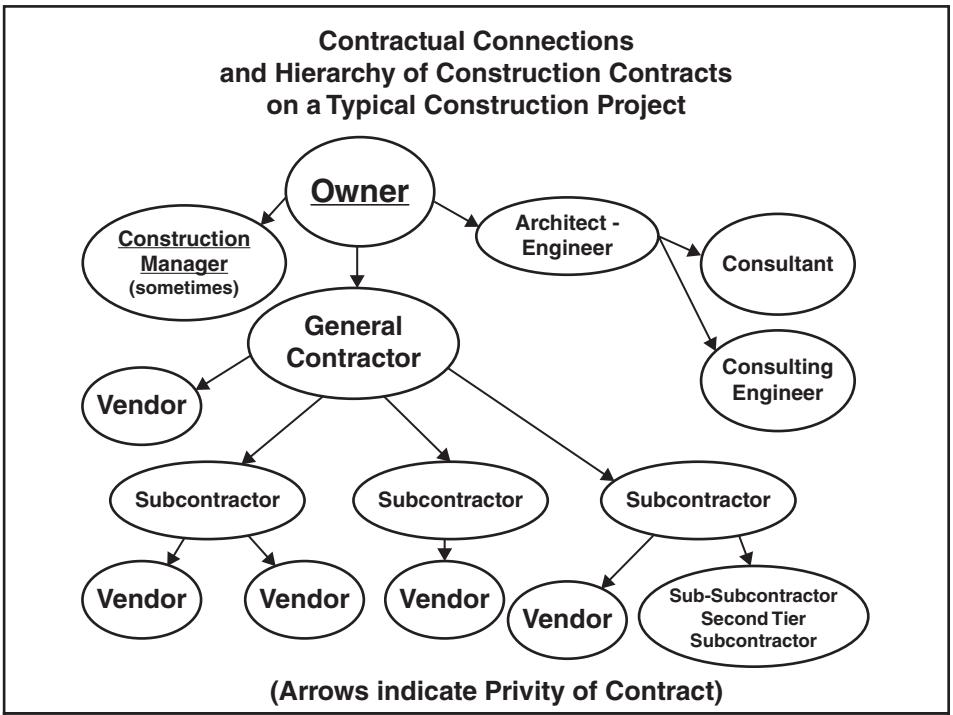
Typically, the owner will next think in terms of financing—how much money he is willing or able to commit to satisfy this need. Additionally, the source of these funds is considered and analyzed. Determinations are made regarding whether the forthcoming project will be funded with owner's funds or with borrowed capital. Most owners will make at least a preliminary determination during the course of this process, with regard to the maximum number of dollars the owner is willing or able to spend for the design and construction that will satisfy the need that has been perceived. This value will become the owner's budget for the project.

Most owners will next seek the services of a design professional—an architect or engineer. The owner will look to this person to assist with defining and codifying, in detail, what the owner's needs are. Then the owner will expect the designer to produce a design that will satisfy the needs of the owner, within the constraint of the owner's budget.

Various methods are employed by owners to determine who the designer will be. The owner may have a familiarity, or a history of past performance, with a certain designer or design firm. Alternately, the owner may seek input from peers and acquaintances regarding competent design firms. Sometimes, the owner may stage a design competition, whereby he sets forth the parameters of his need, and invites design professionals to submit designs in competition with one another for selection by the owner to design the project. These and other methods of the owner's choosing the firm that will produce the design are further discussed later in this book.

It is important to note that the owner will select a design firm and then will enter a contract with that firm. The contract will set forth the exact nature of the services that the designer will provide, and will contain provisions relative to determination and payment of the designer's fees, along with defining all of the administrative elements of the agreement between these parties, as well as the rights and obligations of the two parties. The existence of an actual contract between two parties is referred to as their having privity of contract with each other. The concept of who has privity of contract with whom on a typical construction project is further discussed in succeeding sections of this chapter. Likewise, details regarding the typical content of the contract between the owner and the designer will be further discussed in another chapter. The most common relationship between the owner and the architect-engineer, as well as the names of the other parties most commonly involved in the design and construction of a project, and who has privity of contract with whom, are illustrated in Figure 1.1.

Owners may be characterized as being private owners or public owners, and the construction projects that are designed and constructed for them are described in the same terms. Private owners may be individuals, partnerships, or corporations. The funds that are used to pay for the design and




Note that the contracts between the parties as illustrated here are in a hierarchical arrangement, with the owner at the top of the hierarchy.

The solid lines (arrows) between parties represent the existance of privity of contract, that is, the existance of an actual contractual connection between the parties. In the method of project delivery depicted here, there is privity of contract between the owner and the architect, and there is privity between the owner and the prime contractor, while there is no privity of contract between the architect and the prime contractor or the owner and the subcontractor.

**Figure 1.1** People Involved and Hierarchy of Contracts on a Typical Building Construction Project

construction of the project are private funds, that is, not public or government funds. Most private owners have structures built for their own use: business, habitation, pleasure, or otherwise. However, some private owners do not intend to become the end users. Such owners intend that the completed structure is to be sold, leased, or rented to others.

Public owners are defined as some level of government—national, state, county or parish, municipal, or school district—or some agency or department of government. Public owners range from agencies of the federal government down through state, county, and municipal entities, to a multiplicity of local boards, commissions, and authorities. Construction projects that are designed and constructed for public owners are defined as public projects. Such projects are paid for by appropriations, bonds, tax levies, or other forms of public funding, and are designed and built to meet some defined public need. Public owners are required to proceed in accordance with applicable statutes and administrative directives pertaining to all aspects of the design and construction process.

Most owners relegate by contract the design of their projects to professional architecture or engineering design firms, and award contracts for the construction of their facility to construction contractors. However, there are some owners who, for various reasons, elect to play an active role in the design and/or the construction of their projects.

For example, some owners perform their own design, or at least a substantial portion of it. In similar fashion, some owners choose to act as their own construction managers or perhaps even to perform their own construction. Many industrial and public owners have established their own construction organizations that work actively and closely with the design and construction of their projects. These concepts are further discussed in other sections of this chapter.

### 1.4.2 The Architect-Engineer

The designer or design firm, also known as the design professional, is the party, organization, or firm that designs the project. Both architects and engineers are licensed design professionals. Because the design of facilities is architectural or engineering in nature, and is often a combination of both, the term *architect-engineer* is used in this book to refer to the primary design professional, regardless of the applicable specialty or the relationship between the designer and the owner.

The architect-engineer can occupy a variety of positions with respect to the owner for whom the design is produced. The traditional and most common arrangement is one in which the architect-engineer is a private and independent design firm that produces the project design by the terms of a contract between the owner and the architect-engineer. Appendix B, AIA Document B101–2007, "Standard Form of Agreement between Owner and Architect," provides an example of a typical contract that might be entered between the owner and an architect, as written by the American Institute of Architects (AIA), which is the primary national professional association for architects.

Many public agencies and large corporate owners maintain their own in-house design capability. In such instances, the architect-engineer is a functional part of the owner's organization. In other instances, the owner contracts with a single party for both design and construction services, in an arrangement referred to as design-construct or design-build. In this arrangement, the architect-engineer is a branch of, or is affiliated in some way with, the construction contractor.

There are also arrangements where large industrial firms have chosen to reduce their in-house design staffs and have established permanent relationships with outside architect-engineers. Such "corporate partnerships" call on the architect-engineer to provide a broad range of design, engineering, and related services on an open-ended basis. Such arrangements are said to work to an owner's advantage by fostering a team approach and reducing litigation between the parties.

### 1.4.3 Engineering Consultants

As was noted in the previous section, construction projects have an architect or an engineer as the primary designer. Typically, a variety of engineering consultants are called upon by the primary designer to input their expertise into the design effort for certain elements of the design. If the primary designer for a building construction project is an architect, a civil engineer will typically provide services for site work, drainage, and streets and driveways; a structural engineer may be retained to perform design and analysis on the structural system for the building, or on individual structural members; a mechanical engineer may design or assist with the design of heating, ventilating, and air conditioning

equipment or systems in the building. Other engineers may be called upon to provide oversight or specific assistance with other aspects of the building design, as well.

These engineers typically enter a contract with the primary designer for the provision of their assistance and are typically paid by the primary designer. In other instances, the owner may contract with engineering consultants, whose work then provides input to the design. A typical example in building construction is the owner's providing geotechnical engineering services, whereby the soils at the site are sampled, analyzed, and tested, and where the geotechnical engineer provides both soil investigation and testing information and, frequently, his professional recommendation regarding the type of foundation system that will be suitable for the building to be designed. This information then is made available to the building design architect or engineer who will design the foundation.

### 1.4.4 Other Consultants

In the same fashion as noted previously, a variety of consultants may be utilized by the primary designer or by the owner to provide their expertise with specific portions of the design. Examples include lighting consultants, acoustical consultants, and the like.

### 1.4.5 Construction Manager

The construction manager is a professional who enters a contract with the owner, and by the terms of that contract provides a variety of different services to the owner. The concept of construction management became part of the design and construction process some years ago at a time when design-bid-build was the predominant project delivery method, whereby owners entered contracts with architect-engineers to produce the design, and contractors then submitted bids or proposals with their prices for constructing that which was designed, with one of the bidding contractors then selected for a construction contract to build the project. A number of owners saw value within this process in entering a contract with a third party to represent the owner's interests in the owner's contract with the architect-engineer and in his contract with the construction contractor. Construction management contracts were utilized when the concept originated and continue to be used today, in both the single-contract system and in the separate-contracts system. These methods of contracting are discussed more fully in subsequent sections of this chapter.

As the use of construction management contracts has continued and evolved, a variety of different services have come to be included in these contracts. The fact that the concept has endured and has evolved into several variations is indicative of the fact that owners have recognized, and are willing to pay for, a series of services beyond those defined in traditional historical design contracts and construction contracts.

Construction management services may be performed by design firms, contractors, and professional construction managers. Such services range from providing professional advice and counsel to the owner, to coordinating contractors during the construction phase, to broad-scale responsibilities over project planning and design, design document review, construction scheduling, value engineering, cost monitoring, and other management services. The demand for construction management services has increased greatly in recent years as owners have identified new needs, financial approaches, and construction technologies. Selection of the construction manager by the owner is sometimes accomplished by competitive bidding, using both fee and qualifications as the basis for contract award. In the usual instance, however, the construction management contract is considered to

be a professional services contract and is negotiated. These contracts usually provide compensation for the construction manager on the basis of a fixed fee or percentage of construction cost, plus reimbursement of management costs.

As the construction management concept has evolved, construction management has come to be defined in two basic variations: construction management agency (CMA) and construction management at risk (CMAR). In the construction manager as agent arrangement, the construction manager enters a contract with the owner, and by the terms of that contract, he represents the owner's interests in the owner's contracts with the architect-engineer and with the prime contractor(s). The construction manager has no contractual relationship with the architect-engineer or with the general contractor(s); he provides his counsel and assistance to the owner, and the owner then decides whether to take action. The construction manager as agent is illustrated in Figure 1.2.

In the CMAR contract form, the construction manager enters a contract with the owner whereby he has the responsibility for completing the construction project on time, at or under the stipulated price or the guaranteed maximum price. Often, this form of construction management contract is written by the owner in such a way that the construction manager can also provide consulting services to the owner during design, and the construction manager may actually assist the owner in the selection of the design firm.

In CMAR, the construction manager effectively acts as the general contractor during construction. The CMAR contract form may be utilized in both the single- and separate-contracts systems, as noted in Figure 1.3, and may also be used in the design-build method of project delivery, which is discussed in a subsequent section of this chapter. Thus, the construction management firm frequently has responsibility for delivery of the project to the owner, from the onset of design through final completion of the project.

At the present time, construction management (CM) is extensively utilized in this country by both private and public owners. During its early evolutionary period, confusion existed as to just what the duties and responsibilities of the CM were, what type of business firm was best qualified to perform such services, and how traditional construction relationships and responsibilities would be changed when the system was used. Some problems arose early, following the introduction of the construction management concept, concerning the lack of a practical code of ethics and standards of practice, uncertainty about liabilities of the participants, and the absence of standard contract documents to cover the wide range of CM services being provided by engineers, architects, contractors, and other parties. However, time and experience have served to stabilize this form of construction project delivery.

The Construction Management Association of America (CMAA) is a professional association which has, since its inception, been engaged in developing an accepted professional identity for construction managers and uniform standards for CM practice. In 1986, the CMAA published its standards of practice for construction managers. These standards serve as a guide to CM services and propose criteria for, and measurements of, a construction manager's performance. They describe the component elements of CM practice and define the scope of CM services. CMAA has also developed a series of standard CM contract documents.

### 1.4.6 The Prime Contractor

The prime contractor is defined as a business firm that has a contract with the owner for the construction of a project, either for the entirety of the project or for some stipulated portion thereof. As defined previously, the prime contractor thus has privity of contract with the owner.

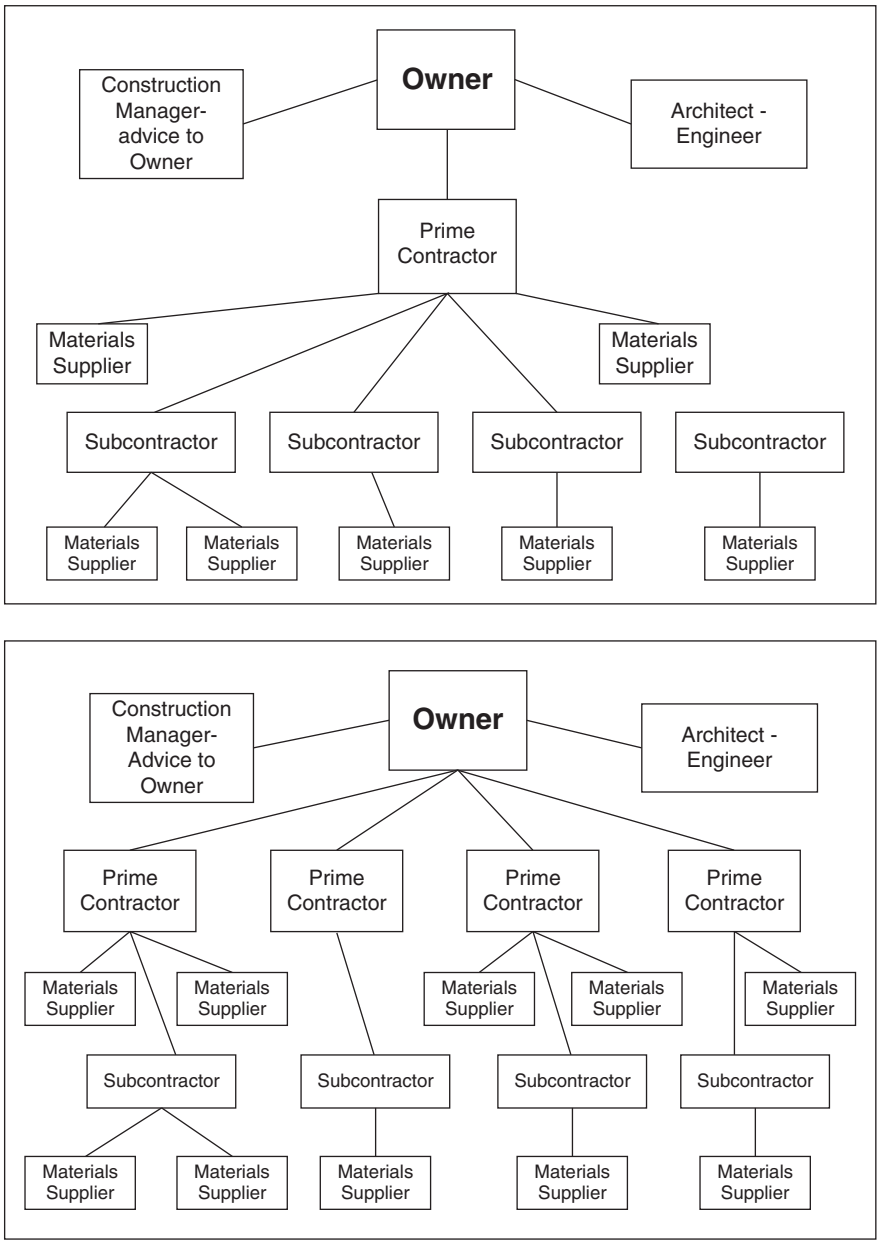



**Figure 1.2** Construction Manager as Agent in Single- and Separate-Contracts Systems

While they are referred to in the context of contract formation as the prime contractors, in business practice these contractors refer to themselves by a variety of names. Many choose the term *general contractor* to indicate that they are generalists in construction practice, interested in and capable of performing different kinds of projects. Other prime contractors identify themselves in terms of the kind of work they prefer to perform, and take on names such as

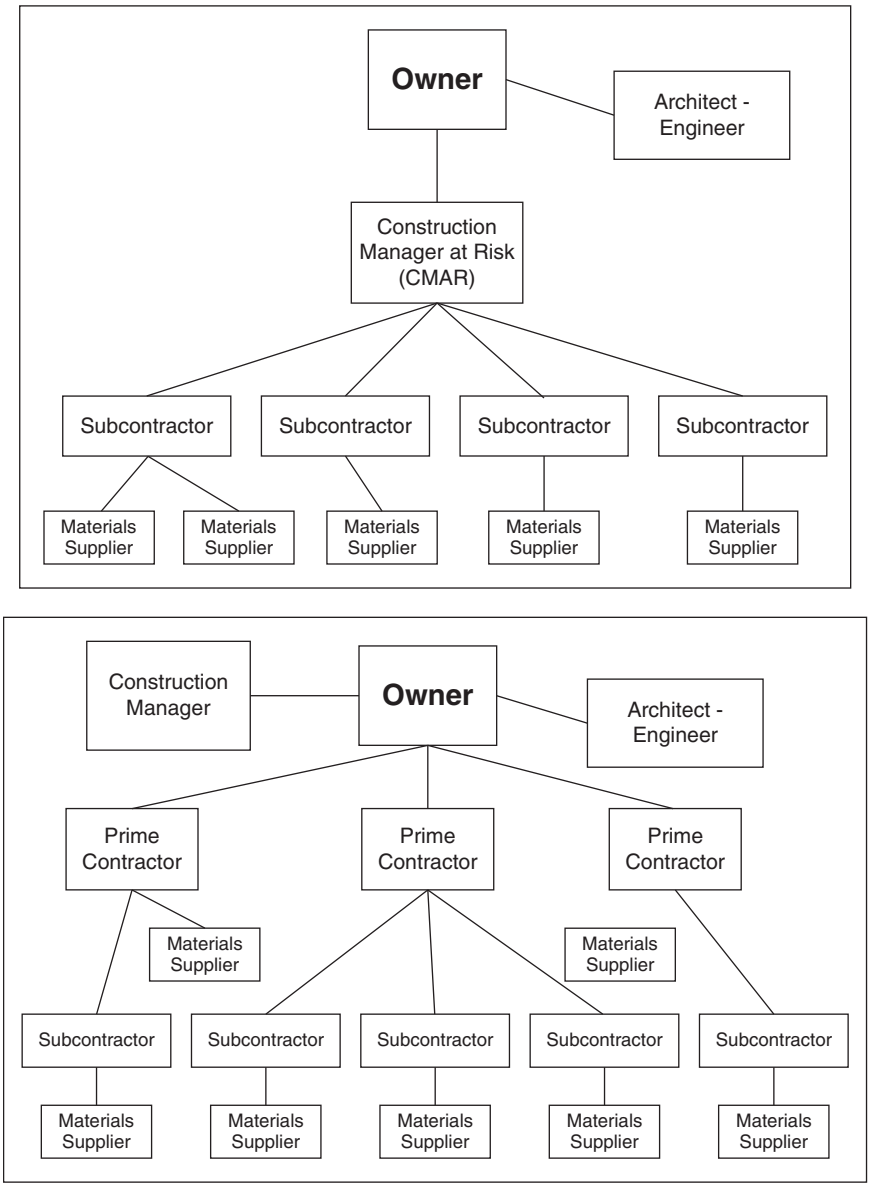



**Figure 1.3** Construction Manager at Risk in Single- and Separate-Contracts Systems

highway contractors, heavy construction contractors, building contractors, residential contractors, and so on. These various types of construction contracting will be defined and discussed in subsequent sections.

On most construction projects, there is one prime contractor. This contracting arrangement is referred to as the single-contract system. In this system, the prime contractor is that party who brings together all of the diverse elements and inputs of the construction process into a single, coordinated

effort. The single prime contractor and single-contract system will be discussed in more detail in subsequent sections of this chapter.

The essential function of the prime contractor is management control and coordination of the entire construction process. Ordinarily, this contractor is in complete and sole charge of the field operations on a project, including the procurement and provision of necessary construction labor, materials, and equipment, and the management of the entirety of the construction process. Additionally, the prime contractor will usually enter contracts with a number of subcontractors, who will perform portions of the work on the project and will be responsible for managing and coordinating their work on the project.

The chief contribution of the prime contractor to the construction process is the ability to marshal and allocate and manage all of the resources required for construction of the project in order to achieve completion at maximum efficiency of time and cost. A construction project presents the contractor with many difficult management problems. The skill with which these problems are met determines, in large measure, how favorably the contractor's efforts serve its own interests as well as those of the project owner.

### 1.4.7 The Subcontractor

A subcontractor is a construction firm that contracts with a prime contractor, that is, has privity of contract with the prime contractor for the performance of a stipulated portion of the work on a project. Subcontractors are also frequently referred to as specialty contractors.

Economic facts, along with the increasing complexity of construction projects, as well as the efficiencies inherent in having specialized contractors performing segments of the work on a project, have confirmed the subcontract system to be an efficient and economical resource for use on construction projects of all kinds. The operations of the average general contractor are not always sufficiently extensive to afford full-time employment of skilled craftsmen in each of the numerous trade classifications and specialties needed to complete the work in the field. With the advent of subcontracting, these contractors are able to keep only a limited number of full-time employees on their payroll and then can award subcontracts for the performance by a specialist of the numerous specialty crafts as the need arises.

By subcontracting, the prime contractor can obtain workers with the requisite skills when they are needed, without the necessity of maintaining an unwieldy and inefficient full-time labor force for all of the numerous and specialized crafts which are needed on construction projects today. Subcontracting firms are able to provide substantially full-time employment for their workers, thereby affording an opportunity for the acquisition and retention of the most highly skilled and productive construction tradesmen. Additionally, these skilled craftsmen and the subcontracting companies that employ them bring with them the equipment, tools, and instrumentation necessary for the specialized elements of many projects. Qualified subcontractors are usually able to perform their specialty work more quickly and at a lower cost than a general contractor could. It can also be argued that those people and the companies that employ them, who perform their specialty work on construction projects day after day, can consistently complete their work at a higher level of quality. Many of the construction specialties that are typically performed by subcontractors, such as electrical work and plumbing work, have particular licensing, bonding, and insurance requirements.

How much of the work the prime contractor decides to self-perform on the projects that he constructs, and how much of the work he performs by awarding subcontracts for the remaining elements, depends on the nature of his management plan the nature of his business organization, and the type

of construction involved. There are instances where all of the work on a project is subcontracted, with the prime contractor providing only supervision, overall project coordination and management, and perhaps general site services. Contractors who perform construction projects in this manner are sometimes referred to as *broker contractors*. At the other end of the spectrum are those projects where the general contractor does no subcontracting, choosing to self-perform the entire work with its own forces.

This occurrence is extremely uncommon today on building construction projects, although in other types of construction this practice is still followed. In the usual case, however, the prime contractor will perform some of the operations that comprise the work on the overall project and will subcontract the remainder to various specialty contractors.

When the prime contractor engages a specialty firm to perform a particular portion of the overall construction project, the two parties enter into a contract called a subcontract agreement or simply a subcontract. This subcontract agreement will pass through to the subcontractor many of the responsibilities that the prime contractor has agreed to fulfill to the owner and will stipulate the exact services the subcontractor is to provide and specific elements of the work that the subcontractor is to perform.

It should be noted that a subcontract agreement between a prime contractor and a subcontractor in no way establishes a contractual relationship between the owner and the subcontractor. The prime contractor, by the terms of its contract with the owner, assumes complete responsibility for the direction and control of the entire construction project. An important part of this responsibility is coordinating and supervising the work of the subcontractors. When the general contractor subcontracts a portion of the work, this contractor remains completely responsible to the owner for the total project and is liable to the owner for any negligent performance of the subcontractors. However, the courts have ruled that, in the absence of provisions in the general contract holding the prime contractor responsible for the negligence of its subcontractors, the contractor cannot be held liable for damages caused by the collateral torts of its subcontractors.

In private construction, the prime contractor generally decides how much of the work on a project he will self-perform with people on his payroll and under his direct supervision, and how much of the work he elects to perform by subcontracting. However, on some private construction projects and frequently on public construction projects, the owner imposes a limitation on the proportion of the total construction on the project that the prime contractor is allowed to subcontract. For example, several federal agencies have set such limitations. Additionally, some states have established statutory restrictions on the subcontracting of public works in those states. Such limitations on construction subcontracting are intended to circumvent any of a number of potential problems associated with extensive subcontracting. An extensive number of subcontracts on a project can lead to problems such as division of project authority, fragmentizing responsibility, complicating the scheduling of job operations, adding to the difficulties of coordinating construction activities, weakening communication between management and the field, fostering disputes, and generally impeding to job efficiency. Obviously, the extent to which these difficulties may actually occur is very largely a function of the experience, organization, and management skill of the prime contractor involved.

### 1.4.8 The Sub-subcontractor

A sub-subcontractor is one who enters a contract with a subcontractor on a project for the performance of a stipulated portion of the subcontractor's work. Sub-subcontractors may be engaged when a subcontractors is not capable of, or may not be interested in, performing all of the work in its scope of work as defined in the subcontract agreement with the prime contractor. While sub-subcontracting

is sometime performed, for the same reasons described in the preceding paragraphs, many owners limit whether and to what extent sub-subcontractors may be utilized on a project. In the same way, many prime contractors include language in their subcontract agreements limiting sub-subcontracting on the part of subcontractors.

### 1.4.9 Vendors

Vendors, also referred to as materials suppliers, are those who provide materials or products for inclusion in a project. They do not provide services or labor for the installation of the materials in a project, and furnish only materials or other products. They generally do so by the terms of a sales contract, purchase order, or purchase agreement that they enter with a prime contractor, subcontractor, or sub-subcontractor.

## 1.5 CONSTRUCTION CATEGORIES

The field of construction is as diversified as the uses and forms of the many types of the end products that it produces. While the several types and categories of construction can be classified in different ways, construction is commonly divided into four main categories: residential construction, commercial construction, heavy/civil/highway construction, and industrial construction. It should be noted, however, that some of these categories may be subdivided and described in other terms, and also that there is some overlap among these divisions and that certain projects do not fit neatly into any one of them.

In general, contracting firms tend to specialize with regard to the types of work they perform, and therefore typically perform most of their work within one of these divisions or one of the subdivisions to be described later. This specialization is usual and necessary because of the radically different equipment requirements, construction methods, trade and supervisory skills, contract types and provisions, and financial arrangements involved with the different construction categories. The four main divisions—residential, commercial, heavy/civil/highway, and industrial—are further described in the following paragraphs.

### 1.5.1 Residential Construction

Residential construction, also referred to as housing, includes the building of residences of all kinds. Included in this category are those who build single-family homes; duplexes; condominiums; multiunit townhouses; low-rise, garden-type apartments; and high-rise apartments. Design of this construction type may be performed by the owners themselves, by architects, or by the builders themselves. Although a number of very large national residential building firms are engaged in various forms of residential construction, this category of construction is dominated by small building firms.

Residential construction typically accounts for about 40 to 50 percent of new construction during a typical year. Historically, residential construction has been characterized by instability of market demand and is strongly influenced by governmental regulation and national monetary policy. Residential construction is also an area of construction typified by periodic high rates of contractor business failures.

A significant proportion of housing construction is financed through private financial lending institutions, while government or quasi-government agencies, such as the Department of Housing and Urban Development (HUD), the Federal Housing Administration (FHA), the Federal National

Mortgage Association (FNMA, or "Fannie Mae"), the Government National Mortgage Association (GNMA, or "Ginnie Mae"), and Veterans Affairs (VA), also provide mortgage financing or mortgage guarantees for residential construction.

Within this category, some residential contractors are speculative builders and others are custom builders, while some residential contractors construct both speculative and custom units. Speculative builders are those who construct a residential building in the role of owner-builder. They acquire real estate and a design for a residence, and then they build the facility and offer it for sale. Their business plan is to sell the property to a new owner during, or soon after completion of, the construction.

Custom residential builders are those who construct a residence for an owner by the terms of a contract between the owner and the builder. The owner will typically own the real estate on which the residence will be built, and usually the owner will have obtained a design for the facility to be constructed, either from the builder, from an architect, or from some other source.

### 1.5.2 Commercial Construction

Commercial construction in the commonly understood sense includes buildings constructed for institutional, educational, light industrial, business, social, religious, governmental, and recreational purposes. Some refer to the construction of churches and schools within this category as *institutional construction*.

Design of the buildings in this construction category is performed predominantly by architects, with engineering design services and consulting services being obtained by the architect for input to the design as needed. Construction of this kind is generally performed by prime contractors or construction managers who typically subcontract substantial portions of the work to specialty firms. Both the single- and separate-contracts systems may be used.

Contractors who perform commercial construction typically refer to themselves as building contractors or as general contractors. In normal business years, private capital finances most commercial construction, which normally accounts for 20 to 30 percent of the annual total volume of new construction.

### 1.5.3 Heavy/Civil/Highway Construction

Almost all of the facilities described with these terms are designed by an engineer, rather than by an architect, and therefore construction of this kind is often broadly referred to as *engineered construction*. This category includes those structures whose design usually is concerned more with functional considerations than aesthetics and involve field materials such as earth, rock, steel, asphalt, concrete, timbers, and piping. Engineered construction is also characterized by the utilization of numerous major items of construction equipment, and projects of this type are characterized by large spreads of this equipment, such as power shovels, tractor-scrapers, pile-drivers, draglines, large cranes, heavy-duty haulers, paving plants, rock crushers, and associated equipment types.

In a general sense, heavy construction typically includes the design and construction of facilities such as power plants, dams, levees, freshwater treatment plants, wastewater treatment plants, desalinization plants, aqueducts, flood control structures, canals, railroads, airports, tunnels, port and harbor facilities, and the like. Most people would use the term *civil construction* to describe the design and construction of water, gas, and electrical utility lines; telephone distribution facilities; streets; curbs and gutters; storm drains; and so on. Highway and airfield construction refers to clearing, excavation, fill, aggregate production, sub-base and base, paving, drainage structures, bridges, traffic signs, lighting systems, and other such items commonly associated with this type of work.

It should be noted that the distinctions between the categories of engineered construction described earlier are not exact. There is a considerable amount of overlap, and some contractors who perform these types of work may refer to themselves with different identifying labels. For example, some highway contractors would routinely include the construction of bridges within their scope of work. Others might award bridge construction to separate contractors or to subcontractors, while some other contractors specialize in the construction of bridges as their primary business. Similarly, some municipal storm drains might be constructed by contractors who refer to themselves as heavy construction contractors, while others performing similar work might call themselves civil construction contractors.

Most engineered construction projects of the kind described here are publicly financed, and therefore are also frequently characterized as public construction projects. Projects of the kind described in this section in the aggregate account for approximately 20 to 30 percent of the new construction market.

### 1.5.4 Industrial Construction

Industrial construction includes the erection of projects that are associated with the manufacture or production of an industrial product or service. Such structures are frequently highly specialized and highly technical in nature, and are typically built by large, specialized contracting firms that perform both the design and field construction. Typical examples of this type of construction are petroleum refineries and process plants of all kinds. Almost all of this type of construction is designed by engineers rather than by architects. In addition to an engineer producing the primary design, other engineering firms, and sometimes a variety of consulting firms, assist with specific elements of the design.

While this category accounts for only 5 to 15 percent of the annual volume of new construction, it includes some of the largest projects built. In the United States, a very large proportion of this category of construction projects is privately financed.

## 1.6 PROJECT FINANCING

### 1.6.1 By Owner

As noted in a previous section, the owner makes the necessary financial arrangements for the construction of most construction projects. This normally requires obtaining the funding from some external source. In the case of public owners, the necessary capital may be obtained by tax revenues, appropriations, or bonds. A large corporate firm may obtain the funds by the issuance of its own securities, such as bonds. For the average private owner, funding is normally sought from one of several possible loan sources, such as banks, savings-and-loan associations, insurance companies, real estate trusts, or government agencies.

Where construction funding is obtained by commercial loans, the owner must typically arrange two kinds of financing: (1) short-term financing, also referred to as interim financing, or as construction financing, to pay the construction costs; and (2) long-term financing, also referred to as mortgage financing, which is repaid over a longer term. The short-term financing involves a construction loan and provides funds for land purchase and project construction. The term of a construction loan usually extends only for the construction period and is typically granted by a lending institution with the expectation that it will be repaid at the completion of construction by some other loan such as

the mortgage financing. The term of the mortgage loan is usually for an appreciable period such as 10 to 30 years. Usually, the first objective of the project owner is to obtain the commitment for the long-term or permanent financing from a lender. Once this commitment is arranged, the construction loan is then typically arranged.

When the mortgage lender has approved the long-term loan, a preliminary commitment is issued. Most lenders will not give the final approval for the loan commitment until they have reviewed and approved the project design documents. Upon final approval, the mortgage lender and the borrower enter into a contract, and by the terms of that contract the project owner promises to construct the project according to the approved design, and the lender agrees to provide the funds for the stated period of time.

When a commitment for the long-term financing has been arranged, the construction loan is obtained. Commercial banks and savings-and-loan associations are common sources for such financing. To obtain this loan, the owner may be required to name its intended design firm and the contractor who will perform the work. Lending institutions typically limit their construction loans to no more than 75 to 80 percent of the estimated cost of construction. Thus, the owner is required to commit his equity in the amount of 20 to 25 percent of the contract amount. When the construction loan has been approved, the lender sets up a "draw" schedule that specifies the rate at which the lender will make payments to the contractor during the construction period. Typically, the short-term construction loan is paid off by the mortgage lender when the construction is completed. This repays the construction loan, and the mortgage is finalized, and the owner is left with the long-term obligation to the mortgage holder.

### 1.6.2 By Builder-Vendor

A builder-vendor is a business entity that designs, builds, and finances the construction of structures for sale to the general public. The most common example of this is tract housing, where the builder-vendor acquires land and builds housing units. This was referred to earlier as speculative residential construction, where the builder-vendors act as their own prime contractors, build dwelling units on their own accounts, and often employ sales forces to market their products. They intend to sell the residential property during the course of construction of the project or soon after the completion of the project. Hence, the ultimate owner incurs no financial obligation until the structure is finished and a decision to purchase the building is made.

In much of this type of construction, the builder-vendor constructs for an unknown owner. Many builder-vendors function more as construction brokers than construction contractors per se, often choosing to subcontract all or nearly all of the actual construction work. The usual construction contract between owner and prime contractor is not present in such cases because the builder-vendor occupies both roles. The source of business for the builder-vendor is entirely self-generated, as opposed to the professional contractor, who obtains its work in the open construction marketplace.

### 1.6.3 By Developer

A developer acquires financing for the owner's project in two different ways. A comparatively recent development in the construction of large buildings for business corporations and public agencies is the concept of design-finance. In this case, the owner teams up with a developer firm that provides the owner with a project design and a source of financing for the construction process. This procedure minimizes or eliminates altogether the initial capital investment of the owner. Developers are invited

to submit proposals to the owner for the design and funding of a defined new structure. A contract is then negotiated with the developer of the owner's choice. After the detailed design is completed, a construction contractor is selected and the structure is erected.

The second procedure used by developers is currently being applied to the design and construction of a wide range of commercial structures. Here, the developer not only arranges project design and financing for the owner but is also responsible for the construction process. Upon completion of the project under either of the two procedures just discussed, the developer sells or leases the completed structure to the owner.

## 1.7 THE CONTRACT SYSTEM

The owner of a proposed construction project has many different options available as to how the work is to be accomplished. It is true that public owners must conform to a variety of statutory and administrative requirements in this regard, but the construction process is a flexible one, offering the owner many choices as to procedure.

In the usual mode of accomplishing construction work, the prime contractor enters into a contract with the owner. The contract describes in detail the nature of the construction to be accomplished and the exact services that are to be performed. The contractor is obligated to perform the work in full accordance with the contract documents, and the owner is required to pay the contractor as agreed in the contract.

Experience has shown that owners can often reduce their construction costs by giving careful thought to the type of contract that best suits their requirements and objectives. The chances for a successful construction process are enhanced by thoughtful and thorough study by the owner before the process is initiated. The careful analysis and consideration of risk during the field construction is a critical issue. Typical contract choices force either the contractor or the owner to bear most of the risk. Each of these contract types has its advantages, but there are variations that apportion construction risks to the party that can best manage and control them.

The means by which the prime contractor is selected, the form of contract used, and the scope of duties thereby assumed by the contractor can be highly variable, depending on the preferences and requirements of the owner. Architects, engineers, and construction managers may provide consultation and assistance to the owner in this regard; however, it is the owner who will ultimately make the decisions. The prime contractor may be selected on the basis of competitive bidding, or the owner may negotiate a contract with a selected contractor, or perhaps a combination of the two may be used. The entire project may be included within a single contract, or separate prime contracts for specific portions of the work may be used. The contract may include project design as well as construction, or the contractor's responsibility may be primarily managerial. The owner may or may not utilize the services of a construction manager, and these services may vary in scope and description. It is to be emphasized here that the owner is the key participant here and is the person who will make these decisions.

## 1.8 PROJECT DELIVERY METHODS

### 1.8.1 Construction Services Only

A large percentage of construction contracts provide that the general contractor has responsibility to the owner only for the accomplishment of the field construction. Under such an arrangement, the contractor is completely removed from the design process and provides no input to the design.

The contractor's obligation to the owner is limited to constructing the project in full accordance with the terms of the construction contract.

Where the contractor provides construction services only, the owner may have an in-house design capability. The more common arrangement, however, is for a private architect-engineer firm to perform the design by the terms of a contract with the owner. Under this latter arrangement, the design professional acts essentially as an independent contractor during the design phase and as an agent of the owner during construction operations. The architect-engineer acts as a professional intermediary between the owner and contractor and often represents the owner in matters of construction contract administration. Under such contractual arrangements, the owner, the architect-engineer, and the contractor play narrowly defined roles, each performing a particular function semi-independently of the others.

### 1.8.2 Design-Bid-Build

The design-bid-build project delivery method has for many years been the most commonplace method of project delivery for construction projects of all kinds. The process derives its name from the sequence in which the design and construction functions are performed. This project delivery method is also referred to as linear construction or as design-then-construct.

In the design-bid-build project delivery method, the process begins with the owner's perceiving a need for the construction of a facility. Typically, the owner considers financing and budget for satisfying the need he has recognized. The owner subsequently enters a contract with an architect or engineer, who will provide complete design services. The designer's basic responsibility as typically defined by the owner is the creation of an original design for a construction project that will satisfy the needs of the owner, within the owner's budget.

The owner's contract with the designer usually includes responsibility for production of a complete set of drawings and specifications that will communicate the design to the owner as well as to the contractor and will define the deliverables in the construction contract. Additionally, complete design services usually include the designer's authorship of all of the bid documents and contract documents for the project. The typical content of the set of bid documents and contract documents for a project is depicted in Figure 1.4.

In addition to providing the services noted earlier, the architect-engineer who is the primary designer will typically provide contract administration services during construction, and representation of the owner's interests through observation of the work during construction, as well as closeout of the project and administration of any warranty issues after construction is complete. As previously noted, the exact nature of the services to be provided is set forth in the contract between the owner and the architect-engineer.

When all of the bid documents and contract documents have been produced and have been approved by the owner, the designer assists in announcing the project to construction contractors by means of an advertisement for bids, an invitation to bid, or a notice to bidders. Through these documents, contractors are made aware of the existence of the project, and are provided a brief description of the project and the form of contract to be employed. Additionally, the contractors are provided information with regard to how to obtain bid documents and contract documents, and are informed with regard to the date, time, and place where contractors' proposals are to be submitted.

The architect-engineer administers the process of making bid documents and contract documents available to the contractors. In addition, the designer will answer contractors' questions, and will provide interpretations and clarifications regarding the information in the contract and bid documents as requested, during the time when contractors are preparing their estimates, which is known as the bid

**BID DOCUMENTS**

1. Advertisement for bids, notice to bidders, invitation to bid
   Instructions to bidders
   Proposal form

**CONTRACT DOCUMENTS**

1. Conditions of the contract
   - General conditions
   - Modifications to the general conditions
   - Supplementary general conditions
   - Special conditions
2. Drawings
3. Specifications
4. Addenda
5. Alternates
6. Agreement
7. Modifications
   - Amendment
   - Change order
   - Construction change directive
   - Written order for a minor change

**Figure 1.4** Bid Documents and Contract Documents for a Construction Project

period. Additionally, the architect-engineer will respond to written requests for information (RFIs) from the contractors during this period.

In addition, the designer will issue addenda as he deems necessary during the bidding period. An addendum (plural: *addenda*) is any modification to any provision of the contract documents or the bid documents for the project, issued by the designer during the bidding period. Addenda are issued in consecutively numbered sequence, and the designer will assure that he sends each new addendum to all of the contractors who have received bid documents and contract documents. Usually, when addenda are issued during the bidding period, the architect-engineer will require written and signed acknowledgment from each contractor on their proposal submitted on bid day that they have received and considered all of the addenda issued, identified by number.

The designer will usually administer the process of receiving the contractors' proposals on bid day, and will conduct the bid-opening process. The architect-engineer will then assist the owner with selection of the contract recipient and with execution of the agreement between the owner and the contractor.

After the contract has been signed between the owner and the contractor, the contractor will proceed to performance of the contract requirements. Throughout this time, the architect-engineer will provide contract administration services for the owner as defined in the owner-architect contract.

### 1.8.3 The Team Approach

An appreciable share of the private construction market is now utilizing the "team approach" for construction project delivery. This method of project delivery may also be referred to as integrated project delivery. When this method is followed, the private owner selects and enters agreements with the architect-engineer and the building contractor as soon as the project has been conceived. From this point forward, the three parties constitute a team that serves to achieve budgeting, cost control, time scheduling, and project design and construction in a cooperative manner.

Using the team approach, the owner assembles his key players, architect-engineer and contractor, to study the proposed project. The team determines the project program, and formulates project scope and budget, and the designer develops preliminary drawings from which the contractor makes conceptual cost estimates. As the process continues, the designer prepares the final drawings and specifications, and the contractor prepares more detailed estimates, and the owner makes the necessary financial arrangements. After financial commitments and required permits are obtained, the actual construction begins. During the course of construction of the project, the designer and contractor work closely together, modifying the design and drawings as may be required. The process offers the owner the advantages of time savings, cost control, and improved quality.

Where the team approach is used, the owner is mainly responsible for setting goals and parameters of the project, as well as providing the funding. The architect-engineer is responsible for developing the functional, aesthetic, and technical features of the building, and for preparing complete drawings and specifications in this regard. The contractor contributes its expertise in building materials, construction methods, construction costs, subcontractor coordination, and project scheduling.

### 1.8.4 Design-Build

The design-build method of project delivery has been rapidly gaining in popularity as well as in commonness of use in recent years. Most professional practitioners believe that this project delivery method will soon become the most prevalent method for delivery of design and construction services, certainly for buildings, and perhaps for other categories of construction as well. Some believe that the use of the design-build method has already surpassed the use of the design-bid-build method of project delivery for building construction.

The design-build method may also be referred to as the turnkey process or as the turnkey project delivery method. In the design-build system, the owner enters one contract with a single professional entity, and that firm has the responsibility for providing both design and construction services for the owner.

The design-build method of project delivery hearkens back to the days many years ago when there was a master builder who provided both design and construction services to the owner. Today, the design-build firm may be an architecture or engineering firm that is collaborating with, or has entered a partnership arrangement or a joint venture arrangement with, a contracting firm to provide design-build services. Or it may be a construction firm that has a collaboration agreement with a design firm, or a construction company that has in-house design capability. Additionally, some construction management firms (to be discussed in the next section) sometimes offer both design and construction capability.

The frequency of owners choosing to utilize the design-build method is explained by the fact that there are numerous benefits to be derived by the owner through his use of this method of project delivery. Perhaps the most important of these benefits is the inherent communication and collaboration that are central to this process, between those who will produce the design for the project and

those who will perform the construction, from the inception of the project to final completion. The contractor's understanding of all aspects of the construction process, as well as his knowledge of construction materials and methods, and connections and details, in addition to his understanding of costs and his knowledge of estimating and scheduling, are important assets that he can bring to the project and that can be provided as input to the design process, beginning at the time the project is first conceived.

Additionally, when owners utilize the design-build method of project delivery, they derive the benefit of one firm's having singular responsibility to the owner for all aspects of both the design and construction. By contrast, in the design-bid-build system, designers usually produce the design, as well as authoring the bid documents and contract documents for the project, without any assistance or input from a contractor. Sometimes, after the construction contract is formed, there are miscommunications and misunderstandings and, at times, disputes between the designer and the constructor regarding various elements of the project design or with regard to a variety of different contract issues. This may lead to delays, additional costs, and perhaps claims. Additionally, when there is conflict, these occurrences leave the owner, who simultaneously has a contract with both the designer and the constructor, in the uncomfortable position of not knowing which of the professionals whose services he has engaged is correct. Owners who have endured such an experience are quick to say that the design-build method, with its single-point responsibility for all design and construction issues residing in one firm, can provide a significant benefit to the owner. Many owners are electing to utilize this design-build method of project delivery today, because of the numerous benefits that this method can provide for the owner.

### 1.8.5 Design-Manage

*Design-manage* is a term sometimes used to refer to a single-source construction service utilized by some owners. Design-manage is an arrangement where the owner enters into a single contract for both design and construction management services. In this arrangement, a single entity both designs the project and acts as a construction manager during the construction phase. A design-manage arrangement is often the result of a joint venture (see Chapter 2) between a design firm and a construction management enterprise.

With design-manage, the construction is typically performed by a number of independent contractors in contract with either the owner or with the design-manage firm, with the design manager planning, administering, and controlling the construction process. As is the case with design-construct and construction management, design-manage can, and usually is, utilized in fast-track construction. Fast-track construction is discussed further in another section of this chapter

### 1.8.6 Preengineered Buildings

Recent years have seen a large increase in the application of a specialized form of design-construct. Referred to as *preengineered* or *systems* building, this construction mode is now applied to a wide range of building types, from industrial applications to office buildings, retail centers, institutional buildings, and government-owned facilities.

Intended to provide an architecturally appealing building to meet an owner's specific requirements, this is a specialized design-build arrangement where the contractor is a dealer in metal structural systems and is directly affiliated with the manufacturer. The contractor, architect-engineer, and building manufacturer work closely together to create a finished project that serves the owner's needs

in optimum fashion. Owners have found that preengineered metal buildings offer a competitive price along with a great deal of design flexibility. Such metal buildings now account for a significant share of the low-rise commercial and industrial construction market in this country. The Metal Building Manufacturer's Association (MBMA) is a national trade association of such producers.

Initially, preengineered buildings consisted of standard modules, but in today's market essentially every metal building system is custom engineered to meet the owner's specific requirements. The producer now has the ability to custom fabricate systems to fit specific project criteria. Manufacturers can fabricate complete metal buildings and multistory structural systems, including the framing, metal roof, walls, finishes, partitions, and necessary subsystems. These preengineered packages are presized, precut, and ready to be assembled on-site into a fully integrated building unit.

The component parts are shipped to the job site where the building is assembled and anchored to the foundation by a local contractor. These are metal building "builders" or "dealers" who are usually formally affiliated with the manufacturer and are usually full-service contractors assigned to serve a given geographical area. Many metal building contractors also market their product and services as subcontractors to other general contractors.

Metal buildings can be manufactured using many different exterior wall materials. A single manufacturer usually supplies a complete package of integrated building components that arrive at the job site ready for assembly and erection. Systems building of this kind has proven to have the advantages of speed of construction, design flexibility, high quality, economy, minimal maintenance, and relative ease of future expansion. Collectively, these features have led to a widespread acceptance of metal building systems by owners, as well as by other construction buyers and specifiers.

### 1.8.7 Fast-Track

Fast-track is a method of project delivery that is sometimes employed when the objective is to reduce to a minimum the time required for design and construction of a project. This method is also referred to as phased construction. Fast-track involves the assumption of considerable risk on the part of the owner, with the objective of reaping a return in dollars and/or time sufficient to justify the exposure or risk that is inherent in the method.

In fast-track construction, the design and construction functions for parts or phases of the project are "leapfrogged" with one another. Instead of awaiting the start of construction until a completed design for the entire project has been produced, fast-track applies a logic of designing one part or phase of the work and, as soon as that design is complete, awarding a construction contract and beginning construction on that phase.

While construction is under way on that part or phase, design proceeds on the next phase of the project, with the objective of having that design completed by the time construction is complete on the preceding phase or by the time the project is ready for construction on the second phase to begin. Then a construction contract is awarded for the most recently designed segment; at the same time, design proceeds on the next phase. This process continues until the project is complete.

For example, on a building construction project, with some basic information in hand, and with some assumptions made with regard to other aspects of the design of the building and the complete facility, site work and utility design can be completed and a construction contract awarded for this phase. While that work is under way, design of the foundation for the building commences. Again, some basic determinations will have been made regarding building size and footprint, structural loads, and so on, sufficient to allow a proper foundation design. As soon as that design is complete, and as soon as there will be no interference with site work and utilities operations that may still be under

way, a foundation construction contract is awarded. While foundation construction is under way, design work continues for the building structural system. In this fashion, the design and construction functions are leapfrogged with one another throughout the project, until its completion.

The advantage of the fast-track method is that construction of the project can begin at the earliest possible time, and the construction of each phase of the building can begin without the need to wait for a complete design of the entire facility. This can significantly reduce the overall time required for design and construction.

The disadvantage, of course, is that when there is not a complete and integrated design for the project before construction commences, some retrofit may be necessary, and some work may have to be removed and replaced, or some parts of the project may be overdesigned because of the assumptions that needed to be made early, in order to allow construction to commence at the earliest time. The objective of fast-track is to have the overall time and dollar savings, which result from having the design and construction completed at the earliest possible time, be sufficient to compensate for the errors and the retrofit and "tear-out and redo" that may result from not having a complete and integrated set of design documents in hand prior to the onset of construction, so that in the end there is a net gain for the owner.

Design and construction contracts for fast-track construction can be structured in a number of different ways. Frequently, though not always, fast-track projects are accomplished by use of the design-build method, as discussed in a previous section. Fast-track is most commonly employed with the separate contracts system in use. Construction management services are also frequently utilized by the owner in the fast-track method of project delivery.

Critics of fast-tracking have argued that the process emphasizes time rather than quality. Additionally, the final construction cost is unknown at the start of fast-tracked construction, which is a form of contract referred to as an open-ended contract. Further, if bids for subsequent phases of the work come in over budget, redesign options to reduce cost are very limited. Fast-track projects sometimes take longer to complete than the usual, sequential process when applied to complex projects or if the fast-track process is not properly managed. As noted earlier, fast-track involves the assumption of considerable risk on the part of the owner. Despite these problems, however, fast-tracking has proven to be a successful and desirable owner option in some cases, when properly applied and managed. It remains a viable and sometimes useful project delivery method today.

### 1.8.8 General Conditions Construction

In the traditional construction process, general contractors customarily provide certain common job services for a project and for the contractors on-site, not only for their own forces but for their subcontractors as well. These services, called general conditions construction, or support construction, include many items normally required and described by the general conditions section of the project specifications. They involve such services as temporary electrical power, temporary heat, fencing and gates, parking areas for construction workers, access to the project, hoisting, weather protection, guardrails, stairways, fire protection, drinking water, sanitary facilities, job security, job sign, trash disposal, and so on. When separate contracts are used, the contractor who is designated as the general contractor or the coordinating prime contractor usually provides these general conditions services for the entire project, including work performed by the other prime contractors.

There are instances in which general conditions construction is the only part of the construction process actually performed by the general contractor. This would be true, for example, when the

contractor, builder-vendor, or owner-builder subcontracts the entire project. Additionally, it should be noted that in some construction management arrangements, the construction manager provides support construction services.

### 1.8.9 Value Engineering

Value engineering is not as much a project delivery system as it is an accompaniment to many of the project delivery systems in use today. Value engineering may or may not be utilized on a project, at the discretion of the owner.

Conceptually, in value engineering the owner and the architect-engineer seek the input of the contractor with regard to his recommendations for alternative materials or systems, different from what the architect-engineer originally included in the design documents, which could be used on the project. The objective may be to reduce construction cost and/or to seek better value for the owner.

The circumstances in which value engineering is employed may vary considerably. Sometimes in competitive bid contracting, especially when the bids received from contractors exceed the owner's budget, the contractor who submitted the lowest proposal price will be asked to "value engineer" the project. This endeavor will be focused on the contractor's putting forth alternative materials or systems that he may recommend, which could be delivered at a lower cost than what was designed and specified in the contract documents prepared by the architect-engineer that the contractor utilized to prepare his original proposal. The architect-engineer and the owner will assess the contractor's recommendations and decide whether to accept or to reject any or all of the alternatives the contractor has put forth. For those accepted, the contract documents and the contract price will be modified accordingly.

At other times in competitive bid contracting, the contractor may be asked to submit his "value engineering" proposals as an accompaniment to his bid. These take the form of proposed alternates to the original contract documents, and again usually include the contractor's recommendations as to alternative materials or systems being proposed in lieu of what the original contract documents set forth, along with the change in price that would result from acceptance by the owner and architect.

In like fashion, sometimes in negotiated contracting and in the competitive sealed proposals method of contract formation (to be discussed later in this chapter), the contractor will submit value-engineering proposals for consideration. In each case, the contractor recommends alternative materials or systems that he believes could reduce the contract price and/or provide better value for the owner. If his recommendations are accepted by the architect and the owner, they are written into the contract agreement and are reflected in the contract price.

## 1.9 TYPES OF CONSTRUCTION CONTRACTS

A number of contract forms and types are available to owners for the performance of their construction projects. All call for defined services to be provided under contract to the owner. The scope and nature of such services can be made to include almost anything the owner wishes. The selection of the proper contract form appropriate to the situation is an important decision for the owner and is deserving of careful consideration and consultation. As has been noted previously, public owners must work within the strictures placed on them by applicable law. Some of the most commonly used types of construction contracts are discussed in the following sections.

### 1.9.1 Single-Contract System

In the single-contract system, there is one prime contractor who has a contract with the owner. This contractor is responsible to the owner for the construction of the entire project and for fulfilling all of the requirements set forth in the contract documents. The single-contract system is the most common type of contract system in use today. This contract system is illustrated in Figure 1.5 below.

In this contracting system, the distinctive function of the prime contractor is to coordinate and direct the activities of the various parties and agencies involved with the construction and to assume full, centralized responsibility to the owner for the delivery of the finished project as defined in the contract documents within the specified time defined as the project duration. Customarily, the prime contractor will construct certain portions of the project with its own forces and will subcontract the remainder of the work to various specialty contractors. The general contractor accepts complete accountability, not only to build the project according to the contract documents but also to ensure that all costs associated with the construction are paid.

The general contractor has privity of contract with the owner and is fully responsible for the performance of the subcontractors and other third parties to the construction contract. It is noteworthy that when a prime contractor sublets a portion of the work to an independent specialty contractor, the general contractor has a nondelegable duty to the owner for the proper performance of the entire work and remains responsible under his contract with the owner for any negligent or faulty performance, including that of the subcontractors. When the work is not done in accordance with the contract, the general contractor is in breach of contract and is liable for damages to the owner, regardless of whether the faulty work was performed by the contractor's own forces or by those of a subcontractor.

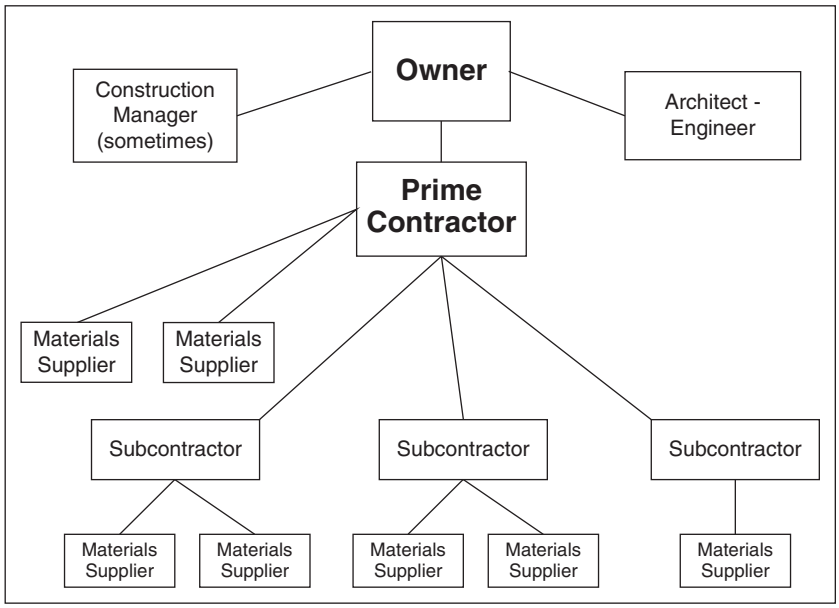



**Figure 1.5** Single-Contract System

### 1.9.2 Separate-Contracts System

In the separate-contracts system, there is more than one prime contractor who has a contract with the owner. Each separate prime contractor is responsible for the performance of a scope of work as defined in his contract, but that scope of work includes only a specific and well-defined portion of the overall project. This separate-contracts system is illustrated in Figure 1.6.

When the separate-contracts system is employed, the owner will subdivide the project into well-defined segments, or phases, or elements of work and will define a work package for each of the various parts. This will in turn define the scope of work for each of the separate prime contracts. A separate prime contract will then be awarded for each of the work packages. Sometimes the owner performs the function of subdividing the overall work to be done and defining the various work packages and the contents of the several separate prime contracts himself, if he has the experience and the expertise necessary to do so. Alternately, the owner may rely on the expertise of the architect-engineer to define the work packages that comprise the separate contract and their scopes of work. At other times, the owner may utilize the services of a construction manager, in either a CMA or a CMAR capacity, to perform this function.

When the separate-contracts system is utilized, it is imperative that there be some method in use for providing coordination among the various separate prime contractors. Whether the owner performs this function himself or relies on the architect-engineer for assistance, or whether he utilizes the services of a construction manager to perform this function in his behalf, it is imperative to have clearly defined responsibilities and definitions of scopes of work among each of the separate work packages and each of the separate contractors. Additionally, the owner may structure the separate contracts in such a way that one of the separate contractors is designated as the "coordinating prime contractor."

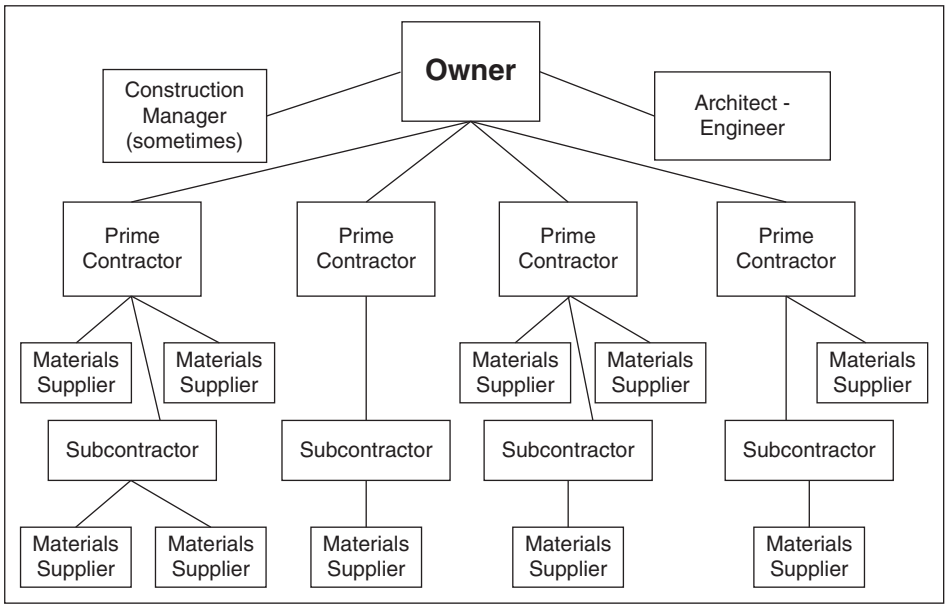



**Figure 1.6** Separate-Contracts System

Each of the separate prime contractors will be responsible for the completion of his scope of work in accordance with the provisions of his contract. Each of the separate contractors may elect to self-perform all of his work or may award subcontracts for the performance of some of the work in his defined work package.

Separate contracts are now widely used to satisfy a number of owner needs and requirements. Natural division points of the work or subdividing the work into stages or specialty areas can give the owner considerable flexibility in awarding the work for contract. For example, the owner of a building that is to be constructed could decide to award separate contracts for site work; general construction; plumbing; heating, ventilating, and air conditioning; and electrical work. Each of these five contractors, some of whom function as subcontractors on other projects, functions as a prime contractor. Each has a contract with the owner, and each performs independently of the others. Subcontracting by any or all of these five prime contractors is still possible.

Another illustrative example occurs in bridge construction, where separate prime contracts are commonly awarded for the foundations and piers, approach structures, bridge superstructure, bridge deck paving, and painting. Fast-track or phased construction, which is discussed in another section of this chapter, often makes use of multiple separate prime contracts as well.

The use of separate contracts, by breaking the work on the project into smaller packages, can also result in contracts of shorter duration, the obtaining of highly skilled specialty contractors, and better prices through increased competition. One of the principal advantages for the owner stemming from the use of separate contracts is the saving of the markup on work that would otherwise be subcontracted. When the entire work is awarded as a single contract, the general contractor includes in its price a markup on all subcontracted work as a fee for its management and coordination of the subcontractors. Separate contracts can reduce or eliminate this markup altogether. Nevertheless, critics of the multiple-contract approach maintain that, for a number of reasons, the system can increase total construction costs to the owner.

The use of separate contracts can be very troublesome unless carefully prepared contract documents are used and the work is rigorously planned, scheduled, coordinated, and controlled. If strong, centralized management control is not exerted over the separate prime contractors, the several possible advantages of separate contracts will likely turn out to be illusory. The owner, architect-engineer, a coordinating prime contractor, or a construction manager may assume this responsibility, or each contractor may be given the duty by contract of coordinating its work with those of the other primes.

Many courts follow the rule that under separate contracts, the owner is responsible for the overall coordination of the project construction unless the responsibility to coordinate is expressly delegated to another. One approach has been to have all the prime contracts except one include an assignment clause that establishes the remaining prime contractor as the lead contractor or coordinating prime contractor. This party then has the responsibility for project coordination and for proper interface among the remaining prime contractors. The construction manager may also shoulder the coordination responsibility where this form of construction is being used.

In any event, if the party assuming responsibility for overall project direction does not possess the experience and skill required to perform the demanding and specialized management functions needed, separate contracts may become a troublesome procedure indeed. Of particular importance is job delay caused by the inadequate performance of one of the prime contractors. In a separate-contract system, allocation of liability for project delay can become extremely complex, and responsibility may devolve to that party having the duty of overall management control and coordination.

A few states have enacted statutes requiring that designated separate contracts be awarded on state-financed public works. Many other public jurisdictions make the use of separate contracts

optional under administrative authority. The application of separate contracts has proven to be very troublesome at times for some public agencies, causing difficulties with regard to contract award procedures, litigation, and extra construction expense. Experience would seem to indicate that public agencies might advantageously be left free to select a contract system appropriate to project circumstances rather than be restricted by law to a specific procedure.

## 1.10 FORMS OF CONSTRUCTION CONTRACT AWARD

There are three basic methods by which the contract for construction may be awarded to a construction contractor: competitive bidding, negotiation, and competitive sealed proposals. Within each of these contract award methods, different specific forms of contracts may be utilized, as indicated in Figure 1.7.

### 1.10.1 Competitive Bid Contracting

Competitive bid contracting has been used historically and continues to be very widely utilized today, for contracts for engineered construction as well as for building construction. Competitive bid contracting has long been the most prevalent form of contract award for construction projects of all kinds. Competitive bidding of public projects is normally required by law and is a formal procedure for public agencies.

In this method of contracting, the owner and the architect-engineer will prepare complete drawings, specifications, and contract documents, which will describe the project in detail and fully define the expectations of the owner in terms of what the contractor is to deliver in performing the project. Bidding documents will also be prepared, which will set forth the procedure by which contractors are

| Competitive Bid | Negotiated | Competitive Sealed Proposals |
|---|---|---|
| | | |
| Lump sum | Lump sum | Lump sum |
| Unit price | Unit price | Unit price |
| | Cost plus a fixed fee | Cost plus a fixed fee |
| | Cost plus a percentage of cost | Cost plus a percentage of cost |
| | Cost plus a fixed fee or percentage of cost, with a guaranteed maximum | Cost plus a fixed fee or percentage of cost, with a guaranteed maximum |
| | Cost plus a fixed fee or percentage of cost, with a guaranteed maximum and a savings or incentive clause | Cost plus a fixed fee or percentage of cost, with a guaranteed maximum and a savings or incentive clause |

**Figure 1.7** Project Delivery Methods and Forms of Contracts

made aware of the project and define all of the details and stipulations regarding the bidding and contract award procedures to be used. (Bid documents and contract documents are defined and described in Chapter 4.)

After they have learned of the existence of the contract documents and bid documents, contractors will, if they are interested, obtain a complete set of these documents from the architect-engineer in accordance with the procedures defined in the advertisement for bids or in the invitation to bid. (Advertisements for bids and invitations to bid are also discussed more fully in Chapter 4.) Contractors will examine these documents carefully and then will make a decision as to whether they are interested in proceeding. If not interested, the contractor will return the bid documents and contract documents to the architect-engineer.

If he decides he is interested in proceeding with his effort to secure a contract award for this project, the contractor will embark on the estimating process. As described in Chapter 5, the contractor will prepare a detailed estimate for the project and then prepare a proposal for submittal to the architect-engineer on the designated day, which is referred to as bid day, at the designated time and place.

The contractor will independently prepare his proposal and submit it to the architect-engineer and owner on bid day, in competition with the other contractors who have made a decision to submit a proposal for the project. The architect-engineer will receive all of the proposals from all of the bidding contractors and analyze each proposal as well as the credentials of the contractor who submitted it, and will, along with the owner and within the number of days set forth in the bid documents, decide who the contract recipient will be. The contract is usually awarded to the lowest responsible bidder.

The contractor whose proposal has been accepted will be notified of this fact and notified to meet with the architect-engineer and the owner in order to formalize the contract by signing the agreement. The contractors who were unsuccessful bidders will likewise be notified that their proposals were not accepted and that they will not be receiving the award of the contract.

After the successful contractor has signed the agreement, a letter of intent or notice to proceed will be issued by the designer and the owner to the contractor. This document will authorize the contractor to occupy the owner's site and to commence work on the project, and will denote the beginning of contract time. The contractor will then commence construction operations.

The competitive bid contract award procedure has, as noted earlier, been in use for many years. It offers the advantage for the owner that—if the contract documents fully describe the project and all of the contractor's obligations (and all that the owner will receive) under the contract—the owner will then be the beneficiary of competition among the contractors on the basis of which contractor can deliver the work as defined in the contract documents for the lowest price.

Competitive bidding is used to encourage efficiency and innovation by the participating contractors, thereby providing the owner with a constructed project of specified quality at the lowest possible price. As has been noted, this mode of contractor selection has served its purpose well. However, like other contracting procedures, this method of project delivery does have its weaknesses. To illustrate, the bidding process places the prime contractor and the owner in adversarial positions, which can lead to undesirable side effects. Evidence can be offered to show that competitive bidding can, and sometimes does, lead to the selection of incompetent contractors, excessive claims by the contractor against the owner, disputes and litigation between the two parties, bid shopping, and other problems.

Two different types of competitive bidding are used in the United States: open and closed. The predominant form is open bidding, in which any and all contractors who are interested and can qualify are made aware of the project and encouraged to submit a proposal. All contractors use the same proposal form, which is provided with the bidding documents, with the bids being opened and read

publicly. In each case, the proposal amount is the contractor's final offer, and there is no subsequent bargaining or negotiation. This procedure is sometimes referred to as the *hard-bid* approach.

In closed bidding, a method sometimes employed by private owners, only those contractors who have been preselected by the architect-engineer and owner are invited to submit proposals. There may or may not be a prescribed proposal form, and there may or may not be a public bid opening. The competing contractors may be required to submit their qualifications along with their bids, and may be encouraged to tender suggestions as to how the cost of the work might be reduced through value engineering. The owner selects one of the proposals submitted or perhaps interviews those contractors whose proposals appear most advantageous and negotiates a contract with one of them.

It is interesting to note that the American preoccupation with the low bidder normally being the successful bidder is not shared in many other parts of the world. Some very good arguments can be advanced to show that the lowest bid is not necessarily the best price for the owner, and there are some interesting variations used in other countries. Comparison of competing proposals using the average of the bids received is common. For example, in one European country, the work is awarded to the bidder whose bid is nearest to the average of all bids received. The bid that is greater than but nearest to the average of all bids received, but is still below the owner's estimate, wins the contract in an Asian nation. In another European country, the successful bidder is the one nearest to the average after the highest and lowest bids have been rejected.

Competitive bidding can also be used where the successful contractor is determined on a basis other than the estimated cost of the construction. When the contract involves the payment of a fee to the contractor, the amount of the fee is sometimes used as a basis of competition among contractors. To illustrate, construction management services are sometimes obtained by an owner using the fees proposed by the different bidders as one basis for the contract award.

#### 1.10.1.1 Lump-Sum Competitive Bid Contracting

The lump-sum competitive bid method of contract award has for many years been the most prevalent method of contract award for building construction work. This system is also referred to as *hard-money contracting*.

In this system, the contractor's estimating procedure results in a single lump-sum dollar amount, which represents the exact amount of money for which the contractor is willing to enter a contract to fulfill all of the requirements set forth in the contract documents. Each contractor will independently prepare his estimate for the project and will submit his lump-sum figure on his proposal form on bid day, and will do so in competition with all of the other contractors who are bidding the project. The expectation is that the dollar amount the contractor has entered on his proposal will become the contract amount if the contractor is selected by the owner to be the contract recipient.

Lump-sum competitive bid contracting is possible in building construction work because when the drawings and specifications and other elements of the contract documents completely and accurately describe the expectations of the designer and the owner, the contractors can accurately determine the quantities and prices for all of the materials and equipment to be provided and for all of the work to be performed under the contract. Contractors are able to use their estimating process to arrive at a lump-sum proposal amount for the project. This method of contract award has served owners well for many years, and thus remains in common use today.

#### 1.10.1.2 Unit-Price Competitive Bid Contracting

Unit-price competitive bid contracts are most commonly utilized on highway construction projects, as well as on earthwork cut-and-fill projects such as dams and levees. These types of projects are almost

always designed by an engineer rather than by an architect and, as noted earlier, are often referred to as *engineered projects*.

This contracting method is often utilized by owners because it offers the owner the same advantages inherent in competitive bid contracting, as discussed previously. Additionally, because the types of projects where these contracts are employed are often public projects, laws typically require the use of competitive bid contracts.

Unit prices, that is, dollars per unit of quantity, are used as the basis for contractor selection, and after the contract is formalized, these same unit prices are used as the basis for payments made to the contractor by the owner. The reason for the use of this method is that on the types of projects where the use of these contracts is commonplace, actual quantities of materials and actual quantities of the work to be performed cannot be determined in advance with sufficient accuracy to permit lump-sum estimating and pricing.

On projects of this kind, the design engineers will derive approximate quantities and provide them to the bidding contractors for use in preparing their proposals. When the contract recipient has been selected and the work is performed, the actual quantities necessary to meet project design requirements are measured and verified and then paid for by the owner on a unit-price basis.

In the unit-price system of contract award, the owner and design engineers will typically provide a listing of the major activities, steps, or operations to be performed in the work. With each activity, the engineer provides an estimated approximate quantity of that material or work activity. The owner will require the contractor to enter a unit price, that is, dollars per unit of quantity, that represents the amount of money for each activity that he proposes to complete that activity or work item named on the proposal form in such a way as to satisfy all of the requirements of the contract documents. An example of a typical unit-price proposal form is provided in Figure 1.8.

When the contractor prepares his estimate, he will analyze each activity the owner has named and consult the drawings and specifications and other contract documents for all of the requirements that pertain, and then compute a price for performing that activity or work item. This price will be the sum of the contractor's anticipated costs for materials, labor, equipment, project overhead, general overhead, and his markup. Then the contractor will divide his total estimated cost for each activity by the owner's estimated quantity (or perhaps by his own determination of estimated quantity), in order to calculate the unit price (dollars per unit of quantity), which he will enter on the proposal form. The contractor will use the same procedure for determining the unit price for each of the activities and work items listed on the proposal form.

The contractor will complete his estimate and prepare his proposal, and will submit the proposal, usually in a sealed envelope, on bid day, on the designated date and at the designated time and place, in accordance with the instructions to bidders in the bid documents that he received from the engineer. The engineer will receive all proposals from all of the contractors who are bidding the project at that time.

After all proposals have been received, each will be analyzed by the engineer and the owner, to determine which of the contractors has submitted a valid proposal that will result in the lowest total cost to the owner. That contractor will usually be named the contract recipient.

When the agreement is signed, the unit prices on the contractor's proposal will become the contract prices for the performance of the work in each named activity or work item. As the work on the project is performed, both the contractor and the engineer will tabulate quantities of each named activity or item of work that is actually performed in fulfilling the requirements of the contract documents.

**Unit Price Proposal Form**

| Item Number | Item Description | Estimated Quantity | Unit | Proposed Unit Price | Estimated Amount |
|---|---|---|---|---|---|
| 1 | Excavation, Unclassified | 1,667 | CY | $3.83 | $6,384.61 |
| 2 | Excavation, Structural | 120 | CY | $50.72 | $6,086.40 |
| 3 | Backfill, Compacted | 340 | CY | $17.77 | $6,041.80 |
| 4 | Piling, Steel | 2,240 | LF | $66.46 | $148,870.40 |
| 5 | Concrete, Footings | 120 | CY | $195.62 | $23,474.40 |
| 6 | Concrete, Abutments | 280 | CY | $380.87 | $106,643.60 |
| 7 | Concrete Deck Slab, 10 in. | 200 | SY | $153.03 | $30,606.00 |
| 8 | Steel, Reinforcing | 90,000 | LB | $1.045 | 94,050.00 |
| 9 | Steel, Structural | 65,500 | LB | $1.725 | $112,987.50 |
| 10 | Bearing Plates | 3,200 | LB | $2.49 | $7968.00 |
| 11 | Guardrail | 120 | LF | $93.59 | $11,230.80 |
| 12 | Paint | 1800 | SF | Subcontract Item | $12,140.39 |
| | | **Total Estimated Amount** | | | **$566,483.90** |

**Figure 1.8** Unit-Price Proposal Form

Prior to each monthly application for payment by the contractor, the engineer and the contractor will review their records regarding actual quantities satisfactorily installed and will reconcile any differences. The engineer will then authorize the owner to make payment to the contractor for the actual quantity of each activity satisfactorily completed, multiplied by the unit price for that activity, less retainage.

This process is continued until the project is complete. It is important to note that the owner will pay, and the contractor will receive, payment for the actual quantity of each activity or work item installed or performed at the contracted-for unit price, without regard to whether this actual quantity is greater than or less than the quantity originally estimated by the engineers during design.

### 1.10.2 Competitive Negotiation

A form of bidding referred to as competitive negotiation is now sometimes used by the federal government and began with passage of the Competition in Contracting Act of 1984. This act was passed to eliminate the noncompetitive, sole-source contracts that were often being used by some departments and agencies of the federal government. This legislation placed the use of competitive negotiation on the same level as sealed bidding, allowing federal contracting officers to use either method, subject to a few conditions.

Under the competitive negotiation process, prequalified contractors submit priced proposals. The agency then advises each contractor how it can improve its proposal from the standpoint of both design and cost, and new proposals are submitted. Selection is based on price and technical factors. Federal construction awarding sometimes waives open competitive bidding and uses competitive negotiation. National contractor organizations have voiced strenuous objections to the use of this procedure as constituting a threat to the long-established process of open competitive bidding for all public works projects and awarding contracts for public projects to the lowest responsible bidder.

### 1.10.3 Negotiated Contracting

Construction contracts can also be, and frequently are, formed through negotiation rather than through competitive bidding. While negotiations can take many forms and can be performed in numerous different ways, the underlying concept is that the owner and the prime contractor will negotiate, or bargain for, the terms and provisions of their contract. Whatever the two parties can bargain for and agree upon, absent fraud or any other kind of criminal activity, becomes the contract.

Negotiated contracts are almost never used for public construction projects because the laws that regulate contract formation on these projects require the use of open competitive bidding. On private construction projects of all kinds, however, negotiated contracts are commonly employed.

There are many instances in which it can be advantageous for an owner to negotiate a contract for a project with a preselected contractor or small group of contractors. It is common practice for a private owner to forgo the competitive bidding process entirely and to handpick a contractor on the basis of reputation and overall qualifications, or perhaps based on past experience with that contractor, to perform the project. The forms of negotiated contracts are almost limitless because such agreements can include any provisions mutually agreeable to both parties and best suited to the particular work involved. Most negotiated contracts are of the cost-plus-fee type, which will be discussed in a subsequent section of this chapter.

Extensive use of negotiated contracts has been traditional in some areas of the construction industry such as residential and industrial construction. However, recent years have seen increasing application of negotiated contracts across the board in the private sector. This can only be interpreted as a sign that owners are increasingly finding that such arrangements are in their best interests. A large proportion of the annual work volume of many contractors now consists of negotiated contracts.

## 1.11 FORMS OF NEGOTIATED CONTRACTS

### 1.11.1 Lump-Sum

Lump-sum contracts for construction projects can be, and are, negotiated. The contractor and the owner negotiate for the conditions of the contract, and often may include discussions regarding alternate materials for use on the project, on the basis of value engineering. The negotiations culminate in the contractor's providing a lump-sum dollar amount for which he is willing to complete all of the requirements of the contract as negotiated and agreed to.

It is important to note that if a lump-sum negotiated contract is to be agreed to, the owner and the architect-engineer must be able to provide the exact scope of work and the exact specifications for the materials and building systems to be employed, as well as standards for the quality of work to be performed. Only when these conditions are in place can the contractor reasonably be expected to determine a lump-sum amount for performing the requirements of the contract.

### 1.11.2 Unit Price

The terms of unit-price contracts for construction projects can also be negotiated between the owner and the prime contractor. The parties can negotiate for the conditions of the contract, and can also negotiate the activities or work items to be defined in the work, as well as the unit prices for the performance of each of these work items. This can be especially useful on engineered projects of the kind where exact quantities of the materials required and/or of the work to be performed cannot be determined in advance of construction. Additionally, this method can be useful on restoration, renovation, and remodeling projects, where exact quantities of the several components of the work cannot be determined in advance of performing the work.

### 1.11.3 Cost-Plus or Cost-Reimbursable

Cost-plus contracts, also known as cost-reimbursable contracts, are very frequently negotiated and are utilized for a variety of construction projects. While they may contain many different provisions and may take a number of different forms, the basic provisions of cost-plus contracts are that the owner will pay or will reimburse the contractor's costs of construction (as defined in the contract), and in addition will pay the contractor an agreed-upon fee or dollar amount for his services.

Cost-plus contracts are commonly employed for any of the following reasons:

1. When the work to be done does not lend itself well to the preparation of complete drawings and specifications in advance of construction.
2. When the exact scope of work is unknown at the time construction commences.
3. When the nature of the work does not lend itself to exact quantity determinations and/or price determinations before construction is to get under way.
4. When speed in commencing construction is an objective.
5. When one of the objectives is to remove or minimize risk in the project for the contractor, thereby making the project more attractive and/or resulting in a better price for the owner.

When cost-plus contracts are negotiated, there are several considerations that should always be included as part of the negotiation and contract formation. Among these are the following:

1. Mutual understanding and firm definition of costs which are to be reimbursable to the contractor, and costs which are nonreimbursable.
2. Whose accounting person or department will be utilized for project accounting.
3. Generally, an "open books" accounting method is employed, whereby all accounting documents for the project are available and transparent to both the owner and the contractor.
4. Regular audits of the contractor's payroll records and/or materials invoices on the part of the owner.
5. Clear understanding must be derived regarding contractor's general overhead and project overhead costs allocated to this particular project.
6. The subcontract award and subcontract payment procedures to be employed.
7. Responsibility for errors in the work and for rework.
8. Provisions regarding the requisite quality in the workmanship, and for rejection of nonconforming work.
9. When the contractor's fees are payable
10. Warranty provisions.

## 1.12 BASIC ELEMENTS OF AGREEMENT IN THE VARIOUS TYPES OF COST-PLUS CONTRACTS

### 1.12.1 Cost Plus a Fixed Fee

The owner will reimburse the contractor's costs of constructing the project, as the costs have been defined and agreed upon, as discussed in the previous paragraphs. Over and above those costs, the owner will pay the contractor an agreed-upon lump-sum fee.

In order for this variation of cost-plus to be workable for the contractor, a relatively firm definition of scope of work is required. A significant drawback of this contract form that is often troublesome for owners and for the financial institutions that provide construction financing and permanent financing for the project is the fact that the contract form places no upper limit on what the total cost of construction will be. This form of contract is referred to as an *open-end contract*.

### 1.12.2 Cost Plus a Percentage of Cost

The owner will reimburse the contractor's costs of construction and, in addition, will pay a negotiated agreed-upon percentage of all of the defined project costs to the contractor as his fee for performing the work on the project.

This form of contract is very useful when the scope of work cannot be accurately defined in advance or when the intent is to get the work under way at the soonest possible time without awaiting complete definition and determination of scope of work. Additionally, this form of cost-plus contract is commonly used on engineered projects where the actual quantities of the work to be performed or the materials or systems to be installed cannot be accurately quantified in advance. This contract form is also very widely used in restoration, renovation, remodeling, and adaptive reuse building projects where the variables that will be encountered in the performance of the work cannot be defined and predicted in advance. Cost plus a percentage of cost is also a form of open-end contract.

### 1.12.3 Cost Plus a Fixed Fee or Percentage of Cost, with a Guaranteed Maximum

The owner will reimburse the contractor's costs of construction, and over and above those costs will pay either an agreed-upon lump-sum fee or an agreed-upon percentage of those costs to the contractor as his fee for performing the work on the project. The contract also contains an additional provision for a guaranteed maximum on the part of the contractor. This means that the contractor guarantees to the owner that the total cost of the construction project will not exceed the guaranteed maximum amount.

If the contractor's costs for performing the agreed-upon scope of work to the agreed-upon level of quality exceeds the guaranteed maximum amount, he still must complete the project and must fulfill all of the requirements set forth in the contract documents. However, the contractor will pay for all additional costs beyond the guaranteed maximum amount, thereby avoiding the difficulties associated with open-end contracts. Complete definition of the scope of work, as well as specific definition of quality of materials and workmanship to be provided, are required.

The contractor is in a risk-taking position, and the owner has a guarantee of the upper limit of the cost of construction. Sometimes the point has been offered, however, that there is little incentive for the contractor to complete the work at a price less than the guaranteed maximum.

### 1.12.4 Cost Plus a Fixed Fee or Percentage of Cost, with a Guaranteed Maximum and a Savings or Incentive Clause

The owner will reimburse the contractor's costs of construction, and over and above those costs will pay either an agreed-upon lump-sum fee or an agreed-upon percentage of those costs to the contractor as his fee for performing the work on the project. Additionally, a guaranteed maximum amount is negotiated by the owner and the contractor, so that the contractor must complete the work to satisfy contract requirements for an amount not greater than the guaranteed maximum amount. If the contractor cannot complete the project for the guaranteed maximum amount or less, he still must complete the defined work and must fulfill all contract requirements; however, all additional costs to complete, beyond the guaranteed maximum amount, must be borne by the contractor. Again, for the owner, the maximum amount that he could pay for the completed construction project is defined by the guaranteed maximum amount in the contract.

In addition, in this form of contract, the contractor and the owner will negotiate a number, called a target figure, also referred to as an upset figure, which is equal to or less than the agreed-upon guaranteed maximum amount. The owner and the contractor agree (and write into the contract) that for each dollar less than the target figure for which the contractor can satisfactorily complete all of the requirements of the contract, there will be some split of those dollars between the owner and the contractor. The amount of the split payable to the owner and to the contractor is negotiated and agreed upon and is written into the contract.

There are advantages as well as disadvantages for the parties to the contract associated with each of these variations of cost-plus contracts. A basic summary of these considerations is provided in Figure 1.9.

## 1.13 COMPETITIVE SEALED PROPOSALS

Competitive sealed proposals is a relatively new method of contract award that is widely used today and is growing in popularity. When this method is used, the owner invites contractors to prepare proposals for a project for the owner. Each contractor will independently prepare a proposal, in accord

**Variations in Forms of Cost-Plus Contracts, and Advantages and Disadvantages Inherent in Each Form**

| | Advantages | Disadvantages |
|---|---|---|
| Cost Plus a Fixed Fee | Some flexibility for the owner to make changes. | Open-ended contract for owner. Owner does not know what the final cost of the construction will be, nor what the maximum cost of the construction will be. |
| | Some flexibility for the contractor to accomodate changes by the owner. | Open-ended contract form is very troublesome for lenders who provide construction and permanent financing for construction projects. |
| | | Open-ended contracts are also very troublesome for those who provide insurance and bonds for construction projects. |
| | | Since his fee is predetermined and is written into the contract, the contractor will require relatively firm definition regarding the scope and duration of the work, as well as the quality of materials and workmanship to be provided. |
| Cost Plus a Percentage of Cost | Maximum flexibility for the owner to make changes in the work, including making changes in the scope of the work. | Open-ended contract for the owner. No definition of what the final cost of the project will be. |
| | Maximum flexibility for the contractor in accommodating changes made by the owner. | Open-ended contract form is very troublesome for lenders who provide construction and permanent financing for construction projects. |
| | Minimum risk for the contractor. | Open-ended contracts are also very troublesome for those who provide insurance and bonds for construction projects. |
| | | No incentive, at least by the terms of the contract, for the contractor to be efficient, or effective, or cost-conscious. |
| Cost Plus a Fixed Fee or Percentage, with a Guaranteed Maximum | Provides definition for the owner, and for those financing the project, for what the maximum cost of the project will be. | Requires the owner to provide firm definition of project scope and duration. Owner also must provide complete definition of materials quality and standards of workmanship in the form of specifications. |
| | | Places the contractor at risk for completing the project requirements for a sum not to exceed the guaranteed maximum amount. |
| | | No reward for the contractor, if he exercises his skill and good judgment, and thereby completes the project for significantly less than the guaranteed maximum amount. |
| | | Requires the owner to provide firm definition of project scope and duration, as well as for quality levels of materials and workmanship to be provided. |
| Cost Plus a Fixed Fee or Percentage, with a Guaranteed Maximum and a Savings or Incentive Clause | Provides definition for the owner, and for those financing and bonding the project, for what the maximum cost of the project will be. | Places the contractor at risk for completing the project requirements for a sum not to exceed the guaranteed maximum amount. |
| | Provides an incentive for the contractor to complete the project with maximum efficiency and cost consciousness, while satisfying scope and quality requirements as established by the owner. | Requires the owner to provide firm definition of project scope and duration, as well as for quality levels of materials and workmanship to be provided. |
| | Provides the owner an opportunity to share in the savings resulting from the contractor's efficiencies. | |

**Figure 1.9** Advantages and Disadvantages of Different Cost-Plus Contracts

with instructions and guidelines that the owner has provided, and will submit that proposal to the owner at the time specified by the owner.

These proposals may include construction services, construction management services, or design-build services. They may include value engineering of a design that the owner has furnished. These competitive sealed proposals also commonly include the contractor's proposed time schedule for the performance of the work. The price that the contractor submits in his proposal may be a lump sum, or a series of unit prices, or it may be one of the variations of cost-plus.

In addition to describing the professional services that the contractor will provide, the competitive sealed proposal will also contain a great deal of additional information about the contractor: his background and experience, his portfolio of projects completed, and the history of owners he has contracted with and performed work for, along with those owners' contact information. The credentials of the contractor's estimating and scheduling and project management personnel, and his supervisory personnel, will typically be provided, often including the resume's of the project manager and the superintendent or foremen who will manage the owner's project.

The contractor will typically be required to submit information regarding his safety policies, as well as his accident history, and his experience modifier rating (EMR). Additionally, the owner will usually request a copy of the contractor's quality assurance policy or his total quality management (TQM) program.

The owner also commonly requires the prime contractor to include in his submittal the names and credentials of the major subcontractors whom he will plan to utilize on the project. Lists of projects completed, including projects of the size and type the owner envisions, are commonly required relative to the key subcontractors. Additionally, lists of references from owners, general contractors, construction managers, and others usually must be furnished, as well as copies of the subcontractors' written quality management and quality assurance programs. Usually, the subcontractors' key management and craft labor personnel and their credentials must be provided, including the names and qualifications of the subcontractors' project manager and supervisor who will be assigned to this project. This allows the owner to evaluate each subcontractor before the project is awarded, including their financial capability as well as their ability to satisfactorily perform a project of the size and type the owner is planning to construct.

The owner will receive this comprehensive package of information in the form of competitive sealed proposals from each of the contractors whom he has invited to submit on the project. The owner, frequently with the assistance of an architect-engineer or construction manager, will review each competitive sealed proposal in detail, in order to determine who the contract recipient will be, who will be selected to enter a contract to perform the owner's project. Sometimes a point system is established by the owner in order to provide the owner a means of quantitatively assessing various components of each contractor's submittal.

Sometimes the owner will make a preliminary assessment of all of the submittals and then will invite some of the contractors who have received good evaluations on their submittals, and who are now finalists to receive the contract award, to prepare verbal presentations for the owner and his design team or management staff and to answer questions and clarify issues presented by the owner and the architect-engineer. At the conclusion of this process, the owner will make the selection of the contract recipient who will perform his project.

The intent of competitive sealed proposals is to provide the owner with a great deal of information with regard to each of the contractors who is submitting a proposal, in advance of selecting the contract recipient. The intent of the owner and architect-engineer and/or construction manager gathering this information is to assist them in making the best choice regarding the contract recipient. For their part,

contractors are afforded the opportunity not only to provide their price, but also to furnish information regarding their experience and their qualifications. Additionally, this method of contract award allows contractors to input their expertise regarding materials and systems for use in the project.

## 1.14 OTHER FORMS OF CONTRACTS

### 1.14.1 Time and Materials Contracts

Owners and contractors sometimes enter contractual arrangements wherein construction work is to be done on a "time and materials" basis. These arrangements are essentially the same as cost-plus contracts.

The owner agrees to reimburse the contractor for the cost of materials and, beyond those costs, agrees to pay the contractor an agreed-upon number of dollars per hour, per day, per week, per month, and so on for his work. The dollars per unit of time agreed upon will compensate the contractor for his labor costs, as well as his equipment costs and his overhead costs, and will include his markup.

### 1.14.2 Job Order Contracting

This contracting arrangement is often used for building maintenance or for facilities management contracts but is applicable to other forms of construction work as well. In this contract form, the owner will compile a list or a schedule of operations or items of work that he has need for, or that he anticipates he may have need for, during a defined period of time, such as one year. The description of each item of work will include a complete scope-of-work definition, as well as specifications regarding the level of quality of materials and workmanship to be provided in performing this work package.

The owner will then enter an agreement with a contractor, often after receiving proposals or price quotations from several different contractors, on a dollar figure for the performance of each work package, in compliance with the specifications. Response times and durations of work for each of the activities are also typically included in the agreement.

Subsequently, when the owner finds himself in need of one of the services described in the job order contract, he will contact the contractor, who will then respond and will perform the work as described and specified. Following completion of the work, the contractor invoices the owner for the work at the agreed-upon rate, and the owner makes payment to the contractor.

### 1.14.3 Construction by Force Account

Force account, also known as doing work by day labor, is another instance where the owner acts as the prime contractor. In this case, the project is normally constructed for the owner's own use. Under this method, owner-builders may choose to perform the work with their own forces, providing the necessary field supervision, materials, construction equipment, and labor.

Alternately, owners may choose to have the work for their facility performed entirely by subcontract, subletting individual segments of the work to specialty contractors. In such a case, owners assume the responsibility of coordinating, managing, and directing the work of the subcontractors.

Many studies have been performed, mostly by public agencies, to compare the costs of construction accomplished by competitive bidding and by force account. These studies have clearly demonstrated that for all but very small projects, the force-account procedure is generally more expensive than the competitive bid method. In addition, it has been demonstrated that the quality of the work is usually better when it is performed by a professional contractor.

There are several good reasons why contract construction is usually cheaper and better than that done by force-account means. A qualified prime contractor has a wide background of experience and is intimately familiar with materials, construction equipment, and field methods. The contractor maintains a force of competent supervisors and workers, and is adequately equipped to perform the work. Construction is a specialized business, and a contractor must be proficient in the work in order to survive. All these factors lead to efficiencies of cost and time that owners find difficult to match unless their own organizations already include trained and experienced construction forces.

In the usual instance, public construction is contracted on a competitive bid basis as required by policy or law. However, there is a continuing issue of government at all levels—federal, state, and local—performing some of its own construction work and being in competition with the private sector. Even though day labor construction by a public agency is ordinarily limited to maintenance, repair, small jobs, and emergencies, there are still many cases of public agencies performing substantial amounts of construction with their own forces. The construction industry has attempted to minimize such government competition with the private sector by seeking legislation to require public owners to make their work available to the professionals in the construction community.

It must be noted at this point that the term *force account* is sometimes used in a different context than that just described. While a contractor is proceeding with work under contract, it is not unusual for the owner to find it necessary to modify or add to the work. Additional payment to the contractor in such an instance is often established on the basis of a lump sum or unit prices. There are times, however, when the contractor is authorized to proceed on some type of a cost-plus or time and material arrangement. This is sometimes referred to as proceeding with the extra work on a force-account basis.

## 1.15 SMALL AND DISADVANTAGED BUSINESS ENTERPRISES

For a number of years, federal, state, and local governments have applied various forms of construction procurement to assist economically and socially disadvantaged contractors. Such programs have been devised by public agencies to assist small businesses, minority business enterprises, and businesses owned by women in obtaining a larger share of public works construction contracts. Such actions are directed toward establishing various forms of bidding advantages for small and disadvantaged contractors. One procedure in this regard is the use of "set-asides" where certain public construction contracts are designated as being available only to such businesses. Various forms of goals have been established, assisted by imposed quotas and bid penalties applied to nonqualified contractors. Another method has been to require prime contractors bidding on designated public contracts to subcontract at least a designated percentage of their work to small businesses or disadvantaged contractors.

Despite some controversy and problems with such public programs, however, there is no doubt that they have made it easier for small and disadvantaged firms to establish and conduct active and viable construction businesses. In so doing, public agencies have clearly increased the business opportunities for such contractors. The National Association of Minority Contractors (NAMC) has rendered valuable assistance in helping minority contractors make the necessary contacts and to meet established certification requirements for set-aside projects. Experience with such construction programs has enabled public agencies to substantially improve the rules and administration of such procurement procedures and to establish better certification rules and criteria for the prequalification of small and disadvantaged businesses.

## 1.16 SEASONALITY IN CONSTRUCTION

The volume of construction that is in progress in this country at any point in time varies with a number of factors, with a major factor being the season of the year when the survey is taken. Although seasonal fluctuation varies with the geographic location and type of construction activity, on a national basis summer is the peak season and winter is a much slower period for almost all segments of the construction industry.

The reason construction is such a seasonal business is primarily the effects that inclement weather and low temperatures have on certain key construction operations. An undesirable result of this uneven work volume is serious shortages of skilled workers during the warm weather months and extensive unemployment during the winter. Work does not stop during the winter months, of course, but frequently there are layoffs, reductions in crew sizes, fewer project starts, and weather delays, which result in significant reductions in the construction workforce.

To illustrate this point, studies have shown that total construction employment in this country during a typical year varies approximately 25 percent from the summer to the winter months. It must also be realized that, like total employment, average weekly hours worked follow a seasonal pattern in the construction industry. Overtime work is common during the summer months, while less than full workweeks are frequent during the winter.

Seasonality in construction is a serious national problem, resulting in inefficiency, increased costs of production, and the wasteful misuse of valuable skilled labor. Peak-season bottlenecks and the resulting inflationary pressures have led to public concern. Several government groups have studied the problem and have recommended actions to provide fuller utilization of construction labor. Recommendations have included the more effective use of science and technology, improved scheduling of public contracts, and the relation of national manpower policy to the stabilization of construction employment. Private action has also been encouraged to better regularize the employment of construction workers throughout the year. Many foreign countries with severe winter climates have been forced to find ways to lengthen their construction seasons. This has been accomplished by a variety of public policies involving licensing, resource allocation, loans, and the payment of government subsidies of one type or another to encourage winter work.

## 1.17 LICENSING

Because construction can affect the public interest, there are special laws pertaining to construction that are designed to protect the public health and safety. These requirements include building codes, zoning regulations, environmental regulations, building permits, field inspections, safety and health regulations, and the licensing of contractors and skilled workers in certain construction crafts. It is to be noted at this point that the discussion of licensing in this section is concerned only with the licensing of a construction contractor per se by a contractors' license board. This matter as discussed here is separate and apart from a requirement for a corporate license to do business as a corporation in a given state and is also separate from an occupational license granted by a country or by a county or city government.

The licensing of contractors is not universally required, but many states and local governments do require that some or all contractors doing business within their jurisdictions be licensed. Some of the licensing statutes or ordinances are solely revenue-raising measures. Under these particular laws, the payment of a license fee confers the right to conduct a construction business, with no further conditions having to be met. Generally, however, the statutes provide that the contractor must not

only pay a fee but also must meet certain minimum qualifications. These statutes establish a board of registration or other regulatory body that administers the law, accepts applications for licensing, gives examinations where required, issues the licenses, collects the fees, and generally enforces the provisions of the licensing law.

Licensing requirements vary widely among those areas that have such laws. In most cases, however, when the law requires a license, it applies equally to general construction and specialty contractors, even when the specialty work is subcontracted. Most of these laws require licenses only for contractors whose annual volume of business exceeds certain designated amounts. Almost all statutes of this kind require that a license be obtained in advance of any bidding within the state, with certain minor statutory exemptions. Some areas exclude from licensing those contractors doing work financed by federal funds or performed for the federal government on government-owned land.

Certain jurisdictions issue various classes of licenses, differentiated in accordance with maximum size of contract or annual volume of business. In addition, licenses may be issued that are valid for, and apply only to, specific construction types such as general engineering construction, general building construction, or any of several classifications of specialty work. In a number of cases, contractors must pass an examination before the license is issued.

It is very important that a contractor be properly licensed where this is a legal requirement of the area in which the work is to be performed. Most licensing laws provide that acting or offering to act in the capacity of a contractor without a valid license is a misdemeanor criminal offense. Also important to note is the fact that a contractor who is not licensed at the time it contracts to perform construction services may not sue to collect for work that has been performed or for breach of contract. Contracts executed by unlicensed contractors are normally void as a matter of law, and such contracts cannot be enforced in court or in arbitration. In addition, the unlicensed contractor may have no right to file or claim a mechanic's lien against the owner's property.

With regard to licensing, where it is required, it is important to note that the construction company must be licensed in the form in which it contracts or offers to contract. For example, if a licensed partnership changes to a corporation, most licensing laws provide that the partnership license is not applicable and that the corporation must be licensed as such. Additionally, the law in some areas makes it unlawful for a joint venture to act as a contractor without being licensed as such, even though each member of the joint venture is individually licensed. There are now some states that require that any party providing construction management services in those states must possess a valid state contractor's license.

In addition, it should be noted that many political jurisdictions require the licensing, registration, or certification of workers in certain crafts. Plumbers and pipefitters, electricians, welders, riggers, elevator installers, sprinkler fitters, and hoisting machine operators are illustrative examples. Required qualifications differ somewhat in various geographical areas and jurisdictions.

## 1.18 LICENSE BONDS

A few states and many local governments require that all licensed contractors, including subcontractors, who operate within their jurisdictions post permanent surety bonds with the appropriate government authority. These are in the nature of performance and payment bonds, a subject discussed more completely in Chapter 7. Such bond requirements are intended to serve for the protection of the public. The public authority or other party may bring process against such a bond in the event of unpaid debt or malfeasance on the part of the contracting firm. The bond also serves to guarantee that the contractor will make proper payment for required permits and inspections.

It is a somewhat more common practice to require bonds of only certain contractors whose work is closely associated with public health and safety. The following is a representative listing of specialty contractors who are typically required to furnish license bonds:

- Boiler installation
- Curb, gutter, and sidewalk (on public property)
- Demolition
- Electrical
- Elevator installation
- Gas fitting
- House moving
- Plumbing
- Sign erection

In many areas, firms proposing to do such work must first post the requisite bond in the required amount with the designated public authority before commencing operations.

## 1.19 BUILDING CODES

Building codes have been adopted by numerous states and municipalities in the United States. A building code can be defined as a minimum set of requirements for building design and construction, adopted into law by some state governments and by many municipal governments, whose stated purpose is "to provide for the safety, health, and welfare of the public."

Passed into law to protect the public health and safety, these statutory building codes establish rules and standards that control the design, materials, and methods of construction, as well as certain aspects of the design and construction processes themselves, and compliance with them within their jurisdiction is mandatory. These codes typically apply to the construction, alteration, repair, demolition, and removal of new and existing buildings, including service equipment in buildings.

Most of these city and state code statutes are based, in whole or in part, on one of four model building codes that have been authored by and are sponsored and administered by parent organizations, whom we will refer to as authoring and administering agencies. These authoring and administering agencies consist of assemblages of experts in a variety of fields associated with building design and construction. These experts organized themselves into a corporate structure and addressed the task of producing design and construction standards that would provide for the safety, health, and welfare of the public. The written work they produced was given a name and was published and made available to governments who might wish to use them. These documents are called model codes. These model code documents have no authority or power of enforcement on their own accord. However, when state or city governments adopt a building code statute, they typically adopt one of the model code documents as the basis for their code statute.

In addition, there are some building codes of law that are not based on model codes but have been specifically written for a particular locality. Chicago, San Francisco, and several other large cities in the United States are of this type.

Additionally, there are special-purpose codes, such as those now adopted by several states, that pertain to prefabricated housing. These state laws regulate operations of housing manufacturers within

the state and set standards for such housing coming into the state from other manufacturers. Mobile home manufacturing is currently regulated by a preemptive federal code.

Generally, when city or state governments have adopted one of the model codes as the basis for their code statute, they have also decided to adopt provisions that pertain to their local needs and conditions and/or to make their requirements more stringent than those set forth in the model code document. These changes are typically adopted into law as amendments to the model code document, and they may add to, delete from, or make changes to the model code document.

Various boards, commissions, building departments, and other public bodies administer and enforce the provisions of their code statutes. The four model building codes mentioned in the preceding paragraph are listed below. These model codes and their authoring and administering agencies are frequently referenced by their names and/or the acronyms for their names.

1. *National/Basic Building Code (NBC)*. Published by Building Officials and Code Administrators International, Inc. (BOCA).
2. *Uniform Building Code (UBC)*. Published by the International Conference of Building Officials Inc. (ICBO).
3. *Standard Building Code (SBC)*. Published by the Southern Building Code Congress International Inc. (SBCCI).
4. *International Building Code (IBC)*. Published by the International Code Congress Inc. (ICC). The IBC bears special mention, inasmuch as it is frequently referred to as a "consensus code."

   First published in 2000, it is authored and administered by the ICC. This body in turn is composed of representatives from the other three model code authoring and administering agencies, BOCA, ICBO, and SBCCI. For this reason, the International Building Code is sometimes referred to as a "consensus code."

   The IBC was written and published in response to the difficulty experienced by owners, architect-engineers, contractors and subcontractors, materials suppliers, building code lawmaking bodies, and code administration and enforcement officials, whereby three different model codes, any of which might be adopted as the code of law by any state or city government, imposed a hardship on the building construction profession.

   The IBC was intended to provide a single model code that would contain the best features of the other three operative model codes. While in many ways the IBC has accomplished this purpose, the problem of multiplicity of code requirements remains, because almost invariably when city or state governments have adopted the IBC as the basis for their code of law, they have also adopted locally written amendments to customize the code requirements to the needs of their local constituency.

These four codes are the basic documents produced by their respective authoring and administering organizations. It should be recognized that each of these model codes is accompanied, or in many cases includes by reference, a variety of standards, subcodes, and other code documents. These standards and other codes address requirements for such specialty items as electrical work, plumbing, fire prevention and safety, mechanical work, solar energy, swimming pools, elevators, and others. Examples of some of these other codes and subcodes are:

- National Plumbing Code, published by the American Public Health Association and the American Society of Mechanical Engineers.
- National Electrical Code, published by the National Fire Protection Association.

- Life Safety Code, published by the National Fire Protection Association.
- International Plumbing Code, International Electrical Code, International Residential Code, International Energy Conservation Council (ICC).

To ensure that applicable codes are adhered to within their statutory jurisdiction, cities that have adopted building code statutes normally require various forms of design reviews, building permits, field inspections at certain stages of construction, and test reports. A general building permit is an almost universal requisite, requiring the filing of complete drawings and specifications prepared by a registered architect-engineer with a designated public building official's office. These documents are reviewed for design conformance with the applicable codes by the responsible building authority before a building permit is issued. Permits for plumbing, electrical work, heating and air conditioning equipment, elevators and escalators, and refrigeration systems are also normally required. In addition, occupancy permits or certificates of occupancy are usually established after the completion of a building, requiring a final inspection to ensure compliance with building code standards.

The form and content of building codes vary widely from one political jurisdiction to another, with the several states and cities varying with regard to their code statutes. Considerable variance exists with reference to code provisions and coverage, job inspection, enforcement, and appeal procedures. Such code diversity has frequently been criticized as inhibiting the use of construction mass-production techniques and the introduction of new materials, systems, and procedures. Difficulties faced by design and construction firms who work over wide areas are cited, in conjunction with pleas for a uniform national code. Similar problems are faced by building material manufacturers who market their products on a national scale. Code diversity is defended as being necessary to make adequate provision for local conditions such as climate, winds, hurricanes and other storms, and earthquake hazards. It can be predicted with certainty, however, that as long as building regulations and building codes remain police powers to be determined by state and local government, any appreciable degree of building code uniformity on a national scale is not likely to take place.

Conformity with the applicable building code is first the responsibility of the design professional, who bears a duty to produce a design that will be compliant with the building code where the building will be constructed. The contractor undertakes to construct in accordance with contract documents and must simultaneously comply with building code requirements. Typically, the contractor is required to notify the city or state government building official at specified intervals during the construction process, in order to allow for inspections of that phase of the construction. Passing the inspection indicates the approval by the building authority of that increment of the construction, and serves as authorization for the contractor to proceed to the next phase of the construction. It is typically the duty of the contractor to be knowledgeable of the building code provisions and to obtain the necessary permits for construction and schedule the requisite inspections during construction.

## 1.20 CONTRACTOR ORGANIZATIONS

A large number of trade, technical, and professional organizations serve the diverse interests of the construction industry. These associations represent the design professionals, general and specialty contractors, homebuilders, manufacturers and distributors of building materials and construction equipment, insurance and surety companies, financial interests, and others.

There are many associations of contractors throughout the country. Among the national associations that represent general contractors, the senior organization is the Associated General Contractors of America (AGC), whose membership includes building, heavy, highway, and utility contractors.

The Associated Builders and Contractors (ABC) is made up of member contractors who operate open shops, also referred to as merit shops. The National Association of Home Builders (NAHB) is a national professional organization representing all aspects the housing industry. Many highway and heavy contractors belong to the American Road and Transportation Builders Association (ARTBA).

Both local and national specialty contractor organizations also function to promote the mutual benefit of their members and to bring their combined resources to bear on common problems. The American Subcontractors Association (ASA), the National Electrical Contractors Association (NECA), the Mechanical Contractors Association of America (MCA), the Sheet Metal and Air Conditioning Contractors National Association (SMACNA), the Association of Plumbing and Heating Contractors (APHC), the National Utility Contractors Association (NUCA), the Mason Contractors Association of America (MCAA), and the National Roofing Contractors Association (NRCA) are among the oldest and most prominent.

These associations usually parallel the craft jurisdictions of the building trades and are represented by aggregations of specialty contractors such as electrical, mechanical, utility, masonry, or roofing contractors. Other National organizations also exist such as the Associated Specialty Contractors which is an umbrella organization of nine national associations of construction specialty contractors, whose combined membership totals more than 25,000 firms. This organization is a coalition of eight national associations of construction specialty contractors that represents subcontractors in all segments of the building construction industry and concentrates on business, contract, and payment issues affecting all subcontractors.

These associations perform a number of invaluable professional services for their members, such as monitoring federal and local and legislation and providing lobbying efforts, providing standard forms of construction documents of all kinds, sponsoring safety and apprenticeship programs, assisting with or conducting labor negotiations, providing tax information, holding conferences, promoting public relations, and serving as clearinghouses for construction information of all kinds. These organizations strive to maintain the business and ethical standards of contracting at a high level and to establish the integrity and responsibility of their members in the public mind.

## 1.21 MANAGEMENT PRACTICES IN CONSTRUCTION

On the whole, it can be said that construction contractors have been slower than some other businessmen in applying proven management methods to the conduct of their businesses. A number of analysts and consultants have characterized management in the construction industry as being weak, inefficient, and slow to react to changing conditions. These generalizations regarding the industry do not mean that all construction companies are poorly managed. To the contrary, some of America's best-managed businesses are construction firms, and it may be noted with satisfaction that the list of profitable construction companies is a very long one indeed. One need only look at compilations such as the Engineering News-Record annual listing of the top 500 contractors in the United States, to see that many construction companies are flourishing and successfully performing huge volumes of work. Nevertheless, in the overall picture, the construction industry is at or near the top in the annual rate of business failures and resulting liabilities.

There are several explanations frequently provided in an effort to explain why the construction industry has been slow in applying management procedures that have proven effective in other industries. Construction projects are unique in character and do not lend themselves to standardization. Construction operations involve many skills, and are largely nonrepetitive in nature. Projects are constructed under local conditions of weather, location, transportation, and labor, which frequently

present variables that are beyond the contractor's control. The construction business is volatile, with many seasonal and cyclical increases and decreases in volume of work. Additionally, despite all of the impressive size of some of the largest firms, the greatest number of construction firms are small operations, where the management decisions are made by one or two persons.

The conclusion cannot be drawn, however, that management problems in the construction industry are uniquely different from those in other industries. The complexity of the product and the lack of production standardization do indeed lead to difficult management problems, but those in construction are not necessarily more complicated than those in other business fields. Many other industries are characterized by a large number of relatively small firms. There are numerous areas of businesses that experience wide seasonal or cyclical variations in the demand for their products and services. Construction is certainly not the only industry that experiences keen competition. Ineffective management in construction is not, therefore, the inevitable result of pressures and demands peculiar to the construction industry. As a matter of fact, the presence of such pressures and demands underscores the need for astute and effective management in the construction industry.

It is an inescapable principle that skilled management and business survival and success are accompaniments to one another. The fact that this maxim has not been recognized by all construction firms is amply demonstrated by the high incidence of financial failures in the construction industry.

## 1.22 BUSINESS FAILURES IN CONSTRUCTION

Construction contracting is one of the riskiest of all business types, and every year many contracting concerns fail for a variety of reasons, causing millions of dollars in losses. The construction contracting business has one of the highest failure rates of any business in the United States. Although companies of all sizes, old and new, fail each year, statistics show that the most likely firms to fail are those that are small in size and limited in experience.

A number of studies have been conducted and the results published by Dunn and Bradstreet and by a number of others, seeking to identify the reasons and combinations of reasons why construction companies fail. The most common reasons cited are the following, which are not rank-ordered:

- Lack of business knowledge.
- Lack of managerial experience.
- Poor accounting system.
- Insufficient capital.
- Inability to be competitive, especially when doing work in a new region.
- Heavy operating expenses.
- Lack of early warning measures.
- High employee turnover.
- General economic conditions.

Consideration of these factors makes it clear that the financial success and the survival of a construction enterprise depends almost entirely on the quality of its management. Many outward manifestations of these root causes are often cited for business failure: seasonal business variations, weather hazards, job delays, inadequate sales, competitive weaknesses, low profit margins, cash flow difficulties of all kinds, and overextension. It follows, however, that these business inadequacies are simply indicative of poor business management.

## 1.23 SUMMARY AND CONCLUSIONS

The construction industry is a complicated industry to understand because it is such a large industry and because of its numerous different characteristics, which exist in many variables and sets and subsets. Additionally, the industry contains many variations and defining terminologies. Certainly, it is a business that is fraught with risk and uncertainty. However, for those who make themselves well informed so as to understand the characteristics and workings of the industry, and who avail themselves of the principle that knowledge and proper management are the keys to success, the construction contracting business can be highly rewarding, in terms of both profitability and the unparalleled sense of personal accomplishment that successful practice in the industry can bring.

## CHAPTER 1 REVIEW QUESTIONS

1. Define and describe privity of contract. On a typical construction project, name three people with whom the prime contractor has privity of contract.
2. Can a construction firm that is a subcontractor on one construction project simultaneously be a prime contractor on another project? Explain.
3. Define the term *construction manager,* and discuss the origin of the concept.
4. Name three of the most common reasons for construction company business failures as defined in this chapter.
5. List and define each of the bid documents that are typically prepared for a project.
6. Provide the names and acronyms for four national contractor professional associations.
7. Define the term *open-end contract,* and name two forms of contract defined in this chapter that are open-end forms of contract.
8. Why are unit-price contracts employed most prevalently on engineered and heavy construction projects?
9. Define fast-track construction, and provide a synonym. Describe the primary objective of fast-track, and the primary risk factors that are inherent in this project delivery method.
10. Define the competitive sealed proposals method of contract award, and explain the advantages it offers.
11. Define building codes, and name the four primary national model codes.
12. Define job order contracting.
13. Name and define the two types of financing that the owner arranges for a construction project. Provide a synonym for each term.
14. Define value engineering.
15. Define and describe construction management agency with construction manager at risk.

# Chapter 2

# Business Ownership

## 2.1 INTRODUCTION

Construction contracting companies, like other business entities, can be established and operated as different forms of business enterprises. Each of the different forms of business ownership that a construction company owner may choose has associated benefits and drawbacks. For a business owner, the form of business ownership he selects is a momentous decision, and one that should engage the input and consulting services of business, tax, and legal experts. All of the variations and all of the complexities involving various forms of business ownership cannot be discussed here. However, this chapter will provide an overview of some of the advantages, disadvantages, and considerations inherent in the most common forms of business ownership, especially as they relate to ownership and operation of construction firms.

## 2.2 ALTERNATIVE FORMS

The typical forms of business ownership for construction contracting companies are the individual proprietorship, the partnership, and the corporation. Some of these basic forms of ownership have subsets or variations of the form they may take. A company owner's selection of the proper type of ownership for the business entity involves a great many considerations and is a matter that merits careful analysis and deliberative decision making. Each form of business organization has its own financial, taxation, and legal implications, all of which must be thoroughly investigated and understood. The selection of the ownership type that is most advantageous and appropriate for an owner's particular circumstances is a critically important business decision. As noted previously, this decision should only be made with the assistance and input of legal counsel, tax specialists, and business consultants when a new business is established or when consideration is being given to changing the form of ownership of an existing business concern.

## 2.3 CONSTRUCTION CONTRACTING FIRMS

The construction industry is one of the easiest of businesses to enter. Any interested person can get started with little or sometimes no capital investment. There are many large firms in the construction industry in the United States, but the large firms are far outnumbered by small and medium-size companies. Family-owned businesses that work close to home are the general rule.

There are approximately 700,000 business firms in the United States that classify themselves as being construction contractors of one type or another. At any point in time, about 75 percent are

individual proprietorships, 5 percent are partnerships, and 20 percent are corporations. Thus, it is easy to see that a large majority of construction firms are small businesses. However, it is also true that most of the very large construction firms in the United States, those that perform an annual volume of construction work of $100 million or more, are corporations.

## 2.4 THE INDIVIDUAL PROPRIETORSHIP

The simplest form of ownership of a business entity is the individual proprietorship, also called sole ownership. Forming a sole proprietorship is the easiest and least expensive procedure for establishing and administering a business. Additionally, this form of business ownership enjoys a maximum degree of freedom from government regulation. No legal procedures are needed to go into business as a sole owner, except the obtaining of required insurance, registration with appropriate tax authorities and municipal and state government, and, in some jurisdictions, becoming licensed as a contractor. The owner has the choice of operating the business under his or her own name or under an assumed company name. In some jurisdictions, an assumed company name must be registered with a designated public authority, as a "doing business as (dba)" concern.

In this type of ownership, the proprietor owns and operates the business, provides the capital, and furnishes all of the necessary equipment and property. As the sole manager of the enterprise, the owner can make any and all decisions for the business unilaterally and can act immediately. Title to property used in the business may be held in the name of the proprietor or in the name of the firm, if they differ. All business transactions and contracts are made in the owner's name.

This mode of doing business has many advantages to offer, including potential tax advantages as compared to other business types, as well as simplicity of organization and freedom of action. Other than the usual obligation to complete its outstanding contracts and to settle its financial obligations, there are no legal formalities barring termination of the business.

As an individual proprietor, however, the owner is personally liable for all debts, obligations, and responsibilities of the business, to the entire extent of his personal fortune. This unlimited liability extends to personal assets, even though they may not be directly involved in the business. Although management in a sole proprietorship is immediate and direct, the owner alone must bear all of the burdens and responsibilities that accompany this function, or must hire the talent needed to assist in operating the business. A proprietorship has no continuity in the event of the death of the owner, unless there is a direction in the proprietor's will that the executor continue the business until it can be taken over by the person to whom the business is bequeathed. In the case of the sickness or absence of the proprietor, the business may suffer severely unless there is a competent person or persons available to assume the management and operation of the business enterprise. Entrepreneurs who form proprietorships can raise money for business purposes only through personal contribution, by borrowing, or through the sale of company assets. This is in contrast to other options that are available for raising capital in other forms of business ownership. The owner must pay income taxes and other taxes at normal individual rates on the full earnings of the business, whether or not such profits are actually withdrawn from the business. Such earnings are added to the owner's income from other sources, and tax is computed on the whole.

It can be seen that the sole proprietorship form of business ownership has both advantages and disadvantages for the owner. As will be discussed in the sections that follow, the same is true of other forms of business ownership as well.

## 2.5 THE GENERAL PARTNERSHIP

A general partnership is an unincorporated association of two or more persons who, as co-owners, conduct a business for mutual profit. The principal benefits to be gained by such a merger are the concentration of assets and personal credit, equipment, facilities, and individual talents of the partners into a common course of action for a common purpose. The pooling of the financial resources of each of the partners results in the increased financial capacity and increased bonding capacity of the business. This, in turn, results in the possibility of a greater scope and volume of construction operations than would be possible for the partners acting individually.

Each general partner customarily makes a contribution of capital and shares in the management of the business to an extent defined in the partnership agreement. Profits or losses are usually allocated in the same proportion as the percentage of ownership. If no agreement is made in this regard in the articles of partnership, however, each partner receives an equal share of the profits or bears an equal share of the losses, regardless of the amount invested.

For most purposes, a partnership is not generally recognized by the law as being an entity separate from the partners. For example, a partnership pays no income tax, although it must file an information return. However, a partnership can operate under a company name and for certain purposes a partnership is recognized as a separate legal entity. In many jurisdictions, for example, a partnership can own property, can have employees, and can sue or be sued as a partnership business entity.

The Internal Revenue Service has ruled that bona fide members of a partnership are not employees of the partnership. Rather, such persons are deemed to be self-employed individuals whose remuneration is not subject to the Federal Unemployment Tax Act, the Federal Insurance Contributions Act, or to income tax withholding.

Partners usually receive drawing accounts against anticipated earnings, or annual salaries that are considered to be operating expenses of the partnership enterprise. In any event, partners must individually pay annual income taxes at the normal individual rates on their salaries, as well as on their allocated shares of the partnership profits. This holds true whether or not the funds that represent partnership profits are actually withdrawn.

A partner's share of the profits in a partnership can be assigned. However, an individual partner cannot sell or mortgage partnership assets. Neither can a partner sell, assign, or mortgage an interest in a functioning partnership without the consent of the other partners. Partners act as fiduciaries for the business entity and commensurately have an obligation to act in good faith toward one another.

## 2.6 ESTABLISHING A PARTNERSHIP

State laws regarding partnerships are not entirely uniform, although most states have adopted the Uniform Partnership Act more or less verbatim. In the formation of a partnership, it is customary and advisable to draw up written articles of partnership, even though it is true that a binding partnership can, in certain instances, be formed by oral agreement.

It is always advisable to obtain the services of an attorney to assist in the preparation of the articles of partnership, which is a contract between the partners. In addition to statutory requirements, these articles may include almost anything the partners believe to be desirable. It is usual that articles of partnership, signed by the parties concerned, contain complete and explicit statements concerning the rights, responsibilities, and obligations of each partner. Although such articles must be individually tailored for each specific business partnership, the following list illustrates some of the types of provisions that are typically included in partnership agreements:

- Names and addresses of the partners.
- Business name of the partnership.

- Nature of the business with any limitations thereof.
- Location of the business.
- Date on which business operations will commence.
- Contribution of each partner in the form of capital, equipment, property, contracts, goodwill, services, and the like.
- Division of responsibilities and duties between partners.
- Statements requiring partners' full-time attention to partnership affairs.
- Division of ownership as it affects allocation of profits and losses.
- Voting strength of each partner.
- Drawing accounts or salaries of the partners.
- Any restriction on the management authority of individual partners.
- Specification of the requirement for majority or unanimous decision on management questions.
- Payment of expenses incurred by a partner in carrying out partnership duties.
- Rental or other remuneration for use of a partner's personal property, or for the provision of personal services.
- Arbitration of disputes between partners.
- Requirements relating to record-keeping and inventories.
- Right of each partner to full and complete access to all books of accounts of the partnership, as well as to all business audits.
- Rights and responsibilities of the individual partners upon dissolution of the partnership.
- Procedure in the event of an incapacitating disability of a partner.
- Rights and powers of surviving partners, such as option to purchase the interest of a deceased or withdrawing partner.
- Provision for final accounting of the business in the event of death, retirement, or incapacity of any partner.
- Provision as to whether the executor or spouse of a deceased partner is to continue as a partner.
- Termination date of the partnership agreement, if any.

Unless there is specific agreement to the contrary, general partners are expected to devote full time to the affairs of the partnership. Partners cannot normally withdraw capital from the partnership unless provision for this possibility has been set forth in the partnership agreement. It is typical that by mutual consent of all of the partners, any provision of a partnership agreement can be modified or deleted or new provisions can be added at any time.

## 2.7 LIABILITY OF A GENERAL PARTNER

A general partner is liable for all of the debts of a partnership. This truism is based on two legal principles. First, each general partner is defined to be an agent of the partnership, and therefore can bind the other partners in the normal course of business without express authority. Second, partners are individually liable to creditors for the debts of the partnership. The implications of these two points will be further discussed in the paragraphs that follow.

Agency exists when one party, called the principal, authorizes another, who is called the agent, to act for the former in certain types of defined business or commercial transactions. An agency

relationship exists by agreement, and an agent can be designated by the principal to conduct any business or to take any action that the principal might lawfully take. The principal is liable for all contracts made by the agent while the agent is acting within the scope of his actual or apparent authority. The principal is also responsible for nonwillful torts (civil wrongs) that the agent may commit in the furtherance of the principal's business.

Further to the definitions discussed earlier, a general agent is one empowered to transact all of the business of his principal. In a partnership, each full member of the partnership is a general agent of the partnership itself and has complete authority to make binding commitments, enter into contracts, and otherwise act as an agent for his fellow partners within the scope of the business. Additionally, under the agency principle, communication to any one partner is considered to be notice to all. These provisions are subject, of course, to any limitations that may be set forth in the partnership agreement.

In most states, the responsibility of a partner for the contractual obligations of the partnership is joint with that of the other partners, which means that all of the partners are necessarily parties to any contractual action. Liability of a partner for torts committed by the partners in the ordinary conduct of business affairs is joint and several. This means that in any such tort action, every member of the firm is individually liable, and the injured party can proceed against all of the parties jointly or against whichever of the partners he chooses.

Each partner assumes unlimited personal liability to third persons for the claims, contracts, and debts of the partnership. If any one partner is not able to pay his proper share of company liabilities, creditors can force the remaining partners to pay the share of the first. A creditor of a partner can attach that partner's interest in the profits of the business but cannot proceed against the property of the partnership unless the partnership is being dissolved.

It should be apparent from the foregoing discussion that careful judgment should be exercised, both in the decision to form a partnership and in the selection of business partners. Each general partner accepts unlimited financial responsibility for the acts of the other partners, and each general partner underwrites the debts of the enterprise to the full extent of his personal fortune. If a partner withdraws from a going partnership, he remains personally liable for the partnership obligations outstanding as of the date of his withdrawal. To protect himself from future partnership debts, the retiring partner should give personal notice to firms doing business with the partnership, and should publish public notice of his departure. In most states, the withdrawing partner can discharge himself of all liability by means of an agreement to that effect between himself, the firm's creditors, and the partners continuing the business.

## 2.8 DISSOLUTION OF A PARTNERSHIP

One of the major weaknesses of the partnership form of business organization is its automatic dissolution upon the death of one of the partners. However, this possibility can be circumvented by making provision in the partnership agreement that the business will continue and that the surviving partners will purchase the decedent's interest. Dissolution of a partnership may also come about as the result of bankruptcy, or through a legal provision called a duration provision in the original partnership agreement, or through the decision of a partner to withdraw, the insanity of a partner, a court of equity decree, or the mutual consent of all parties to the partnership. Dissolution is not a termination of the partnership per se, but rather is simply a restriction of the authority of the partners to those activities that are necessary for the conclusion of the business. Dissolution of the partnership has no effect on the outstanding debts and obligations of the enterprise.

Voluntary dissolution of a partnership is often accomplished by a written agreement between the partners. This agreement provides that the partners will undertake to complete all contracts in progress, to settle company affairs, and to pay all partnership obligations from the proceeds and assets of the business.

In the settlement of the debts of a partnership, outside creditors enjoy a position of first priority. If partnership assets are insufficient to satisfy the outstanding obligations of the partnership, then the partners must personally pay the difference. After all of the creditors have been satisfied, remaining partnership assets are used to repay any loans or advances that may have been made by partners above and beyond their capital contributions. Only after all loans and advances of this kind have been repaid, can there be a return to the partners of their capital investments. If additional partnership assets remain thereafter, these are treated as profits, and are distributed in accord with the provisions of the original partnership agreement. When a partnership dissolves and construction contracts are involved that may require considerable time for their completion, the clearing of partnership accounts is often subject to lengthy delays, pending the payment of all debts, receipt of all accounts receivable, and discharge of all of the construction contract obligations of the partnership.

## 2.9 SUBPARTNERSHIP

A general partner in a partnership can enter into an agreement with an outsider, who is called a subpartner. This can be completed by a written agreement whereby the subpartner will share in some designated way in the general partner's profits or losses as derived from the business activities of a partnership enterprise. The subpartner is not a member of the firm, and consequently he or she performs no active function in the partnership, has no voice in the management, and has no contractual relationship with the partners, other than the one with whom he made the profit-or-loss-sharing arrangement in the subpartnership agreement. Because the subpartner has contracted to participate only in the individual partner's share, he is not personally liable to the creditors of the partnership.

## 2.10 THE LIMITED PARTNERSHIP

In a general partnership, each of the general partners is a recognized member of the firm, is active in its management, and has unlimited liability to its creditors, as discussed in the preceding sections. A limited partner is one who contributes cash or property to the business and then commensurately shares in the profits or losses of the enterprise. However, the limited partner does not, and in fact cannot, provide any services, nor have any voice or vote in matters of management of the firm.

Unlike the general partners, limited partners are liable for partnership debts only to the amount of their investments in the partnership. This is true, however, only as long as their names are not used as part of the firm name, and they do not participate in management.

Under the Uniform Limited Partnership Act, which has been adopted by most states, a limited partnership may be formed by two or more persons, at least one of whom must be a general partner. A contract is drawn up between the partners that clearly defines the individual duties and financial obligations of each of the partners. Additional stipulations in this contract may include the length of time the agreement remains in effect and the date by which the contributions of each limited partner are to be returned.

In addition, state statutes provide that a limited partnership certificate must be signed and filed with a designated public office, and this partnership certificate must be published as required by state statute. The operation of a limited partnership, like its establishment, must be conducted in strict

accordance with the laws of the state in which it is formed. The partnership is not automatically dissolved by the death of a limited partner, as is the case in a general partnership.

The limited partnership is used principally as a means of raising capital for a business enterprise. It is a means for an investor to contribute money into a business while maintaining immunity from any personal liability. The limited partner is not a creditor of the business, but rather is considered to be an owner of a share of the firm. The limited partner is entitled to a share of the profits of the firm while the business is operational, and to a return of capital and undistributed profits upon its dissolution.

By contrast, the obtaining of new investment capital for a business enterprise by bringing in additional general partners can result in serious problems with regard to company control and decision making, due to the fact that each of the new general partners shares in the management of the company. The addition of a limited partner may also be preferable to borrowing the desired funds from a bank or from another source. In this regard, however, one who lends money to the partnership can be in a better position than a limited partner. A lender to whom a firm is in debt can possibly exert some control over the firm, whereas for a limited partner, any show whatsoever of management input or interference can result in the loss of the limited partner's immunity from personal liability. Moreover, a lender enjoys a higher priority in the event of dissolution of a partnership than does a limited partner.

It is to be noted that high corporate income tax rates have generated considerable interest in limited partnerships as an organizational alternative to the corporate form of business ownership. As noted earlier, a limited partner is considered to be an investor in a company rather than a stockholder. Income from a partnership is taxed only at the individual investor's rate, rather than being taxed at both the corporate and individual levels as it is for stockholders. Limited partners, like the stockholders in a corporation, do not have personal liability for company debts and obligations.

A relatively recent development, publicly traded master limited partnerships (MLPs) have been developed and utilized, some of which are listed on the major security exchanges. This form of organization serves principally as a capital pooling technique where small companies or individual investors can pool their resources to initiate large projects. A sponsoring corporation normally serves as the general partner in an MLP.

## 2.11 THE CORPORATION

A corporation is an entity, created by law, that is composed of one or more individuals united into one body under a special or corporate name. While there are several different classifications of corporations, including public and private, profit and nonprofit, quasi-public, and foreign and domestic corporations, the discussion here will consider only the private form of corporation that a contractor would establish for ordinary business and profit motives.

Corporations have certain privileges and duties, enjoy the right of perpetual succession, and are regarded by the law as being business entities that are separate and distinct from their owners. A corporation is authorized to conduct business in the name of the corporation, and can own and convey real and personal property, can enter into contracts, and can incur debts in its own name and on its own responsibility. It can also file suit and can be sued in its corporate name.

The principal advantages of this form of business organization are the limited liability of its owners (who are the stockholders), the perpetual life of the company, the relative ease of raising capital, the easy and workable provision for multiple ownership, and the economic benefit that owners pay taxes only on profits (dividends) actually received. In a corporation, unlike in a partnership, the owners (shareholders) can also be employees.

A corporation is formed under the provisions of state law, by a prescribed number of shareholders filing a certificate of "articles of incorporation" with the appropriate administrative department of state government. The corporation comes into being upon receipt of its corporate charter from the state of domicile, that is, the state where its charter is registered. The powers of a corporation are limited to those that are enumerated in its charter, along with those that are reasonably necessary to implement its declared purpose. The provisions of the corporate charter are usually structured so as to be very broad in nature, in order that the new corporation will be authorized to perform the many different functions that may become necessary or desirable for the business entity in future years.

These charter provisions also include the drawing up of corporate bylaws that pertain to the day-to-day conduct of the business of the corporation. Acts of the corporation are governed and controlled by its articles of incorporation, as well as by its bylaws and the applicable state law.

Corporations are regulated by the various states, with each of the several states having a corporation code that prescribes the formal process that must be followed by the organizers in order to obtain a charter. These legal requirements differ somewhat from one state to another, and it is always important to secure competent legal guidance when establishing a new corporation or when modifying an existing corporation. In any case, as organizers proceed toward obtaining a corporation charter from the state, they find that fees must be paid and substantial quantities of information must be filed with the proper state officials. Additionally, a series of detailed requirements must typically be satisfied regarding the incorporators' residence and financial structure.

A corporation is dissolved by the surrender or expiration of its charter. Dissolution of a corporation merely means that the corporation ceases to exist. State laws govern the means by which the business affairs of a dissolved corporation must be settled.

## 2.12 THE FOREIGN CORPORATION

A business corporation that is created within a certain state and under the laws of that specific state, is known as a domestic corporation. In all other states, this corporation is considered to be a foreign corporation. The state of incorporation is frequently chosen by the organizers of the corporation, not on the basis of the location of work to be performed by the company, but rather because of its more favorable corporation laws. The incorporated contractor that wishes to extend its operations beyond the borders of its state of incorporation must apply for and receive certification to do business as a corporation within each additional state. Usual requirements for the certification of a foreign corporation are the filing of a copy of the corporate charter, the designation of a local state resident as an agent for the service of process, and the payment of a filing fee.

The acts of a foreign corporation within another state are considered to be unlawful until the corporation has become certified to do business as a corporation in that state. Hence, the contractor that is incorporated must exercise great care to comply with the corporation laws of those states in which it does business. Failure to be properly certified as a foreign corporation in a state may very well render construction contracts unenforceable and may eliminate the right of lien. Additionally, an uncertified foreign corporation typically will not have access to the state courts.

A foreign corporation is, of course, subject to the statutory controls of the state within which it does business. For example, if franchise taxes or income taxes are levied on businesses of that state, the foreign corporation must also pay such taxes in accordance with its total amount of business in the state.

## 2.13 STOCKHOLDERS

The ownership of a corporation resides in shares of stock that entitle the owners thereof to a portion of the business profits and also to the net assets of the corporation upon its liquidation. This does not mean that shareholders own the corporate assets because the corporation itself holds legal title to its own property. However, each share of stock represents a share in the ownership of the corporation. Under the laws of most states, all of the stock of a corporation can be owned by a single individual, and in this case, as well as for all stockholders when there is more than one, the courts recognize a clear distinction between the individual and his corporation.

Ordinarily, shares of stock in a corporation are freely transferable, and this is in fact one of the advantages of incorporation. Stock certificates are negotiable instruments that may be transferred by endorsement and delivery in the same manner as promissory notes.

It is commonplace that the shares of stock in a corporation are held by a small group, such as the members of a family or a select group of business associates. In this way, control of the company is maintained within a select group. Such a corporation whose stock is not available to the public is referred to as a closed corporation or a closely held corporation. By contrast, when corporate stock is available to the general public, the company is referred to as a publicly owned or public corporation.

In the case of stockholders who wish to maintain a select group who can own stock, a restriction on the ownership or transfer of the stock of the corporation can be accomplished by stamping the nature of the restriction directly onto the face of the stock certificate. Another method by which stock ownership can be restricted to a small or select group, is to provide in the bylaws that before stockholders can sell their stock to an outside party, they must first offer their stock for sale back to the corporation, that is, the current stockholders.

When a corporation is established, its articles of incorporation will authorize the issuance of a certain dollar value of stock, which is called the authorized capital stock. The actual capital stock is the dollar amount that has actually been paid to the corporation for its outstanding stock. The actual capital stock value does not necessarily equal the amount of the authorized capital stock.

The stock that is issued by the corporation may take the form of common stock or preferred stock, or both common and preferred stock may be issued. Preferred stock is subject to less risk for the stockholder than is common stock because it has a certain defined preference as to dividends distribution, as well as distribution of assets upon liquidation of the corporation. However, preferred stock usually carries no voting privileges with regard to the matters of electing the leadership, and voting on the conduct of some of the business of the corporation.

Common stock, while it does not carry the preferential distribution of dividends and assets of preferred stock, generally entitles its owners to one vote per share. Additionally, common stock often provides at least the possibility of greater ultimate profits to its owners.

Stockholders, those who own both preferred and common stock in the corporation, have certain rights and privileges that are based on the state statutes of the state where the corporate charter resides, and as set forth in the language of the charter of the corporation. Additional rights and privileges accrue from the terms of stock ownership as stipulated on the stock certificate. These stockholder rights typically include the preemptive right to subscribe new stock issues, to carry out reasonable inspection of the corporation's books and records, to bring suit against the corporation, to share proportionately in declared dividends, to receive a share of the net assets of the corporation upon dissolution, to elect officers and members of the board of directors of the corporation, as discussed below, and to enact bylaws.

The profits earned by a corporation are subject to federal and state taxes at the corporate tax rate. Such taxes are paid by the corporation as a business enterprise, before any profits can be distributed

as dividends to the stockholders. Following the distribution of dividends resulting from the corporate profits, the stockholders are then taxed individually on any such dividends which are distributed on a cash basis. Such double taxation is considered by many to be one of the greatest drawbacks associated with the corporate form of business. Because a corporation cannot deduct dividend payments to its stockholders as business expense deductions for tax purposes, both the corporation and its shareholders pay taxes on the same income.

Dividends can be paid only from earned surplus generated by the corporation, and may be declared only if such action does not impair the position of creditors to the corporation. Such dividends, or surplus distributions, are declared as a fixed sum per share of outstanding stock. This dividend payment is generally made quarterly, but may be declared at such intervals as decided upon by the board of directors of the corporation.

An outstanding advantage of the corporate form of business ownership, is the fact that each individual stockholder is immune from personal liability for corporate debts. With very few exceptions, shareholders have no personal liability for obligations of the corporation, and their responsibility is limited to their investment in the corporation's stock. An important exception to this generality sometimes occurs, however, when the stockholders in a closely held company may be required by the bonding company of the construction corporation to provide their personal guarantees for the debts of the corporation. (See Chapter 7 for more detailed discussion regarding bonding companies.) When this is the case, the shareholder's liability is not limited to the amount invested in the corporation.

A stockholder is not an agent of the corporation, and cannot act in any way for or on behalf of the organization. This also illustrates a difference between a stockholder in a corporation and a member of a partnership.

## 2.14 CORPORATE DIRECTORS AND OFFICERS

The voting shareholders of a corporation elect a board of directors that exercises general control over the business of the incorporated company and determines the overall policies of the corporation. The directors must conduct the affairs of the firm in accordance with its bylaws, and the members of the board are ultimately responsible to the stockholders. Directors have no authority to act individually for the corporation, and are not agents of the corporation, nor of the stockholders. Their powers may be exercised only through the majority actions of the board. Directors occupy the position of fiduciaries for the company, and are required to serve the financial interests of the corporation with prudence and reasonable care.

The articles of incorporation for an incorporated company will typically provide that there will be annual meetings of the shareholders, and defined periodic meetings of the board of directors. Minutes of these meetings must be kept and filed in accordance with the articles of incorporation, and in keeping with the laws of the state where the corporation is chartered. Failure to observe such required procedures can lead to serious problems in the event of claims or lawsuits against the corporation. For example, chronic disregard of corporate technicalities might result, for legal purposes, in the business being treated as a partnership or sole proprietorship rather than as a corporation.

The president, vice-president, secretary, and treasurer comprise the typical set of officers of the corporation. There may be other officers, as defined in the corporation charter and bylaws. These officers are usually appointed by the board of directors, and these are the people who have the responsibility of carrying out the everyday administrative and management functions of the company. The officers are empowered to act as agents for the corporation, in accordance with the agency concept discussed earlier in this chapter. The president is authorized to function for the firm in any proper way,

including entering contracts, whereas the lesser officers generally have more limited authority. Officers also serve in the capacity of fiduciaries for the company, and may be held personally liable for corporation losses caused by their neglect or misconduct.

## 2.15 THE S CORPORATION

If a corporation meets certain criteria specified by the Internal Revenue Service, it has the option of being taxed as a partnership rather than as a corporation. If such an election is made, the company is referred to as an *S corporation*. To be eligible, the corporation must meet certain criteria. It should be noted that none of the criteria for an S corporation restrict the size of business volume, profits, or capital.

Included among the required criteria for an S corporation are the following:

- The corporation must be defined as a closely held corporation having no more than 35 stockholders.
- All of the stockholders must be U.S. citizens, estates, or some specified trusts.
- There must be only one class of stock outstanding.
- Partnerships and other corporations cannot be shareholders.

An eligible corporation must elect to be treated as an S corporation and must make a filing with the Internal Revenue Service (IRS). Additionally, stockholders must consent by signing prescribed forms that are filed with the IRS. Once the taxation election is made, this S corporation status must continue until it is properly terminated. This may be done at any time by a majority vote of the stockholders. Once the S corporation designation is terminated, however, the corporation is not allowed to reelect S corporation status for five years, unless approved to do so by the IRS.

The stockholders in an S corporation enjoy the typical corporate benefits such as limited shareholder liability and the ability to easily transfer ownership. The use of an S corporation form of ownership can be especially beneficial in the following circumstances:

- In the early years of a business, when operating losses sometimes occur, and when substantial amounts of capital equipment must be acquired.
- When there is high company profitability with no additional capital needs.
- For family income tax planning.

The prime attraction of this form of company ownership is that profits or losses of the corporation are taxed directly on each stockholder's tax return instead of at the corporate level. Losses incurred by an S corporation, with some limitations, can be offset by the taxpayer who is a shareholder against taxable income from other sources. In contrast, as discussed earlier, a regular corporation pays taxes at the corporate level and then the stockholders must pay a second tax on any profits withdrawn as dividends. Additionally, S corporations are not subject to the penalty tax applied by the Internal Revenue Service when earnings are retained in a corporation beyond its reasonable needs. Also, the IRS cannot assert that unreasonably high compensation is being paid to an employee-shareholder of an S corporation.

## 2.16 EMPLOYEE STOCK OWNERSHIP PLAN (ESOP)

An employee stock ownership plan (ESOP) is a form of deferred compensation to employees, consisting of the employees investing in the stock of the employer corporation, with these investments

funded by tax-exempt contributions made by the employer. The company employees pay no tax on their stock ownership until they withdraw their benefits from the plan, which usually occurs at the time of their retirement. This provides a tax-advantageous way by which to transfer ownership in a closely held corporation.

A company ESOP can provide benefits to both the employers and also to employees. While similar to some other stock bonuses or profit-sharing plans, an ESOP differs in that it invests its assets wholly or primarily in company stock.

Such a plan can be designed to accomplish different purposes, including the following:

- Promoting company growth by providing a new source of equity capital.
- Providing benefits for long-term employees.
- Allowing for the retirement of company owners.
- Accomplishing a change of company ownership.
- Retiring outstanding stock presently owned by stockholders.

By selling company stock to an ESOP trust, the employer determines the quantity of stock to be divested and the rate at which it will be sold to the employees. When an ESOP proposal is accepted by the firm's stockholders and board of directors, there are two ways in which the plan can be implemented. The choice of procedure depends on the purposes to be served by the plan.

One form of ESOP formation is for the corporation to make a series of periodic tax-deductible contributions to the trust, for the benefit of the participating employees. These company payments replace traditional profit-sharing distributions made to individual employees. Where the plan borrows no money from outside sources, such company payments are limited to 15 percent of total payroll.

The second form of ESOP formation is for the trust to obtain a third-party loan with which to buy the shares of stock offered. The loan is retired by a series of tax-deductible company contributions in a manner similar to that of the first procedure. Where funding is borrowed, the company payments cannot exceed 25 percent of covered payroll.

Under either of the procedures, the company is obligated to repurchase the shares of employees who retire, are disabled, die, or are terminated employment for specifically designated reasons. The shareholders of the sponsoring corporation can defer capital gains recognition when they sell their stock to an ESOP, provided that the ESOP owns 30 percent of the corporate stock and the seller reinvests the sale proceeds in securities of other domestic corporations.

An ESOP can be advantageous for some companies but can present serious problems for others. A privately held corporate firm must thoroughly understand all of the risks and drawbacks that can be involved. A wide range of issues must be carefully considered before making the decision to implement such a plan.

## 2.17 LIMITED LIABILITY COMPANY (LLC)

A relatively new form of business entity, the limited liability company (LLC), is coming into increasing usage. The LLC is a company formed by two or more members, with an LLC agreement executed among the members and written in conformity with the applicable state statute. This LLC agreement is much like a partnership agreement or a firm's articles of partnership.

An LLC can offer legal, tax, and economic advantages over the traditional forms of business ownership. An LLC is a statutory entity that combines the limited personal liability feature of a corporation and the partnership feature of taxation at the owner level.

An LLC is classified as a partnership for federal tax purposes. This form of company ownership offers distinct advantages over the S corporation and the limited partnership forms of ownership that attempt to have both limited liability and pass-through taxation. While an S corporation has both limited liability and pass-through tax advantages, it has many restrictions and pitfalls that an LLC does not have. An advantage that an LLC has over a general partnership is limited liability for its members. A limited partnership only partially overcomes the limited liability issue.

## 2.18 THE JOINT VENTURE

A joint venture is not an enduring form of business ownership like the others that have been discussed in this chapter. Rather, the joint venture is temporary form of ownership whereby two or more contractors unite and pool their resources, assets, and skills so as to perform a single construction project, and then go their separate ways again following completion of the project. A joint venture is a method of collaboration between contractors, which is defined as two or more separate and independent contractors uniting themselves into a single business entity for the performance of a single construction contract. The members of a joint venture can be sole proprietorships, partnerships, or corporations, but the joint venture itself is a separate business entity from the businesses owned by the participants in the joint venture.

Joint venture arrangements may be used when two or more contractors unite themselves into a single business for purposes of performing a project that none of them could perform alone. Sometimes complementary needs on the part of the contractors are the motivating force behind joint venture formation. For example, there may be a firm that is well established in a geographic location, with a proven record of performance for owners and architects in the area. This company has determined that it is not financially capable of performing a forthcoming project, or does not have the requisite bonding capacity. There may be another firm based in a different location that has the requisite size, financial capacity, and bonding capacity to perform the project, but is reluctant to submit a proposal because it is unfamiliar with the local owner and architect, and/or because this company is unfamiliar with matters such as labor availability, and availability of subcontractors and suppliers in the area where the project is to be built. These two companies may logically decide to form a joint venture, and to submit a proposal in the name of the joint venture concern, and if they are successful bidders, to perform the project as a joint venture.

A joint venture enterprise begins with the preparation and execution of a joint venture agreement between the companies that are forming the joint venture. This contract will define and describe all of the elements of agreement between the two (or among each of the participants if there are more than two), including all aspects that have to do with how the joint venture will conduct its business operations. This is typically a very complicated matter, requiring expert legal counsel and tax counsel.

Among the elements of content of the joint venture agreement are matters such as definition of the aims and objectives of the enterprise, obligations and rights of each party, the specific responsibilities and contributions of the individual parties, the percentage interest of each participant, details regarding the advance of working capital by each party, limitations of liability, settlement of disputes among the co-venturers, and division of profits and losses. Also to be included are delineation with regard to which contractor will take the leadership role in project administration; the details of contract administration and project management; the conduct and oversight of accounting and purchasing; the procedure in case a co-venturer defaults on its commitments; and the manner of termination of the joint venture agreement. Certainly, there will also be definition and description of particulars regarding project administration, both in the office and in the field; use of equipment, scaffolding, and other

resources of the several contractors; definitions regarding subcontractor selection, and subcontractor coordination and management; management and administration of requests for payment; and so on.

While the listing of matters to be considered in the previous paragraph is not intended to be comprehensive or complete, this cursory set of considerations serves to exemplify how many matters there are that need to be agreed upon and decided, and how complex the matter can be, of melding two or more companies into one functional but temporary business enterprise, capable of constructing a project for the mutual benefit of the co-venturers.

A joint venture serves to combine the resources, assets, and skills of the participating companies. Such a combination offers the multiple advantages of pooling construction equipment, estimating capabilities, office facilities, personnel, and financial and bonding capabilities. Each joint venturer participates in the conduct of the work and shares in any profits or losses in accordance with the joint venture agreement. Some of America's largest structures have been built by joint ventures. Hoover Dam, constructed by a joint venture of six companies, was an early example. Succeeding years have seen the formation and use of joint ventures develop into common practice in the construction industry.

An important consideration to be noted is that a joint venture can select its own accounting procedure for tax purposes, without regard to the methods used by the individual venture members. Prior to bidding, it may be necessary to obtain a contractor's license for the joint venture, to prequalify the joint venture for bidding, and to file a statement of intent to submit a joint venture proposal with the owner.

Usually, prior to the preparation and submittal of a proposal, the participants in the joint venture agreement will make a courtesy visit to the owner and architect-engineer for the project. They will present their joint venture agreement to the owner and the architect-engineer, and will typically make the joint venture agreement available for consideration by legal counsel of the owner. The intent is to provide full disclosure to the owner, to let the owner and architect-engineer know that the joint venture enterprise will be submitting a proposal, and to provide assurance that if selected to receive the construction contract, the joint venture will be fully prepared to satisfactorily perform the construction.

On bid day, the participating contractors will submit their proposal to the owner in the name of the joint venture business. The proposal will contain the names of all of the joint venture participants and will stipulate that all of the participants in the joint venture, jointly and severally, are directly bound to the owner for the performance of the contract. Each co-venturer is thereby individually liable for the performance of the entire contract and for the payment of all construction costs.

When the joint venture is selected to be the contract recipient, the business entity will, of course, enter a contract with the owner and will complete the project in accordance with all of the provisions of the contract documents, and will simultaneously fulfill all of the elements of their joint venture agreement among themselves. When the project has been completed and the joint venture agreement has been fulfilled, the participating contractors will again go their separate ways.

## 2.19 SUMMARY AND CONCLUSIONS

As was noted at the beginning of this chapter, there are numerous different forms of ownership for a construction company, and each has its own advantages and disadvantages. Further, it is noted that the summary of forms of business ownership presented here, and the accompanying discussion of advantages and disadvantages, is only a basic summation. A great many other details reside within the body of knowledge to be considered with regard to each form of ownership.

A company owner's selection of the proper type of ownership for the business entity that is the construction company involves a great many considerations and is a matter deserving of careful study and serious deliberation. It is recommended that this selection be made only after qualified input has been received from legal counsel, taxation experts, and business and financial consultants.

## CHAPTER 2 REVIEW QUESTIONS

1. What are the primary advantages of a limited partnership form of construction company ownership?
2. What is the difference between a public and a private corporation?
3. Define a joint venture contractor, and explain the rationale for the use of this form of business entity.
4. Define ESOP and explain its use.
5. What is the meaning and significance of the term *foreign corporation?*
6. State one key advantage and a key disadvantage to each of the following forms of construction business ownership: sole proprietorship, general partnership, limited partnership, corporation, S corporation.
7. Explain the rationale employed by those who argue that corporations are subject to double taxation.
8. About how many firms in the United States classify themselves as construction firms, and what is the most prevalent form of ownership of those companies?
9. Define and contrast the duties and responsibilities of the members of the board of directors of a corporation, and the officers of the corporation.
10. Define an LLC, and describe one key advantage to its usage.

# Chapter 3

# Company Organization

## 3.1 INTRODUCTION

The operation and management of a construction company involves a large number of separate and diverse activities. Procuring work, preparing cost estimates, negotiating contracts, procuring materials and labor and other resources, planning and scheduling projects, determining construction methods, equipment management, insurance, surety bonds, material control and storage, as well as managing payroll, accounting, documentation and record keeping, cost control, labor relations, safety management and training, supervisor training, and a great many other functions are included in the business of construction contracting. It is the role of the construction contractor to coordinate all of these activities into an effective and profitable plan of action for the operation of the enterprise.

The basic element in this entire process of business management is the contractor's company organization. Top-level management of the construction company will create an organization structure that will facilitate the functioning of these numerous separate functions. It should be noted that the organization is not an end in itself, but rather is a means to achieve the objectives of the company.

In carrying out the necessary actions of its business, the construction contractor must continually cope with complex and shifting organizational problems. The contractor faces the need for devising a general company organization that acts in a support capacity for the total of all company operations, as well as a suitable field organization for each of the projects the company performs. In the construction industry, it is common practice for a contractor to locate all of its central business functional groups together in a central office, which is often referred to as the home office, and to locate a field office or job office on the site of each of its construction projects, to support the management functions that are conducted on the construction site. This chapter will discuss company organization as it applies to the home office or, for large companies, to a regional office. Project organization is further discussed in Chapter 10.

## 3.2 ORGANIZATION BASICS

With the formation of any private business, company ownership must first establish the fundamental purpose of the enterprise, define the overall scope of operations, set forth long-term objectives, establish a general operational plan of action, and establish company policies and procedures. Once these basics have been formulated, a company organization can be designed and created that will implement these plans and work toward the goals identified. An indispensable ingredient for any successful enterprise is an efficient company organization.

Establishing and maintaining an effective company structure is one of the principal functions of a firm's management and is the subject of this chapter. The organizational structure is the foundation for

the operating management of a business and provides the operating framework that makes a successful and profitable business possible.

Organizing refers to establishing company structure and to establishing the functions and duties of its several parts. It is the process of determining the responsibilities and scope of authority of each position in the management structure and defining how each company segment interrelates with each of the others. A primary objective of any organizational plan is to establish an effective operating routine for each element of the company that will require a minimum of direction from upper management.

## 3.3 GENERAL CONSIDERATIONS

Organizing a business can be described as determining what individual job positions are required, defining the duties and responsibilities of each position that has been defined, and establishing the working relationships among these positions. Properly done, this will allow company members at each level and in each defined function to be well aware of the part they are expected to play in the operation of the company, and also to know what is expected of them.

The primary task of a construction contractor's organization is to procure construction contracts, and then to plan, direct, and control the many elements associated with field operations in the performance of those contracts in such a way that efficiency and profitability are achieved. The contracting firm must create an organizational structure that meets all of the operational needs of the company and is especially suited to meet the peculiar needs and demands of its specific mode of operation.

The organizational framework must be sufficiently stable to assure action, and yet sufficiently flexible and adaptive to meet unique or changing needs and circumstances. There should be a certain degree of company-wide order and discipline, along with a certain degree of personal freedom of action for the people in the company. The company's management philosophy should permeate the organizational framework and the documents with which it is conveyed.

It is very important that those who bear the decision-making responsibilities within the company be relieved of excessive detail in the conduct of their everyday operations. To accomplish this, the structure and defined responsibilities in the company should be arranged in such a way that the people in responsible charge are not expected to act on every matter arising within their general jurisdiction. Rather, matters that are repetitive or routine, or that could be effectively handled at a lower level of responsibility, should be delegated to subordinates.

An understanding of the terms *authority, responsibility,* and *duty* is useful to understanding the principles of organization. Authority may be defined as the ability to act or to make a decision without the necessity of obtaining approval from a superior. Authority may be delegated to others. Responsibility implies the accountability of a supervisor for the successful accomplishment of an assigned function or duty. Although responsibility may be assigned to subordinates, the supervisor remains accountable in full (responsible) to his own superior. A duty is a specifically assigned task that cannot be delegated to another. As will be discussed in sections to follow, when a company organization plan is devised, the individual positions of authority and responsibility must be identified, and the duties of each participant must be defined.

Management must protect against both underorganization and overorganization. A balance must be struck between definition of duties and responsibilities, and the cost to the organization of the salaries of the people who will perform those duties, along with the organizational and monetary benefit actually to be realized from those salaries. It is a serious organizational failing to burden too

few people with too many duties and too much responsibility. It is equally undesirable to have an organization that is top-heavy, with half-productive administrators and supervisors.

## 3.4 PRINCIPLES OF ORGANIZATION

No single organizational structure could possibly be appropriate for every construction firm. An operational plan for a highway contractor will not likely fit the needs of a design-construct industrial contractor or a contractor acting as a construction manager. Each company must devise an organizational plan that best suits its own particular operation.

There are, however, certain well-recognized principles of organization that can be applied by any contracting firm that wishes to formulate an efficient organizational plan for its business. No business is so small that accepted methods of organization cannot be profitably applied. The mere act of making a formalized analysis of the necessary tasks to be performed, determining how they relate to the functioning of the company as a whole, and specifying who is responsible for each task, creates a clear understanding of who, what, when, and how. An effective organizational plan for the enterprise helps remove confusion, indecision, buck passing, duplicated efforts, and neglected duties.

The following steps are suggested for the development of an effective company organization. The accomplishment of these steps should include extensive discussion and consultation with all of the people concerned who will be functioning in this structure.

1. List every duty that must be performed for the successful operation of the company.
2. Divide the listed duties into individual job positions, and define the responsibilities of each position.
3. Arrange these positions into an integrated functional structure, showing lines of supervisory authority.
4. Staff the organization with people who have the necessary qualifications to fulfill the responsibilities.
5. Establish lines of communication.
6. Prepare a manual of company policies and procedures.
7. Prepare an employee handbook.
8. Implement the plan, monitor results, and adjust as necessary.

### 3.4.1 List of Duties

The conduct of a construction contracting business involves certain duties, whether the business is large or small. These duties will be carried out by only a few persons in a small organization, whereas many people will be involved in a larger company. In making up a list of company duties, the question invariably arises as to how detailed such a list should be. The answer is that a level of breakdown should be used that is appropriate for the size of the company and the number of employees involved. It seems reasonable to suggest that the larger the company, the finer and more refined the subdivision of duties should be.

The more detailed the thinking concerning the definition of all of the duties that define the requirements for effective and profitable operation, the less likely it is that something essential will be overlooked. The following list of duties that pertain to different functional levels in the organizational

management structure of a company will be used for illustrative purposes. However, it should be noted that this listing is provided as an overview and general guide, and is not intended to be complete or comprehensive or applicable to every construction company. It should also be noted that a given company might include some of these duties within different functional divisions.

**Executive**

Scope of operations
Company organization
Business organization
Long-range planning
Physical facilities
Capital improvements
Operating procedures and policies
Contract negotiation and execution
Financial structure
Investment
Banking
Construction loans
Legal matters
Auditors and audits
Legislative matters
Public relations
Industry associations
Labor policy
Safety policy
Quality assurance and quality control policy
Personnel policies and personnel relations
Salaries, bonuses, pensions, and profit sharing
Education and training plans
Professional development plans

**Accounting and Payroll**

General books of accounts
Subsidiary records
Cost records and reports
Historical cost database
Financial reports
Tax returns and payments

Billing
Collections
Bank deposits
Payment of invoices
Assignments
Personnel records
Payrolls and records
Wage and personnel reports to public agencies
Office services

**Procurement**

Requisitions
Purchase orders
Subcontracts
Change orders
Inventories
Ordering and control of stores
Expediting
Licenses
Insurance, for the company and for projects
Subcontractors' insurance
Owners' contract bonds
Bonds from subcontractors
Releases of lien
Guarantees and warranties
Routing and scheduling materials
Building permits
Checking and approval of invoices
Information on prices and sources of supply
Verification of quantity and quality of deliveries

**Estimating**

Awareness of projects announced for bid
Decision to bid
Visiting the site
Obtaining bidding documents and contract documents
Mailing bid invitations
Prebid conferences

Quantity takeoff
Materials quotations
Subcontractor proposals
Pricing of proposals
Checking estimates
Preparation of proposals
Bid bond
Delivering proposals
Bills of materials and subcontracts
Pricing change orders

**Construction Operations/Project Engineering**

Project planning
Construction schedules
Project budgets
Schedules of values
Project cost accounting
Project monitoring
Project cost breakdowns for pay purposes
Periodic project pay requests
Shop drawings
Project cost reports
Project cost control
Project schedule control
Field and office engineering—submittals, requests for information (RFIs), etc.
Safety procedures
Personal protective equipment (PPE)
Safety training
Internal accident and near-miss reports
Accident reports to insurance companies
Relations with owners and architect-engineers
Labor relations
Quality assurance/quality control procedures

**Construction**

Hiring craft labor
Supervision of construction
Coordination of subcontractors

Timekeeping
Labor cost coding
Project cost data
Project accident and near-miss reports
Project safety programs
Project progress reports
Construction methods
Storage of materials on project sites
Labor discipline and dismissal issues
Scheduling construction equipment

**Yard Facilities**

Receipt, storage, and warehousing of project materials
Maintenance and repair of construction equipment
Storage of construction equipment
Maintenance and issue of stores
Issue, receipt, and repair of hand tools
Transportation
Equipment rental
Prefabrication and subassembly
Spare parts

### 3.4.2 Division of Duties

After the duties have been listed, the next step in the development of an organizational plan is to subdivide these duties into groups so that the duties in each group can become the assigned responsibilities of a single individual. To illustrate, suppose the business is a small partnership consisting of two partners and an employed bookkeeper. One partner is in charge of the office and the other supervises the field operations. The three people concerned must, in a collective way, carry out all of the duties listed for company operations. The executive duties would normally be carried out by both partners acting together. The bookkeeper would perform the accounting and payroll tasks. The office partner could be responsible for all duties related to procurement and estimating, and be responsible for the bookkeeper and all of the bookkeeping operations. The field partner's duties could include those associated with all construction operations, and company yard facilities. It is obvious that the duties could be distributed among the three participants in any way desired. The experience, education, expertise, and talents of individuals will normally be the basis for the allocation of company responsibilities. It is important that every duty be assigned and conversely, that every position created include responsibility for a specific list of duties. The list of duties for any given position is referred to as its *job description*.

From the foregoing, it is clear that a member of a small construction company will normally be responsible for a considerably broader range and diversity of duties than would be the case in a

large company. It is an intrinsic characteristic of a large organization that most of its members have relatively narrow job responsibilities and will tend to be considerably more specialized. To illustrate, a small firm may have one person who does all the takeoff, pricing, bidding, and purchasing for the company. A large contractor may well employ several people to accomplish the same things, each being involved with only a limited aspect of the total process.

### 3.4.3 Organizational Structure and Organization Chart

The organizational procedure discussed thus far ensures that the employment positions established for the company will accomplish each duty that has been identified as being necessary for effective business operation. The next step is to link these positions together into an integrated company operational structure.

It is common practice in the construction industry to establish jurisdictions or departments within the company. Each department usually is roughly equivalent in authority and although interrelated with the others, each department operates semi-independently of the others.

This is referred to in management as developing a functional form of organizational structure, that is, one that is formed by partitioning the work to be done into major functional areas. The functional system of management has the advantage that an individual or group can specialize to some extent in a particular aspect of the business. Semiautonomous departments are created, each of which performs a specialized function. How far this horizontal division is carried depends on the size of the company involved and on the wishes of its management. Each department is assigned a specific area of responsibility (e.g., estimating) and is headed by a manager who possesses training, experience, and skill in that particular aspect of the business.

Each of the departments thus created is then divided vertically. Vertical division refers to the establishment of lines of supervision, with each individual along a line being accountable to the person above and acting in a supervisory capacity to those below. The farther down a position appears on the organizational hierarchy, the more limited is the responsibility and authority of the person concerned.

The company's organizational structure is depicted in pictorial form in organization charts, showing every position of responsibility, and all lines of supervision and authority. These charts provide an understanding of the company's structure at a glance. The organizational chart is a particularly efficient way to establish clearly in the minds of the employees involved, where their individual positions fit within the overall company organization, along with the identities of their supervisors, and those whom they supervise, and the nature of their duties. It constitutes an established, permanent reminder of job responsibilities. Such a chart also underscores for employees the fact that the business is well organized and that top management knows at all times who is responsible for what. A company organization chart has been shown to be well worth the necessary thought and effort that it requires, in terms of thinking through all company functions and duties and the fixing of responsibilities. It is also very useful in fitting new personnel into the organization.

Figure 3.1 depicts a typical organizational structure of a small contracting company being operated as an individual proprietorship.

The organization chart for a small partnership is presented in Figure 3.2.

Figure 3.3 is a typical organization chart that might pertain to a moderately large corporate firm. It should be recognized, however, that the organizational structure of construction companies can be infinitely varied, and the charts shown are intended only to illustrate typical or frequently utilized frameworks. The organizational structure and the assignment of duties depicted in these charts are for illustrative purposes only, and the allocation of duties is not intended to be complete. It should be

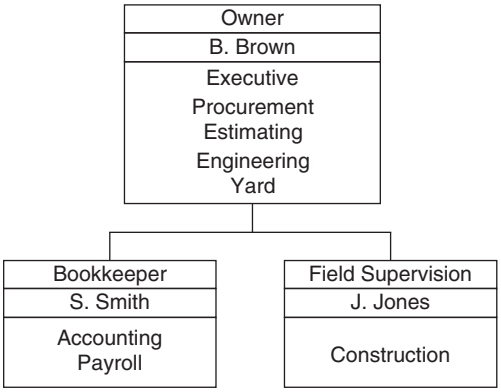



**Figure 3.1** Organization Chart for a Small Individual Proprietorship

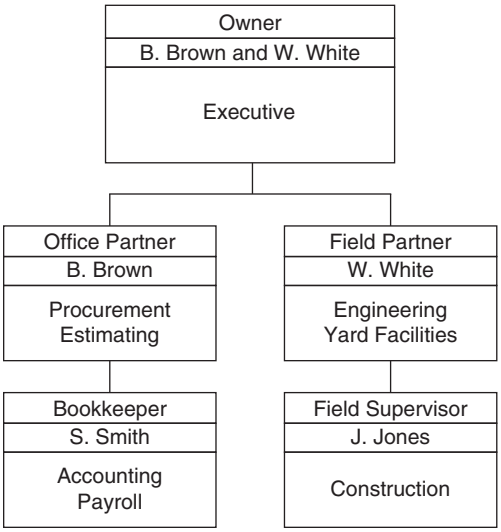



**Figure 3.2** Organization Chart for a Small Partnership

noted that within a company, a person's name will appear with each position shown, along with a list of major job responsibilities.

At this stage of development, the organization chart has established a business team that, in a collective and coordinated manner, will perform all of the duties and functions necessary to allow the organization to function efficiently and profitably. There should be no misunderstanding among participants concerning their job duties, responsibilities, authorities, or with regard to their position in the company.

A valuable accompaniment to the organization chart is an operating chart that serves to establish and define the working relationships among company personnel. The chart shows who participates, and to what degree, when a given activity is performed.

An example of an operating chart is shown in Figure 3.4. Listed across the top of the chart are all of the positions, and the people who are involved in a given function, along with the extent and

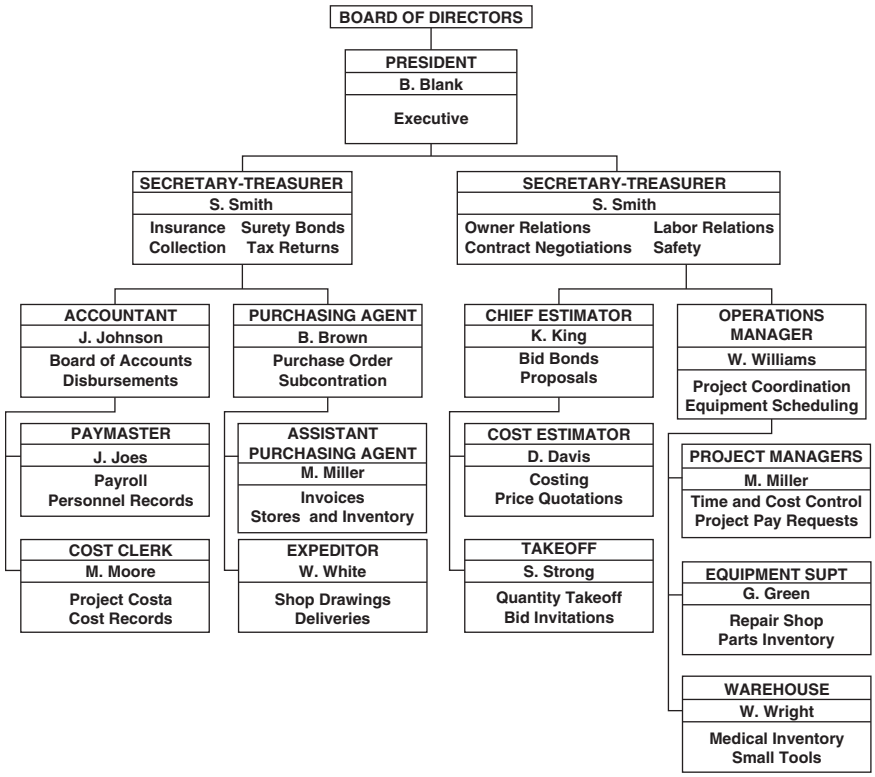


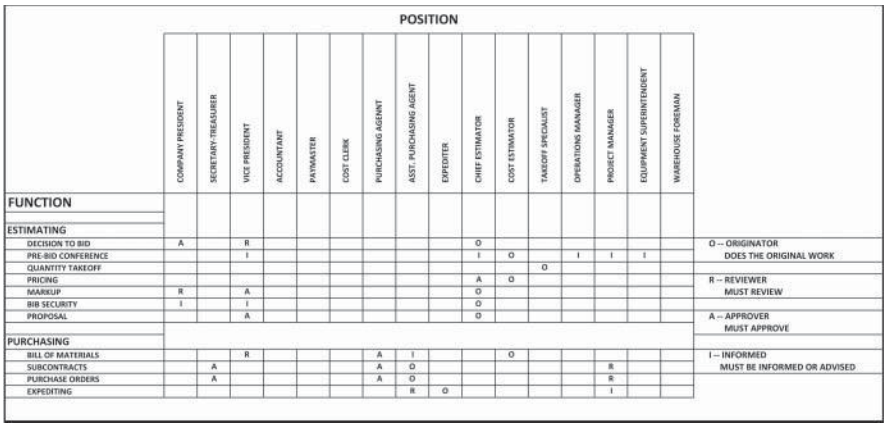

**Figure 3.3** Organization Chart for a Moderately Sized Corporation

nature of their involvement. Listed on the left are the functions for which an individual is responsible and the nature of this responsibility. This serves as an amplified job description. This figure is not intended to be complete or to apply necessarily to the operations of any given construction firm, but it does illustrate the type of information that can be conveyed by such a chart, which is a very effective component of the company organizational plan.

### 3.4.4 Staffing

The organizational structure devised must now be staffed; that is, a person must be assigned to each of the positions created. A company consists of what its people make it, and it is impossible to overemphasize the importance of management selecting the right person for each position it has defined. In the construction industry, supervisory personnel are typically selected on the basis of their field construction knowledge or their technical ability rather than on their management training or experience. The reasons for this are plainly apparent.

However, it should be pointed out that the selection of an individual for a supervisory position only on the basis of construction competence is no guarantee that the most effective person will thereby be obtained. Certainly, detailed knowledge of the construction process is an important attribute for the person who will manage the construction process, but other qualifications are also required. Positions on the lower rungs of the organizational ladder are concerned primarily with specific and technical details. Correspondingly, it is entirely appropriate that people be selected for



| FUNCTION | COMPANY PRESIDENT | SECRETARY-TREASURER | VICE PRESIDENT | ACCOUNTANT | PAYMASTER | COST CLERK | PURCHASING AGENT | ASST. PURCHASING AGENT | EXPEDITER | CHIEF ESTIMATOR | COST ESTIMATOR | TAKEOFF SPECIALIST | OPERATIONS MANAGER | PROJECT MANAGER | EQUIPMENT SUPERINTENDENT | WAREHOUSE FOREMAN |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ESTIMATING | | | | | | | | | | | | | | | | |
| DECISION TO BID | A | | R | | | | | | | O | | | | | | |
| PRE-BID CONFERENCE | | | I | | | | | | | I | O | | I | I | I | |
| QUANTITY TAKEOFF | | | | | | | | | | | | O | | | | |
| PRICING | | | | | | | | | | A | O | | | | | |
| MARKUP | R | | A | | | | | | | O | | | | | | |
| BIB SECURITY | I | | I | | | | | | | O | | | | | | |
| PROPOSAL | | | A | | | | | | | O | | | | | | |
| PURCHASING | | | | | | | | | | | | | | | | |
| BILL OF MATERIALS | | | R | | | | A | I | | | O | | | | | |
| SUBCONTRACTS | | A | | | | | A | O | | | | | | R | | |
| PURCHASE ORDERS | | A | | | | | A | O | | | | | | R | | |
| EXPEDITING | | | | | | | | R | O | | | | | I | | |

O -- ORIGINATOR
DOES THE ORIGINAL WORK

R -- REVIEWER
MUST REVIEW

A -- APPROVER
MUST APPROVE

I -- INFORMED
MUST BE INFORMED OR ADVISED

**Figure 3.4** Company Operating Chart

such positions largely on the basis of their job knowledge, because their management function is limited. However, in selecting individuals for progressively higher positions in the management of field operations, more and more attention must be paid to managerial ability and general experience in the industry. It is now well understood that technical ability alone does not assure managerial success.

Similarly, careful thought and detailed analysis are in order, for determining the qualifications for, and the people who are selected for, all of the field operations of the company. In a literal sense, a company can be said to be what its people make it to be.

### 3.4.5 Communications

The proper functioning of a business depends on the exchange of information of many kinds, both within the firm itself and with external agencies. A good system of company communications is essential for smooth and profitable operation. Top management must be kept apprised of job costs and job progress. Procurement personnel must receive purchasing information concerning materials and subcontractors required for a new project. The project superintendents must be kept advised of contract changes, such as drawing revisions and change orders. Procurement people must keep the yard and the projects aware of the delivery status of materials, and be told of the nature and extent of delivery shortages or damage. Information regarding all job accidents must be conveyed from the projects to company management. The payroll department must be informed concerning hirings and layoffs. Information on back charges against material suppliers and subcontractors must get to the accounting department. These are only a few examples of communications within a company. Numerous examples could also be cited of the need for effective communications with external agencies such as owners, architect-engineers, materials suppliers, subcontractors, banks and other lenders, insurance companies, sureties, and governmental agencies at various levels of government, as well as with the general public.

Communications needs that are repetitive and routine in nature can be met by the establishment of set procedures. The next section discusses the manual of policies and procedures, which has as one of its principal purposes the description of routine communications processes.

Periodic meetings of various groups within company management are a necessity. These meetings provide an opportunity to check and communicate the current status of operations, convey information, exchange ideas, resolve misunderstandings, and decide on future courses of action. Also, this mode of communication can help to establish and maintain team spirit. Brainstorming sessions of such groups have proven to be extremely effective in producing new ideas and management innovation.

To disseminate company information of general interest, bulletin boards, and a company publication are very effective. Issued periodically, the publication can contain matters of interest to company employees and to external constituencies of the organization.

### 3.4.6 The Manual of Policies and Procedures

Company organization and operation charts are very useful and effective management devices, but they alone cannot completely describe the total workings, details, and interrelationships of the organization. There is an obvious need for further development and more detailed and comprehensive descriptions of the company plan. Once the organizational structure has been established, written company policies and operating procedures can be prepared that augment the organization chart and operation chart. These policies and procedures should be set forth in a manual made available to all company personnel concerned. If a loose-leaf manual is used, it is easy to make revisions and add new sheets. In larger organizations, manuals are often issued in separate sections, each of which pertains to the operation of a single department.

Decision making is the essence of management. Some business situations requiring decisions are unique and must be handled separately and individually. However, other situations are recurring and routine. Company rules and regulations or policies provide standard decisions for such repetitive cases. Policies serve as guides for action by all levels of company management and provide uniform and consistent guidance in the handling of problems that recur frequently. Obviously, policies are designed to meet specific situations. Such rules and regulations enhance the effectiveness of the organization and are important to the conduct of everyday business affairs.

Operating procedures establish general rules governing communications, the flow of paperwork, and other routine company operations. Such rules remove much of the necessity for decision making from office routine and allow duties to be assigned to the lowest practical management level. The very act of reducing these procedures to writing helps to clarify ambiguities, removes areas of overlap, and reveals discrepancies and other shortcomings in the organizational plan. The written procedures ensure uniformity of action, are valuable in training new personnel, and reduce the need for close supervision.

The first step in writing any such set of company procedures is generally to have the supervisor of each department consult with his personnel and then write down the procedures that apply to his own area of responsibility. These various procedures are then incorporated into a single set of rules through a series of interdepartmental meetings in which the proposed procedures are coordinated and adjusted.

The policies and procedures manual must be explicit concerning the keeping of records. Records of various kinds are indispensable to the conduct of a business. Government agencies require that certain kinds of business records be kept. In addition, company records pertaining to project costs, shop drawings, equipment maintenance, inventory, job progress, estimating, personnel, and other aspects of the business are of significant importance. Although too few records can be costly, excessive record keeping can become equally expensive. It makes no sense to keep records, other than those

required by law, that are not actually used and whose potential value does not at least equal their cost of preparation.

Record forms should be carefully selected so as to yield a maximum of information with a minimum of effort and clerical time. The manual can include samples of all standard record forms, with explanations and illustrations regarding their use. Printed forms for records and communications are very effective and can save a great deal of time. They simplify the task of adhering to company policies and procedures, and make it possible to use clerical people with less supervision. Additionally, when information is repeatedly presented in the same format, it can be quickly understood by all who make reference to it.

Another matter to be covered by the operating manual concerns routine company reports—who prepares them, when they are prepared, and to whom they are to be routed. Effective decision making depends to a large degree on the timely and continuous flow of needed management information. Reports on project costs, accident experience, current financial status, cash projections, and similar matters present vital operating information in a condensed and summary form for use by company management.

### 3.4.7 The Employee Handbook

Either as a part of the manual of policies and procedures or as a separate document, every company should prepare and distribute to all of its employees, an employee handbook that describes company personnel policies. The handbook should describe every facet of established company personnel procedures, in detail, for the employees. By putting such information into writing, and by providing the employee handbook to all employees, the company can be assured that all employees are informed so that they will know what expectations are. The handbook can do much to establish consistency in company operations and serves to not only set forth the rules of company policy but also to convey company philosophy and expectation.

The employee handbook can serve to enhance morale and sense of belonging. It can help minimize such personnel problems as turnover, absenteeism, and low productivity. By establishing a set of specific policies, the employee handbook also provides those who manage and enforce company policies with invaluable guidance and a solid basis for action in making future personnel decisions.

Matters regarding employee compensation should be discussed, together with a description of how the company rewards merit and superior performance. Company policy on hours of work and overtime should be included. Also included should be a discussion of how the firm deals with tardiness and absenteeism. Vacation time is an important topic, including how the time is accumulated and rules for compensation. Company policy on drugs and alcohol is an especially important aspect of a personnel manual, as is a description of the company safety policy including penalties for violations.

The employee handbook should address itself to how disputes between employer and employee are handled. The employee should be advised of available means of solving problems, and lines of communication should be provided and kept open. A company open-door policy can be very helpful in such matters.

Matters of discipline and causes for termination should be addressed. In addition, a full description of company benefits is needed, along with a reminder of what the company pays, in addition to base pay, to provide these benefits. Opportunities for further training and professional development can be included.

National contractor professional associations such as the Associated General Contractors of America (AGC), Associated Builders and Contractors (ABC), and National Association of Home Builders (NAHB) can provide their contractor members with valuable guidance in developing an

employee handbook. It should also be noted that if the contractor employs union craft workers, the content of the employee handbook must be coordinated with the elements of the collective bargaining agreement.

The handbook should be written in language the employees can understand, and should continuously convey a positive image of both the company and the relationships it intends to develop and maintain with all of its employees. In an overall sense, the handbook should stress the company's desire to create and maintain an atmosphere of mutual concern and mutual respect regarding working conditions and personnel relationships.

### 3.4.8 Plan Implementation and Adjustment

To plan and formulate a company organization requires considerable time and effort. All members of the team must be consulted, and many decisions must be made concerning a wide range of details and relationships. When the organizational plan has reached an advanced stage, a meeting of company personnel should be called to discuss, debate, and finalize the pertinent issues.

Next, the plan can be finalized and implemented. There will then be a period of adjustment and readjustment, as people adapt to the plan, and as the plan is modified so as to work more smoothly and more efficiently. In this regard, it must be recognized that no organizational plan can apply very long without being corrected and revised. As business conditions evolve, and as company size, personnel, and attitudes change, so must the company organization be altered to suit current circumstances. Therefore, the policies and procedures document should contain provisions for the periodic review and adjustment of both the organizational plan and the manual of policies and procedures.

## 3.5 RESPONSIBILITY, AUTHORITY, AND DELEGATION

Responsibility is a personal assignment for which one is held accountable. In a business venture such as a construction company, each employee is charged with specific responsibilities that are attached to the company position that person occupies. Each individual is personally answerable for each of these responsibilities.

Authority is the power to act and make the decisions that are necessary in the process of meeting one's assigned responsibilities, without the need to obtain approval from a superior. It is a basic principle of management that authority commensurate with responsibility must apply at all operating levels. When responsibility for a specific aspect of company operations is assigned, adequate authority must be conveyed at the same time.

In every instance, authority must be given to the individuals concerned, to perform their specific jobs in any way they choose, so long as the results are satisfactory and the procedures conform to established company policies. Responsibility and authority for each company operation must be specifically delegated to an individual, and the necessary resources must be provided. Top management must be able to hold one person fully responsible for each aspect of company operations.

Delegation is the process of assigning specific responsibilities and authorities to individual employees. Employees should be delegated responsibilities commensurate with their training and experience. The obvious objective of delegation is to ensure the effective functioning of the organization as a whole, and to move duties downward until they reach the level of a qualified person who is responsible for their completion.

Basically, delegation is the management function that links the needs of the company with the activities of the individuals who perform the work. Depending on how well the patterns of delegation

mesh with the basic talents and preferences of the individual employees, it can either enhance the organization or detract from its effectiveness. Delegation defines the organization and has a tremendous impact on all company employees. Delegation creates the lines of company authority and establishes the emotional atmosphere of the firm as it applies to individual development and advancement. Delegation should emphasize not only productivity but also the quality of the work environment, sensitivity to the needs of employees for personal satisfaction and fulfillment, and the enhancement of morale in the workplace.

At this stage of development, the organization chart has established a business team that, in a collective and coordinated manner, will do all that is required for the effective operation of the company. There should be no misunderstanding among any company employees concerning job duties, responsibilities, authority, or company position.

## 3.6 MAKING THE ORGANIZATION WORK

There are further considerations in structuring a company organization in such a way that it will function effectively and produce so as to realize its full potential. A positive environment in the workplace and a favorable work atmosphere are basic factors in a company's employee relations program. Some concepts in this regard are briefly discussed next.

### 3.6.1 Decision Making

When decisions are needed, the company policy and management plan should ensure that effective business decisions are made promptly and positively. A common source of management difficulty is the failure of some member of the organization to make needed business decisions in a timely manner. While some decisions cannot be rushed and must receive careful consideration, any unnecessary delay in decision making generally only makes the situation worse.

Decisions rarely please everyone. However, indecision, procrastination, and vacillation serve only to further exacerbate the matter that requires a decision, and to frustrate those awaiting the decision. At each level of the organization, there should be an individual whose function it is to decide on operational courses of action when decisions are required. This person should have the benefit of being able to consult with and to seek recommendations from others as needed, but should realize that he or she has full responsibility for making and implementing the decision, and also has the responsibility for the outcomes of the decision.

### 3.6.2 Personnel Development

People should be provided the opportunity to acquire or improve the skills, attitudes, and abilities necessary to effectively perform the work that is assigned to them. Based on an appraisal of individual strengths and weaknesses, a plan for the personal improvement of each employee in a company is an important management responsibility. Such programs can pay huge dividends, not only in terms of improving employee competence and productivity, but also in terms of enhancing employee morale, and job satisfaction.

Among the many ways in which this can be accomplished is by encouraging and supporting continuing education, training, and professional development through any of a variety of methods, such as providing for the employee to attend formal courses and seminars. When the company pays all or a part of the attendant costs and allows time off from work to do this, the effect is even more dramatic.

Encouraging membership and participation in construction professional associations, along with such measures as encouraging committee participation, job rotation, and coaching on the job, can also be effective.

### 3.6.3 Training of Replacements

One of the keys to company success and continuance is the matter of seeing to the development and support of aspiring talent. People do, in fact, become ill and miss work, or retire, or die, or leave the company and must be replaced. In cases of sickness or other temporary absence, someone must fill in. Management must develop means for maintaining company operations when events of these kinds occur.

Additionally, people currently in the company should be encouraged to develop to their full potential and level of aspiration. The person in a position of job responsibility who, because of a dominant personality or fear of his job security, does not develop likely successors from among subordinates, is not an effective worker or manager and is not serving the best interests of the company.

Additionally, the company should always be on the lookout for new talent that can contribute. Whether in office functions or in field operations, or whether in staff positions, craft positions, or management positions, new infusions of new ability, intellect, and personality, when needed, can be expected to have positive effects on company operations.

### 3.6.4 Motivation

People within the organization should be encouraged, inspired, and impelled to do what needs to be done. One of the key factors in employee motivation is the human need for a feeling of recognition, self-esteem, and satisfaction. In this regard, it should be noted that it has repeatedly been demonstrated that money (wages or salary) is not the only compelling element. Working with other people in a professional and nurturing environment is the primary means of employees securing a feeling of recognition and importance. It has been shown that most people want to feel they are part of a team and that they are contributing in a positive way in something they know is bigger than themselves.

Managers and employees at all levels do well to learn more about the elements of human motivation and job satisfaction. It has been demonstrated repeatedly that motivated and satisfied workers, regardless of their rank or position in a company, are more productive, and work more safely.

One of the tests of a good manager is his ability to build a closely knit, effective operating group. To do this, employees should be given the opportunity to display their talents and capabilities, and there should be a suitable reward system or other outward manifestation of recognition for achievement.

## 3.7 SUMMARY AND CONCLUSIONS

Company organization is an indispensible management function. As has been illustrated in this chapter, this process involves consideration of a great many factors. Knowledgeable and effective company owners and managers follow a process and build a structure that meets the needs of the company and its employees and allows the company to fulfill it objectives.

## CHAPTER 3 REVIEW QUESTIONS

1. Define staffing of a construction company, and name the most important consideration in staffing.
2. Define the manual of policies and procedures in a company.
3. Define the employee handbook.
4. Describe who in a construction company should have a copy of the manual of policies and procedures and the employee handbook.
5. Define the terms *duty, authority, responsibility,* and *delegation*.
6. Restate the cardinal rule regarding the relationship that should exist between responsibility and authority.
7. Review and list the eight steps in the development of an effective company organization, as presented in this chapter.
8. List and discuss three important objectives of a company organization chart.

# Chapter 4

# Project Design and Contract and Bid Documents for a Project

## 4.1 INTRODUCTION

The discussion in Chapter 1 included a definition and description of "the people involved in a construction project." This chapter will focus on the evolution and development of the design for a project, and the contract and bid documents that are used by the architect-engineer to communicate the design. As those topics are developed, the roles of some of the people involved—owner, architect-engineer, construction manager, prime contractor, subcontractor, and vendor—will be further discussed in the context of the evolution of the design of a construction project and in terms of the development and use of the contract and bid documents for the project.

## 4.2 THE ARCHITECT-ENGINEER

As was noted in Chapter 1, construction projects are designed by licensed professional designers, architects, and/or engineers. The nature of the project and the preference of the owner determine the division of responsibilities between these two design professionals. As a general rule, building projects are designed by architects or have an architect as the primary designer, and civil, structural, electrical, and mechanical engineering services are provided to the architect by consulting engineers as needed.

Highways, bridges, and heavy construction projects, as well as utility and industrial projects, are typically designed with an engineer as the primary designer, and architectural services are included as may be needed. Such projects are typically referred to as engineered projects or engineered construction.

Additionally, there are a number of firms that designate themselves as architect-engineers that perform planning and design work in both classifications of construction work. In this text, the term *architect-engineer* is used to designate the organization, person, firm, or team that performs the project design, whether it be architectural, engineering, or a combination of both, in composition.

The architect-engineer can occupy a variety of positions contractually relative to the owner and contractor on a project. Typical among these are the following.

### 4.2.1 Owner-Client

In the traditional project delivery method, the architect-engineer is a private professional design firm that enters a contract with the owner to perform professional design services, as depicted in Figure 4.1.

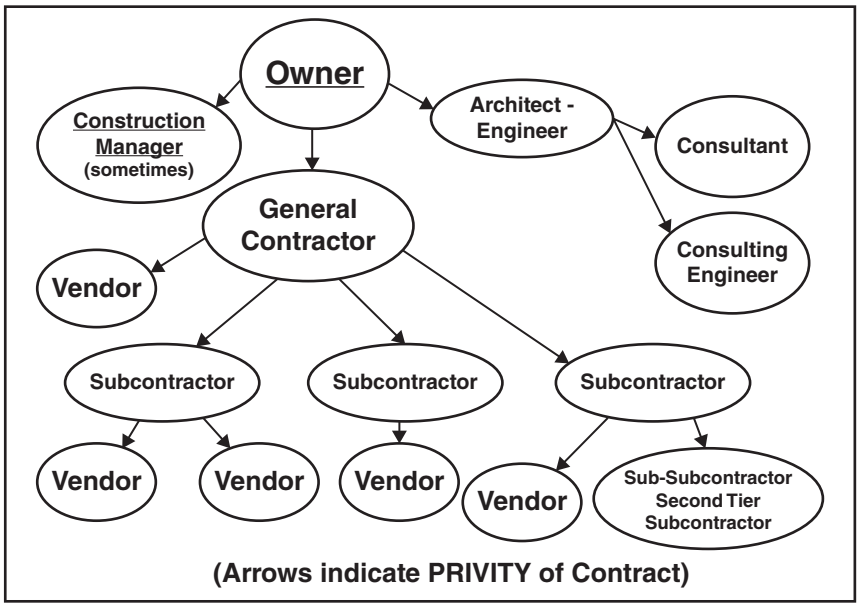



**Figure 4.1** Contractual Connections and Hierarchy of Contracts on a Typical Building Construction Project

Most often, the construction is performed by a single prime contractor or by a number of separate prime contractors who also have a contract with the owner. In this project delivery method, there is no privity of contract between the prime contractor and the architect-engineer.

### 4.2.2 In-House Capability

Owners sometimes have their own in-house design capability. For example, some large industrial firms and petrochemical firms, as well as many public agencies that have ongoing construction needs, maintain their own design departments. In these firms, the architect-engineer is an integral part of the owner's organization. Construction is usually accomplished by an independent construction firm or firms, who enter a contract with the owner in the single-contract system or the separate-contracts system. However, some large firms and agencies also maintain in-house construction capability for the construction of their projects.

### 4.2.3 Design-Build

In this project delivery method, the owner contracts with a single entity for both the design and construction of the project. This project delivery method is very popular today and is being employed by an increasing number of owners. Although the architect-engineer and the contractor may be related in a variety of ways on design-build projects, four of the most commonplace arrangements are:

1. An architect-engineer design firm may maintain in-house construction capability alongside its design staff.

2. A contractor may have in-house design capability with architects and/or engineers on its staff.
3. The contractor and architect-engineer, both functioning as separate and independent firms, may form a joint venture design-build firm for the performance of a given project or contract.

### 4.2.4 Construction Management

The owner may enter a contract with a construction management (CM) firm separate from the contracts that the owner has with the architect-engineer and with the prime contractor, in an arrangement referred to as construction manager as agent, construction management agency, or construction management at risk (CMAR).

In the construction management agency arrangement, the owner is generally seeking the input and advice of the construction manager and is looking to the construction manager to represent the owner's best interests throughout the evolution of the design, as well as after the design is complete and when a contract has been awarded to a contractor. The contract between the owner and the construction manager, as well as the contract between the owner and the architect-engineer, will call for extensive collaboration and cooperation between the architect-engineer and the construction manager in the evolution of the design and the production of the contract and bid documents, as the owner seeks to ensure that his best interests are maximized throughout the process. During the construction process, and often extending through the warranty period following completion of the project, the owner's contract with the construction manager calls for the construction manager to continue to provide guidance, advice, and counsel to the owner.

The owner may also enter a contract with a construction manager, which is a CMAR arrangement. In this form of CM contract, the construction manager takes contractual responsibility for completion of the contract in accord with the provisions of the contract documents for the project, and is further bound to complete the project not later than a specified date, and for not more than a specified sum. In this arrangement, the construction manager typically will provide input during project design as well. The separate-contracts method of contracting is commonly used in this arrangement.

Both construction manager as agent and construction manager at risk, as well as single-contract and separate-contract delivery methods, are more fully discussed and are illustrated in Chapter 1.

### 4.2.5 Design-Manage

In this arrangement, the owner enters a single contract for both design and CM services. A design-manage firm may perform both the design and CM functions, or the architect-engineer can be a corporate affiliate or subsidiary of the construction manager, or there can be a joint venture between the architect-engineer and the construction manager.

## 4.3 DESIGNERS' PROFESSIONAL ASSOCIATIONS

Several associations of designers of construction projects provide a variety of very valuable services for architect-engineer professionals. These associations provide ethical, professional, and business guidance to the individual architect-engineer. Among these professional organizations are the American Institute of Architects (AIA), National Society of Professional Engineers (NSPE), Construction Management Association of America (CMAA), and the American Council of Engineering Companies (ACEC). These professional associations serve in a number of ways to promote and protect the image and reputation of the design profession and to assist their members in achieving higher professional,

ethical, business, and economic standards. Additionally, these professional associations produce and publish a variety of "standard form documents" that are very widely utilized in professional practice.

## 4.4 SELECTION OF THE ARCHITECT-ENGINEER

When the owner has in-house design capability, there is no need for a selection process to choose an architect-engineer to design a project for the owner. Otherwise, and for most construction projects, some form of selection process must be followed. Four options that the owner may exercise when selecting a design firm are:

1. The owner seeking out a firm, or a number of firms, and negotiating a contract with the firm of choice.
2. A design competition wherein interested firms present designs and qualifications to the owner, who then selects a designer with whom he will enter a contract.
3. Call for submissions from interested designers with selection based on professional qualifications alone.
4. Call for submissions, which include designation of fees that become a part of the evaluation criteria.
5. Call for bids for professional services and selection on the basis of price alone.

Traditionally, professional societies of architects and engineers have opposed competitive bidding and price competition as a basis for selecting firms to perform professional design services. A number of professional associations have included in their codes of ethics prohibitions against such competitive bidding by their members. These organizations advocate that design professionals should be selected by the owner, based on their qualifications and competence, with the professional fee to be determined through negotiation. Objection to competitive bidding for planning and design services is voiced on the grounds that it is not in the best interest of the client or the public.

However, in 1978, the U.S. Supreme Court ruled that the National Society of Professional Engineers' ethical ban on competitive bidding for engineering services was not permissible under the Sherman Antitrust Act. As a result of this decision, the professional societies for designers, to which almost all designers belong, may not prohibit competitive bidding procedures if those in practice wish to engage in such methods. Consequently, it is not now considered unethical to submit or to invite such bids. Professional societies, however, may encourage owners to continue using the traditional selection and fee-setting procedures. Professional designers are not required to submit bids, and owners may, if they wish, shun competitive procedures in their procurement of professional design services.

Most agencies of the federal government are prohibited from using competitive bidding in the procurement of design services by the Brooks Act (1972). This act mandates the negotiation of design contracts at fair and reasonable prices on the basis of demonstrated competence and qualifications for the type of professional service required. Many states have passed legislation with provisions similar to those in the Brooks Act, that set forth professional selection and negotiation procedures for state-financed projects.

Nevertheless, recent years have witnessed a pronounced shift away from the traditional selection of design professionals exclusively on the basis of qualifications. Following the 1978 Supreme Court decision on competitive bidding by design professionals, there has been a substantial movement by public owners, other than the federal and some state governments, toward the use of price as one of the criteria to be utilized in the selection of architect-engineer firms. The procurement codes of many

state and local governments now make the design fee an integral and important component of the selection process. Certain public agencies presently issue fee schedules that apply to their selection of design professionals. In the private sector, the amount of the designer's professional fee usually plays an important role in the procedure for the owner's selection of a designer.

Additionally, there are now requirements that certain designated construction design contracts be set aside for small businesses. Such "set-aside projects" frequently require a specified maximum estimated professional fee or a specified maximum estimated project cost. Small design businesses are identified by the U.S. Small Business Administration as those with annual gross billings of less than a specified maximum average value.

## 4.5 SERVICES PROVIDED BY THE ARCHITECT-ENGINEER

The scope of services to be provided by the architect-engineer is subject to considerable variation, depending on the needs and wishes of the owner, and as formalized in the owner-designer contract. Basic to such services, however, are the following:

- Analyzing and ascertaining the needs of the owner.
- Developing a design that will meet the needs of the owner within the owner's budget.
- Preparing the contract and bid documents for the project.
- Assisting the owner in the selection of a contractor.
- Usually, representing the interests of the owner during the construction process.
- Sometimes the architect-engineer firm is also called upon in its contract with the owner to assist the owner with warranty matters following the conclusion of the construction contract.

The function of analyzing the needs of the owner is usually referred to as programming. The architect-engineer assists the owner in the development of a complete and detailed itemization of the owner's needs and wishes. The design produced by the architect-engineer will then address those items that have been listed in the program.

The design produced by the architect-engineer will need to be constructed within the budget the owner has established. In this regard, an early action in the initiation of a proposed construction project is the architect-owner's assisting the owner with the establishment of his budget, as well as the formulation of an estimate of the probable final cost of the project. Such conceptual and feasibility cost estimates (discussed more fully in Chapter 5) are standard procedure for most construction projects and provide the owner with invaluable information concerning necessary project financing. A conceptual cost estimate is the usual starting point for a construction project and is often made using the standards manual issued by the American Society of Professional Estimators. In this ease, the estimating guidelines are based on the standardized system developed by the Construction Specifications Institute (CSI) and called "Construction Specifications Institute MasterFormat 2014," as shown in Appendix C of this text.

Additionally, the architect-engineer firm may utilize other construction cost summaries such as those produced by the RSMeans Company, the Frank Walker Company, or others. In addition, architect-engineers sometimes engage the services of contractors on a paid consulting basis to provide conceptual and preliminary estimates for use by the owner and the design team as the design is produced.

Whether the project delivery method is competitive bid or negotiated, the architect-engineer's contract with the owner will typically include a requirement that he assist the owner in receiving

contractors' proposals, analyzing the proposals and other submittal data, evaluating contractors' credentials and references, and selecting the contractor.

The scope of services provided to the owner by the architect-engineer during construction of the project depends on the needs and preferences of the owner. While the responsibility of the architect-engineer to the owner may cease when the contract documents are finalized and delivered, the owner may require full construction-phase services, including project inspection or observation during construction, the checking of shop drawings, the approval of periodic payments to the contractor, the issuance of a certificate of completion, the processing of change orders, and project closeout. Additionally, owners frequently include provisions in the designer's contract whereby the architect-engineer will assist the owner with administration of warranty issues during the contractor's warranty period for the project.

Although the architect-engineer is not usually a party to the construction contract between the owner and contractor, the contract between the owner and the architect-engineer often conveys certain powers to the architect-engineer such as the authority to act on behalf of the owner, to decide contract interpretation questions, judge performance, condemn defective work, and stop field operations under certain circumstances.

A standard form of design contract between the architect and owner, published by the American Institute of Architects, AIA Document B101–2007 "Standard Form of Agreement between Owner and Architect," which is widely used for building construction, is reproduced in Appendix B. It should be noted that this and other standard forms and documents reproduced in this text are for illustrative purposes only. Because AIA documents are revised from time to time, users should obtain from the AIA the current editions of the documents reproduced herein.

## 4.6 FEE FOR DESIGN SERVICES

When an architect-engineer, acting as a private practitioner, performs a design service for a client, the professional fee may be determined in a number of different ways. The most commonly used are the following:

Percentage of construction cost.

Multiple of salary cost.

Multiple of salary cost plus nonsalary expense.

Fixed lump-sum fee.

Total expense plus professional fee.

Hourly or per diem charge plus expenses.

The basic elements of the agreement as previously described in the clauses, are typically supplemented with additional language relating to compensation for the architect-engineer's expenses such as travel, document reproduction, and so on.

Fees for the design professional on publicly financed projects are often subject to statutory or administrative conditions and limitations. There are instances where the design contract between the owner and architect-engineer provides that payment of the fee is contingent in some way on the project cost being within the budget established by the owner. For example, such contracts may provide that the architect-engineer shall not be entitled to any increase in fee when project redesign is required to keep construction costs within an agreed-upon budget amount. It is common for design contracts to provide that the architect-engineer's fee be paid in installments, as designated phases of the designer's

services are completed. It should be noted that contracts between the owner and the architect-engineer in private construction projects often contain provisions similar to these as well.

## 4.7 RESPONSIBILITY TO THE OWNER

Although the owner and architect-engineer are usually joined together by contract, their exact relationship depends on the duties being performed by the architect-engineer as defined in the contract. In the preparation of bid documents and contract documents, the architect-engineer firm functions primarily as an independent contractor; however, during construction of the project, its role is that of being an agent of the owner, acting to ensure that the contractor fulfills all of the requirements set forth in the contract documents. Throughout, the architect-engineer has a fiduciary obligation to its client requiring fairness, trust, and loyalty to the owner. Additionally, the design professional must avoid any conflict of interest that could work to the disadvantage of the owner.

The common-law standard of care applicable to architect-engineers is the same as that for other licensed professionals such as doctors and lawyers. The services of experts are sought by the public because of the special skills which they possess. These professionals have a duty to exercise ordinary skill and competence in carrying out their function, and a failure to discharge this duty will subject them to liability for negligence.

As a professional, the architect-engineer is required to exercise care and diligence in carrying out its responsibilities. Learning, skill, and experience are expected to the degree customarily regarded as being necessary and sufficient for the usual practice of that profession. By the contract of employment, the architect-engineer implies that it possesses the ordinary skill and ability for a person acting in this capacity, and that it will carry out the design with promptness and a reasonable exactness of performance.

The designer is responsible for the adequacy of the materials, components, and systems that are selected and specified. The architect-engineer also bears the responsibility for preparing design documents that are in conformance with applicable building codes, setback requirements, zoning regulations, and environmental regulations. It is not expected that the architect-engineer produce a perfect design, or even satisfactory end results. However, the law expects the design professional to carry out the tasks it has undertaken with reasonable standards of care, skill, and performance. If the owner suffers loss or injury because this standard is not met, the architect-engineer is liable for damage or injury that may result.

Architect-engineer liability to the owner may arise through breach of contract or through tort responsibility. More specifically, the designer can be held liable to its client for violation of a specific contract provision, from an express or implied warranty in the design contract, or from negligence in the performance of the architect-engineer's duties under the contract. If the design professional is found to have given an express or implied warranty regarding the sufficiency of the design, or indicating that the structure would be reasonably suitable for the purpose intended, then the architect-engineer is strictly liable for damages caused by a breach of the warranty, and it is not necessary that the owner prove any specific negligence. Although legal interpretations vary somewhat, most jurisdictions hold that there is no implied warranty by design professionals that their plans and specifications are adequate for a specific purpose, except as previously noted. According to most courts, an architect-engineer warrants its work only to the extent that it has used the customary skill of the profession.

Although the architect-engineer firm can be held responsible for lack of care, diligence, or skill, it is not normally considered to be negligent because of errors in judgment. However, there is a

definite trend in the courts toward expecting a greater degree of perfection and foresight on the part of architect-engineers and holding these parties responsible for their negligence. In addition, if the architect-engineer represents itself to be a specialist in a certain type of work, it will likely be held to a greater degree of competence and care than would a general practitioner.

If the architect-engineer selects and employs consultants such as electrical engineers, mechanical engineers, acoustical engineers, or landscape architects to design or advise concerning specialized portions of the project, as he almost always does, the architect-engineer remains responsible to the owner for the overall adequacy of the completed design. In this regard, the design professional has a nondelegable duty to the owner and promises by implication that all services will be properly performed. If a consultant's work should prove to be faulty, the architect-engineer is liable to the owner for any resulting damages. The consultant is, in turn, accountable to the architect-engineer for whom the special work was done.

If the architect-engineer's contract with the owner includes provision for inspecting or observing the work of the contractor during construction, it has the duty to ensure that the contractor materially complies with the drawings and specifications and fulfills the requirements of the contract documents. It has the responsibility to see that the owner receives substantially the structure called for by the construction contract.

Design professionals sometimes include exculpatory clauses, which are also known as "hold harmless" clauses, in their design contracts in an attempt to limit their professional liability. Some of these clauses provide that the architect-engineer will not be liable to the owner for damages resulting from negligence of the designer. Other clauses limit the potential liability of the architect-engineer to a specific amount. However, such agreements generally apply only to parties who sign them and cannot limit the architect-engineer's liability to third parties.

Additionally, with regard to exculpatory language in design contracts, certain contractual exemptions from liability have been declared invalid by state statutes, and the general enforceability of such contract clauses is uncertain at best. Courts favor strict interpretation of such exculpatory clauses and seek to avoid contract provisions that excuse parties from their own fault or negligence.

A relatively new approach called a contingency reserve provides that the owner agrees to establish a fund of some specific percentage (perhaps 5 percent) of the construction cost of the project. This reserve is to be used by the owner as necessary to pay the contractor for expenses arising from minor design errors or omissions. The owner agrees not to bring any action against the architect-engineer for additional construction costs within the limits of the contingency reserve, even though they may be the fault of the architect-engineer.

## 4.8 LIABILITY TO THIRD PERSONS

Legislative law now generally recognizes that an architect-engineer can be held liable to a third party if bodily injury or property damage is caused to that party by reason of negligence or failure in duty of the designer. Common laws have long held architect-engineers to a similar standard. The law of negligence requires a professional to exercise reasonable care to protect third parties during the performance of the professional's work. In addition, the architect-engineer may in some instances be held liable to third parties for economic loss suffered as a result of its negligence. In this context, *third party* refers to any party who does not have privity to the design contract between the architect-engineer and the owner.

Third-party liability can arise from a project either during its construction or after its acceptance and occupancy by the owner. Under this concept of liability, architect-engineers now find themselves

subject to damage claims by contractors, subcontractors, construction workers, sureties, suppliers, lenders, and outsiders lawfully on the project premises, where the negligent performance of duty by the architect-engineer allegedly caused or contributed to harm or injury.

Recent years have seen the design professional increasingly held liable to general contractors and subcontractors for economic loss caused by the architect-engineer's negligence. Architect-engineers have been held liable for a variety of injuries suffered by workers during construction and by members of the general public after project completion. There have been several cases in which an architect-engineer firm, being responsible in its contract with the owner for job inspection, has been judged responsible for the safety of the work and has been made liable for damages when it failed to take corrective measures, if it knew or should have known of a dangerous job condition. Negligence suits stemming from injuries suffered on completed projects have been filed by parties whose injuries were caused by alleged improper or inadequate design. An architect-engineer's continuing liability for completed projects is often limited by special statutes of limitations, a subject discussed in the following section.

In any discussion of tort liability arising out of negligence, the matter of strict liability arises. There is an increasing trend in this country toward imposing strict liability, on the basis of implied warranty, for injuries caused to the user or consumer of mass-produced products. Product liability, or strict liability, refers to liability without proof of fault; that is, liability for damages is not based on a demonstration of negligence on the part of the producer of the goods. Under this theory, the person suffering injury or damages can receive compensation if it can be proved the product was defective and this defect caused the injury or other loss. The courts have not yet applied product liability to architect-engineers or construction managers, although strict liability has been applied to the manufacturers of prefabricated buildings and to builder-vendors who produced and sold homes that were shown to be defective. These findings were based on implied warranties of workmanship and habitability.

## 4.9 STATUTES OF LIMITATIONS

Most states now have special statutes of limitations that apply to the accountability for damages that arise out of a defective and unsafe condition created as the result of an improvement to real property. These statutes apply to architect-engineers and construction contractors and establish a time beyond which these parties are no longer liable for damages arising out of completed construction projects. Such statutes provide that the time during which the architect-engineer and contractor remain liable begins with the substantial completion of the work or acceptance of the work by the owner. These statutory periods vary from 4 to 20 years in the various states, with the average being about 7 years.

In those states without such statutes, the architect-engineer and contractor must rely on the states' general statutes of limitations. The time period within which a given action must be brought under these statutes varies. However, a typical statute provides for a three-year period for torts (negligence) and a six-year period for breach of contract. A serious question concerning these general statutes of limitations arises with regard to when the statutory time begins. The usual provision for negligence suits against architect-engineers and contractors is that time starts when the cause of action accrues. The right of the owner to sue for breach of contract ordinarily begins when the work is accepted. However, there can be exceptions when the construction defect is concealed. Such defects are commonly referred to as *concealed defects* or *latent defects*.

The result of these conditions is that in those states without special statutes of limitations, the architect-engineer and contractor are indefinitely vulnerable to suits charging negligence or breach of

contract. In this regard, it must be noted that some of these special statutes of limitations have been declared unconstitutional in recent years.

In general, it can be said that architect-engineers must be aware of the liability that they assume in the performance of their design work. As a matter of fact, most architect-engineer firms carry professional liability insurance, which is commonly referred to as *errors and omissions* insurance to assist them in managing this risk.

## 4.10 CONTRACTOR INPUT INTO DESIGN

Although construction contracting firms do not typically think of themselves as participants in the design process, increasingly the experience and expertise of constructors are being sought for use by owners and designers. It has repeatedly been shown that construction contractors are a valuable addition to the design team.

In the traditional and still predominant linear construction process, there is usually no input from the contractor into the design process. There are occasional instances where the owner or architect-engineer obtains the consultation services of a contractor during the planning and design phases, but this is much more the exception than the rule. However, extensive contractor input into design is a normal part of design-construct, construction management, and design-manage contracts, where the team concept prevails.

Where the input of experienced construction people into the planning and design of the project is a part of the procedure, the contractor typically enters the process at an early date. The constructor does not perform the design but provides continuing advice concerning general site planning, local work practices, labor availability and costs, material availability, delivery times, and alternative work methods and procedures. The contractor prepares cost estimates and construction and procurement schedules and participates in the value-engineering program. The contractor's knowledge of prices and the availability of materials and services is an invaluable source of information to those making design decisions. As one who is familiar with performance, maintenance, and installation costs, the contractor can help assess life-cycle costs and benefits. Additionally, as one who is familiar with construction procedures and details, the contractor can provide input regarding constructability, and/or the most effective use of various materials, methods, and details to best advantage. Under the right circumstances, contractor input into the design process can result in substantial benefits of all kinds to the owner.

## 4.11 PROJECT DESCRIPTION—COMMUNICATING THE DESIGN

The nature and extent of the construction to be performed, the materials to be provided, and the quality of workmanship required for the project are described by the drawings and specifications. Complementing each other very closely, the drawings and specifications present a complete description of the project and the work to be done. The drawings portray pictorially the extent and arrangement of all of the components of the structure. The specifications describe in writing the quality of the materials and the standards of workmanship required. These documents serve four important functions. First, they are the communication tools with which the design of the project is articulated to the owner, to the contractor, and to all other parties associated with the project. Second, they define the entire project and all that is to be built, and thereby serve as a basis for competitive bidding or contract negotiation. Thus, they become the basis for formation of the construction contract. Third, they serve as contract administration documents during the construction phase, describing the work to be accomplished and

defining the rights and duties of the participants. Fourth, they are component elements of the contract documents for the project (as discussed in the paragraphs that follow), that define and describe the materials to be used (concrete, brick, steel, wood, gypsum products, etc.) in terms of comprehensive reference standards that have been developed, which define their key properties. The drawings and specifications will be further discussed in sections to follow, in the context of being components of the complete set of contract documents for a project.

## 4.12 ANNOUNCING THE PROJECT TO CONTRACTORS

When the architect-engineer has completed the design and the owner has approved, the project will be announced to construction contractors, meaning that the bid documents and contract documents (to be more fully discussed in sections that follow) will be made available to contractors, and contractors will be invited to prepare and submit proposals for negotiation or competitive bidding. Generally speaking, there are two methods by which the project may be announced to contractors: advertisement for bids and an invitation to bid.

### 4.12.1 Advertisement for Bids

The advertisement for bids serves as public notice to all contractors that those who are interested and can qualify are being sought to submit proposals for the construction of the project. This method of making contractors aware of the project may be used at the election of the owner on private projects. On public projects, statutory requirements typically indicate that this method must be employed.

Advertisements for bid are typically placed in newspapers, magazines, and in design and construction professional journals. They are listed with contractor news services such as the Dodge Reports, and are furnished to contractor professional associations such as the Associated General Contractors (AGC), Associated Builders and Contractors (ABC), and others. The intent is to place the advertisements for bids wherever the owner and architect-engineer believe contractors may see them and to attain broad distribution so that any contractors who are interested can learn of the project and determine whether they wish to prepare and submit a proposal.

The advertisement for bids typically is included in the bid documents that the architect-engineer makes available to the contractors. The bid documents and the other elements that comprise the set of bid documents are further discussed in the sections that follow.

The advertisement for bids may also be referred to as a *notice to bidders* or as *public notice*. Additionally, in a semantic twist, the advertisement for bids may also sometimes be referred to as an *invitation to bid*. Even when this term is used, this method of making contractors aware of the project is distinguished from the invitation to bid, as it will be discussed in a following section, by the fact that it is public notice to any and all interested contractors.

The advertisement for bids usually contains basic information regarding the name of the owner and architect-engineer, the location of the project, approximate size of the project, and a general description of the scope of work.

Also included is information regarding the procedure for contractors' obtaining the bid documents and contract documents, and reference to deposits that may be required, along with a notation indicating whether deposits are refundable. The expected start date for the project, along with its

duration, which is the amount of time that has been allocated for the contractor's completion of all contract requirements, will typically be included. The contract system or project delivery method is described, along with the date, time, and place when proposals are due. Additionally, requirements for bonds, and any prequalifications that the owner and architect-engineer may have established, will be set forth. Instructions and procedures for contractors' obtaining bid documents and contract documents are included. The advertisement will also typically include a statement reserving the owner's right to reject any and all bids.

In addition, the advertisement for bids will usually contain a general description of materials and construction trades to be included in the project. This may take the form of a listing, or this information may be conveyed in terms of divisions of the Construction Specifications Institute (CSI) divisions and/or division numbers that are applicable.

Figure 4.2 illustrates an advertisement for bids for a building construction project, and Figure 4.3 provides an example of an advertisement for bids for an engineered construction project.

**Advertisement for Bids**

Sealed bids for the construction of a Municipal Airport Terminal Building at Portland, Ohio, will be received by the City of Portland at the City Manager's Office at 1234 Main Street until 2 PM EST May 22, 20__, and then will be opened and publicly read aloud. Bids received after bid closing time will be returned unopened.

Drawings, Specifications, and Bid Documents and Contract Documents will be available March 20__, and may be examined without charge in the City Manager's Office; in the office of JLM architects, 157 South Welsh Street, Portland, Ohio; and in Plan Rooms in Cleveland, Akron, Toledo, and Youngstown, Ohio. Copies may be obtained from the Architect-Engireer upon payment of a refundable deposit of $250 per set, as a guarantee for the safe return of the documents not later than 10 days after bids are opened.

A single prime contract will be awarded for construction of a four story building of approximately 45,000 sf. The work includes: drilled pier foundations; cast-in-place concrete isolated slab on grade; carton forms; cast-in-place concrete columns and elevated structural slabs; structural steel framing; structural and cladding precast concrete; face brick and CMU masonry; single ply membrane roof; light gauge metal stud framing; rigid, batt, and sprayed-in thermal insulation; drywall; vinyl wallpaper; interior and exterior painting; carpet and vinyl composition tile flooring; fixed glass and operating sash glazing; metal door frames and wood and metal doors; hardwood paneling; millwork; suspended acoustical tile ceiling; sprayed-on acoustical ceiling; water-exchange HVAC system; high-voltage and low-voltage electrical systems; complete security and fire protection systems.

Bids are to be submitted on the Proposal Form provided in the Bid Documents, with all entries on the Proposal Form to be completed and the proposal signed by the contractor. The Proposal Form is to be submitted in a sealed envelope accompanied by an acceptable Bid Bond bearing a face amount of ten percert of the largest possible total of the bid submitted, including the Base Bid and all Alternates, and providing a guarantee that one hundred percent perforrnarce and payment bonds will be provided at contract signing. No bidder may withdraw his proposal after the hour set for the opening thereof, or before the award of contract, unless said award is delayed for a period exceeding 30 days. The owner reserves the right to reject any and all proposals, and to waive any formalities or technicalities.

John Smith

City Manager

City of Portland

**Figure 4.2** Advertisement for Bids for a Building Construction Project

**Advertisement for Bids**

***BID INVITATION***
***RFB NO.*** *2014-015*

**City of Waco**
(Owner)

Sealed bids for **ACT Services Road** for the City of Waco will be received by the CITY OF WACO in the office of **Purchasing Services, 1415 North 4th Street, Waco, Texas, 76707** until **2:00 P.M.** on **May 22nd** and will be opened and publicly read at 2:01 P.M. in the office of Purchasing Services on the same day. Mailing address is **Purchasing Services, P.O. Box 2570, Waco, Texas, 76702-2570**.

Information for bidders, bid forms, contract forms, plans, specifications, bid bond forms, performance and payment bond forms and all other contract documents related to this project may be obtained for a **$100.00 deposit per printed set for General Contractors ONLY (2 set maximum) a complete set on CD, available to both General Contractors and Subcontractors, by contacting Bryan Gray at 254-750-6640.**
**Blueprint deposits and/or purchase of CD must be in the form of check or money order ONLY, made payable to City of Waco. Cash or credit card will NOT be accepted.** Any bona-fide bidder, upon returning the documents in good condition **within ten (10) days** from the date of receipt of bids, shall be returned the depoist. All Checks will be deposited after the ten-day deadline has passed and will no longer be refundable.

**A pre-bid conference** for this project will be held on **May 13th at 2:00 P.M.** at The Waco Regional Airport Conference Room, 7909 Karl May Drive, Waco, Texas 76708. All Subcontractors are welcome and encouraged to attend the session.

The owner reserves the right to waive any informality or to reject any and all bids.

Each bidder must submit a depost with his bid security in the minmum amount of 5% of the greatest amount of bid. The bid bond and surety's power of attorney must both reflect the bid opening date.

Bidders shall pay particular attention to the required employment conditions that must be observed and the minimum wage rates to be paid under the contract.

The established Disadvantaged Business Enterprise (DBE) Goal for this project is 6.64% as required by 49 CRF part 26. *Participation By Disadvantaged Business Enterprises in Department of Transportation Financial Assisstance Programs*.

No bidder my withdraw their bid within 60 days after the actual date of the bid opening.

CITY OF WACO, TEXAS
WACO REGIONAL AIRPORT
SERVICE ROAD

**Figure 4.3** Advertisement for Bids for an Engineered Construction Project

## 4.12.2 Invitation to Bid

The invitation to bid is utilized by the owner and architect-engineer when they wish to notify contractors, whom they have preselected, of the existence of the project and of the fact that they and selected others are being invited to submit proposals. Invitations to bid, as defined here, are typically prohibited by statutory stipulations that regulate contract formation in public construction work. However, they are legal for use on private construction projects and are utilized when the owner and architect-engineer have preselected or have prequalified certain contractors that they wish to invite to submit proposals. When this method is employed, there is typically a stipulation in the invitation and/or in the instructions to bidders, that only those contractors who have been invited may submit proposals to be considered for the project. The invitation to bid typically also contains the same kind of basic information about the project, and the contracting method, etc. as described above for the advertisement for bids.

## 4.13 PROJECT MANUAL

The architect-engineer commonly assembles the bid documents and the contract documents into a book or binding, which is referred to as the project manual. This manual, along with the drawings for the project, is what the contractor will receive when he contacts the architect-engineer and requests a copy of the bid documents and contract documents for the project.

This document is sometimes referred to as the specifications, and contractors frequently say they are requesting the "drawings and specifications" from the designer. When this vernacular is employed, it should be remembered that the specifications are a component of the contract documents that are bound into the project manual. To facilitate the distinction, the term *technical specifications* is sometimes utilized for the specifications as a component of the contract documents.

## 4.14 BID DOCUMENTS

On a competitive bid project, the architect-engineer will typically produce and publish a set of documents referred to as the bid documents for the project. These documents usually include the advertisement for bids or the invitation to bid, along with the instructions to bidders and the proposal form. These documents are graphically depicted in Figure 4.4.

The advertisement for bids and the invitation to bid were discussed in preceding sections. The sections that follow will discuss the instructions to bidders and the proposal form.

**BID DOCUMENTS**

1. Advertisement for bids, notice to bidders, invitation to bid
   Instructions to bidders
   Proposal form

**CONTRACT DOCUMENTS**

1. Conditions of the contract
   - General conditions
   - Modifications to the general conditions
   - Supplementary general conditions
   - Special conditions
2. Drawings
3. Specifications
4. Addenda
5. Alternates
6. Agreement
7. Modifications
   - Amendment
   - Change order
   - Construction change directive
   - Written order for a minor change

**Figure 4.4** Bid Documents and Contract Documents for a Construction Project

## 4.15 INSTRUCTIONS TO BIDDERS

For competitive bidding to be a valid procedure, all competitors must bid under exactly the same conditions for an identical package of work. This requires that a set bidding procedure be established and all bidders be required to conform.

Consequently, when competitive proposals are requested, a considerable amount of information concerning the technicalities of the bidding process must be communicated to the contractors involved. This information usually comprises one of the first divisions of the project manual and is designated as instructions to bidders. These instructions review the requirements that the owner or contracting authority has established for the form and content of the bids, and also prescribe certain procedures with which the bidding contractors are required to conform. This document, for example, states conditions pertaining to the form of the bid, where and when it must be delivered, bid security required (see Chapter 5), and information concerning late bids and bids submitted by mail, telegram, or e-mail. A contractor's failure to comply with any stipulation of the instructions to bidders can result in a contractor's bid not being accepted.

Clauses are commonly included that give the owner the right to reject any or all bids, to postpone the date of bid opening, and to exercise many prerogatives in the selection of the successful bidder. An example of instructions to bidders is contained in Appendix A. Standard forms of instructions to bidders are used by many public agencies, many of whom have developed their own form of these documents. The American Institute of Architects has developed a standard form of instructions to bidders. However, standard sets of instructions are designed for general use and do not normally provide all of the information peculiar to a specific project that would be required by prospective bidders. Consequently, supplementary instructions or modifications are customary, or reference is made to certain specific information of interest to bidders already contained elsewhere, such as in the advertisement or invitation to bid. Appendix E is a set of supplementary conditions, which demonstrates this fact.

## 4.16 CONTRACT DOCUMENTS

The contract documents for a project are the set of documents that together comprise the contract for construction. These documents are typically prepared by the architect-engineer under the terms of the designer's contract with the owner. Included in the set of contract documents as defined by the architect-engineer are the following: conditions of the contract, drawings, specifications, addenda, alternates, agreement, and modifications to the contract. No one of these comprises the contract for construction; rather, the set of all of these documents defines the contract for construction of the project. Figure 4.4 graphically depicts these documents.

### 4.16.1 Conditions of the Contract

The conditions of the contract define and describe the administrative and operational elements of the contract. From the definitions of the parties involved and their roles and responsibilities, to the closeout and termination of the contract, all operational and administrative aspects of the project are set forth.

The conditions of the contract typically exist in several elements: the general conditions of the contract for construction, followed by some combination of modifications to the general conditions, supplementary conditions, and special conditions. The general conditions are frequently in the form of a standard form document, as produced by one of the professional associations for architect-engineers.

For building construction projects, documents published by the AIA are frequently utilized by the architect as contract documents. For example, AIA Document A201–2007, "General Conditions of the Contract for Construction," is frequently utilized as the general conditions, or this document may be modified or amended to structure the general conditions as the architect wishes. This document is reproduced in Appendix D in this text.

It should be noted that this and other standard forms and documents reproduced in this text are for illustrative purposes only. Because AIA documents are revised from time to time, and because the documents included in this book are samples and included for illustrative purposes only, users should obtain from the AIA the current editions of the documents reproduced herein.

### 4.16.2 Drawings

The drawings, also referred to as the working drawings, portray in graphic form all of the elements of the design. The drawings are considered to be a working pair with the specifications, and these two documents communicate and convey the design of the architect-engineer.

The drawings depict, with line drawings and dimensions, each component element of the design. The drawings contain a variety of views such as perspective, plan, elevation, and section views of the building and all of its component parts. They are typically divided into sections such as plot plan, foundation, architectural, structural, electrical, mechanical, and plumbing. Additionally, the drawings typically include sheets of details, sections, and schedules (for items such as windows and doors), and commonly include written "notes" as well.

The drawings may be produced on paper or on mylar, and are reproduced as blueline or blackline prints on paper. Alternately, the drawings may be produced and conveyed electronically in the form of computer-aided design and drafting (CADD) or building information model (BIM) files. They may be made available to contractors in the form of "hard-copy" paper drawings or electronic files, or they may be filed on a secure web site for reference and use by contractors.

### 4.16.3 Specifications

Closely complementing the drawings, the specifications written by the architect-engineer for a project provide a written description of the work. They define the quality of all materials to be used in the project, and the standards of workmanship to be provided in the construction of the project.

On building construction projects, the specifications are frequently organized in accord with the divisions and subdivisions of the CSI format. The CSI MasterFormat, with its standard named and numbered sections, is included as Appendix C in this book.

Specification language, the manner in which the architect-engineer goes about calling out and establishing quality standards for the materials and products for use in the structure being designed, is described as being "open" or "closed." Open specification language is used in both private and public projects, while closed specifications, also referred to as proprietary specifications, are often prohibited by statute for use on public projects and therefore are used primarily on private projects.

#### 4.16.3.1 Open Specifications

Open specifications for materials are those that describe the characteristics and attributes of materials and equipment to be incorporated in the project in generic terms, which establish the quality required in the material by the designer in terms of standardized industry generic language, compliance with

industry standards, and criteria that can be verified by standardized testing, which will fit or apply to a number of brand names or manufacturers. Commonplace examples include such entries as, "all portland cement used for concrete on the project shall comply with ASTM Standard C150," or "softwood plywood to be used for roof sheathing shall bear the recognizable grade stamp of the American Plywood Association and its Product Standard 1, and shall be 3/4" thick, and in a grade of C-D with exterior adhesive." Designers establish the structural, appearance, or performance attributes of the material or product and/or require its compliance with recognized industry standards, and the contractor takes price quotations from, and eventually purchases the product from, distributors or vendors who can supply a product that fits the descriptive requirements.

#### 4.16.3.2 Closed Specifications

A second method that designers may employ to establish a desired level of material quality is the use of a closed specification, also known as a proprietary specification. In this type of specification entry, the quality requirement established by the designer is established by listing a specific brand-identified product, sometimes including model name and/or model number. In addition, sometimes designers will write the specification language in such a way that only the product made by the supplier whom they have chosen can satisfy the specification language.

Many public bodies do not allow the use of closed specification entries on the specifications relating to the design of projects they will construct. Open specifications are required, in the interest of avoiding favoritism and promotion of fair trade and open competition.

Sometimes, especially in public construction, the designer will name a proprietary product in the specification, and then will convert the specification entry into an open specification with suitable wording in the project specifications. One way to achieve an open specification is to follow a specification for a manufacturer or brand name, a proprietary specification, with the words "or approved equal."

The purpose of an "or-equal" provision is to enable an alternative material or product to be used without adversely affecting quality. This, then, allows an owner to realize the full economic benefit of competitive bidding and contractor expertise. The primary problem with the use of the or-equal provision is the determination of what constitutes an equal, as well as the timing of the making of that determination. It is unusual for comparable products of different manufacturers to be identical in every respect. Different brand-name items, equally suitable for some particular application, will usually differ in certain respects.

Usually, in the context of an or-equal provision, a substitute need not be identical in every respect to the product specified as a standard of quality. A substitute may be equal but be different in appearance, size, configuration, or design. The equality of an alternative product is established on the basis of the quality and performance of the substitute, as compared to the brand-name product specified. The equality of substitutes proposed by the general contractor or a subcontractor is decided by the architect-engineer or owner. For each proposed substitution, samples, descriptive and technical data, test reports, and other information typically must be submitted by the contractor as a means of demonstrating equality. Even though the or-equal clause is useful in allowing substitutions when cost savings are possible, or when the availability of materials specified is uncertain, this provision has been and continues to be troublesome for both the architect-engineer and the contractor.

Because it is often not possible to obtain approval for a material substitution before proposals are submitted on a competitively bid project when this specification language is employed, contractors are frequently faced with difficult decisions as to what material prices they should use in their proposals. It is not uncommon that the lowest price received by the contractor for a certain item

applies to a brand or model not listed in the closed specifications. The contractor is then faced with the dilemma of whether or not to use this lower price, and thus taking the risk with regard to whether the architect-engineer will subsequently approve the substitution. Alternatively, if the bidding firm states in its proposal that the bid amount is based on the stipulated substitutions, the contractor takes the risk that its proposal may be rejected by the bidding authority as being irregular or nonresponsive.

Although the contractor has the obligation of providing proof that a substitution meets the standards originally specified, the architect-engineer must bear the responsibility for its decisions regarding material equality. Architect-engineers must exercise care in this regard because they can be held liable for the inadequacy of approved substitutions. In spite of the troubles frequently encountered with closed specifications and or-equal clauses however, the or-equal approach to specification writing continues to be commonly used.

Additionally, there are several cases on record where a court has ruled that when the specifications provide for or-equal substitutions, the contractor is entitled to make a substitution that it can show is, in reasonable terms, equivalent to or equal to the product specified. If the owner or architect-engineer rejects the substitution of a product that is less expensive but equal, and directs the contractor to install the more expensive product specified, this has been ruled to constitute a constructive change to the contract. This entitles the contractor to recover the cost difference between the less expensive substitute and the product that it was originally directed to install, plus a reasonable profit.

Another common way to convert a proprietary specification to an open specification is to include a paragraph defining the usage of trade names, and describing the applicable substitutions policy. On public projects, there is often a "standard of quality" clause that permits substitution of equal products. In such cases, the term *or approved equal* is not used.

#### 4.16.3.3 Other Material Specification Types

As discussed in the preceding sections, a closed specification has the advantage of ensuring the desired quality of material, but the disadvantage of eliminating competition among manufacturers and suppliers. An open specification will provide competition but, by permitting substitutions, introduces the possibility of materials being used that are inferior to those desired by the architect-engineer. Several specification writing methods have been developed, whose purpose is to attain the advantages and minimize the disadvantages of the open specification and closed specification concepts. Unfortunately, a completely satisfactory procedure has yet to be devised.

One of these combination-type specifications referred to in the last paragraph is called a base-bid material specification or substitute-bid specification. When this procedure is followed, materials are identified in the technical specifications of the contract documents by reference to a manufacturer's name, model number, catalog number, or other specific data. The words *or equal* do not appear. The intent is that only those items listed are to be used by the contractors in preparing their base bids. However, the bidding contractors may offer alternate items, either on the proposal form or as an attachment to the proposal. These alternate proposals are accompanied by full descriptions and technical data, along with a statement indicating the cost additional to, or deductive from, the base bid, if the substitution is approved.

In this method, the architect-engineer or owner does not approve or disapprove such alternates before the bid opening, and the submission of material or equipment alternatives is voluntary with the contractor. The low bidder is determined on the basis of the base bid price submitted on the proposal. After the bids have been submitted, decisions regarding whether to accept or reject any or all of the alternate proposals suggested by the bidding contractors are made by the owner. If decisions

concerning approved substitutions are made prior to execution of the contract, they can readily be incorporated into the contract documents through the use of addenda (see addendum section 4.16.4). After the signing of the contract, approved substitutions can be incorporated into the contract by change order.

Another method sometimes used is for a closed specification to be written, but with a provision that proposals for substitutions can be submitted by a bidder up to a stipulated number of days prior to bid opening. Notice of any approved product substitution is circulated to all bidding contractors by addendum. After the deadline for substitute requests has passed, no further substitutions are permitted.

#### 4.16.3.4 Standard Specifications

Standardized specifications, including both the technical and nontechnical provisions of the specifications, are used by some segments of the construction industry. These have found considerable application in highway, bridge, and utility construction projects. They are also frequently used in federal projects for both civilian and military work. These preprinted standard specifications are issued by the contracting agency and may be readily obtained by any interested party. Although they may not form a physical part of the specification booklet or project manual that is prepared by the architect-engineer for a specific project, these specifications are made a part thereof by reference.

When standardized specifications are included by reference in a project, the project manual that is produced for the individual projects consists merely of the conditions of the contract, the proposal, bond forms, and the agreement, together with any necessary modifications and special provisions regarding the standard specifications. This practice can save considerable time and effort in the preparation of project specifications, and is conducive to bidding and construction uniformity.

Similar standard specifications, sometimes used in other fields of construction, have been prepared to cover the work of the various trades, such as electricians, plumbers, and drywall applicators. A number of government, state, and city agencies utilize these standard trade specifications, augmenting them with modifications in order to make them conform to the unique aspects of a particular project under consideration. However, to date, the use of standard specifications by the construction industry has met with only limited acceptance, with the notable exceptions of highway, bridge, and utility construction, where their use is commonplace. Architect-engineers who design building construction projects, continue generally to favor the customized specification approach.

### 4.16.4 Addenda

Addenda (singular: addendum) are defined as any modifications to the bid documents or to the contract documents, issued by the architect-engineer during the bidding period. The bidding period is the time between the announcement of the project to contractors by means of the advertisement to bid or the invitation to bid, and the time when proposals are due to the architect-engineer and owner from the contractor. On public projects, an addendum is sometimes referred to as an amendment.

Addenda may take the form of interpretations or explanations of elements of the contract or bid documents, additions to or deletions from these documents, changes in the date when bids are due, or modifications of any other kind. Addenda can be issued only by the architect-engineer. Each addendum is defined to be a part of the contract documents, and must receive the full attention of all parties who are preparing bids for any or all portions of the project.

When addenda are issued for a project, they are typically issued in consecutively numbered series to help contractors ensure that they have received all of the addenda that have been issued. The architect-engineer, when he decides to issue an addendum, will typically distribute the addendum to

all of the contractors and trade associations and others who have requested contract and bid documents from the architect-engineer.

When addenda are utilized, the architect-engineer will typically require each contractor to include a signed affirmation on his proposal that he has received and considered in his proposal all of the addenda that have been issued, by number. This provides assurance to the owner and the architect-engineer that all of the proposals from all of the bidding contractors are based on exactly the same information and that all of the bids are therefore comparable. Typically, absent this signed affirmation on the proposal on projects where addenda have been issued, the contractor's proposal will be rejected.

### 4.16.5 Alternates

Classically, alternates are defined as alternative materials or methods, or alternative elements of the design, which are included within the original contract documents as prepared by the architect-engineer, and sent to contractors. Alternates of this kind are referred to as owner-designated alternates, in order to distinguish them from contractor-designated alternates, which will be addressed in the next section. Alternates provide a means for the architect-engineer and owner to consider different alternatives to the original design, and then to include them in the construction contract or not, as they choose, after proposals have been received from contractors. They are a method of allowing the architect-engineer and owner to structure the contract for construction so as to attain maximum value or, perhaps, to get the contract price within the owner's budget.

Each alternate will describe a design alternative as a specific body of information and scope of work that completely defines, describes, and specifies all of the elements that are the content of the alternate. This will typically include drawings, details, and specification language, so as to set forth a definition, and to provide a clear understanding of the content of the alternate, and to clearly define all of the requirements that must be met.

When alternates are included on a project, the architect-engineer will typically note in the instructions to bidders and/or in the special conditions that contractors are required, when they submit their proposals, to submit a "base bid" for a basic, well-defined scope of work that is defined as the "base bid items." In addition, the contractor is required to determine and submit a separate price for each alternate included in the contract documents, as an addition to or a deduction from the base bid.

Whether or not to submit a price for each alternate, is not an option for the contractor. Additionally, the architect-engineer and owner will typically note that they reserve the right to accept or reject any or all of the alternates in any combination.

Alternates are used for many different elements of work, but common examples of alternates might include to delete (or to add) a well-defined package of exterior lighting on the façade of the building and/or to portions of the site; to provide window units described and defined as "X," rather than the window units as drawn and specified in the basic contract documents and defined to be base bid items; or to add an exterior patio area or outdoor gathering space as drawn, specified, and described and defined in this alternate, to the base bid items, which do not include these elements.

When more than one alternate is used on a project, then each alternate, whether additive to or deductive from the base bid, will be clearly delineated as a body or work. Additionally, when more than one alternate is included on a project, each alternate will be consecutively numbered.

When alternates are used on a project, when the proposals are received from contractors, the architect-engineer and owner will consider each contractor's base bid price, as well as his price for each alternate. The construction contract (as defined in the agreement, to be discussed in the following

section) will then designate that the construction contract is for the base bid items and those alternates that have been accepted as listed. The contract amount will be then be the contractor's base bid amount as proposed, adjusted upward or downward by the "add" or "deduct" alternates the architect-engineer and owner have chosen to accept. The agreement form in Appendix G illustrates the incorporation of alternate proposals in the formalization of the contract.

In another variation of owner-designated alternates, public owners in bridge construction projects have sometimes provided a base design, and also alternate designs for a bridge. They have then structured the conditions of the contract and the instructions to bidders in such a way as to indicate that the contractor is required to bid only the alternative design that the contractor believes will result in the least total construction cost to the owner.

It is clear that alternates provide the architect-engineer and the owner with a considerable degree of flexibility with regard to what will be included in and what the final price will be for the contract for construction. Alternates can be of special importance to owners as a means of ensuring that they receive a bid within their limited financing or providing them with an opportunity to make the most judicious selection of a material, process, or scope of work. However, it can also be clearly seen that the use of alternates by the owner and architect-engineer complicates the bidding process, and the more alternates there are on a project, the more difficult the contractor's bidding becomes.

The award of a lump-sum contract with alternates is made to a single contractor. Normally, the low bid is determined from the algebraic sum of the base bid and any alternates accepted by the owner. Especially when there are several alternates, it has been argued that it may be possible for the owner to manipulate the alternates that are to be selected for inclusion in the contract in such a way that a preferred contractor receives the contract. To combat this possibility, it is usual for the bidding documents to state the order of acceptance of the alternates. Occasionally, the low bidder on a project with alternates is identified on the basis of the low base bid only. This then leaves the owner free to accept or reject any combination of alternates. Additionally, sometimes the conditions of the contract will indicate the order in which the owner will select alternates.

### 4.16.6 Contractor-Designated Alternates

Another variation in the use of alternates has sometimes been used, whereby the owner and the architect-engineer make provision for the contractor to include alternates in his proposal when none were incorporated in the original design by the owner and architect-engineer. On private projects, provision is sometimes made in the bid documents and/or the contract documents, whereby a bidding contractor is allowed to include with its proposal alternate materials or systems, and their prices, that it considers potentially attractive to the owner, in terms of price, or quality, or value. Unsolicited alternates of this kind are ordinarily not accepted by a public owner or on a private project where specific provision has not been made.

In recent years, some public owners have developed contract documents and bid documents structures wherein the owner produces a base bid design. The owner and architect-engineer state that contractor-originated design alternates are permitted; that is, a contractor is allowed to submit its own design and the corresponding price for construction, if it believes the cost will be less, and/or the value will be greater for the owner than the base design proposed by the owner. The contractor normally engages a professional consulting firm to make the design and pays the resulting cost. The contractor then submits its bid on the basis of its design alternate, the owner's base design, or both. The successful contractor is selected on the basis of project cost, owner evaluation of the alternate design, and a study of life-cycle costs.

The entire objective of the inclusion of alternates in contract documents is to produce a quality structure at the lowest cost to the owner by allowing evaluation of different design options and their prices. The use of contractor-originated design alternates is still relatively new, and questions remain concerning design quality, design liability, economy to the owner, procurement procedures, and selection of the successful bidder.

### 4.16.7 Agreement

The agreement is the document that is signed by the owner and the contractor that formalizes the contract between the two for the construction of the project. The agreement will list all of the elements of the contract documents as they have been defined by the architect-engineer, incorporate them by reference, and indicate that by their signatures on the agreement, both parties are binding themselves to all of the elements of content of all of the contract documents.

Additionally, the agreement will typically include the number of days allotted for completion of all of the contract requirements (which is called the duration of the project), and will often make reference to the liquidated damages amount that the contractor will be required to pay to the owner for each day past the completion date stipulated by the duration, which the contractor requires to complete all requirements of the contract documents. Reference to addenda will also frequently be included. If alternates have been included as part of the proposal process, a listing will be made on the agreement of the alternates that have been accepted, along with a designation regarding the final dollar amount of the contract.

Often, the agreement takes the form of a standard form document provided by one of the designer professional associations. Appendix G includes the agreement form authored by the AIA, Document A101–2007, "Standard Form of Agreement between Owner and Contractor Where the Basis of Payment Is a Stipulated Sum," which is very widely used as the agreement form on building construction projects. It is noted that this example contains project duration and liquidated damage stipulations as noted earlier, as well as reference to addenda and indication of the alternates that have been accepted, along with the contract price.

### 4.16.8 Modifications to the Contract

The architect-engineer and owner almost always reserve for themselves the right to make changes in the contract requirements, after the agreement for the contract for construction has been signed. Usually, the conditions of the contract will state that the architect-engineer and owner reserve this right, that the contractor is required to implement such changes as may be properly requested, and that the contract sum and/or the contract time will be adjusted accordingly.

The standard form AIA General Conditions of the Contract for Construction, AIA Document A201, which is very commonly used on building construction projects, provide that such changes can be by a modification to the contract. AIA Document A201–2007 is included in Appendix D.

In AIA Document A201–2007, modifications to the contract are defined as:

1. A written amendment signed by both parties.
2. A change order.
3. A construction change directive.
4. A written order for a minor change in the work issued by the architect.

The written amendment signed by both parties is self-explanatory. A change to the contract is proposed by one party or the other in written form, and then is agreed to, and then is signed by both parties to the contract. The change order, construction change directive, and written order for a minor change are fully defined and described in the general conditions and/or in the modifications to the general conditions. A basic definition and summary of each will be provided here.

A change order is a written instrument prepared by the architect and signed by the owner, architect, and contractor, directing a specific change in the work and stating their agreement regarding the exact nature of the change, and the change, if any, in contract sum and/or contract time. Change orders on a project are usually issued in consecutively numbered series.

A construction change directive is a written order prepared by the architect, and signed by the owner and the architect, directing the contractor to effect a change in the work prior to agreement with the contractor regarding adjustment, if any, in contract sum or contract time, or both. The general conditions contain additional language that describes the manner of determining the change in contract sum and/or contract time, and noting that the contractor is obligated to proceed immediately with the change in the work as directed, and noting the contract sum and/or time will be adjusted at a later time. When the contractor subsequently signs the construction change directive, his signature indicates his agreement, including the adjusted contract sum and/or contract time. Additionally, when the contractor signs the construction change directive indicating his agreement, the document is immediately recorded as a change order. There is additional language in the general conditions regarding how resolution will be achieved, and describing the rights of the parties if the contractor and the architect and owner should disagree on the manner of determining compensation or credit for the change and/or the amount of the change in contract sum and/or contract time.

With regard to minor changes, the general conditions stipulate that the architect has the authority to order minor changes in the work that do not involve changes in the contract sum or extension of the contract time and are not inconsistent with the contract documents. The general conditions provide that such changes will be effected by means of a written order signed by the architect, which is binding upon the owner and the contractor.

## 4.17 SUMMARY AND CONCLUSIONS

While the terms *contract* and *contractor* are commonly used in the singular form to describe the basis on which construction projects are performed and the person who performs construction contracts, as has been discussed here, there are a number of documents that together define the construction contract. Additionally, there are a number of people involved in the process of designing and constructing a project, and each has a role, a specific set of duties, and a defined series of responsibilities that are likewise defined by a variety of contracts.

## CHAPTER 4 REVIEW QUESTIONS

1. Define a *closed specification,* and provide a synonym for the term.
2. Define the term *alternate,* and state two different forms of alternates.
3. Discuss the objection that has been held by professional associations of architects and engineers against the use of competitive bids as the basis of selection of architects-engineers to design construction projects.
4. State the full name of the standard form of the general conditions that is frequently used in building construction contracts.

5. Define the project manual, and list its contents.
6. Describe the basic services provided to an owner by an architect-engineer firm.
7. Define MasterFormat, describe its source, and discuss its use in construction contracting.
8. List and define the four forms of modifications to the contract typically provided for in the conditions of contract for a building construction project.
9. Define the term *contingency reserve,* and describe its use.
10. Which component of the contract documents actually formalizes the contract and is signed by the owner and by the contractor?
11. Define the term *addendum,* and contrast an addendum with a change order.
12. Define the term *base bid*, and discuss its usage.
13. Describe the difficulties that may be caused by the use of an "or−equal" clause in a set of specifications.
14. Discuss the significance of the Brooks Act.
15. State the name of the method that must, by law, be used on most public construction projects to inform contractors that a project has been designed and to let contractors know that the owner and architect-engineer are soliciting bids from contractors.

# Chapter 5

# Cost Estimating and Bidding

## 5.1 INTRODUCTION

Cost estimating is a function that is central and indispensable for every construction contracting business. Estimating can be defined as the estimator's making the best possible prediction of what the cost of performing a construction project will be, given the time and other resources available. Construction estimating involves the determination and analysis of the many factors that influence and contribute to the cost of a construction project. Estimating, which is done prior to the physical performance of the work, requires detailed study of the bidding documents, as well as a careful analysis of numerous factors that will have a bearing on construction costs. Estimators apply their knowledge and skills, carefully analyze the construction documents, and examine as many other factors and influences as they can foresee, and then, through the application of their skills, produce this prediction—the cost estimate.

## 5.2 GENERAL

Construction cost estimates are prepared for a variety of purposes, and much of the credit for the success or failure of a contracting enterprise can be ascribed to the skill and astuteness, or the lack thereof, of its estimating staff. If the contracting firm obtains its work by competitive bidding, the company must be the low bidder on a sufficient number of the projects it bids if it wishes to stay in business. However, the construction projects the firm obtains must not be priced and bid so low that the company cannot realize a reasonable profit from their performance. In an atmosphere of intense competition, the preparation of realistic bids requires the utmost in good judgment and estimating skill.

Although negotiated contracts frequently lack the intensity of the competitive element inherent in competitive bid contracting, the accurate estimating of construction costs nonetheless constitutes an important aspect of these contracts as well. In this environment, the contractor is expected to provide the owner with reliable advance cost information, and the contractor's ability to do so determines in large measure its continuing ability to attract owner-clients and to be able to enter contracts with them for the performance of their construction projects. In design-construct and construction management contracts, the contractor and the construction manager are called upon to provide expert advice and assistance with determining construction cost as the design is developed. The advance estimation of costs is a necessary part of any construction operation and is a key element in the conduct of a successful construction contracting business.

It must be understood that construction estimating bears little resemblance to the compilation of industrial "standard costs." By virtue of standardized conditions and close plant control, a manufacturing enterprise can predetermine the total cost of a unit of production in an almost exact way.

Construction estimating, by comparison, involves determining prices for an environment that is far more variable. The absence of any appreciable standardization of conditions from one project to the next, coupled with the inherently complicating factors of weather, materials, labor, transportation, locale, and a myriad of others, makes the advance computation of exact construction costs a matter much more complex than in a more controlled environment. Nevertheless, on the whole, construction estimators do a remarkably good job, despite the numerous variables of all kinds with which they are confronted on almost every project.

While the fundamentals of the estimating process are consistent and do not change, it should also be recognized that every estimator has his or her own unique approach to the estimating process, as well as his or her own subtle variations in procedure. In addition, the policies and procedures of the construction company or of its estimating department, will determine some aspects regarding the preparation of the estimate. It has been said, therefore, that estimating is partly an art and partly a science.

There are probably as many different estimating procedures as there are contractors. In any process involving such a large number of intricate determinations, innovations and variations will naturally result. The form of the worksheets, the order of procedure, and the mode of applying costs all are subject to considerable diversity, with procedures being developed and molded by the individual estimator and the individual construction company to suit their own needs. However, in a move designed to eventually introduce a measure of uniformity to construction estimating, two national trade groups representing estimators have agreed to produce a set of uniform standards for the practice of construction estimating. The American Society of Professional Estimators (ASPE), representing estimators who work for contractors, and the American Association of Cost Engineers (AACE), made of up estimators working for large industrial owners, have agreed to a joint effort in this regard.

It should also be noted that computer hardware and software play an indispensable role in the estimation of construction costs in construction professional practice today and that there are numerous different elements of hardware and software in widespread usage by contractors. However, the basic component elements of producing an estimate are the same; different computer applications simply manage the data in different ways. This chapter presents and discusses primarily the fundamentals of estimating terminology and procedure. Computer applications of the estimating process are discussed later in the chapter.

## 5.3 TYPES OF ESTIMATES

Estimates are prepared by contractors for different purposes, and in response to different needs of architect-engineers, developers, and owners. These different types of estimates likewise produce different degrees of accuracy in their prediction of construction costs.

### 5.3.1 Approximate Estimates

For a variety of reasons, a contractor may need to determine an approximate estimate, which is also referred to as a conceptual cost estimate. These estimates are usually needed and usually produced within a short period of time. By definition, they do not provide the same amount of accuracy as a detailed estimate, but are generally order-of-magnitude estimates. Estimates of this kind are also referred to as factor estimates or as parametric estimates.

An owner or a developer may need an approximate estimate as part of a feasibility study, or as a prelude to arranging project financing. Negotiated contracts with owners are sometimes entered

while the drawings and specifications are still in development, often beginning at a rudimentary stage. In such a case, the contractor is frequently asked to compute an approximate target estimate for the owner by some approximation procedure.

Sometimes it may be desirable to make a quick and independent check of a detailed cost estimate. The general contractor may wish to compute an approximate cost of a specialty item of work usually subcontracted, either to serve as a preliminary component within its bid or perhaps to provide a check on quotations already received from subcontractors.

The preparation of preliminary estimates is an art quite different from the making of a detailed estimate of construction cost. Fundamentally, all approximate cost estimates are based on some system of unit costs, which are obtained from historical records of previous construction work. The original costs are converted to unit prices and extrapolated forward in time to reflect current prices, with additional adjustments made in an effort to reflect current market conditions and the peculiar character of the project currently under consideration. The level of experience and acquired knowledge base of the estimator will also play an important role in the formulation of approximate estimates.

Some of the methods commonly used to prepare approximate estimates are:

- *Square-foot cost estimate*. An approximate cost obtained by using an estimated price for each square foot of gross floor area, or perhaps cost per square foot of air conditioned space or in some cases, square feet under roof. Square foot estimates can also be used for items such as number of square feet of sod in place, or asphalt paving, or of concrete flatwork, etc.
- *Cubic-foot cost estimate*. An estimate based on an approximated cost for each cubic foot of the total volume enclosed, or perhaps per cubic foot of air conditioned space.
- *Cost-per-function estimate*. An analysis based on the estimated cost per item of use, such as cost per patient in a hospital, cost per student or per seat in a school, cost per vehicle space for a parking facility, or cost per unit of production in a manufacturing environment.
- *Modular takeoff estimate*. An analysis based on the estimated cost of a representative module, such as a hospital room or college dormitory room, this cost then being extrapolated to the entire structure, plus the estimator's assessment of the cost of common central systems such as heating, ventilating, and air conditioning systems; elevators; and so on.
- *Partial takeoff estimate*. An analysis using quantities of composite work items that are priced using estimated unit costs. Preliminary costs of projects can be computed on the basis of making estimates of the probable costs of concrete in place, per cubic yard; structural steel erected, per ton; excavation, per bank cubic yard; hot-mix asphalt paving in place, per ton; and the like.
- *Panel unit cost estimate*. An analysis based on assumed unit costs per square foot of floors, perimeter walls, partition walls, ceilings, and roof.
- *Parameter cost estimate*. An estimate involving unit costs, called parameter costs, for each of several different building components or systems. The costs of site work; foundations; floors; exterior walls; interior walls; structure; roof; doors; glazed openings; plumbing; heating, ventilating, and air conditioning equipment; electrical work; and other items are determined separately by the use of estimated parameter costs. These unit costs can be based on dimensions or quantities of the components themselves or on the common measure of building square footage.

The unit prices used in conjunction with these approximate estimates can be extremely variable, depending upon specific requirements, geographical location, weather, labor productivity, season,

transportation, site conditions, and other factors. There are many sources of such cost information in books, journals, magazines, and the general trade literature. Unit costs are also available commercially from a variety of proprietary sources, as well as from the contractor's own past experience. In addition, there are many forms of national price indexes that are useful in updating cost information of past construction projects. When such costs or cost indexes are used, care must be taken that the information is adjusted as accurately as possible so as to conform to local and current project conditions.

Contractors who prepare approximate estimates will apply their judgment and skill in determining which source or sources of information are best to be utilized. Where possible, most contractors will base such estimates on their own historical cost information, a topic that will be discussed in subsequent sections of this chapter.

### 5.3.2 Detailed Estimates

Detailed estimates are the most accurate and reliable form of estimates of what future construction costs will be. They require that complete drawings and specifications describing the work be available. Detailed estimates are much more costly and time consuming to prepare than approximate estimates.

A detailed estimate of project cost is what the contractor will normally compile for bidding or negotiation purposes whenever an estimate that is to culminate in a proposal is required. Detailed estimates are also usually employed by subcontractors in the preparation of the quotation prices, or proposal prices, which they submit to prime contractors. Detailed estimates are also used while a project is under way, for the pricing of changes in the work.

### 5.3.3 Lump-Sum Estimates

Two forms of detailed estimates are widely used in the construction industry. These are the lump-sum estimate and the unit-price estimate. Cost estimates in the field of building construction are customarily prepared on a lump-sum basis. Under this procedure, a fixed price is compiled, and if a contract is entered, the contractor agrees to perform a prescribed package of work in full accordance with the drawings and specifications and the other elements of the contract documents for the lump-sum price that was derived from the estimate and will be written into the agreement as the contract price. The contractor agrees to carry out its responsibilities so as to fully comply with all of the elements of the contract documents, even though the cost may prove to be greater than the stipulated amount, and therefore he is said to be at risk for the contract amount that was derived from the detailed estimate.

Lump-sum estimates are applicable only when the exact nature of the work and the quantities involved are well defined by the bidding documents. From the owner's standpoint, such a contract can have many advantages. For example, the contract amount fixes the total project cost, a condition that can be useful when the owner is making the financial arrangements for the project. Additionally, if the drawings and specifications clearly describe the work and therefore define exactly what it is that the owner will receive, then the lump sum competitive bid method of contracting places contractors and subcontractors in competition with one another for the award of the contract, thus yielding the lowest construction cost for the owner.

A prime contractor's detailed lump-sum estimate consists of six components: materials, labor, equipment, indirect cost, subcontractor quotations, and markup. The estimator will make a determination of his best prediction of the project cost for each of the first five components, and then will determine and enter a markup amount. The lump-sum cost estimate, that is, the amount to be entered

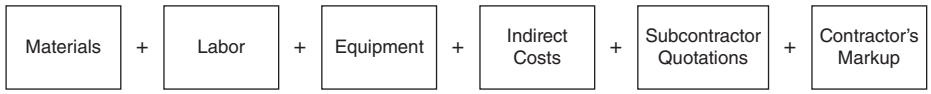



**Figure 5.1** Components of a Detailed Lump-Sum Estimate

onto the proposal, will be the total of these six components of the estimate. Figure 5.1 illustrates this process in graphic form.

When a prime contractor is preparing a lump-sum proposal, he will typically require the subcontractors to submit lump-sum proposals for their specialty items of work. Subcontractors will use the same procedure in determining the amount of their proposal. For a subcontractor, the estimate will consist of five components (unless the subcontractor plans to sub-subcontract a portion of the work), which are totaled in order to arrive at the lump-sum amount of their proposal.

Lump-sum estimating requires that a "quantity survey" or "quantity takeoff" be made. This is a complete listing of all the materials and items of work that will be required. Using these work quantities as a basis, the contractor computes the costs of the materials, labor, equipment, indirect cost, and subcontracts. The sum total of these individual items of cost constitutes the anticipated overall cost of the construction. Addition of a markup yields the lump-sum estimate that the contractor submits to the owner as its price for doing the work. The quantity takeoff process will be discussed in greater detail in subsequent sections of this chapter.

### 5.3.4 Unit-Price Estimates

Engineering construction projects are generally bid, not on a lump-sum basis, but rather as a series of unit prices, and the contract that is awarded is a unit-price contract. In engineering projects where the unit-price method of contracting is commonly employed, often quantities of the materials and the actual amount of the work activities cannot be determined in advance of contract formation with sufficient accuracy to permit the use of lump-sum contracts. Therefore, the estimate is based on the contractor's unit prices, dollars per unit of quantity, for named activities and items of work as defined by the architect-engineer, and in an approximate quantity estimated by the architect-engineer during the design. A unit-price contract is formed, with the contract stipulating that each of the activities and work items to be performed will be completed by the contractor in such a way as to fulfill all of the requirements of the contract documents, at the unit prices that have been set forth in the contractor's proposal.

The bidding schedule in Figure 5.2 shows a typical list of unit price activities or work items, which become bid items in a unit price proposal. An estimated quantity is shown for each item. As was noted earlier, these quantity estimates are those made by the architect-engineer as the design is produced and are not guaranteed to be accurate.

When unit-price proposals are involved, a somewhat different estimating procedure from that described in the previous section must be followed. A quantity survey is made, much as for a lump-sum estimate, but in this method a separate survey is needed for each bid item. This survey not only serves as a basis for computing costs but also checks the accuracy of the architect-engineer's estimated quantities. A total project cost, including labor, equipment, materials, subcontracts, indirect cost, and markup is compiled, just as in the case of a lump-sum estimate. However, in this method, all costs are kept segregated according to the individual bid item to which they apply. More information on this process is presented in sections that follow in this chapter.

**Activities, Work Items, and Engineer's Estimated Quantities**

**Project: Brazos Bridge Project**

**Brazos County, Texas**

| Bid Item Number | Bid Item Description | Estimated Quantity | Unit | Proposal Unit Price | Amount |
|---|---|---|---|---|---|
| 1 | Excavation, Unclassified | 1,667 | CY | | |
| 2 | Excavation, Structural | 120 | CY | | |
| 3 | Backfill, Compacted | 340 | CY | | |
| 4 | Piling, Steel | 2,240 | LF | | |
| 5 | Concrete, Footings | 120 | CY | | |
| 6 | Concrete, Abutments | 280 | CY | | |
| 7 | Concrete, Deck Slab, 10 inch | 200 | SY | | |
| 8 | Steel, Reinforcing | 90,000 | LB | | |
| 9 | Steel, Structural | 65,500 | LB | | |
| 10 | Bearing Plates | 3,200 | LB | | |
| 11 | Guardrail | 120 | LF | | |
| 12 | Paint | 240 | SF | | |
| | | | | | |
| | | Total amount | | | |

**Figure 5.2** Unit-Price Bid Items

When computing unit prices, the contractor must keep several important factors in mind. The quantities, as listed in the schedule of bid items, are estimates only. The contractor will be required to complete the work specified, in accordance with the contract documents, and will be paid on the basis of the quoted unit prices, whether quantities are greater than or smaller than the designer's estimated amounts.

Sometimes this requirement is modified by provisions in the contract that provide for an equitable adjustment of a unit price when the actual quantity of an activity or work item on the proposal varies more than a stipulated percentage above or below the quantity first estimated by the architect-engineer. Values of 15 to 25 percent are often used in this regard.

In unit-price contracting, all items of material, labor, supplies, or equipment that are not specifically enumerated for payment as separate items, but are reasonably required to complete the work as shown on the drawings and as described in the specifications, are considered as subsidiary obligations of the contractor. No separate measurement or payment is made for these items. Rather, the owner expects to pay, and the contractor expects to be paid, solely on the basis of the activities and work items set forth in the proposal, and at the unit prices that were proposed, and which then became part of the contract.

## 5.4 PRELIMINARY CONSIDERATIONS PRIOR TO COMMENCING THE ESTIMATE

General contractors may learn of the existence of a project that has been designed and for which proposals are being sought, through seeing an advertisement for bids, or by receiving an invitation to bid. Additionally, contractors may be contacted by an owner or an architect-engineer to make them aware of the existence of a forthcoming project. Contractors may also learn of the project through one of their professional associations or from a plan room operated by one of these associations.

### 5.4.1 Reporting Services

Another source of bidding information is the plan service centers that have been established in larger metropolitan areas around the country. These centers publish and distribute, on a regular basis, bulletins that describe all projects, public and private, to be bid in the near future within that locality. In addition, these services keep copies of the bidding documents on file for the use of subscribing general contractors, subcontractors, material dealers, and other interested parties.

These plan centers provide a valuable service in making bidding documents available to a wide circle of potential bidders. Prime contractors use the services as a central source of bidding information, to make a quick check of the bidding documents to determine whether they wish to bid, and as an indication of which subcontractors and material dealers may be bidding a given project.

The use of plan centers for actual estimating purposes is generally limited to those subcontractors and material vendors whose takeoff is not as extensive as that of the general contractor. Sometimes these plan rooms and plan centers allow their member subscribers to check out the contract documents for projects for a limited period of time. Prime contractors who are planning to bid a project will typically obtain contract documents and bid documents directly from the architect-engineer.

On the national level, Dodge Reports, published by the Dodge Division of McGraw-Hill Information Services Company, provide complete coverage of bidding and construction activity within different specified localities. Subscribers receive daily reports concerning jobs to be bid in their area, or a designated area of interest, including all known general contractor bidders. This is valuable information inasmuch as it provides the general contractor with information regarding who his competition is likely to be on a project, and tells subcontractors and material vendors who the bidding prime contractors are. Following each bidding, the subscribers are informed with regard to who the low bidders or apparent low bidders are, and sometimes they provide complete bid tabulations.

The reporting services also will frequently monitor the status of the project regarding whether and when a contract is formed between the owner and prime contractor. During construction, reports are issued periodically listing the general contractor and the subcontractors. Other services are also available from these contractor news services, and subscriptions can be tailored to suit the needs of the contractor.

### 5.4.2 Availability of Drawings and Specifications

After learning of the existence of a project, the contractor will examine the information in the advertisement for bids or the invitation to bid and will determine whether he is sufficiently interested in the project to procure the bid documents and contract documents. The advertisement or invitation will provide information for general contractors regarding procedures for obtaining contract documents and bid documents for the project from the architect-engineer.

If a general contracting firm has decided it is sufficiently interested in the project to examine the contract and bid documents, it will normally obtain the necessary sets of bidding documents from the architect-engineer or the owner. The number of sets needed will depend on the size and complexity of the project, the time available for the preparation of the bid, and the distribution the architect-engineer has made to subcontractors, material dealers, and plan services. In general, more sets will be required for shorter bidding periods and for more complex projects.

It is typical for architect-engineers to require contractors to pay a deposit for each set of documents they request from the designer, as a safeguard against frivolous ordering, and as a guarantee for the safe return of the documents to the designer. This deposit, which may range from 50 to several hundred dollars per set, is usually refundable. It is not uncommon, however, for the architect-engineer to note that a contractor wishing to receive bid documents and contract documents must pay a fee or a nonrefundable deposit for each set of documents requested. The objective of this practice, which amounts to contractor purchase of the documents, is to help the owner or architect-engineer recoup some of the printing costs involved in making the documents available.

Certainly, the reproduction of these documents by the architect-engineer is costly, and certainly no more sets should be provided by the designer or requested by contractors than are really necessary. However, undue limitation by the architect-engineer or owner with regard to providing the number of sets of bid documents and contract documents needed by all of the potential bidders and plan services can be shortsighted. Any aspect of the bidding process that inhibits competition can only result in a higher cost for the owner. There can be no argument that the architect-engineer providing sufficient numbers of bidding documents to achieve a reasonably thorough coverage of the total bidding community produces the best competitive prices, particularly for large and complex projects. Plan services perform a valuable function in this regard by making drawings and specifications readily available to interested bidders.

For takeoff and pricing purposes, subcontractors and materials dealers can obtain their own bidding documents from the architect-engineer, or they can use the facilities of local plan services. Additionally, it is common practice for the prime contractor to make its own copies of the bid documents and contract documents available to parties wishing to bid on various aspects of the project. Sometimes they allow subcontractors and vendors to check out the documents from the prime contractor's office.

General contractors must be cautious, however, in lending contract and bid documents, and must assure that all bidding and contract documents in their entirety, including addenda that may be issued during the bidding period, are made available. This foresight will eliminate potential difficulties later with subcontractors or material suppliers claiming that they bid on the basis of incomplete information and hence did not tender a complete proposal.

As a matter of professional courtesy, the general contractor frequently will set aside a well-lighted plan room on its own premises for the use of the estimators of subcontractors and material dealers. When such facilities are available, the drawings and specifications need never leave the office of the general contractor and can be made available to a wider range of bidders in an efficient manner.

## 5.5 SET-ASIDES

It is possible that when the contractor examines the bid documents and contract documents, he may discover that he is not eligible to bid on certain public projects. This can occur on those projects that have been "set aside" for only those contractors who can satisfy specific criteria. For example, under regulations of the U.S. Small Business Administration (SBA), certain federal construction projects are

set aside specifically for small contractors. In such an instance, a contractor must conform to certain measures of annual business volume in order to be eligible to bid on such a project. In addition, under certain SBA programs, some federal construction contracts are removed entirely from competitive bidding, and contracts are negotiated with socially and economically disadvantaged small business firms (SDBs) as defined by the SBA.

Another example is afforded by public construction work at the federal, state, and local levels that is set aside for disadvantaged business enterprises (DBEs) or minority-owned business enterprises (MBEs). To be eligible to bid such projects, a construction company must be able to provide evidence that it is owned and controlled by minorities, women, or historically disadvantaged groups, and the company meets prescribed certification criteria. There are also some public construction projects that are set aside and reserved for locally based contractors.

## 5.6 QUALIFICATION

Bidder qualification is most often based on experience, competence, and financial criteria, and is entirely separate from set-asides as discussed in the previous section. Many states have enacted statutes that require a general contracting firm wishing to bid on public work in those states, to be qualified before the firm can be issued bidding documents or before it can submit a proposal. Other states require that the contractor's qualifications be judged after it has submitted a proposal. The first method is called prequalification, and the second is called postqualification. Many other public bodies, including agencies of the federal government, require some form of qualification for contractors bidding on their construction projects. While the relative merits and drawbacks of the qualification process are subject to debate, it is a matter of fact that qualification in some form has become almost standard practice in the field of public construction. The obvious purpose served by qualification is to eliminate the incompetent, overextended, underfinanced, and inexperienced contractors from consideration.

Prequalification requirements apply almost universally to highway construction, and in certain jurisdictions all construction projects financed with public funds require contractor prequalification. In those states in which contractors' licenses are required, contractors must be licensed prior to applying for prequalification. To prequalify, the contractors must submit detailed information concerning their experience, equipment, finances, current projects in progress, references, and personnel information, as set forth by the architect-engineer or owner. Evaluation of this information results in a determination as to whether the contractor will be allowed to submit a proposal. Highway contractors usually submit qualification questionnaires at specified intervals and are rated as to their maximum contract capacity. Their construction activities are reflected in their current ratings, with bidding documents being issued only to those who are determined to be qualified to bid on each project. The prequalification certificate may also limit the contractor to bidding on certain types of work, such as grading, concrete paving, or bridge construction.

Although the foregoing description of qualification is centered on publicly financed projects, the same procedures can be and frequently are also utilized on private projects as well. In prequalification and postqualification, the architect-engineer and owner typically request financial information, the contractor's history of past projects performed, names and contact information of owners for whom the contractor has constructed projects, names and qualifications of the contractor's management personnel, and so on. It is increasingly common for the architect-engineer and owner to request information regarding the contractor's safety program, workers' compensation EMR rating, training program, and quality management program as well.

A somewhat different procedure, often used in closed bidding, is for the contractor to submit an individualized qualification summary or portfolio to accompany its proposal. This is essentially a sales document and contains information designed to enhance the contractor's status in the eyes of the owner.

In jurisdictions that require postqualification, the contractor is called upon to furnish certain information as specified by the owner along with its proposal. The information requested has much the same form and content as that required for prequalification, but it serves the qualification purpose only for the particular project being bid.

## 5.7 THE DECISION TO BID

After learning that proposals are to be taken on a given construction project, and usually after obtaining and thoroughly studying the bid documents and contract documents, the contractor must make a decision as to whether it is interested in submitting a proposal for the project. The decision is momentous. If the contractor decides not to bid, obviously he has no chance of obtaining a contract award for the project. If the contractor decides to prepare and submit a proposal, he must be prepared to commit to the estimating process, which will result in a proposal.

In a general sense, the "bidding climate" prevailing at the time has a bearing on the contractor's decision to bid or not. The decision to bid involves a study of many interrelated factors, such as his opinion of the owner and the architect-engineer, the nature and size of the project as it relates to company experience and equipment, the amount of work presently on hand, the location of the project, the time of year, the bidding period, the duration of the project, the terms and conditions set forth in the contract documents, the contractor's bonding capacity, the probable competition, labor conditions and skilled labor availability, and so on. It is certainly to a contractor's advantage, and assuredly a good business practice, for the contractor to make as comprehensive and thorough an investigation of all aspects of a project as possible, before the firm expends the considerable time, effort, and money required to compile and submit a proposal. Because it involves such a substantial commitment of resources to prepare a proposal for a project, it goes without saying that once an affirmative decision to bid has been made, the contractor will exert every effort to be the successful bidder.

## 5.8 THE BIDDING PERIOD

The bidding period is defined as the time between the announcement of the project and availability of bid and contract documents to the contractors, and the time when proposals are due for submittal to the owner. During the bidding period, the contractor will very carefully examine all of the contract and bid documents, prepare his estimate of the cost of the construction, and prepare his proposal for submittal to the owner and the architect-engineer. The results of his detailed study of the bid and contract documents provide the contractor an overall concept of the total package of work and provide the basis for making the most realistic detailed estimate he can for the price of the construction of the project.

During the bidding period, it is not uncommon for the contractor to find errors, inconsistencies, and missing information in the bidding documents. It is the responsibility of the contractor to bring such imperfections to the attention of the architect-engineer or owner, so that suitable modifications might be made by the responsible party. The contractor will typically submit a number of requests for information (RFIs) to the architect-engineer during this time. The designer will respond, in writing, to each RFI. Sometimes the designer will issue an addendum to provide missing information,

clarification, or interpretation of some element of the bid or contract documents. Addenda are more fully defined and described in Chapter 4.

A sufficient allocation of time in the bidding period on the part of the architect-engineer and the owner can be an important consideration. The contractor's estimating process takes considerable time and must be dovetailed into contractors' current operations. Careful study and analysis of the bid and contract documents on the part of the contractor will usually result in lower bid prices, and a more comprehensive and accurate proposal, and thus substantial savings for the owner.

The more complicated and extensive the project, the greater the dividends a reasonable bidding period will pay to the owner. Unless the work is truly of a rush or emergency nature, it is sound economics for the owner to allow sufficient time for the bidding contractors to make a thorough study and examination of the proposed work.

When an insufficient bidding period is allotted, many of the best prices will not have been received by the contractor in time for inclusion in its proposal. In addition, when a short bidding period and unreasonable bidding deadline is imposed, and the contractor does not have time to thoroughly understand and properly estimate all of the components of the work in the project, he will inevitably compensate for his uncertainty and the resultant increase in the amount of risk he perceives by including additional dollars in his estimate.

Additionally, from the contractor's point of view, the owner should avoid setting any day following or preceding a weekend or holiday as the date for receiving bids. Such times impose undue hardships on the contractors and other bidders and greatly restrict the availability of prices and other information. Afternoon hours for proposal submittal deadlines are much preferred. As far as is practicable, a bidding date should not conflict with other construction bid openings.

## 5.9 PREBID MEETINGS

During the bidding period, two different types of prebid meeting are commonly conducted. The first is a prebid meeting initiated and conducted by the architect-engineer and the owner. Early in the bidding period, the owner and designer typically meet with the contractors who are planning to submit proposals for the project. Subcontractors and materials suppliers also frequently attend these meetings. The purpose of this prebid meeting is to provide the designer and the owner an opportunity to review the project requirements with those who will be submitting proposals, to emphasize certain aspects of the proposed work, to clarify or explain difficult points, and to answer questions and to provide clarifications for those who are engaged in preparing proposals for the project. This type of meeting can be very beneficial and is especially appropriate when the work will be complex or when it will involve unusual procedures.

Many contractors believe it is desirable to also hold an internal prebid meeting for projects on which they are planning to submit proposals. These meetings are typically attended by the estimators and the persons who will occupy the principal supervisory positions on the project if the bid is successful and a construction contract is awarded. The exchange of information between those who are estimating the costs of the project and those who will perform the work on the project can be extremely beneficial. Such meetings can be used to explore the alternative construction procedures that might result in a competitive advantage and/or to make tentative decisions regarding methods, equipment, personnel, and time schedules. This information can be very beneficial for the estimator, to assist in preparing a more accurate and competitive proposal.

## 5.10 WORK TO BE SELF-PERFORMED AND WORK TO BE SUBCONTRACTED

Prior to beginning preparation of the detailed estimate, the contractor's estimating and management staff will make a determination of which items of work on the project the contractor plans to perform with its own craft labor forces under its own supervision, called self-performed work, and which items of work the contractor will plan to perform with subcontractors. For those items of work the company plans to perform with its own craft labor, the materials, labor, and equipment costs will be estimated by the contractor.

For those items of work the company plans to perform by subcontracting, subcontractors' proposals will be sought, and will be incorporated into the prime contractor's estimate. Each subcontractor's proposal is expected to include the subcontractor's determination of all materials, labor, equipment, indirect costs, and markup necessary to complete its work to satisfy the requirements of the contract documents.

Early in the bidding period, the contractor will usually send bid invitations to all material dealers and subcontractors who are believed to be interested and whose bids would be desirable, as well as to those subcontractors and vendors with whom the general contractor has had a favorable working relationship in the past. The general contractor advises of the project under consideration, the item for which a quotation is requested, the deadline for receipt of proposals by the prime contractor, the place where bids will be accepted, the name of the person to whom a proposal should be directed, the place where bidding documents are available, and any other special information or instructions that may be necessary. Specific reminders concerning the status of addenda, alternates, taxes, and bond requirements are typically included as well.

General contractors typically maintain a file that lists names, addresses, contact information, and other pertinent information regarding material suppliers and subcontractors. These files are maintained both by geographic area and by specialty. Therefore, when a contractor is planning to bid a project and has made the determination regarding which work on the project he will plan to subcontract, he has a ready source of subcontractor information.

## 5.11 SITE VISIT

Following his initial examination of the contract and bid documents, the contractor will usually visit the construction site. Information will be gathered concerning a wide variety of site and local conditions. Examples include:

- Project location, and physical address.
- Probable weather conditions and influences the weather may bring.
- Availability of electricity, water, telephone, and other services.
- Access to the site and access considerations at the site.
- Location and proximity of emergency services.
- Local codes, ordinances, and regulations.
- Conditions pertaining to the protection or underpinning of adjacent property.
- Space available for storage and for laydown areas and onsite fabrication.

- Surface topography and drainage.
- Subsurface soil, rock, and water conditions.
- Underground obstructions and services.
- Transportation and freight facilities nearby.
- Conditions affecting the availability, hiring, housing, and per diem expenses for workers.
- Material prices and delivery information from local material dealers.
- Facilities for rental or lease of construction equipment.
- Local subcontractors.
- Demolition and site clearing.
- Facilities for disposal of debris and location.

It is important that an experienced person perform this site inspection, particularly in locations that are remote from or relatively new or unfamiliar to the contractor's organization. The visitor should become familiar with the project requirements in advance of the site visit and should take with him a set of drawings and specifications for reference. It is desirable that the information developed during the site visit be recorded in a signed report or on a form the contractor may have developed for this purpose, which will become permanent reference information for use throughout the preparation of the project estimate.

It is usually helpful to have available a camera, tape recorder, measuring tape, and other aids appropriate to the occasion, perhaps to include items such as an earth auger and hand level. Photographs and sketches should be used to augment the site visit report. It is not uncommon that a follow-up visit be made on very large or important projects, or when the estimator discovers the need for an important fact or verification of some feature of the site.

When access to the site is restricted for some reason, visits to the site may have to be coordinated with other bidding contractors, a representative of the owner and/or the architect-engineer, and the primary sub-bidders. Site conditions where remodeling or renovation work is included can be especially demanding, involving such considerations as use of existing elevators, control of noise and dust, matching existing materials and finishes, and maintenance of existing services and operations. Experience has shown that the advance preparation of a checklist of items to be investigated during the site visit can be extremely valuable.

## 5.12 PROJECT TIME SCHEDULE

Prior to beginning the detailed estimating process, the estimating staff will carefully evaluate the project duration. The duration is defined as the number of days allotted for completion of all of the requirements of the contract documents for the project following signing of the contract, as stated in the contract documents. The project duration is a very important consideration in the estimating process.

In order to predict construction costs, the contractor must prepare at least a preliminary construction schedule, which is the contractor's plan, on a timeline, for completing the requirements of the contract documents within the specified duration. If the project duration permits, the contractor will most likely plan to perform the work on a five-days-per-week, eight-hours-per-day schedule. However, as indicated by the duration and the amount of work to be performed on the project, the contractor may find it necessary to work on weekends and/or to work overtime, and perhaps even to

work in consecutive shifts, in order to complete the project on time. These determinations will have a profound effect upon the cost of the construction, and must therefore be reflected in the estimate.

In some cases, the contractor is required to indicate on the proposal form its own time requirement for completing the project. In either case, construction time becomes a contract provision, and failure to complete the project on time is a breach of contract that can subject the contractor to significant damage claims by the owner, or to the necessity of paying liquidated damages to the owner, as is typically included in the contract language. Liquidated damages are discussed in more detail in Chapter 6.

An approximate construction schedule is also needed for pricing purposes because a number of items of project overhead expense (to be discussed in more detail in a subsequent section of this chapter) are directly related to the duration of the construction period for the project. These are referred to as time-related overhead costs.

In addition, a general schedule of the major segments of the project provides the estimator with valuable information concerning weather conditions to be expected. This provides a basis for decisions regarding equipment and labor productivity, hot and cold weather operations, and other similar considerations.

In cases where the contracting firm believes the stipulated contract time will be inadequate for project completion using normal construction procedures, it may request that the owner and architect-engineer reconsider the duration that they originally established and allow a longer construction period. Otherwise, the feasibility of overtime or multiple-shift work must be investigated.

## 5.13 PREPARING THE ESTIMATE

For every construction project to be performed, whether an engineered project or a building construction project, when the contractor prepares a detailed cost estimate, there are six components of cost to be tabulated: materials, labor, equipment, subcontractor proposals, indirect costs, and markup. Although these elements were depicted in Figure 5.1, they are repeated in Figure 5.3 for convenience.

### 5.13.1 Estimating Materials Costs

#### 5.13.1.1 Quantity Takeoff

The estimator's first step in estimating materials is to identify each material that will be required in the performance of the work in constructing the project. For purposes of discussion in this text, the term *materials* is construed to mean everything that becomes a part of the finished structure. This includes electrical and mechanical items such as elevators, boilers, escalators, air-handling units, and transformers, as well as the more obvious and traditional items such as lumber, structural steel, concrete, and paint.

Identifying the materials that will be necessary for the performance of the work so as to fulfill the requirements of the contract documents will be determined from the estimator's analysis of the

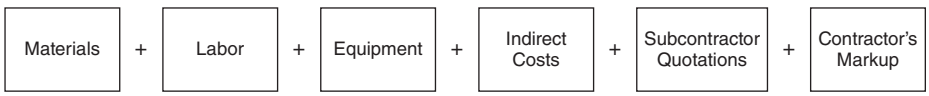



**Figure 5.3** Components of a Contractor's Detailed Estimate

drawings and the specifications for the project. Most of the materials that will be required in a building construction project are not called out in the contract documents in the form of a list or a table; rather, the drawings and specifications show and describe what the finished construction product will be. Therefore, the estimator must analyze all of the components of the contract documents in order to identify all of the materials that will be required to construct the project and to fulfill contract requirements.

On most engineered projects, some of the materials are listed in the unit-price bid items. However, the estimator must determine exactly what the characteristics and properties of those materials are required to be, in order to fulfill the requirements of the contract documents. In addition, the estimator must determine what other materials may be necessary to accompany, or to complete, the proper installation of the bid item materials.

When the requisite materials have been identified and listed, the estimator must determine from the contract documents, the quality levels in which the materials must be furnished as set forth in the contract documents. Most of these requirements will be found in the specifications. Many construction materials such as lumber and plywood are available in a number of different grades; others, such as portland cement concrete or asphaltic concrete, have varying compositions and proportions of ingredients; others such as metals, have different metallurgical properties, various levels of strength, or different finishes specified.

The estimator must infer from the description of materials requirements in the specifications, and from information that may be provided on the drawings, all of the pertinent elements of quality for each material that will be necessary for the construction of the project, so that the end product will comply with the requirements of the contract documents.

The estimator's next step will be to determine the quantity of each material that will be required for the project. This step in the estimating process is usually referred to as the quantity takeoff (QTO) or the quantity survey. The amount of each material needed to perform the work must be quantified in the unit of measure in which the material or product is produced and marketed: cubic yards of cast-in-place concrete, sheets of plywood, bank cubic yards of soil to be excavated, and so on.

Some materials such as concrete are quantified by calculation, based on dimensions in the drawings. Other materials, which are of identical kind, size, and description, such as door units, lighting fixtures, windows, and the like, are quantified by counting the number of identical items as indicated in different parts of the project, as shown on the drawings. Such items are referred to as *count items* in estimating.

Following the quantification of each material in its appropriate unit of measure, the estimator will determine the amount of each material that will actually need to be purchased in order to complete the work. This is called determining a waste allowance or overage allowance. For some materials, such as framing lumber, the estimator must allow for the fact that the stock lengths in which lumber is sold will be cut by the carpenters to the exact lengths required for the work. Thus, more lumber will need to be purchased than the precise quantity that has been calculated as being necessary for the finished product. For other materials, such as electrical switchgear or air-handling units in the mechanical system, the waste or overage factor will be expected to be zero. The amount of waste or overage allowance to be applied will come from the estimator's experience and judgment.

Additionally, for some materials, the contractor must know the stock sizes in which the material is produced and marketed, and then must calculate the quantity that will need to be purchased to complete the work as required, based on those stock sizes and the language in the specifications. For example, carpet is produced and sold in standard rolls that are 12 feet wide. The drawings and/or specifications will frequently indicate where seams may be made in certain rooms, or they may indicate

the maximum number of seams allowable in certain rooms. From this information, the estimator must determine the quantity of carpet that will actually need to be purchased in order to complete the work in compliance with the specifications.

It should also be noted that there are some materials for which contractors do not typically determine quantities. In these instances, contractors rely on vendors or fabricators to determine the quantity necessary. Reinforcing steel and structural steel are commonplace illustrations of this practice.

#### 5.13.1.2 Estimators' Quantity Surveys

Although the bid documents for a unit-price project customarily provide contractors with estimated quantities of each bid item, these are approximate quantity determinations only, and the architect-engineer typically assumes no responsibility for their accuracy or completeness. Architect-engineers' quantities are sometimes computed only within so-called paylines, and may not be representative of work quantities that must actually be done to accomplish the bid item. In addition, more detail is usually required for accurate pricing of the work. Consequently, contractors customarily make their own quantity takeoffs, even on projects for which estimated quantities are given.

In making quantity surveys, the estimator must be able to visualize how the work will actually be accomplished in the field, given the description of the activity or work item on the unit-price proposal form. Correspondingly, many contractors believe that some appropriate on-the-job experience is a necessary prequalification, or at least a significant advantage, for construction estimators.

The quantity survey provides the contractor with valuable information during the construction period, as well as for the initial estimation of project cost. For example, it can provide the contractor with data concerning time that will be required in the field for work accomplishment, crew sizes, and equipment needs. The quantity survey provides purchasing information as well, and serves as a reference for various aspects of the field work as it progresses. Additionally, it is often useful in providing the owner with a variety of costs pertaining to the work.

#### 5.13.1.3 Professional Quantity Surveyors

There are a number of proprietary firms whose principal business is making quantity surveys and cost estimates of selected construction projects. Such firms provide these services on a fee basis. This may be done after the design of the project has been completed, or the firm may act as a cost adviser to the owner and architect-engineer during the design stage. The services of such companies are engaged mostly by owners and architect-engineers as a means of monitoring costs during design so as to keep project costs within budgets and to get the most for the owner's construction dollar. Companies engaged in this form of business are commonly called quantity surveyors.

It has long been standard practice in the United States for bidding contractors to make their own quantity takeoffs. This results in considerable duplication of effort since the owner and architect-engineer may already have determined materials quantities to meet their needs during the evolution of the design. Nevertheless, contractors seldom utilize the services of professional quantity surveyors for purposes of preparing proposals. Contractors prefer to prepare their own quantity surveys, in which they have a sense of confidence. They maintain a staff of experienced estimators whose reliability and accuracy have been well established. During the takeoff process, the estimator must make many decisions concerning procedure, equipment, sequence of operations, and other such matters. All these decisions must be considered when costs are being applied to the quantity surveys. In addition, work classifications used in quantity surveys must conform with the contractor's established cost accounting system.

It is interesting to note that in Great Britain, the quantity surveyor is an established part of the entire construction process. This party is hired by the owner at the inception of the project and makes cost feasibility studies, establishes a construction budget, makes cost checks at all stages of the design process, and prepares a final quantity takeoff. This takeoff is submitted to the contractors who will be bidding the project, and the contractors then use the quantity surveyor's information as the basis for their pricing of the work. Additionally, the quantity surveyor advises the owner on contractual arrangements and compiles certificates of interim and final payment to the contractor who is performing the work. In some ways, the duties of the British quantity surveyor and the American construction manager, especially when the construction manager is acting as an agent of the owner, are quite similar.

#### 5.13.1.4 Materials Pricing

After determining the quantity and quality of materials the contractor will need to purchase for the project, the estimator will next determine prices for each of these materials. The estimator will contact materials suppliers, distributors, or manufacturers and will solicit price quotations for each of the materials to be purchased. The estimator will furnish information to the materials suppliers regarding the exact description of the material, the quality level in which the material is specified, and the quantity of each material to be purchased. Materials suppliers will provide price quotations in response to the estimator's request, and the estimator will tabulate the price quotations, and then will compare them and determine the price to be included in the estimate for each material.

The estimator will compile this information for each material, and will then determine the dollar amount that the company will expect to pay for the material when the project is performed. The estimator must include in the materials price determination, details such as applicable taxes, shipping fees, delivery fees, special handling requirements, and so forth, for the materials, all of which will add an increment of cost to the original quoted price.

In addition, suppliers will often include the designation FOB in their price quotations, which translates literally to "free on board" or "freight on board." The FOB designation in a price quotation will be accompanied by a specific location or destination, as stipulated by the vendor (e.g., "FOB my loading dock, Kansas City, Missouri"). This location is the designated place where the supplier will have the material located for the contractor when the material is purchased. This location might be the supplier's or manufacturer's location, a warehouse, or a port facility. Or it could be the contractor's job site. This is also the location to which the supplier assumes responsibility and the point at which the contractor assumes responsibility for the material or product at the price that has been quoted. Additional information regarding the FOB designation is provided in subsequent sections of this book.

When all of the elements of the cost of each material have been finalized, all of the prices for all of the materials needed for the project are totaled by the estimator. This total becomes the materials cost subtotal in the estimate.

While this process may seem direct and straightforward, there is actually a considerable degree of uncertainty, and therefore risk, in this materials price determination. First, there is no relief for the contractor if the estimator's identification of the materials required or his determinations of the necessary quantities are inaccurate. The contractor is required to provide and install the materials necessary to fulfill the requirements of the contract documents without regard to whether this is the quantity determined by the estimator.

Additionally, some materials prices are stable, while others fluctuate. Time will elapse between the taking of the price quotation from the supplier, and the point in the future when the material is actually purchased for the project. Materials prices will often change during that time.

Sometimes materials suppliers will guarantee their materials price quotations for a specified period of time following their initial price quotation, but often not. Therefore, the price that the estimator includes in the estimate at the time of its preparation must reflect, as nearly as possible, the price for which he or she expects the company to buy the material on that date in the future when that material is actually purchased for the project.

While materials are frequently purchased from suppliers or distributors as previously described, there are times, especially on engineered projects, when the contractor produces its own materials, for example, when a contractor is producing its own aggregate as required for a highway project. In such an instance, the contractor would determine its own cost of production, per cubic yard or per ton, by determining the costs of drilling, blasting, crushing, screening, stockpiling, and delivering the required aggregate to the several portions of the project. Similarly, highway and heavy construction contractors frequently install their own batch plants on the site for the production of portland cement concrete and asphaltic concrete for the project.

#### 5.13.1.5 Materials Price Summaries

Upon completion of the quantity survey by the estimator, most contractors enter the materials prices onto some type of summary sheet or into their estimating spreadsheet or software. Usually, the total amount of each work classification is obtained and listed. Figure 5.4 presents a form of summary commonly used for a lump-sum project. For this type of contract, a similar summary is prepared for each major work classification. Figure 5.4 contains final quantities of concrete and formwork materials on the Municipal Airport Terminal Building, a hypothetical project that will be used in this text to illustrate selected procedures.

Similar summaries are prepared for all of the other principal work types. When the total quantities of work for each classification have been entered, the summary is then used for the pricing of materials.

Figure 5.5 shows an example of a materials summary for an engineered project where a unit-price contract is employed. For this type of bidding on an engineered project, a summary is prepared for each bid item. As illustrated in Figure 5.5, all work types associated with the accomplishment of that bid item are listed on the summary, which often includes several different work categories. With the work quantities obtained from the takeoff, the contractor uses the cost summary to obtain the total direct costs of that bid item. The summary sheets for unit-price projects customarily serve for the computation and recording of material, labor, equipment, and subcontract costs. Figure 5.5 illustrates this point as well.

It should be noted that each work classification entered on a summary is typically identified by a cost account number. These numbers are the company's standard cost account numbers, which are basic components of its cost management system and historical information database system. Each estimate is broken down in accordance with the established cost accounts. Chapter 12 discusses the essentials of a contractor's project cost management system.

#### 5.13.1.6 Alternate Materials

As discussed in Chapter 4, the material specifications on certain projects require that a specifically named product be furnished (closed specification), while sometimes providing the bidding contractor the right to propose a less costly substitute as an alternate in its proposal. When the contractor determines the amount of its bid, the cost of the specified product is used. However, the proposal

SUMMARY SHEET

Project Municipal Airport Terminal Building Work Item Concrete and Forms

| Cost Account Number | Work Item | Unit | Total Quantity | Material Cost Each | Material Cost Total | Labor Cost Each | Labor Cost Total | Total Cost |
|---|---|---|---|---|---|---|---|---|
| 240 | CONCRETE | | | | | | | |
| .01 | Footings | c.y. | 1,040 | $59.25 | $61,620 | $6.75 | $7,020 | $68,640 |
| .05 | Grade beams | c.y. | 920 | $63.75 | $58,650 | $9.45 | $8,694 | $67,344 |
| .07 | Slab | c.y. | 2,772 | $59.25 | $164,241 | $9.00 | $24,948 | $189,189 |
| .08 | Beams | c.y. | 508 | $63.75 | $32,385 | $9.45 | $4,801 | $37,186 |
| .09 | Bond beams | c.y. | 62 | $63.75 | $3,953 | $13.50 | $837 | $4,790 |
| .11 | Columns | c.y. | 102 | $63.75 | $6,503 | $13.05 | $1,331 | $7,834 |
| .12 | Walls | c.y. | 466 | $63.75 | $29,708 | $10.13 | $4,718 | $34,426 |
| .16 | Stairs | c.y. | 317 | $63.75 | $20,209 | $11.70 | $3,709 | $23,918 |
| .19 | Sidewalks | c.y. | 320 | $59.25 | $18,960 | $9.00 | $2,880 | $21,840 |
| .20 | Expansion joint | l.f. | 41,060 | $0.38 | $15,398 | $0.23 | $9,239 | $24,636 |
| .40 | Screeds | s.f. | 148,000 | - | - | $0.18 | $26,640 | $26,640 |
| .50 | Float finish | s.f. | 22,000 | - | - | $0.23 | $4,950 | $4,950 |
| .51 | Trowel finish | s.f. | 128,000 | - | - | $0.38 | $48,000 | $48,000 |
| .52 | Stair finish | l.f. | 2,060 | - | - | $1.58 | $3,245 | $3,245 |
| .60 | Rubbing | s.f. | 2,530 | $0.09 | $228 | $0.83 | $2,087 | $2,315 |
| .91 | Curing | s.f. | 180,000 | $0.06 | $10,800 | $0.05 | $8,100 | $18,900 |
| | | | | | $422,652 | | $161,198 | $583,851 |
| | Indirect Labor Cost | | | | | 39% | $62,867 | $62,867 |
| | Total Concrete | | | | $422,652 | | $224,065 | $646,718 |
| 260 | FORMS | | | | | | | |
| .01 | Footings | s.f. | 1,220 | $1.05 | $1,281 | $1.50 | $1,830 | $3,111 |
| .05 | Grade beams | s.f. | 4,840 | $1.20 | $5,808 | $1.50 | $7,260 | $13,068 |
| .08 | Beams | s.f. | 1,965 | $1.32 | $2,594 | $1.62 | $3,183 | $5,777 |
| .11 | Columns | s.f. | 1,642 | $1.62 | $1,786 | $2.99 | $3,267 | $5,053 |
| .12 | Walls | s.f. | 3,240 | $1.32 | $2,852 | $1.50 | $4,860 | $7,712 |
| .17 | Risers | l.f | 910 | $1.02 | $928 | $1.92 | $1,747 | $2,675 |
| .45 | Chamfer | l.f. | 510 | $0.12 | $61 | $0.12 | $61 | $122 |
| .60 | Oil, ties, nails | s.f. | 13,443 | $0.09 | $1,210 | - | - | $1,210 |
| .63 | Anchor slot | l.f. | 2,800 | $0.45 | $1,260 | $0.09 | $252 | $1,512 |
| | | | | | $17,780 | | $22,461 | $40,241 |
| | Indirect Labor Cost | | | | | 43% | $6,908 | $6,908 |
| | Total Forms | | | | $17,780 | | $29,369 | $47,149 |

**Figure 5.4** Summary Sheet Lump-Sum Bid

**SUMMARY SHEET**

Project Holloman Taxiways and Aprons  Bid Item No. 5 Concrete Pavement, 9 inch

| Cost Account Number | Work Item | Quantity | Unit | Material | | Labor | | Equipment | | Subcontract |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Unit Cost | Total | Unit Cost | Total | Unit Cost | Total | |
| 250.03 | Concrete, production | 23,625 | c.y. | $30.90 | $730,013 | $22.91 | $541,131 | $5.16 | $121,905 | - |
| 254.01 | Concrete, hauling | 23,625 | c.y. | - | - | $0.45 | $10,631 | $0.53 | $12,403 | - |
| 258.02 | Concrete, lay-down | 90,000 | s.y. | - | - | $1.59 | $143,100 | $0.74 | $66,150 | - |
| 270.08 | Reinforcing | 50 | ton | $825.00 | $41,250 | $525.00 | $26,250 | - | - | |
| 248.20 | Grooves | 105,000 | l.f. | $0.06 | $6,300 | $0.05 | $4,725 | $0.02 | $1,575 | - |
| 240.95 | Curing | 90,000 | s.y. | $0.15 | $13,500 | $0.06 | $5,400 | $0.008 | $675 | - |
| | | | | Totals | $791,063 | | $731,237 | | $202,708 | - |
| | | | | | | Labor Indirect Cost, 37% | $270,558 | | | |
| | | | | | | Labor Cost | $1,001,795 | | | |

**Figure 5.5** Summary Sheet Unit-Price Bid

also identities the substitute product proposed for use and the difference in price to the owner if the alternative product is approved.

#### 5.13.1.7 Owner-Furnished Materials or Items

It is not unusual for the bidding documents to provide that certain materials will be supplied by the owner to the contractor at no charge. These materials are referred to as owner-furnished materials or owner-furnished items.

For these items or materials, no material costs per se need to be obtained by the contractor or be included in the project cost estimate. However, all other costs associated with such materials, such as job site storage and protection, and handling or lifting, as well as installation costs, must be included.

#### 5.13.1.8 Allowances

On occasion, the architect-engineer or owner will designate in the bidding documents, a fixed sum of money that the contracting firm is directed to include in its estimate to cover the cost of some designated item of work. This is called an *allowance* and is often used with regard to materials such as finish hardware, face brick, or light fixtures. Such an allowance establishes an approximate material cost for bidding purposes in those instances in which the designer does not prepare a detailed material specification, or where a selection of the exact product to be used has not been made, in advance of bidding.

The contractor does not solicit material prices for these items, but rather simply includes the designated allowance amount in the bid. After the contract is awarded, at some point a final material selection is made by the owner or architect-engineer, and the contractor purchases and installs that which has been selected.

The inclusion of an allowance in the proposal does not necessarily mean the contractor is entitled to receive payment in the amount of the allowance. The contract documents typically provide that, after the completion of construction, an adjustment in the contract amount will be made for any difference between the designated allowance amount for an item and the final actual cost of that item.

## 5.14 ESTIMATING LABOR COST

### 5.14.1 Direct Labor

As noted earlier, the estimator will ordinarily calculate labor costs for the craft labor that the contractor plans to self-perform, that is, to perform with craft workers on his payroll. Having decided what parts of the work will be self-performed and what parts of the work will be performed by subcontracting, the estimating staff will determine the labor cost of the contractor's craft labor forces that will perform work on the project.

While there are a number of different approaches to the process of labor estimation, many estimators believe that the best approach is for the estimator to "build the job in his mind" and to estimate labor in doing so. In building the project in his mind, the estimator will determine all of the activities that must be performed in order to complete the work. Activities are defined as elements of work that are identifiable and quantifiable and that consume resources.

Next, the estimator will envision the number and the classification—how many journeymen, apprentices, crew leaders, and so on—of craft workers necessary to perform each defined activity. This is referred to in estimating terminology as making the work breakdown structure (WBS).

The next crucial step is determining, literally estimating, the number of man-hours necessary for the crew and each of its craft workers to complete each activity that has been identified. This component of the labor estimate is both vital and, at the same time, filled with uncertainty.

This determination of craft labor hours is vitally important because this is where labor man-hours are quantified. Obviously, this determination will form the basis for the quantification of labor cost on the project. On building construction projects, labor cost is typically the largest single component of the total cost of a construction project.

At the same time that the quantification of labor craft hours, and therefore labor cost, forms the basis for the largest component of the cost of a project, this determination is also the most uncertain and therefore the most risky component of the estimate. This is true because estimating labor man-hours is literally based on estimating the productivity of the craft labor on the project. It is one of the ironies, and also one of the elements of difficulty associated with cost estimating, that labor is both the largest component of cost within an estimate and at the same time the most difficult and therefore the most risky-to-estimate component of construction cost.

There are many factors that influence what the labor productivity will be on a construction project, and many of these factors are difficult to predict in advance. Additionally, their impact on labor productivity is difficult to quantify. A few examples will illustrate this point.

Weather has a profound influence on labor productivity. Hot and cold weather, high humidity, wind, and precipitation all have an influence on the rate at which craft labor can perform the work. While general weather trends can usually be predicted, the daily weather and its variability, as well as sudden and unforeseen weather events such as storms or precipitation, certainly affect productivity but cannot be predicted with accuracy.

Additionally, factors such as geographic location of the project, the composition of the construction team—owner, architect, general contractor personnel, subcontractors, building officials, and so on—all have a bearing on the craft labor productivity on a project. Likewise, the composition and management abilities of the contractor's team—supervisor, superintendent, project manager, and office staff—also have an influence. All of these various factors exert an influence on how craft labor does its work and how productive the craft workers will be.

While other factors could be listed that may impact labor productivity, it should now be clear that the estimator faces a daunting task in his endeavor to quantify and to determine the cost of craft labor and its performance of the construction work on a project. Nonetheless, the estimator must make the best prediction possible of the cost of labor to perform the project, given the time and other resources available.

To accomplish this task, there are several different methodologies that may be employed. Both of the methods described here make extensive use of the historical cost information that the contractor's cost estimating, cost accounting, and cost control system has developed. This is, in fact, the very reason for the contractor's compiling and maintaining this file of information. While the system or cycle of cost accounting and management will be further discussed in another chapter, the relationship of this cycle and its historical cost information database to the process of estimating labor is shown in Figure 5.6.

The historical cost data is a tabulation of the contractor's costs of performing work, by project and by activity, on past projects. This information is generated as each project is performed, and is stored in a systematic manner in the historical cost database. This database is one of the contractor's most important and most closely guarded assets.

By one estimating philosophy and methodology, the estimator "builds the job in his mind" and estimates construction costs as though this database of information did not exist. He proceeds with

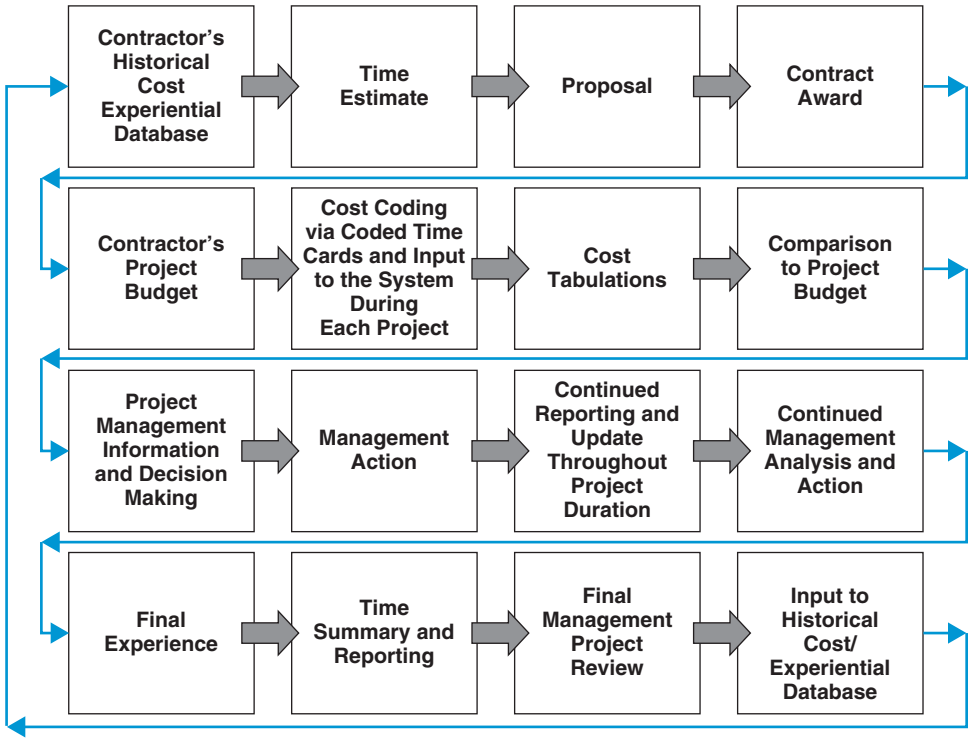



**Figure 5.6** Cycle of Cost Accounting, Cost Reporting, and Cost Control, and Historical Information Database

estimating labor as we have described, envisioning activities to be performed, determining the WBS, and estimating craft labor man-hours for the performance of the work. Periodically during the development of the estimate, or sometimes when the labor estimate is complete, the estimator will then check the values he has derived in his estimate, against labor man-hours for the same activities on similar or comparable projects that have been completed on the past, as stored in the historical cost information. This comparative analysis allows the estimator to determine his comfort level with the values he has derived in this estimate, as a function of how these values compare to the contractor's experience on similar activities and projects that the contractor constructed in the past.

A second method for estimating labor is the converse of the first. By this approach, estimators consult the historical information first, and based on the activities to be performed on the project currently being estimated, they then extract from the historical information the number of man-hours in the performance of these activities on past projects. The estimate being prepared presently is then structured accordingly. Finally, the estimators adjust the man-hours or production rates in the current estimate in such a way as to reflect their best determination of what the man-hours or production rates will be on the project currently being estimated, in order to reflect current conditions or influences on this project.

Certainly, individual estimators, as well as different construction company owners, have their opinions regarding which method of estimating labor yields the best results. In the final analysis, however, the conclusion is the same: the estimator must utilize his skill and judgment, and the best

tools and resources available, to include the historical information database, to estimate with the greatest degree of certainty attainable, the cost of the craft labor in performing the construction work on the project.

Following the determination of all the activities to be performed in completing the work on the project and the estimation of the number of man-hours of craft work necessary to complete each activity, the estimator will develop totals for labor man-hours by craft and by skill level. The total number of master carpenter hours, journeyman carpenter hours, carpenter apprentice hours, ironworker hours, cement finisher hours, and the like will be determined.

The labor cost to be included in the estimate will then be calculated by multiplying the craft man-hours estimated for each craft, by the rate (dollars per hour) at which that craft and skill classification will be paid on the project. The total dollars determined by this process is referred to as the direct labor dollars.

In a variation of the process described above, estimators may also use historical cost information from past projects to produce production rates for different activities. Labor production rates, in turn, can be expressed in a variety of ways. One of these methods is to determine the man-hours or crew-hours required to accomplish a unit or prescribed number of units of a given work type. As an example, six hours of carpenter time and six hours of carpenter-helper time may be required to assemble, erect, plumb, brace, strip, and clean 100 square feet of rectangular concrete column forms.

To obtain the estimated labor cost for a given quantity of such work, the labor hours required per unit of work are multiplied by the appropriate wage scales per hour for the craft, and then are again multiplied by the total number of units of work of this category as obtained from the quantity survey.

A different way to express this type of labor production rate is the number of units of work accomplished per working day by a worker or by a crew in a certain craft. Another version of labor production rates is total man-hours or total crew-hours to complete a given job of work.

When estimating the costs of construction labor, a cost per unit of work, or a unit price, can be useful and convenient. For example, if carpenters earn $28.35 per hour, and a carpenter-helper's wage scale is $21.50 per hour, the rectangular column forms cited previously will have a labor unit cost of $2.99 per square foot [($28.35 + $21.50) × 6 ÷ 100]. These "labor unit costs" are quick and easy to apply, as illustrated by Figure 5.4. However, the estimator must ensure that his labor unit costs are kept up-to-date and that they reflect the probable levels of work production and the applicable wage rates.

Certainly, the most reliable labor productivity information is that which the contractor obtains from its own completed projects, stored in his historical cost database. Information on labor productivity and costs is also available from a wide variety of commercial sources. However, while information of this type can be very useful at times, it must be emphasized that labor productivity varies greatly from one geographic location to another and is further modified by seasonal influences and many other factors.

Estimators must be very circumspect when using labor unit costs that they have not developed themselves. For the same work items, different estimators will include different expense items in their labor unit costs. It is never advisable to use a labor unit cost derived from another source, without knowing exactly what it does and does not include.

### 5.14.2 Indirect Labor

The total labor dollars on the project will include the determination of both direct labor and indirect labor dollars, as illustrated in Figure 5.7. Indirect labor is also frequently referred to as labor burden.

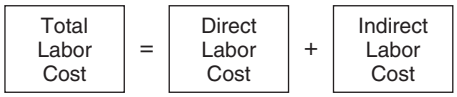



**Figure 5.7** Total Labor Dollars Determination for the Estimate

Indirect labor dollars are defined as dollars that the contractor must pay, expressed as a fraction or percentage in several different categories, for each direct labor dollar of labor cost. Examples include federal withholding taxes, Social Security taxes, workers' compensation insurance premiums, unemployment insurance premiums, union fringe benefits, employee medical care, and employer-furnished fringe benefits such as paid vacation time, pension plans, health and welfare funds, and so on.

Each of these elements of indirect labor cost is typically defined as a percentage of direct labor dollars. Most contractors will tabulate the total of all of the indirect labor components to be included for each craft and skill level and will then apply that percentage as a multiplier to the direct labor for that craft and skill level. While the amount will vary by location and by contractor, the indirect labor is frequently in the range of 40 to 50 percent of the direct labor amount.

Indirect labor costs can be included in the cost estimate in different ways. For example, labor unit costs or hourly labor rates that include both the direct and indirect costs of labor can be used. However, this procedure does not always interrelate well with a contractor's cost accounting methods. For this reason, direct and indirect labor costs are often computed separately when job costs are being estimated. One commonly used method is to add the proper percentage allowance for indirect costs to the total direct labor cost, either for the entire project or for each major work category. Because of the appreciable variation of indirect costs from one labor classification to another, it may be preferable to compute indirect labor cost at the same time that direct labor expense is obtained on the summary sheets. The 39 percent and 43 percent additions to the labor column of Figure 5.4 represent the total indirect labor costs associated with the concrete placing and forming, respectively.

### 5.14.3 Other Considerations in Estimating Labor

The pricing of labor in a construction cost estimate can also be influenced by local-hire rules, as well as bid advantages offered by some local governments on certain of their projects. For example, hiring quotas or goals are established for local residents, minorities, women, and members of historically disadvantaged groups on some public projects. Another version occurs when some bidding contractors receive a bidding advantage when they bid a project, based on the number of local residents, minorities, women, and members of historically disadvantaged groups whom they promise to employ if they receive the contract award.

It should also be noted that because of the importance of the labor cost determination, after the labor estimate is complete, this component of the estimate is almost always subjected to several levels of review on the part of the contractor. The estimating staff will typically make the initial determination, followed by a review on the part of the head of the estimating department or by the chief estimator. In some companies, company management or the owner of the company may conduct a final review of the labor cost determined by the chief estimator, prior to finalizing the proposal.

## 5.15 ESTIMATING EQUIPMENT COST

The estimation of equipment cost begins with the estimator's determining what items of equipment will be necessary for the performance of the work on the project being estimated. Equipment will be

defined in this sense as machinery that is necessary for the contractor's performance of the work. First, there is sometimes confusion regarding the term *equipment* and its definition as machinery necessary for the performance of the work on a project, as contrasted with equipment that is to be installed in the project, such as heating, ventilating, and air conditioning equipment.

Machinery that is necessary for the performance of the work may include cranes, backhoes, materials lifts, temporary elevators, track hoes, earthmoving equipment, and so on. As used herein, *equipment* refers to a contractor's equipage used for the physical accomplishment of the work on construction projects.

It should also be noted that the management of the construction company will have done some decision making in the development of the company's estimating and cost accounting systems regarding its definition of equipment. Most contractors define equipment as noted earlier, with the additional element of definition to include the fact that equipment usually is defined as a capital expenditure subject to depreciation.

In most contractors' organizations, the concept of capital equipment is what distinguishes equipment from other similar elements necessary for the performance of the work, such as tools. While a pan scraper earth-moving machine would certainly be a capitalized piece of equipment, concrete vibrators, circular saws, electric drills, extension cords, sledge hammers and other hand tools, and so on would be most commonly be classified as tools. Tools, in turn, will typically have their costs accounted for and will be included in the estimate as project indirect cost items, which will be discussed in a subsequent section of this chapter.

Sometimes tax laws govern the determination of the classifications of capital equipment, as contrasted with tools. When legislation does not provide the distinction, the contractor will make internal company definitions of equipment and tools classifications. Sometimes standard accounting practice will also indicate how these classifications are structured.

It is important to know that while both equipment and tools as described thus far have costs associated with their purchase and use, the matter of where and how the cost is tabulated and estimated is not as important to understand as is the realization that every component of cost, no matter its name or its classification in an accounting sense, comprises a component of the cost of performing construction work and must be included in the contractor's estimate. Many contractors utilize the expression, "If I need this item in order to perform the work, and if I do not have its cost included in the estimate, then I will be furnishing it to the project free." This is hardly a good business procedure. Therefore, every effort is made by the estimator to include a cost in the estimate for everything that will be needed in terms of equipment and tools, in order to perform the work on the project.

Equipment costs, like labor costs, are difficult to evaluate with exactness. Equipment accounts for a substantial proportion of the total cost of most engineering projects, but is typically somewhat less significant as a fraction of the total cost in building construction work.

When the nature of the work (usually engineered construction) requires major items of equipment such as bulldozers, pan scrapers, motor graders, concrete plants, draglines, and so on, detailed studies of the associated costs must be conducted. In his determination of what elements of equipment will be needed to perform the work, the estimator must first carefully assess the exact characteristics the equipment must have, in order to effectively perform the work on the project being estimated. Factors such as lifting capacity, height or depth of reach, production rate, mobility, and many other factors determine the suitability of the particular equipment to meet the specific needs of the work to be done.

If the contractor owns the equipment having the characteristics needed for the project being estimated, and if the plans are to use this equipment on the project being estimated, the estimator

will proceed with determining its cost to the project by calculating the contractor's ownership and operating costs for each piece of equipment, and ascribing those costs to the project based on the amount of time the machine will be needed on the project. The production rate for each machine will also enter into the estimator's calculations of equipment cost. If the contractor does not own a piece of equipment whose need has been identified for a project, he may consider purchase, or he may rent or lease the necessary equipment. If a purchase decision is made, the estimator will proceed with determining ownership and operating costs.

If the contractor does not own the needed equipment and decides not to purchase, then the equipment will be rented or leased for the project. While there certainly are differences between equipment rental and lease agreements, for purposes of understanding the estimating process, the process of estimating the costs of equipment rental or leasing will be considered as being the same.

In this case, having determined the needed characteristics in the machine to be rented or leased, the estimator will contact equipment rental or lease agencies in order to obtain price quotations. These quotations are usually stated by rental or lease agencies as a rate—dollars per hour, per day, per week, and so on. The estimator will determine the amount of time the equipment will be needed on the project, based on the quantity of work to be performed and the production rate of the equipment, and will multiply by the best rate quoted to obtain the equipment cost.

The estimator must add to the quoted equipment rate his consideration of the cost of other typical elements of the rental or lease agreement such as delivery and pickup charges, setup fees, loss and damage waivers, and the like. Additionally, operating and maintenance costs, as well as the cost of the equipment operator, must usually be determined and included as additional elements of the cost of the rented equipment. The estimator will tabulate all of these elements of the cost for the rented machine and will then include these costs in the estimate.

For equipment the contractor already owns that is needed for a project, the estimator will determine the rate, also known as the internal rate, for the machine that is needed. The internal rate is the sum of the contractor's ownership and operating cost for the machine, as illustrated in Figure 5.8. This cost is typically expressed as dollars per unit of time—dollars per hour, per day, per week, and so on. Ownership and operating costs for equipment the contractor owns will have been determined by the cost accounting system the contractor has developed for his business.

Ownership costs can be defined as costs that continue to accrue, whether the machine is in use or not. Examples include financing costs for buying the machine (or sinking fund contributions for replacing the machine at the end of its useful life), and depreciation. Operating costs, as their name indicates, include costs associated with the operation of the machine. Examples include fuel, lube, hydraulic fluid, filters, tires, scheduled maintenance, repairs, and so on.

To determine ownership and operating costs, most contractors utilize their historical cost database or perhaps a separate ledger account for equipment. Machine costs are tabulated over a period of time, stored in the historical cost database, and then converted to the internal rate.

The estimator will determine how long the piece of equipment is needed on the project whose cost he is estimating, based on the machine's production rate and the quantity of work to be done with the machine. He will then multiply the amount of time the machine is needed by its internal rate in order to determine the cost of utilizing that machine on the project. In the future, as the project


**Figure 5.8** Equipment Cost

is constructed, revenue received for the performance of the work will be allocated, on an internal accounting basis in the contractor's office, to pay for the ownership and operating costs of the contractor's owning this machine and furnishing it for use on this project. Additionally, as the project is constructed, the costs of the machine performing work on the project will be tabulated and stored in the historical information database.

The estimator will also determine the cost of the machine operator in the project cost estimate. The operator's hourly rate will be multiplied by the time he or she will spend operating the machine on the project, in order to determine dollars of operator cost for the estimate, for each machine, for the time it is used on the project.

It should be noted that, although equipment operator costs are estimated as noted, these costs are usually tabulated in the labor cost section of the estimate. Though it is logical to assume that the equipment cost should include equipment operator cost, the inclusion of operator costs in the labor cost section of the estimate simply facilitates calculations of indirect labor costs, which are based on labor payroll dollars.

### 5.15.1 Equipment Expense

To estimate the expense of major equipment items as realistically as possible, as noted previously, management decisions must be made concerning the exact equipment sizes and types that will be required and the manner in which the necessary units will be provided to the project. A method sometimes used by contractors when the duration of the construction period will be about equal to the service life of the equipment is to purchase new or renovated equipment for the project and then sell it at the end of construction activities. The difference between the purchase price and the estimated salvage value is entered into the project estimate as a lump-sum equipment expense.

The most common manner in which equipment is provided to construction projects is where the contractor owns the equipment and uses it on a succession of projects during its economic lifetime. Rather than a lump-sum equipment purchase expense or cost of rental or lease, ownership costs and operating costs are tabulated and included in the estimate in this instance.

Ownership cost is of a fixed nature and accrues whether the equipment is working or not, and includes considerations such as depreciation, interest on investment or financing cost, taxes, insurance, and storage. Operating costs include such expenses as fuel, oil, grease, hydraulic fluids, filters, repairs and parts, tire replacement and repairs, and maintenance labor and supplies. The calculations for the determination of a contractor's ownership and operating costs for a bottom-dump hauling truck are illustrated in Figure 5.9. Note that the calculations result in a cost per hour for the contractor's ownership and operation of this piece of equipment. As noted previously, this is referred to as the internal rate.

The direct labor cost of a given work type is computed by combining a labor production rate with the applicable hourly wage scales and total work quantity. Most equipment costs are calculated in much the same fashion, except, of course, that equipment production rates and hourly equipment costs must be used. The hourly wage rates of various labor categories are immediately determinable from applicable labor contracts, prescribed prevailing wage rates, or established area practice. However, this is not true for equipment.

As noted previously, for equipment the contractor owns, ownership cost and operating cost are tabulated by the contractor in order to establish the internal rate, expressed as dollars per unit of time. Additionally, the production output of each machine is determined from historical records maintained by the contractor, and is expressed as the production rate for the machine. Contractors establish their

**ESTIMATE**
Hourly Ownership and Operationg Cost for
DP-12 Bottom-Dump Hauler

Ownership Cost

1. Depreciation

| | | | |
|---|---|---|---|
| Purchase price | = $ | 105,450 | |
| Freight | = $ | 3,279 | |
| Delivered price | = $ | 108,729 | |
| Less tires | = $ | 17,620 | |
| Depreciable value | = $ | 91,109 | |
| Hourly depreciation | = $ | $\frac{91,109}{12,000}$ | = $ 7.59 |

2. Interest, taxes, and storage

$$\frac{\$57,997.50(0.16)}{1,200} = \$\ 7.73$$

Total hourly ownership cost = $ 15.33

Operating Costs

3. Fuel, 4 gallons per hour @ $1.62 = $ 6.48
4. Oil, lubricants, filters (1/3 of fuel cost = 1/3($6.48) = $ 2.16
5. Repairs, parts, and labor 35% of depreciation = 0.35($7.59) = $ 2.66
6. Tire replacement = $\frac{\$17,620}{3,500}$ = $ 5.03
7. Tire repairs (15% of tire replacement cost) = 0.15(5.03) = $ 0.76

Total hourly operating cost = $ 17.09

Total estimated ownership and operating cost = $ 32.41

**Figure 5.9** Determination of Equipment Ownership and Operating Cost

own hourly equipment costs, as well as their equipment production rates. Ownership cost is combined with operating cost to derive an estimated total cost per operating hour for most items of production equipment. Power shovels, tractor-scrapers, and ditching machines are examples of equipment whose costs are usually expressed in terms of hourly rates.

However, the costs of some classes of a contractor's production equipment are frequently expressed in terms of expense per unit of product produced. Portland cement concrete mixing plants, asphalt-paving plants, and aggregate plants are typical examples. The logic for tabulating the costs of such equipment is the same as that expressed earlier; the contractor must develop a method for determining his cost of owning and operating the equipment, and must include those costs in the estimates of the projects where that equipment will be used.

Additionally, it should be noted that there are some types of equipment, normally referred to as support equipment, for which it is more appropriate to express costs in terms of time units other than production rates. Air compressors, welding machines, and cranes of various types are examples of equipment required on the job site on a continuous basis during particular phases of the work, and production rates have no real significance with regard to determining the cost of furnishing such equipment to the project. Costs per week or per month are much more appropriate for such equipment items.

Move-in, erection, dismantling, and move-out expenses, also called mobilization and demobilization costs, are independent of equipment operating time and production and are not, therefore, usually included in equipment hourly rates. These equipment expenses are separately computed for inclusion in the estimate, often as an item of project overhead.

The preceding discussion assumes that equipment accounting is done on an individual machine basis. However, contractors vary somewhat in how they maintain their equipment accounts, some preferring to keep equipment costs by categories of equipment rather than by individual unit. These firms use a single account for all equipment items of a given size and type, and compute an average budget rate based on the composite experience with all of the units included. Thus, the same expense rate is applied for any unit of a given equipment type regardless of differences in age or condition. When estimating equipment costs on a future project, there may be some logic in using an average actual hourly cost rate for any given equipment type and capacity, because it is often not possible to predict exactly which equipment units will be placed on a particular project.

There are many external sources of information concerning ownership and operating costs for a wide range of construction equipment. Manufacturers, equipment dealers, and a large assortment of publications offer such data. It must be realized, however, that these are typical or average figures, and that they must be adjusted to reflect contractor experience and methods and to accommodate the specific circumstances of the project being estimated. Climate, altitude, weather, job location and conditions, operator skill, field supervision, and numerous other factors can and do have a pronounced influence on equipment costs.

When a new piece of equipment is procured for which there is no cost history, equipment expense must be estimated using available sources of information considered to be reliable. When estimating equipment costs, an excellent reference is the *Contractor's Equipment Cost Guide,* published by the Associated General Contractors of America and Dataquest, Inc. Another source of ownership and operating costs for construction equipment is the guidelines for federal construction projects and the values predetermined and used by the federal government when paying a contractor for its equipment costs incurred in contract modifications. Methods such as these are applied when the contractor cannot establish its own equipment hourly costs from actual accounting records.

### 5.15.2 Ownership and Operating Costs

Hourly expense rates are computed and periodically updated for each major piece of production equipment a contractor owns. Figure 5.9 illustrates a commonly used procedure by which these tabulations are done, using a bottom-dump hauler as an example. The average annual usage of this hauler is approximately 1,200 hours, and it is assumed that the useful life of the machine will be a total of 12,000 operating hours, or 10 years.

In Figure 5.9, the original price of the hauler, less tires, is depreciated uniformly over 12,000 hours. The cost of the tires is deducted from the original purchase price because the tires have a shorter service life than the mechanical equipment itself. Depreciation is equipment expense caused by wear and obsolescence, and allows for the recovery of the invested capital over the useful life of the equipment. The method by which the depreciation expense is spread uniformly over the total service life is referred to as *straight-line depreciation*. As discussed in another section, there are several different depreciation methods that may be utilized. Regardless of the mode of equipment depreciation a contractor may use for tax and other accounting purposes, the use of straight-line depreciation for estimating and job cost accounting is usual practice.

Taxes, insurance, storage, and interest on investment, together referred to as investment cost, are customarily based on the average annual value of the equipment. The example in Figure 5.9 assumes taxes at 2 percent, insurance and storage at 5 percent, and interest at 9 percent, for a total annual cost of 16 percent of the average yearly value. A standard way of computing the average annual value, based on straight-line depreciation, is by the equation:

$$\frac{C \times (n+1) + S \times (n-1)}{2n}$$

where $A$ = average annual value
$C$ = delivered cost
$n$ = number of years of useful life
S = salvage value

In Figure 5.9, with a salvage value of zero, the average annual value is calculated as follows:

$$\frac{\$105,450 \times (10+1) + 0 \times (10-1)}{2 \times 10} = \$57,997.50$$

The calculation above illustrates the determination of the average annual value ($57,997.50) of the bottom dump hauler, on a straight-line depreciation basis. This value is reflected in Item 2 of Figure 5.9, as a component of annual ownership cost for the equipment.

Operating costs are computed on the basis of the contractor's own experience, or by using available national averages. Equipment manufacturers and dealers provide typical ownership and operating costs. It must be realized, however, that these are average figures and that they may not reflect the conditions of the project being estimated. Job estimates must be based on individual job conditions, and the contractor's past experience is the best guide in this regard. Nevertheless, there are times when national averages can be very useful.

In the computation of tire replacement cost in Figure 5.9, a new set of tires is assumed to have a life of 3,500 operating hours. Costs of major repair and overhaul are not normally regarded as operating expense but are capitalized and treated as an element of ownership expense.

Figure 5.9 shows that for the bottom-dump hauler, the ownership cost is $15.33 per operating hour, and the estimated operating costs are $17.09 per operating hour. This piece of equipment operating in the field will cost the contractor a total of $32.42 per working hour, not including operator's labor.

It is important to note that ownership expense goes on whether or not the equipment is working. If the bottom-dump hauler actually works 1,200 hours or more per year, the owner recovers this cost. If the hauler works less, the contractor does not recover all the annual ownership costs, and the deficit comes out of general company profits. Operating costs are, of course, incurred only when the equipment is actually being used.

When equipment is leased or rented rather than owned, there is no ownership cost involved. Rather, the lease or rental cost, expressed on an operating hour basis, is used. Operating costs apply as before, with the sum of the two again providing the rate for the item.

The costing of smaller equipment items the contractor owns and is capitalizing, is done in a somewhat similar manner. A common example might be the calculation of the expense of an electric concrete vibrator whose initial cost is $840. Suppose the service life of this vibrator is approximately four years and about $240 per year must be spent on servicing, repairs, and new parts. With an annual investment cost of approximately $67, this translates into a total cost of $2,068 spread over 48 months, or $43 per month. If concrete pouring on a project will extend over four months, the equipment expense to be added into the estimate for this project for the concrete vibrator will be $172.

### 5.15.3 Equipment Production Rates

In addition to equipment cost, equipment production rates are also needed for the computation of equipment cost in a construction estimate. Applying equipment hourly expenses and production rates to total job quantities enables the estimator to compute the equipment cost for the project. Equipment unit costs, equipment costs per unit of production, can also be determined.

Equipment production rates, like labor production rates, are subject to considerable variation, and are influenced by a host of different jobsite conditions. In addition, some equipment production rates must be computed using specific job conditions such as haul distances, grades of inclines to be traversed, and rolling resistance. Estimators must consider and evaluate all of these factors when they are determining equipment costs for a project.

There are several sources of equipment production information. The most reliable by far are the contractor's production records from past projects. Additionally, input from the equipment operators can be very useful at times. If a new piece of equipment is involved with which there has been no prior experience, production information provided by the equipment manufacturer or dealer can be of assistance.

There are many rules of thumb and published sources of information concerning average equipment production rates. "Stopwatch spot checks," made to obtain the productivity of specific equipment items at a moment in time, may be of value. In this regard, however, it should be noted that production rates of equipment used for estimating purposes should be average values taken over a significant period of time. Daily job production tends to be variable, and this is a drawback of using

**ESTIMATE**
Hourly Production and Equipment Cost

| | |
|---|---|
| Project Hollowman Taxiways | Production required 280 bank c.y. per hour |
| Hauler DP-12 Bottom-Dump | Maximum capacity 40,000 lb. |
| Payload per cycle, loose c.y. 15.0 | b.c.y. 12.1 |
| Type of loading Power Shovel | Bucket Size 2 1/2 c.y. |
| No. of passes per load 6 | Loading rate 355 b.c.y. per hour |

| | | | |
|---|---|---|---|
| 1. | Loading time | = | 2.04 minutes |
| 2. | Haul time | = | 2.32 minutes |
| 3. | Return time (empty) | = | 1.29 minutes |
| 4. | Turning and dumping time | = | 0.30 minutes |
| 5. | Spotting time at shovel | = | 0.50 minutes |
| 6. | Total cycle time | = | 6.45 minutes |
| 7. | Average number of trips per 50-minute hour | = | $\frac{50}{6.45} = 7.75$ |
| 8. | Average hauling production per unit = 7.75(12.1) | = | 93.8 b.c.y. per hour |
| 9. | Number of haulers required | = | $\frac{280}{93.8} = 3$ |
| 10. | Fleet hauling production = 3(93.8) | = | 281.40 b.c.y. per hour |
| 11. | Hourly cost of haulers | | |
| | Owning and operating 3 haulers @ 32.412191071 | = | $ 97.24 |
| | Owning 1 standby hauler @ 15.32541 | = | $ 15.33 |
| | Hourly cost of fleet of 4 haulers | = | $ 112.56 |
| 12. | Equipment hauling cost | = | $\frac{\$\ 112.56}{281.4} = \$\ 0.40$ per b.c.y. |

**Figure 5.10** Estimate of Equipment Production Rate and Unit Cost

daily values and stopwatch spot checks. Production records from past projects produce good time average values.

Production rates may be applicable to a single piece of equipment, or may be determined for an equipment spread, which is an aggregation of a number of pieces equipment items working together as a group to accomplish a given aspect of the job. Figure 5.10 illustrates how a production rate and equipment unit cost are obtained for earth hauled by the bottom-dump haulers.

As is true for all such production equipment, the manufacturer of the bottom-dump hauler provides the contractor with much valuable information concerning its capacity and its performance characteristics. As illustrated by Figure 5.10, the contractor can use this information, together with operating characteristics of the power shovel which is loading the bottom-dump hauler, as well as the length, grade, and condition of the haul road, to determine the hauling production rate of the bottom-dump unit.

Applying the cost figures derived in Figure 5.9 to the production rate in Figure 5.10 results in a determination that the equipment unit hauling cost is $0.40 per bank cubic yard for a fleet of four such units. "Bank measure" refers to soil in its original, undisturbed condition, as compared to "loose" measure, which applies to the soil after excavation. Bank soil generally is more dense and has less volume than the same soil after it has been excavated. If an equipment unit cost that includes both loading and hauling is desired, the cost of the power shovel per bank cubic yard must be obtained and then can be added to the hauling cost.

Equipment production rates, whether provided by the manufacturer or observed on the job, are usually those that occur when the equipment is producing its maximum possible output. It should be noted that such rates are seldom maintained continuously, and allowances must be made for time losses and delays. The "50-minute hour" is commonly used, and was used in the calculations in Figure 5.10, with regard to excavating equipment as well as for other forms of production equipment. This term means that, on the average, the equipment is productive for a net time of 50 minutes per hour. The remaining time is consumed by nonproductive actions such as shifting position, operator delays, waiting, fueling, greasing, minor repairs, routine maintenance, etc. The application of the 50-minute hour is illustrated in Item 7 of Figure 5.10.

## 5.16 INDIRECT COSTS

Indirect costs are also referred to as overhead costs. Indirect costs can be defined as costs a contractor incurs, and dollars the contractor must pay, for elements that do not contribute in a direct way to the completion of a project, in the sense in which materials and labor and equipment do. Indirect costs are often referred to as costs for items that support the work being performed on the project.

Indirect costs are subdivided into two categories: project overhead and office overhead. Project overhead costs may also be referred to as general conditions costs, or as project indirect. Office overhead costs may also be referred to as company overhead, or as general overhead.

### 5.16.1 Project Overhead

Project overhead costs, as the name implies, refer to overhead costs incurred on the job site. These costs are typically a significant item of expense on a project and will generally contribute from 5 to 15 percent of the total project cost, depending somewhat on where and how certain project costs are included in the cost estimate.

Project overhead costs can be estimated with reasonable accuracy, and are compiled and included in the estimate by the estimator. Project overhead costs should be computed by listing and costing each item of overhead individually, rather than by using an arbitrary percentage of project cost. This is true because different projects can and do have widely varying job overhead requirements. The only way to arrive at an accurate estimate of job overhead is to analyze the particular needs of each project and determining the cost.

Typical items of job overhead are listed in Figure 5.11. This list is not represented as being complete, nor would all the items necessarily be applicable to any one project. The project overhead items listed in Figure 5.11 show that the prime contractor normally provides and pays for temporary job utilities and standard site services for use by the entire construction team.

Usually, the salaries of project supervision, foreman and superintendent, are included in project overhead, and sometimes the project manager's salary is included here as well. These project overhead costs for a project may be determined by direct estimation. More typically, however, these costs are extracted from the contractor's historical cost database and are then included in the estimate.

| | |
|---|---|
| Job Mobilization and Move-In | Worker Housing |
| Project Manager | Worker Transportation |
| Project Engineer/Assistant Project Manager | First Aid |
| Project Superintendent | Storage and Weather Protection |
| Nonworking Foremen | Protection of Adjoining Property |
| Timekeepers | Storage Area Rental |
| Badges | Legal Expenses |
| Security Clearances | Barricades |
| Temporary Electricity | Small Tools |
| Temporary Lighting | Tool Boxes/Gang Boxes |
| Temporary Water | Job Fencing |
| Temporary Heat | Job Gates and Locks |
| Sanitary Facilities | Miscellaneous Locks, Chains, Keys |
| Temporary Roads | Photographs |
| Parking Areas | Temporary Partitions |
| Security Watchmen | Temporary Walkways |
| Video Surveillance Security | Storage Buildings |
| Night Lights | Temporary Enclosures |
| Utilities for Job Office | Temporary Stairs |
| Computer Equipment for Job Office | Engineering Tests |
| Job Sign | Load Tests |
| Drinking Water Facilities | Engineering Services |
| Building Permits | Surveys |
| Other Permits and Fees | Equipment Move-In and Assembly |
| Builder's Risk Insurance | Equipment Disassembly and Move-Out |
| Other Insurance | Timekeepers |
| Field Office Supplies | Winter Operation Protection |
| Job Telephone | Pads for Laydown Areas |

**Figure 5.11** Typical Elements of Project Overhead

### 5.16.2 General Overhead

General overhead, or office overhead, includes general business expenses such as the cost of owning or leasing the contractor's home office; salaries of the home office staff such as the company president, estimators, cost accountants, reception and clerical workers, and so on; utilities and equipment for the home office; insurance; office supplies; furniture; regular legal expenses; travel; donations;

advertising; association dues; and so on. Some companies include the salaries of project managers in the category of general overhead. The total cost of this overhead expense generally ranges from 3 to 10 percent of a contractor's annual business volume.

From the preceding it is easy to see that general overhead includes costs that are incurred by the contractor in support of the overall company operations, and that generally cannot be charged to any specific project. For this reason, general overhead is normally included in an estimate as a percentage of the total estimated job cost. Details vary as to how the contractor arrives at this amount or percentage, but the logic is always the same: each project the contractor estimates, and ultimately the cost of each project the contractor performs, must bear a portion of the cost of the contractor's being in business.

To facilitate estimating general overhead, the construction company typically tabulates the costs that have been defined as general overhead over a period of time such as a year. Then these costs are apportioned to each project the company estimates on a pro rata basis. Some companies apportion the cost of office overhead to each project being estimated, based on the number of projects the company usually performs in a calendar year. Other firms prorate the anticipated total cost of the project being estimated, as a fraction or percentage of company volume in a year, and then include that fraction or percentage of yearly company overhead costs in the cost estimate for the project currently being estimated.

It is not as important to understand the exact method of apportionment of company overhead costs, as it is to recognize what the components of these costs are, and to know that the company must have some reasonable method of apportioning these costs and including them in the cost estimate for each project the company will perform. After the company has been awarded a construction contract, as the work on the project is performed and revenue is generated on the project, some of that revenue is utilized to pay the costs of the company's general overhead.

## 5.17 SUBCONTRACTOR PROPOSALS

For those items of work on the project that the contractor does not plan to perform with his own craft labor forces, he will plan to award subcontracts. Quotations from subcontractors are an important element in the compilation of a project estimate, especially in building construction, where subcontracting is typically utilized more extensively than on engineering or industrial construction projects. It is commonplace for 70 to 85 percent of the dollar value, and sometimes more, of a building construction project to be performed by subcontractors.

Most contractors will maintain a file of subcontractors in a variety of specialty trades whom they know and have worked with in the past. The estimator will inform subcontractors in trades whose work is included on this project that the contractor is planning to submit a proposal for the project, and will invite subcontractors to prepare and submit proposals for their part of the work to the contractor in advance of bid day. In addition, it is common for subcontractors who have learned of the existence of the project being proposed to inquire of a number of general contractors whether they are planning to submit a proposal and whether they would accept a subcontractor proposal.

Each subcontractor will follow an estimating process parallel to the one being employed by the general contractor. The subcontractor will analyze the contract documents, primarily the drawings and specifications, for those elements of the project that pertain to his trade. The activities or items of work to be performed by the subcontractor are referred to as his scope of work, often referred to simply

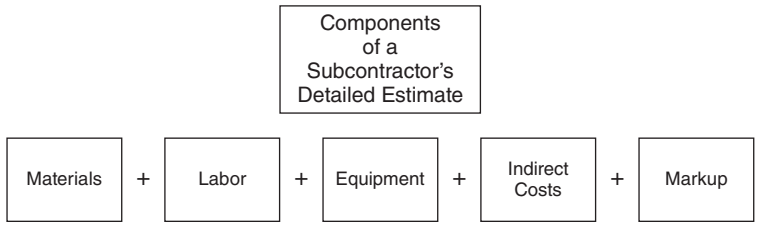



**Figure 5.12** Components of a Subcontractor's Estimate

as scope. As is illustrated in Figure 5.12, the subcontractor's estimator will estimate materials, labor, equipment, indirect cost, and markup, in order to arrive at a price to be entered onto a subcontract proposal for the subcontractor's defined scope of work.

When they prepare their estimates, prime contractors do not ordinarily concern themselves with making quantity surveys for all work categories, but limit their takeoff to items that they may reasonably expect to carry out with their own forces. The specialized categories of work performed by subcontractors are not usually investigated in detail nor estimated by prime contractors. However, at times prime contractors may analyze any of these categories as a check against the possibility that they may be able to do the work for less money than the best available subcontract bid. In addition, they may determine an estimated price for a given trade specialty, either to check sub-bids received for reasonableness or when no subcontractor quotations have been submitted.

The subcontractor will prepare a subcontract proposal that includes a scope statement, a listing of items of work included in the proposal, and items of work excluded from the proposal, along with the proposal amount, which is usually in lump sum form. The scope statement will provide definition for the work the subcontractor will perform in descriptive format, and often will include a listing of the Construction Specifications Institute (CSI) division numbers of the proposed work.

Subcontractors will submit their proposals to one or more general contractors, in time for the general contractor to include the subcontractor's proposal in his estimate prior to the time his proposal is due to the owner. The general contractor will receive all of the subcontractor proposals for each category of the work on the project that he does not plan to perform with his own craft labor forces. He will analyze each proposal and will compare the proposals for each category of work, considering completeness of scope versus price for each subcontract proposal.

The prime contractor's estimator must be sure to ascertain exactly what each sub-bid includes and what it does not, a matter that can require considerable checking and analysis, especially when a number of sub-bids are involved. It is not unusual for a subcontract quotation to provide labor only and not to include the cost of any materials. Additionally, the inclusion of taxes and surety bond, as well as the acknowledgment of addenda must either be stipulated on the quotation or determined by the general contractor.

On building construction projects in particular, many items of work must be checked with the bidding subcontractors to be sure of their inclusion. For example, the prime contractor must check with the plumbing and electrical subcontractors to see whether their bids include an allowance for connecting temporary water, sanitary, and electrical power and temporary lighting services. Another consideration is the need to make a background check and financial check on those subcontractors hitherto unknown to the general contractor.

Following his receiving and analyzing all of the subcontractor proposals, the general contractor will then select the proposal in each category of work that is the most complete and most competitive,

and will include that proposal price in his own estimate as the estimated price for that component of the work on the project. In this manner, the proposals of the plumbers; electricians; heating, ventilating, and air conditioning specialists; roofers; and all of the other subcontractors who will perform the work that the general contractor is not planning to self-perform with his craft labor will be entered into the general contractor's estimate and will become a component of his proposal price.

Subsequently, when the general contractor's proposal has been accepted by the owner and the prime contract has been formalized, the general contractor will notify those subcontractors whose proposals have been accepted. A subcontract agreement, commonly referred to as the subcontract, will be entered between the general contractor and each of the subcontractors, after the general contractor has signed the agreement with the owner. The subcontract agreement will contain the scope of work and the subcontract price in accord with the proposal the subcontractor submitted at the time of making the estimate.

### 5.17.1 Additional Considerations Regarding Subcontractor Proposals

It is not uncommon that a number of the subcontractors' proposals will not be submitted to the prime contractor until late—and often very late—in the bidding period. This makes it very difficult for the prime contractor to study and analyze them and to give the subcontractor proposals the consideration they need.

Additionally, subcontractors frequently submit their proposals by phone or by e-mail, and often change the proposal amount and/or the items included or excluded from consideration in the proposal price, following their initial submittal. These occurrences can make it very difficult for the prime contractor to properly analyze and compare the subcontractors' proposals and to finalize his own proposal during that hectic period immediately prior to the bid opening.

Frequently, subcontractor proposals contain stipulations regarding the use of hoisting facilities or the supply of electricity, water, and heat on the part of the general contractor or conditions to be met before they will work, provisions relating to the delivery and storage of materials, and many others. Because the subcontractors' proposal stipulations often require some commitment on the part of the prime contractor, all of the elements of these proposals must receive careful attention during the bidding period, so that all of the elements of cost regarding items the prime contractor is to furnish or provide can be included in the prime contractor's estimate.

Additionally, the general contractor needs time to determine from the list of inclusions and exclusions in subcontractors' proposals, whose proposal is providing the best value. The general contractor also must assure that in the combinations of inclusions and exclusions from the various subcontractor submittals, all of the materials and activities necessary for the performance of the work on the project are provided and that duplications in various subcontractors' proposal scope statements are taken into account and eliminated.

It should also be recognized that the subcontract proposal with the lowest price is not necessarily the best proposal. The general contractor must consider, in addition to the price being submitted, the subcontractor's integrity, organization, financial strength, and factors such as the subcontractor's equipment, as well as the subcontractor's capacity for and reputation for getting the project completed satisfactorily.

Additionally, when considering the award of subcontract work, the general contractor must never lose sight of the fact that a subcontractor is reliable only to the extent of its financial capability. The financial soundness of a subcontractor must always be a top criterion in the prime contractor's award of subcontracting work.

The submission of written quotations by subcontractors, with sufficient time to allow the general contractor to analyze the proposals, is much to be preferred. To obtain time for sub-bid evaluation and study, it may be desirable for the general contractor to establish some deadline for the submittal of subcontractor proposals, or for revisions of these proposals. Such an arrangement works best when all of the general contractors in a given area agree to abide by the same deadline. If a contractor establishes this practice unilaterally, he may well miss out on some favorable last-minute figures. Additionally, it can be noted that in areas where prime contractors have endeavored to enforce deadlines for submittal or modification of subcontractor proposals, such efforts have met with very limited success, and frequently with no success at all.

Another consideration regarding written subcontractor quotations, is the general question of whether oral bids are legally enforceable. The answer depends on the particular facts of the case and the jurisdiction involved. Nevertheless, it must be recognized that there can be serious questions in this regard, and much time and expense can be involved in settling such disputes.

Sometimes a subcontract bid is submitted that is substantially lower than the amount of any other proposal received for the same work. In these instances, the prime contractor must proceed with care. He needs to assure that there was not a gross error in the subcontractor's preparation of the proposal, while at the same time recognizing that the subcontractor may have discovered some significant competitive advantage over his peers. Typically, the general contractor will ask the subcontractor to carefully reevaluate its proposal before the bid is included in the prime contractor's final bid. The reason for this is that if the subcontractor made an error of a mathematical, typographic, or clerical nature in compiling the final figure, the courts are apt to permit the subcontractor to withdraw its bid without penalty. Also, it is to be noted that a subcontractor's bid is not binding on the subcontractor if the general contractor has specified, as he almost always will do, a bidding condition that no contractual obligation is created between the two parties until a formal subcontract is executed.

In general, the prime contractor has complete freedom in selecting its subcontractors. On some public projects, however, the prime contractor may be required to award some stipulated percentage of its total contract to minority business enterprises, women-owned businesses, firms owned by historically disadvantaged groups, or local firms. In such cases, the contractor must seek out and use the proposals of such companies. The contractor's purchasing business services such as contract bonds and insurance from minority-owned businesses can sometimes be counted toward meeting subcontracting goals.

On private projects, the owner and architect-engineer may occasionally provide a list, usually in the instructions to bidders, of the names of subcontractors acceptable to the owner for major divisions of the work such as electrical, plumbing, heating and air conditioning, and elevators. In such cases, the general contractor can subcontract these items of work only to one of those subcontractors listed.

Many general contractors have a tendency to award a majority of their subcontracts to the same preferred companies. However, while this practice certainly has its advantages, it can also prove detrimental to the general contractor in that other competing subcontractors may not continue to submit their most competitive prices to firms that they know or believe are engaging in this practice. It is to the advantage of a prime contractor to establish a good working relationship with a number of subcontractors associated with each work specialty.

### 5.17.2 Assigned Subcontracts

The usual procedure previously described, of subcontract bids being submitted to the bidding prime contractors for inclusion in their bids, is not always followed. In some states, on the bidding of

state-financed projects, separate proposals are requested by the state for general construction and for designated specialty areas such as electrical; plumbing; heating, ventilating, and air conditioning; and others. The general construction bids include all work on the project not covered by the designated specialty areas. Bids for work in all of the specified areas are submitted directly to the state agency involved, rather than to the general contractor.

After the bidding deadline has passed, the agency that is the owner identifies the low general construction bidder and the low bidder for each of the specialty areas named in the bidding documents. The state then awards contracts to the low bidders, with the successful general construction bidder now being identified as the project general contractor. The state then assigns its contracts with the specialty contractors to the identified general contractor. From that point on, the specialty contractors are regarded as being subcontractors to the general contractor and the project is constructed in the usual fashion.

There is an extension of this procedure, called prepurchasing, which has been employed on some private projects. In this method, a developer of a large commercial project breaks down the project into several constituent parts. The developer then solicits bids on these separate packages from general contractors, subcontractors, and suppliers. After bids are received, the developer negotiates final prices with subcontractors and suppliers, and assigns them to the low-bidding general contractor.

## 5.18 MARKUP

Markup, also referred to as margin in some construction companies, and sometimes referred to as profit, refers to the number of dollars included in the estimate, which the company plans to have for itself, as its return for performing the work, after all of the costs associated with the performance of the project have been paid. The markup determination is typically the last component to be determined and included in the estimate when the estimate is finalized.

While some may refer to this component of the estimate as profit, others submit that the term *profit* refers to dollars the company has earned after all project costs have been paid. At the time the estimate is being prepared, consideration is given to how many dollars the company would like to have earned or anticipates having earned after all costs have been paid. This is the rationale for the usage of the term *markup,* rather than *profit* for this component of the estimate.

The amount of the markup to be included in the estimate for the project is typically determined by company executive management or by the chief estimator. The decision is momentous.

In a business sense, the company should expect to earn sufficient markup to justify the business enterprise and the effort and the risk of performing construction projects. In the competitive environment of the construction industry, however, the company cannot overprice its expected markup to the extent that it then is not sufficiently competitive to be awarded the contract.

Additionally, the markup determination is tempered by a number of other considerations. These include the amount of confidence that management or the chief estimator have in the other components of the estimate. This thought is based in the realization that if the company is awarded the construction contract, and if some component of construction cost exceeds the estimated amount when the work is performed, those additional costs can be recovered in only two ways. Either the construction of some other element of the project must be completed at a cost less than the estimated amount, in order to compensate for the overage, or the cost overrun must be compensated by reduction in the amount of the markup the company will receive.

Other factors that influence the markup determination include composition of the project team, the owner, and architect; who the other contractors are who are competing for the contract award

(which the company may or may not know at the time of preparation of the estimate); and the company's assessment of how urgently it needs a contract award for a project, in order to maintain its operations or to keep its key people employed. Also to be considered are the time of year and expected weather during the time the construction will be performed; market conditions relative to the availability of craft labor, materials, and subcontractors needed to construct the project; and so on.

The single concept that seems to best describe in summary fashion the factors that determine the amount of markup the contractor will include in the project estimate is summarized in the term *risk*. Where the contractor sees or perceives risk in the contract documents or in the conditions in which the work will be performed, he will add dollars in his estimate to compensate for his assuming the risk. The greater the risk the contractor perceives in the project in all of the many forms it may take regarding the project, the greater the amount of markup he will include in the estimate, in order to compensate for the risk.

## 5.19 THE LUMP-SUM RECAP SHEET

The preparation of a detailed cost estimate results in the determination of a great many separate prices that are scattered throughout a number of work sheets of various kinds, in hard-copy form, on a spreadsheet in the computer, or, more typically, in an electronic estimating software. All these costs are finally brought together and entered onto a summary sheet, which is referred to as a recapitulation or recap sheet. Figure 5.13 illustrates a typical recap sheet for a lump-sum bid.

The costs associated with work items the contractor proposes to carry out with its own forces are posted from the summary sheets and entered in the appropriate material and labor columns. Equipment costs are brought forward from either an equipment sheet or from the individual summary sheets. The equipment unit cost as determined in Figure 5.10 would be multiplied by the quantity of work to be done by that piece of equipment and entered into the "Materials" column on the recap sheet. Alternately, the recap sheet could include an equipment column where this information is brought forward from the worksheet(s) to be included in the recap sheet, and then into the proposal. Project overhead costs are entered from an overhead sheet, with wages placed under the labor heading and the total of all other expenses in the material column. General overhead is entered as a lump sum item. The subcontract bids selected for use are shown under the subcontract heading. The contractor's bid price is determined by the inclusion of final changes, appropriate taxes, and markup.

Taxes applicable to construction projects vary widely from one locality to another, and can differ between public and private projects. A common tax provision requires the contractor to pay a gross receipts tax or sales tax on its total business volume.

## 5.20 THE UNIT-PRICE RECAP SHEET

In a manner similar to that described for a lump sum bid, all costs associated with a project being bid as unit prices are accumulated and summarized on a final recap sheet. Figure 5.14 illustrates a typical recap sheet for a unit-price bid. To produce a separate bid value for each item designated in the proposal form, this recap sheet must maintain all costs of each bid item separately. The costs associated with each bid item are entered from its summary sheet onto the recap sheet.

In Figure 5.14 the total direct cost of the entire quantity of each bid item is obtained by adding its labor, equipment, material, and subcontract costs. The sum of all such bid-item direct costs gives the estimated total direct cost of the entire project ($7,194,789). To this are added the job overhead, markup, bond, and tax, which produces a total bid price of the total bid price ($8,918,488).

## RECAP SHEET

Project Municipal Airport Terminal Building

| | Work Item | Material | Labor | Subcontract | Total |
|---|---|---|---|---|---|
| 1 | Clearing and grubbing | $1,725 | $12,930 | - | $14,655 |
| 2 | Excavation and fill | $21,090 | $23,670 | - | $44,760 |
| 3 | Concrete | $422,652 | $224,065 | - | $646,718 |
| 4 | Forms | $17,780 | $29,369 | - | $47,149 |
| 5 | Masonry | - | - | $633,000 | $633,000 |
| 6 | Carpentry | $28,680 | $20,460 | - | $49,140 |
| 7 | Millwork | $81,090 | $30,317 | - | $111,407 |
| 8 | Steel and misc. iron | $377,835 | $110,010 | - | $487,845 |
| 9 | Kitchen equipment | - | - | $89,972 | $89,972 |
| 10 | Insulation | - | - | $33,420 | $33,420 |
| 11 | Caulk and weatherstrip | - | - | $7,470 | $7,470 |
| 12 | Lath, plaster, and stucco | - | - | $255,300 | $255,300 |
| 13 | Ceramic tile | - | - | $29,000 | $29,000 |
| 14 | Roofing and sheet metal | - | - | $274,155 | $274,155 |
| 15 | Resilient flooring | - | - | $33,936 | $33,936 |
| 16 | Acoustical tile | - | - | $42,029 | $42,029 |
| 17 | Painting | - | - | $125,010 | $125,010 |
| 18 | Glass and glazing | - | - | $93,479 | $93,479 |
| 19 | Terrazzo | - | - | $126,162 | $126,162 |
| 20 | Miscellaneous metals | $91,842 | $16,973 | - | $108,815 |
| 21 | Finish hardware | $65,400 | $6,645 | - | $72,045 |
| 22 | Plumbing, heating, and air-conditioning | - | - | $813,180 | $813,180 |
| 23 | Electrical | - | - | $508,107 | $508,107 |
| 24 | Clean glass | - | - | $4,200 | $4,200 |
| 25 | Paving, curb and gutter | - | - | $119,330 | $119,330 |
| 26 | Construction equipment | $84,239 | - | - | $84,239 |
| 27 | Job overhead | $59,325 | $132,407 | - | $191,732 |
| | | $1,251,658 | $606,845 | $3,187,748 | $5,046,250 |
| | | | | Changes | ($143,178) |
| | | | | | $4,903,072 |
| | | | | Markup, 8% | $392,246 |
| | | | | | $5,295,318 |
| | | | | Bond | $49,317 |
| | | | | | $5,344,635 |
| | | | | Sales tax | $160,339 |
| | | | | | $5,504,974 |

**Figure 5.13** Recap Sheet for a Lump-Sum Bid

**RECAP SHEET**

Project: Holloman Taxiways and Aprons  Bid Date: August 9, 20--  Estimator: GAS

| Item No. | Bid Item | Unit | Estimated Quantity | Labor Cost | Equipment Cost | Material Cost | Subcontract Cost | Direct Cost | Bid Unit | Bid Total |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Clearing | l.s. | job | $5,139 | $11,097 | - | - | $16,236 | $20,125.76 | $20,126 |
| 2 | Demolition | l.s. | job | $5,726 | $7,383 | - | - | $13,109 | $16,248.98 | $16,249 |
| 3 | Excavation | c.y. | 127,000 | $75,636 | $175,194 | - | - | $250,830 | $2.45 | $310,923 |
| 4 | Base course | ton | 79,500 | $352,670 | $651,995 | $159,479 | - | $1,164,143 | $18.15 | $1,443,043 |
| 5 | Concrete pavement, 9 in. | s.y. | 90,000 | $1,001,795 | $202,708 | $791,063 | - | $1,995,565 | $27.49 | $2,473,655 |
| 6 | Concrete pavement, 11 in. | s.y. | 115,400 | $1,572,819 | $318,252 | $1,241,967 | - | $3,133,038 | $33.65 | $3,883,639 |
| 7 | Asphalt concrete surface | ton | 150 | $1,035 | $1,304 | $2,208 | - | $4,547 | $37.57 | $5,636 |
| 8 | Concrete pipe, 12 in. | l.f. | 1,000 | $5,183 | $5,439 | $15,477 | - | $26,099 | $32.35 | $32,351 |
| 9 | Concrete pipe, 36 in. | l.f. | 300 | $2,937 | $3,756 | $6,809 | - | $13,502 | $55.79 | $16,736 |
| 10 | Inlet | ea. | 2 | $111 | $164 | $801 | - | $1,076 | $666.58 | $1,333 |
| 11 | Fiber duct, 4-way | l.f. | 600 | $3,278 | $10,367 | $5,126 | - | $18,770 | $38.78 | $23,266 |
| 12 | Fiber duct, 8-way | l.f. | 1,200 | $9,035 | $20,576 | $16,095 | - | $45,705 | $47.21 | $56,655 |
| 13 | Electrical manhole | ea. | 6 | - | - | - | $9,315 | $9,315 | $1,924.44 | $11,547 |
| 14 | Underground cable | l.f. | 34,000 | - | - | - | $255,957 | $255,957 | $9.33 | $317,278 |
| 15 | Taxiway lights | ea. | 120 | - | - | - | $45,710 | $45,710 | $472.17 | $56,660 |
| 16 | Apron lights | ea. | 70 | - | - | - | $26,313 | $26,313 | $465.96 | $32,617 |
| 17 | Taxiway marking | l.s. | job | $3,560 | $675 | $4,683 | - | $8,918 | $11,053.92 | $11,054 |
| 18 | Fence | l.f. | 26,000 | $28,506 | $7,977 | $129,477 | - | $165,960 | $7.91 | $205,720 |
| | | | Totals | $3,067,427 | $1,416,885 | $2,373,183 | $337,295 | $7,194,789 | | $8,918,488 |
| | | | | | | Job overhead | | $272,091 | | |
| | | | | | | | | $7,466,880 | | |
| | | | | | | Markup, 15% | | $1,120,032 | | |
| | | | | | | | | $8,586,912 | | |
| | | | | | | Bond | | $71,815 | | |
| | | | | | | | | $8,658,727 | | |
| | | | | | | Sales tax | | $259,762 | | |
| | | | | | | Total Project Bid | | $8,918,488 | | |

Factor = $\frac{\$8,918,488}{\$7,194,789} = 1.240$

**Figure 5.14** Recap Sheet for a Unit-Price Bid

Dividing the total project bid price by the total direct project cost gives a factor of 1.241. By multiplying the total direct cost of each bid item by this factor, the total bid amount for that work item is obtained. Dividing the total bid amount of each work item by the quantity yields the unit price on a unit-price basis for that bid item, with overhead and markup embedded uniformly in unit-price bid items.

There are instances in which projects are bid as a combination of lump-sum and unit prices. An example of this might be a powerhouse, built under a single contract, where the foundation was bid on the basis of unit prices and the structure itself was bid lump-sum. Another instance occurs when the proposal form of a building being bid lump-sum requires the submittal of unit prices on certain items of work as well as the lump-sum price. This might be done when some changes to the work during the construction phase appear likely, and bid prices are requested on a unit-price basis for the possible later addition or deletion of work items such as concrete or excavation.

## 5.21 BID CHANGES

The recap sheet must be totaled and checked at a time when the contractor needs a dependable method for incorporating last-minute price revisions into the final bid amount. Some contractors use a "bid change sheet" similar to the example in Figure 5.15. Change sheets of this kind, in paper form or electronic form, are commonly used by estimators to list and summarize such changes and as a means for adding in items previously forgotten or overlooked.

CHANGE SHEET

Project Municipal Airport Terminal Building

| | Increase | Deduct |
|---|---|---|
| 1. Plumbing, heating, air-conditioning | -- | $69,450 |
| 2. Lath, plaster, and stucco | -- | $14,100 |
| 3. Roofing and sheet metal | -- | $24,720 |
| 4. Electrical | -- | $33,000 |
| 5. Ready-mix concrete | -- | $7,875 |
| 6. Metal doors | $2,723 | -- |
| 7. Chain link fence | $3,245 | -- |
| 8. | | |
| 9. | | |
| 10. | | |
| Total changes | $5,967 | $149,145 |
| | | $143,178 |

**Figure 5.15** Bid Change Sheet

Estimating softwares and spreadsheet programs, which are typically used in preparing proposals today, contain features which make it relatively easy to input changes, and to track those changes through the other portions of the sheets and totals in the estimate which are affected. Most of these softwares contain features whereby the estimator can determine when and where a change was made, and can track the influence of that change on other parts of the estimate.

## 5.22 FINALIZING THE ESTIMATE

The contractor will double-check all of the components of his estimate for completeness and accuracy before preparing and signing the proposal and submitting it to the owner. This process is referred to as closing out the estimate.

The proposal form is then completed in exact compliance with the stipulations set forth in the instructions to bidders, and is then submitted to the owner. The general contractor's proposal will be analyzed by the owner following its submittal, in competition with the proposals of the other contractors who are seeking the award of the contract for the construction of the project.

A prime contractor will be selected by the owner to receive the contract award, and will sign the agreement, which formalizes the contract between the owner and the prime contractor or general contractor. The general contractor will proceed with completing subcontract agreements and materials purchase orders.

Subsequently, the contractor will receive a letter of intent, or a notice to proceed, from the owner. These documents denote the beginning of project duration. The contractor will then immediately occupy the construction site and will commence work on the construction of the project.

## 5.23 THE PROPOSAL

A bid, more properly referred to as a proposal, is a written offer, tendered by the contracting firm to the owner, which stipulates the price for which the contractor agrees to perform the work described in the contract documents. A proposal also contains a promise that, upon its acceptance by the owner, the contractor submitting the proposal will enter into a contract with the owner for the amount of the proposal. Thus, if the owner accepts the contractor's proposal in timely fashion, the proposal is binding on the contractor.

When open bidding is being used, a prepared proposal form is usually included with the bid documents and must be used by the contractor to present its bid. Failure to do so will normally result in disqualification of the contractor. The prepared proposal form is both desirable and necessary so that all bids will be presented and can be evaluated by the owner and the architect-engineer on the same basis. It facilitates the detection of omissions and other irregularities, and makes the comparison and analysis of the figures an easier matter for the owner and the architect-engineer.

A typical example of a lump-sum proposal is shown in Appendix F. The usual basis of contract award, assuming that all bidders are considered to be qualified, is the base bid plus or minus any alternates accepted by the owner, with the lowest valid or lowest responsible proposal usually selected for acceptance by the owner.

In cases where there has been an error in multiplication or addition by the contractor in preparing the proposal, there is often question as to whether the unit price amount, the extended line amount, or the total amount of all line items prevails in terms of what the contractor is proposing and what the owner is accepting. On public projects, statutes often provide the procedure to be followed. Otherwise, the bid documents should, and usually will, specify which amount prevails. A common provision in

this regard is for the unit price to control, and the corrected total sum to govern identification of the low bidder.

Contractors sometimes find that they would very much like to include certain information concerning their bid that is not provided for on the proposal form. This is often in the nature of some form of limitation on the bid, either placing certain restrictions on owner acceptance, or establishing special conditions pertaining to the conduct of the work. Under such circumstances the contractor may be tempted to "qualify" its bid. In general, this is not permissible on public bidding, and any bid qualification will make the bid subject to rejection. A private owner generally has more latitude regarding proposal qualifications. However, many owners and architect-engineers in private construction likewise include statements in the instructions to bidders to indicate that any qualification of the contractor's proposal may be cause for rejection of the proposal.

When closed bidding is in use by the architect-engineer and owner, the form of the proposal submitted is frequently left up to the individual bidder. In such biddings, the contract is not necessarily awarded to the lowest bidder, but may be negotiated by the owner from among the two or three lowest bidders. Consequently, the wording and content of the proposal are typically structured by the contractor to meet the circumstances and to put its bid in the best possible light with the owner.

## 5.24 BIDDING PROCEDURES

The procedures, rules, and requirements that pertain to the bidding process that will be followed on public and private construction projects vary from one public agency to another, and from one owner to another in private construction. Each is controlled by different aspects of law. It is sometimes difficult to establish whether a given project is public or private. There are many instances when a private owner is involved but the financing is supported by, or guaranteed by, some level of government or a government agency. Additionally, public-private partnerships for the performance of certain types of construction are becoming much more prevalent in construction contracting. In cases such as those described here, bidding rules are often mandated by the public agency involved, or by statutory requirements.

Public contracting procedures are prescribed by various procurement statutes. These controlling statutes dictate rules and regulations that must be followed by the public owner. In a general sense, the public authority does not have the right to modify or waive these statutory bidding procedures. Even where a public owner is given discretionary powers, specific procedures must usually be followed in making any exception to standard directives. Public bidding statutes are designed to protect the public interest, not that of the contractor or architect-engineer. Their essential purpose is to protect public funds; to prevent fraud, collusion, and favoritism; and to obtain the best quality construction at the most reasonable and fair prices for the public body.

Private bidding procedures are normally conducted by rules and regulations established by the owner, with the advice and assistance of the design professional. The bidding procedures can be modified, altered, or waived at the discretion of the owner.

For both public and private projects, the instructions to bidders, prepared by the architect-engineer, and provided to contractors along with the other bid documents in accompaniment to the contract documents, will set forth all of the provisions, in general and in detail, regarding preparation and submittal of the prime contractors' proposals. The instructions to bidders are more fully discussed, along with other bid documents, in Chapter 4, and an example of a set of instructions to bidders is included in Appendix A.

## 5.25 SUBMISSION OF PROPOSALS

It is the responsibility of the contractor to deliver his proposal to the proper place, and in the proper form, and in the designated format and manner, prior to the deadline time designated in the instructions to bidders. The completed proposal form, together with the bid security and other necessary supplementary information, is usually required to be sealed in an envelope that is addressed as directed by the instructions to bidders and clearly labeled as a proposal for the project being bid.

Bids may be submitted usually at any time prior to the deadline scheduled for their acceptance by the architect-engineer. If feasible, it is usual practice for the contractor to personally deliver the sealed bid shortly before opening time.

However, proposals sometimes may also be dispatched by letter, telegraph, or messenger service. Sometimes facsimiles may be accepted. A common problem associated with the delivery of competitive bids, whether in person or via one of these other mechanisms, occurs when the bid arrives after the established time for submittal of proposals. Almost always, in both public and private work, all proposals that have not been submitted by the time indicated in the instructions to bidders are rejected.

Statutes and policies that regulate bidding on public projects almost always require that at the bid opening, after the deadline for submittal of proposals has passed, all proposals shall be opened publicly and read aloud. This process of open bidding is also commonly used on private projects. Bid openings are usually well attended by the bidding general contractors, subcontractors, material vendors, and other interested parties. The ceremony consists of the owner or architect-engineer opening each bidder's sealed envelope, noting the type and amount of bid security, verifying receipt of addenda, and reading the amount of each proposal. Other bid formalities may also be noted for the record.

At some bid openings, the estimate of cost prepared by the architect-engineer or owner during the design process is also read or distributed to those attending. In addition, bid tabulation forms are typically made available to those present by the architect-engineer, so that they can record the bids of other contractors for comparison purposes. Bid tabulations are defined as a listing of all of the contractors who submitted proposals for a project, and the amount of their bid.

It is customary and usual that the opening will adjourn without an official announcement concerning the identity of the successful bidder. Sometimes the architect-engineer will make announcement of the "apparent low bidder" before the bid opening ceremony is adjourned. This is because, before the contract award can be made, and even before any "official" acknowledgment regarding the low bidder is made, all of the proposals must be carefully evaluated and analyzed by the owner and architect-engineer. This process sometimes referred to as canvassing the bids.

After the bids have been opened and read at the bid opening, the contractor communicates the results of the bidding and the bid tabulation to its surety company. This information is incorporated into the surety's permanent file for the contractor and constitutes an important part of the contractor's record of performance.

In closed bidding, the amounts of the bids typically are not disclosed. Following delivery of the proposals to the owner and architect-engineer by the contractors, the owner and architect are free to use the proposals in any manner they see fit, so as to serve the owner's best interests. They can select any of the bidders they choose, or they can reject all bids. The owner often makes a final selection of the successful contractor in this bid system, only after extensive negotiations.

## 5.26 RESPONSIVE BID AND TECHNICALITIES

On competitive bid construction projects, an acceptable proposal must be "responsive" to the invitation for bids, and in particular, to all of the requirements set forth in the instructions to bidders.

Responsiveness is determined by whether the bid as submitted is submitted on time and in a format and manner consistent with the instructions to bidders, and consists of an offer to perform, without exception or qualification, the exact work as called for by the invitation, and upon acceptance will require the contractor to enter a contract to perform in accordance with all the terms and conditions of the contract documents.

A bid is referred to as being nonresponsive if it contains any qualifications or conditions not in the invitation, or if it contains language that varies from the invitation or from the instructions to bidders. Additionally, a bid may be nonresponsive if it does not conform to the technical bidding requirements established in the instructions to bidders. This means that the proposal must conform with all of the standards, requirements, and conditions listed in the contract solicitation and in the instructions to bidders and must not deviate from the criteria in any material way.

The instructions to bidders set forth specific requirements for the preparation submission of the proposal. Any deviation from any of these requirements on the part of the contractor constitutes a bidding informality or irregularity that may result in rejection of the proposal. A clause is sometimes included that allows the owner to waive a minor informality or irregularity and to accept the bid as being responsive. A private owner has considerable latitude in this regard. Public owners are often bound by statute or policy not to permit such waivers, and will generally insist on strict compliance with all bidding technicalities. As noted earlier, many private owners and architect-engineers will insist on strict compliance as well.

## 5.27 BID SPREAD

It is commonplace, after bids are received and opened at a public bid opening, to determine the bid spread. Bid spread refers to the amount of money between the lowest bidder, who ostensibly is a valid bidder and is expected to be named the apparent low bidder and eventually the contract recipient, and the amount of the second-lowest bid. The bid spread is often expressed as the percentage difference between the two, as well. The contractor who submitted the amount of the low bid is often heard to use the expression, "I left $x$ dollars on the table," meaning that he could have bid higher, up to the amount between his bid and that of the next lowest bidder, and would still be low bidder, and would still be expecting to receive the contract award.

Bid spread is also sometimes expressed in terms of total spread, or total bid spread, meaning the dollar or percentage difference between the low bid and the highest bid received. If the total spread is greater than normal competitive bidding on a project of this kind would indicate, the owner and the architect-engineer are left to wonder why some bidders saw so much more in the project than others did or how and why the low bidder was able to determine a price so much lower than that of others.

The bid spread and the total spread are of great interest to others besides the bidding contractors. The owner and architect-engineer will also very carefully examine the bid spread, especially if it is more than a few percentage points. The question in their minds is whether the difference reflected in the bid spread is the result of good practice and finding a competitive advantage on the part of the low-bidding contractor, or whether his low bid is the result of an estimating error or oversight on his part, which might make it difficult or impossible for him to satisfactorily complete the project for the amount indicated in his proposal.

Surety companies likewise decidedly take an interest in bid spreads and total spreads on projects where a contractor for whom they have provided bonds has submitted a proposal. If their contractor is low bidder, the surety will have the same questions as the owner and architect-engineer regarding the sufficiency of the bid. Even when their contractor is not the low bidder, the surety is interested in where their contractor's proposal ranked in the competitive bidding, so as to derive an indication of the effectiveness of his estimating processes as well as his overall business practices.

## 5.28 OUT OF THE MONEY

When proposals have been received and tabulated by the owner and architect-engineer on bid day, sometimes the lowest proposal amount received exceeds the owner's budget for the project. This is commonly expressed as the project proposals being "out of the money."

This occurrence is, of course very troublesome for the architect-engineer and owner, and for the bidding contractors as well. Following the bid opening, the owner and the architect-engineer will carefully analyze both all of the proposals received and also their own position, in order to decide the owner's next course of action. Typically, the owner will select from the following options:

- Reject all proposals and announce that no contract will be awarded.
- Sometimes the announcement is accompanied by an announcement that the owner and the architect-engineer will redesign certain parts of the project, and will rebid the project at a later date.

  Some owners will have provided for this possibility by having included a clause in their contracts with the architect-engineer to indicate that if the owner exercises this option, the architect-engineer must redesign, issue new contract documents, and again assist the owner with receiving and analyzing proposals on a future date, at no additional cost to the owner.
- Endeavor to value-engineer the project with the low bidder, or sometimes with the lowest two or three bidders, in order to reduce the proposal amount to a sum within the owner's budget, and then negotiate a contract with one of these contractors.

## 5.29 THE ACCEPTANCE PERIOD

The bidding documents normally contain a provision that provides the owner a stated period of time after the opening of bids for the owner and architect-engineer to make acceptance. During this period, the contractor cannot withdraw or change its bid except under penalty of forfeiture of its bid security. An acceptance period of 30 to 60 days is common, although other periods of time may be specified.

During this waiting period, the subcontractors and material dealers are presumably obligated to the general contractor to stand by their price quotations, just as the prime contractor is obligated to the owner. If the owner does not accept one of the proposals within the acceptance period, any of the bidding contractors are free to withdraw or to adjust their proposals at their discretion.

Contractors are sometimes requested by the owner to grant an extension of the acceptance time. The contractor is generally willing to oblige, but sometimes in its eagerness to get the contract award it will agree to such an extension without giving the matter sufficient consideration. Contractors must exercise care in this regard. Such action means that the completion date of the project will be set back by a length of time equal to the extension of the acceptance period. Increases in labor wages or materials prices may occur during the additional time. Also, the extension means that the placing of orders for fabricated materials such as reinforcing steel will be delayed, with the ever-present possibility of price increases. Another important consideration in this matter is that a subcontractor or supplier, having submitted its price based upon the specified acceptance period, may not be willing to stand by the price for a longer period of time, especially if it submitted what it now considers an excessively low price.

All these factors represent potential elements of additional cost that the contractor may have to assume should it too hastily grant an owner additional acceptance time. When increased costs are anticipated and the contractor does not wish to absorb them, he can consider offering a reasonable additional amount to the owner in exchange for extending the acceptance period.

## 5.30 REJECTION OF PROPOSALS

The bid documents and/or the contract documents typically reserve for the owner the right to reject any or all bids. A prime contractor bidder may be rejected because of the owner and architect engineer's determination that he has insufficient finances to handle the project, lack of experience, unsatisfactory reputation indicating irresponsibility or unreliability, inadequate personnel or equipment, or failure to submit a responsive bid. Private owners are relatively free to ignore technical bidding inadequacies if it is in their interest to do so, but public owners must be careful to observe applicable regulations in this regard. Rejection of proposals on both public and private projects because of bidding informalities is relatively common.

Rejection may also be based on irregularities in the bidding procedure, collusion, flagrant unbalancing of bid unit costs (to be discussed in a subsequent section), not enough bona fide bidders, or unexpectedly high proposals. The lowest proposal sometimes exceeds the available funds in the owner's budget for the project, and the project must then be abandoned or revamped. Public contracts are subject to statutory regulations in this regard. For example, some states have regulations that on any bidding where the lowest bid exceeds the estimated cost by more than 10 percent, all bids shall be rejected.

In the event the owner wishes to reduce the project cost by a minor amount, it may elect to negotiate a final contract with the low-bidding contractor. If major savings are required, it is usual that all proposals are rejected. After redesign or other corrective procedures, the project is then readvertised, and new bids are taken.

## 5.31 WITHDRAWAL OF BID BY PRIME CONTRACTOR

Under ordinary contract law, a person who makes an offer or a proposal can withdraw or revoke its offer any time prior to its acceptance by the other party. The situation is considerably different in construction, however. Despite the common law doctrine of revocability, a prime contractor's bid proposal is normally considered to be irrevocable after the bid opening and throughout the acceptance period prescribed by the bidding documents. This concept is based in many and varied statutes and local ordinances pertaining to public construction.

It is reasonable, therefore, for a general contractor to regard as normally impossible the withdrawal of its bid after the deadline for the receipt of proposals, without forfeiture of the bid security. (Bid securities are discussed more fully in Chapter 7.) The courts have long held that a bidder cannot unreasonably refuse to comply with its bid without penalty.

There is, however, one generally accepted legal basis for relieving the prime contractor from its bid: the doctrine of unilateral mistake. Prohibiting the withdrawal of bids, either by provisions created by the owner or by rules of law, is almost uniformly construed as inapplicable to prevent relief from the submission of a bid containing a gross error, provided the following conditions are met:

- The mistake is of such grave consequences that to enforce the contract as offered would be unconscionable.
- The mistake relates to a material feature of the contract.
- The mistake has not come about because of the violation of a positive legal duty or from culpable negligence.
- The owner is put in a position whereby he suffers no serious prejudice except the loss of its bargain.

When the preceding conditions apply and when the mistake is excusable and is an error of fact and not caused by a mistake in judgment on the part of the contractor, when the error is of a mechanical or clerical nature, and when the contractor acts promptly to notify the owner of the mistake and to rescind the bid, the courts almost unanimously permit withdrawal of the bid and the return of the contractor's bid security. Errors of a clerical nature include faulty addition, omission or erroneous entry of certain bid components, misplaced decimals, typographical errors, and transposed figures.

There are state statutes and provisions in federal procurement regulations that specifically provide for relief for the contractor from a unilateral mistake under certain circumstances. The criteria just discussed have served to relieve bidders from their obligations, both before and after the owner has accepted the bid. However, relief for the contractor will likely be denied where it proceeds with the work without first seeking recision of its bid.

In granting relief to the contractor, it must be noted that the courts rarely will allow the erring contractor to correct his bid, but rather will only permit the contractor to withdraw the proposal without penalty. However, it has been the policy of the federal government and some other public agencies to allow the bid to be corrected and not allow it to be withdrawn in the special case of where the bid, as corrected, remains the lowest bid. There has also been at least one case on the bidding of a federal project where the General Accounting Office (GAO) ruled that the second low bidder, which had discovered an error on its bid, could correct the error and displace the low bidder.

## 5.32 WITHDRAWAL OF BID BY SUBCONTRACTOR

Occasionally, the general contractor is faced with a request from a subcontractor or material supplier to withdraw its quoted price. The legal question regarding the withdrawal of such a bid offer is a tangled one and is very much a matter to be decided by the specific facts of the case. Nevertheless, there are some general concepts that can be presented. The following paragraphs will provide some general guidance in this regard.

In general, a subcontractor can withdraw its bid any time before the prime contractor's bid is submitted to the owner and the general contractor has not indicated acceptance of the subcontractor's proposal. In many jurisdictions, the subcontractor can rescind its bid any time prior to its formal acceptance by the prime contractor. There are some exceptions to this, such as where informal understandings were made between the prime contractor and subcontractor prior to the award of the general contract. Oral acceptance of the subcontractor's proposal on the part of the general contractor may not be binding because of the applicable state statute of frauds that requires certain contracts to be in writing before they are enforceable.

Additionally, the courts have sometimes ruled that the general contractor and subcontractor did not intend to bind themselves contractually until a written subcontract agreement was executed. This entire matter is further complicated by the fact that the general contractor cannot reasonably accept a subcontractor proposal before the owner has made a formal award of the general contract. In light of these complications, it is not surprising that attempts by general contractors to hold low-bidding subcontractors to their bids on the basis of acceptance prior to withdrawal have met with variable results.

When the low-bidding prime contractor bases its proposal on a subcontract bid that is considerably lower than any other submitted, the withdrawal of this low subcontractor proposal can cause the contractor substantial loss. As a result of this condition, the courts have sought rationales by which subcontractors would be required to hold their prices firm for some reasonable time, such as the acceptance period specified in the bidding documents for the owner to determine the recipient of the prime

contract. It is also noted that general contractors sometimes require subcontractors to provide a bid bond to accompany their proposals. In essence, these bid bonds stipulate that if the prime contractor accepts the subcontractor's proposal, the subcontractor will enter a subcontract agreement with the prime contractor, for the amount of its proposal. This matter is further discussed in Chapter 7.

Probably the most common approach to the matter of holding a subcontractor to its bid is now based on the doctrine of *promissory estoppel*. This doctrine has been applied to prevent subcontractors from withdrawing their offers even though the offers were not accepted, and no contracts had been formed, and the parties had attempted to withdraw their offers. This doctrine avoids entirely the question of whether the subcontractor's bid was formally accepted by the prime contractor.

The elements of *promissory estoppel* can bind a subcontractor to its bid price if the prime contractor can prove the following:

- That it received a clear and definite offer from the subcontractor.
- That the subcontractor could expect that the general contractor would rely on the offer.
- That the contractor actually did rely on the offer and that such reliance was reasonable.
- That this reliance worked to the general contractor's detriment.

Where the general contractor can establish these points, a subcontractor's low bid is generally binding if the detriment can be avoided only by enforcement of the bid.

For the contractor to have the defense of relying on the subcontractor's proposal, it must notify the subcontractor when the bid is so low that it suggests a mistake might have been made, and must request the subcontractor to verify the bid's correctness. In addition, the contractor must accept the subcontractor's bid with reasonable promptness after its own bid is accepted by the owner. In accepting the subcontractor's proposal, the general contractor may not change the terms on which the initial bid was solicited.

Questions continue to arise with regard to just what constitutes acceptance of a subcontract bid by a general contractor. The law is not entirely consistent on this matter, but there have been court decisions to the effect that a general contractor's use of a subcontractor's bid or the listing of the subcontractor's name in the prime contractor's proposal to the owner does not by itself create a binding contract between the two contractors, and the prime contractor is not bound to award the subcontractor the work involved. This is in the absence of any prior agreement or understanding. The subcontractor's bid is an offer and does not become a contract until it is voluntarily and expressly accepted by the prime contractor.

It is to be noted, however, that some states and the federal government have enacted statutory regulations concerning the listing of subcontractors. For example, some of these public regulations require a subcontractor listing with the contractor's proposal, and these subcontractors must be used to accomplish the work unless a substitution is permitted by the owner because of special circumstances.

## 5.33 LIST OF SUBCONTRACTORS

It is a requirement on some projects, especially some public projects, that the prime contractor must submit a listing of the subcontractors whose bids were used in the preparation of the prime contractor's proposal as an accompaniment to his proposal. In some cases, the dollar amounts of the subcontractors' bids must also be included. Details regarding this requirement vary considerably, but the owner and architect-engineer will typically require a listing of the subcontractors who are to perform the major categories of work (mechanical, electrical, plumbing, etc.), and typically will require that other

subcontractors be listed if they are performing work in an amount comprising a given percentage of the bid. This listing requirement can serve the purpose of allowing the owner and the architect-engineer to approve the subcontractors and is also intended to limit the likelihood of bid shopping and bid peddling on the part of the general contractor.

The owner and architect-engineer typically require that this listing be included when the general contractor submits his proposal, or the general contractor's bid will be deemed nonresponsive. Typically, such requirements do not include the contractor's being required to name the material suppliers as long as they are not acting as subcontractors performing work on the job site.

Under some bidding requirements of this type, subsequent changes in the named subcontractors can be made only under certain designated circumstances and with permission of the owner. In others, the general contractor has a prescribed length of time after the bidding within which it can make changes to its subcontractor list. If a contractor violates the provisions of the listing requirement, the owner may either cancel the contract or assess a dollar penalty. In general, it can be said that subcontractor listing is favored by subcontractors and is opposed by prime contractors.

The listing of subcontractors can be troublesome on the bidding of projects with alternates. The problem arises because the identity of the low-bidding subcontractor for a given work specialty can depend on which alternates the owner may choose to accept or reject. In such an instance, the prime contractor will normally list its subcontractors on the basis of the base bid, excluding the alternates.

## 5.34 CONTINGENCIES ALLOWANCES AND SUBCONTRACT ALLOWANCES

The architect-engineer may also state that a given sum is to be included in the estimate to serve as a contingency for extras that might be necessary as the work progresses. Such contingency provisions are sometimes utilized for remodeling and other types of work that have many uncertainties associated with them.

Occasionally, allowances are used for subcontracted work. For example, the owner may solicit bids from specialty contractors for specific portions of the project in advance of the date for the opening of the prime proposals. After the low-bidding subcontractors have been determined, the bidding prime contractors are advised of the amounts and nature of the sub-bids to be included within their estimates. As an alternative to this, the specifications may merely indicate a sum of money to serve as an allowance for certain subcontracted work that will be let after the award of the prime contract. Landscaping is a common example of this. In either case, however, the prime contractor must be cognizant of all conditions pertaining to the award of the subcontracts and the exact nature of the work covered by them.

Serious operational problems can develop when the general contractor does not select its own subcontractors, as may be the case with subcontract allowances. If the two parties should be incompatible or have had previous difficulties, job relationships can deteriorate badly. This situation can be especially troublesome when one is a union contractor and the other is not.

## 5.35 DISCLAIMERS AND WAIVERS

The prime contractor is required to bid under a form of contract that has been designed to protect the owner and architect-engineer and to provide for and protect their best interests. In their attempts to afford these parties protection against liabilities and claims arising out of the construction process, the writers of contract documents usually incorporate a great deal of language into contract documents,

expressly for the protection of the owner and the architect-engineer, including disclaimers and waivers of one kind or another.

A common disclaimer provides that neither the owner nor architect-engineer assumes any responsibility for the accuracy or completeness of boring logs or other subsurface information submitted with the bidding documents, and that the contractor must assume full responsibility for any and all unknown physical conditions, including subterranean, that may be found at the construction site. Most of the court cases involving contract disclaimers pertaining to underground conditions have upheld them in the absence of fraud, warranty of the information by the owner, or deliberate failure to disclose all available information. As a general rule, the courts have placed the risk of unknown subsurface conditions on the contractor unless there are contractual provisions that give the contractor a right to make a claim for additional costs.

Other disclaimer clauses sometimes force the contractor to assume liability for almost all contingencies, some of which involve eventualities over which it would have no control whatsoever. For example, provisions are found in some contract documents that require the contractor to waive any claims for damages against the owner for damages caused by project delay, even delays caused through the owner's own fault or negligence. Provisions are sometimes included which indicate that almost nothing will provide a valid basis for an extension of project time. There may be contractual terms providing that the contractor waive all lien rights, provisions stipulating unreasonable change order and claims procedures, or clauses allowing the owner or the architect-engineer to render binding decisions in case of disputes.

It is again noted and emphasized, that it is imperative for the contractor to carefully read and thoroughly understand all of the language in the contract documents. Only after doing so, can he make an informed decision with regard to whether to prepare and submit a proposal for the project, knowing that if he does, and if the proposal is accepted, he will be required to sign a contract which contains these stipulations.

When such severe language is used in private contracts, the contractor can sometimes protect itself by inserting protective language on the proposal form or by submitting a qualifying letter with its proposal. This is not usually possible on public contracts, and in both public and private projects, places the contractor risk at disqualification of his bid.

When the general tone of the bidding and contract documents places the risk of the unexpected entirely on the contractor, the contractor, if he still wishes to bid the project and assume the risks if awarded a contract, is forced to give consideration to the inclusion of a contingency allowance in the markup amount which is included in his bid. As was noted earlier in this chapter, the single catchword for determining the amount of markup the contractor will include in his proposal, is risk—the amount of risk the contractor sees or perceives in the bid documents and contract documents.

It is debatable whether such one-sided and burdensome contract language of the kind discussed here truly serves the best interests of the owner. Qualified contractors who otherwise would have submitted a competitive proposal for the project may not bid the project at all after they have read such contract provisions which they consider to be onerous. Additionally, such contract terms can result in owners paying for contingencies that never happen.

## 5.36 BID ETHICS

How the general contractor handles its subcontractor proposals, and the manner in which he translates them into subcontract agreements, can involve a number of ethical considerations. When a subcontractor submits a proposal to a prime contractor the general expectation is, that the general contractor

will hold that bid in confidence, that he will analyze the proposal in order to determine whether he will include this proposal for that specialty item of work in his own proposal to the owner, and that if he is selected by the owner to be the contract recipient, he will determine the best subcontractor proposal, and will then execute a subcontract agreement with that subcontractor.

Sometimes however, in an attempt to improve his bidding position, a general contractor may disclose to successive subcontractors the amounts of the bids of previous subcontractors, in an effort to extract a lower price. This practice is referred to as bid shopping, and is an unethical practice on the part of the general contractor. Subcontractors are greatly concerned that some unethical general contractors may "shop" their proposals. Their fear that their bids may be disclosed or shopped explains, at least in part, why subcontractors often wait until the last possible moment on bid day to submit their subcontract proposals to prime contractors.

After the bid opening, when the general contractor has been declared to be the apparent low bidder, and after he has signed the agreement with the owner he will then proceed to analyzing the subcontractor proposals, and making subcontract awards to the successful subcontractors. The prevailing concept of this process would be that the general contractor award subcontract agreements to those subcontractors whose bids were used in making up the general contractor's estimate. Thus, in most instances, the low-bidding subcontractor for a given portion of the project would be awarded a subcontract, except in those relatively unusual cases in which the low bidder was determined not considered to be capable or desirable, and therefore his bid was not used. Further, the general expectation is, that the subcontract agreement will be in the same amount as the subcontractor's proposal.

Sometimes however, general contractors employ a different logic. They may reason that the procurement of subcontractor services is no different than bargaining for any other commodity on the open market. Under this philosophy, the general contractor would feel no sense of obligation to those subcontractors whose prices were incorporated into its own proposal. Rather, after being declared the contract recipient, the general contractor may resort to bid shopping in order to obtain lower subcontract prices than those originally used in formulating the contractor's proposal. At this point, of course, the general contractor who was declared the successful low bidder for the project has a very strong bargaining position, and if he can extract subcontract prices lower than those that he originally incorporated into his proposal, he increases his potential markup.

The prime contractor may also at this point, attempt to persuade an original low-bidding subcontractor to reduce its quotation, or to get another subcontractor to underbid the original low bidder, an activity sometimes referred to as "bid peddling." Subcontractors, in their zeal to be awarded the subcontract, may actually facilitate this process by reducing their original proposal amounts when approached by the general contractor.

These practices of bid shopping and bid peddling are obviously extremely distasteful to subcontractors. It often leads them not to submit their bids to those prime contractors who resort to such methods. Another action that subcontractors may take is to inflate their original bids when it appears there is going to be hard bargaining on the part of the general contractor at a later date.

Some government agencies have taken steps directed toward minimizing or eliminating bid shopping on public projects. Several states have passed legislation that imposes regulations on the bidding of state-financed projects. In some states, for example, the major subcontract items in building construction work, such as heating, ventilating, and air conditioning; plumbing; and electrical work on state-financed projects must be awarded as separate contracts and not as a portion of the overall prime contract. Another procedure requires general contractors bidding on a public project to name their subcontractors at the time they submit their bids to the owner, as discussed previously in this chapter.

A system of bid filing is used on public contracts in some states. Under this system, subcontractors file their bids with the awarding authority. The authority then furnishes the prime contractors with a list of the sub-bidders and the amounts of their proposals. The general contractors then use these subcontractor proposals as they see fit, in the preparation of their own proposals.

It can be said unequivocally, that it behooves a general contractor to be, in all ways and at all times, as fair and as ethical as possible in all matters pertaining to subcontractors, including the important matters having to do with receiving, honoring, and accepting subcontractors' proposals and the formation of subcontract agreements.

To do otherwise compromises the contractor's professional ethics, and contributes in a disparaging way to his personal and professional reputation. It can be said, however, that subcontractors actively seek out those general contractors whom they know they can trust, and submit their best prices to those contractors.

## 5.37 BID DEPOSITORIES

By a rationale similar to that discussed in the preceding section, some private owners have used bid depositories as a means of avoiding some of the problems associated with the submittal and acceptance of subcontractor proposals, and sometimes for materials price submittals as well. The ethical considerations are momentous. Additionally, the last-minute submittal of price quotations, and the repetitive changing of the proposals that often accompanies, lead to very serious difficulties for the general contractor as he endeavors to finalize his proposal for submittal. This is even more burdensome on a project that contains bid alternates. Serious errors can result, which may well lead to even more difficulties for the general contractor.

While bid depositories may take different forms and may vary somewhat in the details of their operation, all depositories are designed to accomplish a central purpose. At its essence, a bid depository is a facility created by a group of contractors or by a trade association whose purpose is to collect written proposals from subcontractors and material suppliers, and then to convey these proposals to the general contractors who are bidding a project. Rules of bid depositories vary, but a common requirement is that quotations must be submitted to the depository before an announced deadline prior to the bid opening. Additionally, a typical provision is that after a subcontractor proposal or material price quotation has been submitted to the depository, it can be withdrawn prior to the deadline but cannot be changed, except in the case of correction of obvious errors or clarification of some entries on the proposal. After the deadline, these proposals and price quotations are transferred by the depository to the general contractors for their use in compiling their final cost figures. Many depositories tabulate the subcontractors' quotations after the bid opening and disseminate this information to the bidders.

Bid depositories are not a new idea, and while they have sometimes accomplished their intended purpose, their use has not been without difficulties. For example, some depositories have been found to be in illegal restraint of trade and in violation of antitrust laws. Rules prohibiting subcontractors that are members of the depository from submitting bids to general contractors that are not members, and forbidding general contractor members from accepting bids from nonmember subcontractors, have led to serious legal difficulties.

If the bid depository system is to be effective, it must have the support of the general contractors and subcontractors. However, some general contractors and subcontractors may make their own arrangements for the submitting and receiving of proposals, thus defeating the purpose of the depository. Additionally, subcontractors frequently may wish to submit different proposal amounts to the

various general contractors who are bidding the same project, depending on the reputation of some of the general contractors and reflecting their past experience history with the general contractors. Bid depositories make this impossible. So while there is some logic to support the use of bid depositories, and while they have been used at times, they have in general met with very limited success.

## 5.38 BID RIGGING

Bid rigging, which may also be known as price fixing, involves an arrangement between contractors to control the bid prices for a construction project, or to divide up customers or market areas. Bid rigging can occur in a variety of forms, varying from prearranged agreements among companies, to casual or spur-of-the-moment actions. It can involve a series of projects over a period of time, or it may occur as an isolated incident. Such arrangements have at times been nationwide in scope, or they may be limited to a single locality. No matter their form, bid-rigging activities are both unethical and illegal. They constitute a restraint of trade and are violations of antitrust laws. Bid rigging is a criminal offense, and the project owner who can prove bid rigging can seek treble damages under the Sherman Antitrust Act.

An example of bid rigging occurs where a group of contractors decides to divide up the available construction contracts among themselves and to fix the amounts of the successful low bids for projects. To accomplish this objective, the participating contractors will meet during the bidding period and will discuss bids, and then will reach an understanding with regard to who the low bidder will be on a certain project and what the bid amounts will be for the project. Thus, these firms enter into a continuing collaboration wherein they allocate the available work and fix the amounts of the low bids for projects. All but the selected low bidder on a project will either submit noncompetitive, collusive bids or may refrain from bidding the project.

Another example of price fixing occurs when a contractor who is anticipating being the only bidder on a project, persuades other contractors who have no intention of bidding the project to submit bids higher than that of the initiating contractor. Thus, it will appear outwardly that the first contractor was the lowest competitive bidder. In such cases, the bid winner may even subsequently pay designated sums of money to the other participating contractors.

Recent years have seen a number of bid-rigging cases reach the courts in the United States and in other countries as well. Consequences have been most unpleasant for the convicted participants. Some very large construction firms and their executives have been found guilty of bid rigging, resulting in severe penalties including fines, imprisonment, and debarment from bidding future work. Projects where bid rigging has occurred include both public and private work involving highway, airport, power plant, and water projects.

## 5.39 UNBALANCED BIDS

On a unit-price project, a balanced bid is one where the unit price for each bid item includes its own direct cost plus its pro rata share of the project overhead, general overhead, and markup. For a variety of reasons, a contractor may increase the unit prices on certain bid items in the bid while proportionally reducing the prices on others, so that the total bid for the project remains unaffected. A proposal structured in this manner is called an unbalanced bid.

It is common practice, for example, for a contractor to increase certain unit prices for items of work that are accomplished early in the course of performing the construction projects and then to reduce proportionately the prices for certain bid items that will follow later in the project. This process

serves the purpose of increasing the early progress payments that are made to the contractor in such a way that a minimum of the contractor's own capital is required to finance its initial operations. Such a structure that provides early overpayment is of considerable assistance to the contractor in recovering his costs of estimating and procuring the project, and recovering his mobilization, move-in, and other early costs incurred before the actual start of construction.

Unbalanced unit-price quotations may be submitted for other reasons as well. Sometimes, when the contractor detects what he believes to be a substantial error in the quantities listed in the proposal form, some unbalancing of unit costs is likely to be necessary in order that the fixed costs such as equipment and overhead will be properly distributed over the true quantities of work. Additionally, for cash flow purposes and for profit motives, the contractor may increase unit prices on items that he believes will substantially exceed the estimated quantities, and will then reduce his unit costs commensurately on other items. In addition, the contractor may simply modify certain unit costs in order to disguise the actual composition of its prices.

When submitting an unbalanced bid, the contractor must be willing to assume the risk of having its proposal declared unacceptable by the contracting authority. However, bid rejection because of unbalancing is rare, simply because it is difficult to detect and to substantiate. Some unbalancing is standard practice in most unit-price biddings for reasons of cash flow.

To illustrate some of the elements of unbalanced bidding, we will consider a numerical example. To understand the rationale behind unbalancing, two characteristics of a unit-price contract must be kept in mind. First, the low bid is determined on the basis of total cost, using the engineer's quantity estimates and the unit prices submitted in the contractor's proposal. Consequently, the raising of some prices and the corresponding reduction of others is normally done in such a way that the total amount of the bid remains unchanged. Second, the contractor is paid on the basis of its quoted unit prices and the quantities of work actually performed.

For the sake of illustration, we will consider two bid items. For one of these the contractor believes the estimated quantity on the proposal form is substantially in error. The engineer's estimate for ordinary excavation is 150,000 cubic yards, but the contractor's takeoff indicates the actual amount will be about 200,000 cubic yards. The contractor decides to unbalance its bid as illustrated in Figure 5.16 below.

Let us assume that when the project is performed, the quantity of ordinary excavation actually turns out to be 200,000 cubic yards and selected excavation is actually 100,000 cubic yards. Payment made on the basis of actual quantities of work done would then vary as follows between a balanced bid and the unbalanced bid the contractor decided to use, as illustrated in Figure 5.17.

| Bid Item | Engineer's Estimate | Balanced Bid | | Unbalanced Bid | |
|---|---|---|---|---|---|
| | | | | | |
| | | Unit | Total | Unit | Total |
| | | | | | |
| Ordinary Excavation | 150,000 cy | $2.50 | $375.000 | $3.50 | $525.000 |
| Selected Excavation | 100,000 cy | $6.10 | $610,000 | $4.60 | $460,000 |
| | | | | | |
| **Total Cost** | | | **$985,000** | | **$985,000** |

**Figure 5.16** Contractor's Unbalanced Unit-Price Bid

| Bid Item | Actual Quantities | Balanced Bid | | Unbalanced Bid | |
|---|---|---|---|---|---|
| | | | | | |
| | | Unit | Total | Unit | Total |
| | | | | | |
| Ordinary Excavation | 200,000 cy | $2.50 | $500.000 | $3.50 | $700.000 |
| Selected Excavation | 100,000 cy | $6.10 | $610,000 | $4.60 | $460,000 |
| | | | | | |
| **Total Payment** | | | **1,110,000** | | **1,160,000** |

**Figure 5.17** Effect of Unbalanced Bid on Contractor Payment

As can be seen in Figures 15.16 and 15.7, the contractor's use of unbalanced bidding results in his receiving an increased payment of $50,000.

## 5.40 COMPLIMENTARY BIDS

A complimentary bid is one that a contractor submits to the owner, which the contractor himself did not prepare but obtained from another contractor. In another sense, a complimentary bid may be one that a contractor prepares and submits to an owner, which is sufficiently high in amount so as to assure the contractor not being low bidder, and thus not selected to be the contract recipient, yet low enough in amount so as not to seem unreasonable.

Complimentary bids can be utilized by contractors for a variety of reasons. For example, there are times when a contractor finds it impossible or undesirable to bid a project when asked to do so by an architect-engineer or owner. To maintain their goodwill and so as to be included in consideration for bidding future work, the contractor may submit a complimentary bid, which may also be known as a courtesy bid.

Where a contractor furnishes the complimentary bid, he makes it safely larger than his own but sufficiently reasonable that it will appear to be a genuine proposal. The contractor submitting the complimentary bid thus is assured of not submitting the low bid and has no knowledge of any other contractor's proposal amount, with no collusive action of any kind intended or involved.

Nevertheless, contractors who provide or those who use complimentary bids must be very cautious in this regard, especially on publicly financed projects. On these projects, complimentary bidding may be considered to be an unlawful form of price fixing. In addition, many public owners require that each bidding contractor certify that its bid is noncollusive, that it has compiled its bid independently, that it has not disclosed its bid to any other bidder, and that it has made no attempt to have any other contractor bid or not bid.

## 5.41 STATE PREFERENCE STATUTES

Some states have enacted statutes pertaining to the award of their public construction projects that give preference to bidding contractors who are domiciled in that state or who have previously satisfactorily performed public contracts and have paid specified state taxes for a statutory period. These statutes typically provide that a preferred bidder will be awarded the contract for a state public work if his

bid does not exceed the lowest proposal submitted by more than a stipulated percentage (5 percent is typical). Such laws do not apply where federal funds are involved. Similar provisions giving a bidding advantage to minority- and women-owned businesses and businesses operated by historically disadvantaged groups have been applied in some areas.

The motivation behind such protectionist actions is to have the tax expenditures on public works provide maximum benefit to the local citizenry. It is debatable, however, whether such procedures are conducive to obtaining quality construction at the best possible price.

## 5.42 SCHEDULING BID DATES

The architect-engineer and owner should be mindful of the importance of scheduling bid dates conducive to the greatest number of contractors submitting proposals. Studies by the American Society of Professional Estimators (ASPE) have shown that the best time for owners to receive bids is between 2 P.M. and 4 P.M., Tuesday through Thursday. Days before or after holidays and those between Christmas and New Year's should be avoided.

## 5.43 SCOPE BIDDING

A concept introduced relatively recently and which is an innovation in the competitive bidding of construction projects, is the use of "scope bidding." Where scope bidding is used, the bidding documents notify the bidding contractors that the drawings and specifications do not necessarily indicate or describe all of the work required for full performance under the contract. The bidders are advised that the successful contractor must furnish all work and materials required for the proper execution and completion of the work, on the basis of the general scope indicated and described. In other words, the contractor is required to furnish all materials and all work required for the normal functioning of project parts and systems, whether or not they are shown on the contract documents. The architect-engineer or owner, who are responsible for the design, are given the authority to decide what work must be included within the general scope of the contract.

This contradicts the long-standing concept of competitive bidding, which holds that the contractor's cost estimate and proposal are based principally on a detailed quantity takeoff of work items as they appear on the drawings and are described in the specifications. The designer has produced a complete design and has described and communicated all aspects of the design in the drawings and specifications. The architect-engineer and owner expect to reap the benefits of competition among contractors for delivering the well-defined elements of the drawings and the specifications.

It is usual and has long been expected on competitive bid projects that the contractor be required to provide those items that are a normal part of its trade and are installed as a normal and usual part of its work. However, the scope bidding concept can be considerably more demanding and can involve the much greater risk of the contractor's being required to perform unanticipated work on the basis that it lies within the designer's view of the contemplated scope of the project.

Scope estimating has been used where performance specifications are written, and on negotiated work for the establishment of target estimates or guaranteed maximum contract amounts. However, competitive scope bidding can introduce an uncertainty and a severe element of risk for contractors and subcontractors involving their being held responsible for major work items that were not anticipated because they were not included in the contract documents.

## 5.44 RANGE ESTIMATING

The estimating of future construction costs always involves a number of subjective judgments and a considerable degree of uncertainty. No estimate is ever exactly correct; therefore, it can be said that every project estimate is in error. The amount of the error and whether it is plus or minus is unknown until completion of the project.

There are certain probabilistic procedures that can be introduced into the estimating process which enable the estimator to establish the mathematical probability that the actual cost of the project will not overrun any particular figure. This technique of risk analysis, known as range estimating, is certainly not suitable for use in every estimate. However, it can be of considerable value to owners, architect-engineers, contractors, and construction managers on very large and complex projects.

In an effort to measure uncertainty, the estimator determines an upper and lower cost limit, as well as a target value, for each major element of cost in the project. Included with these determinations is a determination of the confidence level or the probability that the actual cost of the project element will be at least as favorable as the target estimate. In effect, this range of possible costs for each critical cost element of the project brackets the traditional single-value estimate or target cost. The results of these price distributions are analyzed by a computer algorithm that iterates through thousands of simulations of project cost and potential job experience, ranging from conservative to optimistic perspectives.

The results of the simulations are reported in the form of a profile that shows different total project costs along with the probability of overrunning each of these total costs. Thus, individual uncertainties in the estimate are combined in such a way that the uncertainty associated with the project's total cost is determined and presented for decision-making purposes. Range estimating can provide management with a means of determining and then coping with the problems that major project uncertainties may present.

## 5.45 INTRODUCING PROBABILISTIC DETERMINATIONS INTO THE ESTIMATE

As has been noted, the objective of estimating all project costs and determining the markup to be included in the estimate is to include the maximum possible markup, and thus the maximum profit potential, while at the same time keeping the bid at a competitive level. Stated another way, the contractor wishes to be the low bidder but with a minimum spread between its low bid and that of the second-low bidder.

Procedures have been developed to assist the contractor in selecting markup figures that will maximize its profits over the long term. The two best known and most widely accepted of these "bidding strategies" are known as the Friedman Model and the Gates Model. The Friedman Model is the simpler of the two and assumes that all bidders are acting independently of one another. This means that the probability of underbidding a group of competitors equals the product of the probabilities of underbidding each competitor separately. The Gates Model assumes that bids from competing contractors are not totally independent of one another and procedures are applied to take this into account.

Not widely used in everyday construction contracting, mathematical simulations such as range estimating and probabilistic estimating may have a place in the analytical procedures of some contractors, especially on very large and complex projects. They are included here primarily for the sake of completeness, and for providing familiarity with the terminology, and perhaps for provoking further thought.

## 5.46 COMPUTER-BASED ESTIMATING

Computers and specialized softwares are now very widely used by contractors as tools for assisting with their cost estimating functions. Computers are also used for tracking construction costs and schedules as construction projects are performed, and for maintaining the contractor's historical cost information database. Computerization provides the estimator with the necessary information to make the best possible decisions concerning the job being estimated and for making the best predictions with regard to what construction costs will be. The speed and accuracy with which computers can calculate the various elements of construction costs, and can reflect changes from one part of the estimate to the other affected parts, provide a tremendous assist to the estimating function.

Digitizer pens, digitizer tables, building information models, and other similar electronic devices enable the estimator to make a quantity takeoff from the drawings, with the measurements and counts being entered directly into the software as they are determined. The computer can convert the takeoff data into pricing units such as square feet and cubic yards. Using prices determined by the estimator or productivity and pricing information extracted from the database, the computer can perform the calculations to produce an estimate. The computer can calculate prices for labor and equipment by combining work quantities obtained from the takeoff with unit costs of production or with production rates and hourly costs from historical cost information.

A large number of estimating softwares have been produced to facilitate the estimating process. Construction firms typically assess the different program available, and then select for use the one that best fits their needs. The industry has seen a rapid evolution in the different forms of estimating software and the powerful features they provide.

The most recent technological advance in computerized estimating is building information modeling (BIM), which is also referred to as BIMS (building information modeling systems). This technology uses a three-dimensional model of the building design, developed and stored in the software, as the basis for producing an estimate of the cost of constructing the building. The software also produces a construction schedule, thus integrating the determinations of cost and time for performance of the project.

It should be recognized that BIM software determines the elements of cost by use of the same logic as described in this chapter. With all of the elements of the building design stored in digital form in the computer's memory, the machine can perform the calculations and can make the determinations necessary to calculate costs for materials, labor, and equipment. Subcontractor prices can be input as subcontractor proposals are received (with the subcontractors frequently having utilized the BIM data for the preparation of their proposals), and tabulations can be produced that show the subcontractors' proposal prices and items included and excluded from each proposal. The contractor can input project overhead, using the BIM model for determination of quantities for the elements of project overhead. When the contractor inputs his general overhead and markup determinations, the software tabulates the final price. When adjustments are made by the estimator, or when subcontractor proposals are changed during the bidding period, the software calculates the effects of the changed information wherever the original estimate has been impacted and calculates the updated price. The software can also produce an array of other summaries and tabulations the contractor may wish to have. Examples include summaries of prices received from minority-owned businesses for materials, and subcontractor quotations from firms operated by historically disadvantaged groups and the like.

It should also be recognized that computers, the variety of powerful softwares now available, and other technological advancements that are sure to follow cannot replace the human element in estimating. Computers are aids to and tools for estimating as performed by estimators. The experience,

skill, and judgment of the talented people who are knowledgeable of the estimating process, as well as being knowledgeable of the construction process, are irreplaceable elements of the decision-making processes on the part of the estimator, consisting of his acquired learning and experience, which are essential elements of successful estimating. The computer assists but decidedly does not replace the estimator.

## 5.47 SUMMARY AND CONCLUSIONS

Cost estimating, pricing, and preparing proposals for construction projects are central and fundamental components of all construction contracting. The effectiveness with which a construction contractor performs these functions on an ongoing basis is critical to the profitability and to the survival of the construction contracting enterprise.

### CHAPTER 5 REVIEW QUESTIONS

1. Name the six components of a contractor's detailed lump-sum estimate.
2. Name, define, and state the typical usage of three different types of approximate estimates.
3. Define the term *internal rate* for estimating equipment cost, and describe its determination.
4. State five components of indirect labor cost.
5. Name and describe the two ways in which construction labor costs are stored in the contractor's historical information database, and describe the advantages of each.
6. What is an allowance, and why is it included in an estimate?
7. Explain why, when preparing a unit price estimate for a competitive bid project, a contractor will often prepare his own estimates of quantities, even though the owner and architect-engineer have provided quantities with each of the named activities and work items listed on the proposal form.
8. Define *scope bidding,* and describe its ramifications for a contractor.
9. Define an unbalanced unit-price bid, and discuss why a contractor might prepare such a proposal.
10. List five typical components of a contractor's project overhead.
11. List the steps in the estimator's determination of materials prices for a lump-sum detailed estimate.
12. General overhead, project overhead, and markup are typically included as line items on a unit price estimate or on the unit price proposal form. Describe how these items are included in a contractor's detailed unit price estimate.
13. Explain why estimators must develop a basic project schedule during the course of preparing a detailed estimate for a project.
14. List five components of a contractor's general overhead.
15. Name and describe two different types of prebid meetings that a contractor may take part in when preparing a detailed estimate for a project.
16. Name and define two different equipment depreciation methods described in this chapter. Discuss why equipment depreciation becomes an element of consideration in a detailed estimate.
17. Define *complimentary bidding*.
18. Define the term *bid spread* in its two connotations, and describe the significance of the term.

**19.** Why is equipment operators' time usually estimated with labor cost rather than as a part of the cost of the equipment?

**20.** Beyond the basic consideration of return on investment, what is the largest determinant of the amount of markup a contractor will include in his estimate for a competitive bid project?

**21.** Name and describe five items of information the owner and architect-engineer typically require contractors to provide as part of the prequalification process.

**22.** Explain why a contractor's bonding company will be interested to know the bid spread on every bid the contractor submits.

**23.** What are the options an owner may exercise if a project comes in "out of the money" on bid day?

**24.** Discuss the ethics of this situation: a general contractor was low bidder on bid day, and fully expects to be awarded the construction contract for a building construction project. During the bidding period, he received a subcontract proposal for the electrical work on the project from Spark Electric, a firm he has worked with many times in the past. He and Spark operate on the basis of mutual respect. Spark's proposal was the best received for the electrical work and the contractor included that price in his proposal for the electrical work. After the apparent low bidder was announced, and before any notifications were sent to any of the subcontractors indicating who was low bidder on any of the subcontract items, Ace Electric brings the general contractor a proposal for the electrical work on this project, and asks that it be considered. The contractor also has a good history of working with Ace, a reputable and reliable company. Ace's proposal price is significantly less than the price submitted by Spark. What do you think the general contractor should do? Explain.

# Chapter 6

# Construction Contract Provisions

## 6.1 INTRODUCTION—CONSTRUCTION CONTRACTS

Construction contracts exist in a number of variations, and contain numerous different provisions. Chapter 1 of this book provides an overview of the basic taxonomy for discussing and understanding the variations in forms of construction contracts: the single and separate contracts systems; competitive bid, negotiated, and competitive sealed proposals methods of forming contracts; and lump-sum, unit-price, and cost-plus forms of contract.

Figures 6.1, 6.2, and 6.3 provide a graphic overview of these classifications.

It is not the intent of this chapter to review the elements of all of these forms of contract; Chapter 1 defined and discussed each of them. Rather, it is the purpose of this chapter to discuss some of the workings of, and some of the common terminology and contract provisions contained in, these various forms of contracts. While certainly not every significant clause of every contract variation can be discussed, some of the more commonplace and typical contract provisions that are encountered and commonly utilized in the practice of construction contracting will be presented.

Most of the elements to be discussed are written into the bid documents and/or into the contract documents prepared by the architect-engineer in accordance with the terms of his contract for professional services with the owner. For reference, the typical set of contract documents produced by the architect-engineer for a project are listed in Figure 6.4. Each of these documents is defined and is more fully discussed in Chapter 4.

## 6.2 CONTRACT CLAUSES

As noted earlier, it is beyond the scope of this book to attempt a complete discussion of the meanings, significance, and legal implications of all contract clauses. However, the most important aspects of some of the principal contract provisions encountered in the practice of construction contracting are discussed under topical headings in this chapter. The following sections consider contract clauses of special significance that are not treated elsewhere in this book.

Construction contracts can and frequently do include provisions pertaining to specified liabilities, waivers, damages, responsibilities, requirements, and other disclaimers that are designed to protect the owner and/or the architect-engineer by transferring risk and uncertainty to the contractor. While it is true that there are limits to the enforcement of some of these types of contract provisions by the courts, the contractor cannot assume that such contract language will be unenforceable. Such exculpatory language has at times been invalidated by the courts where there was interference by the owner with the contractor's work or a failure on the part of the owner to act in some essential manner. However, the contractor cannot assume that such severe and seemingly unfair contract language will

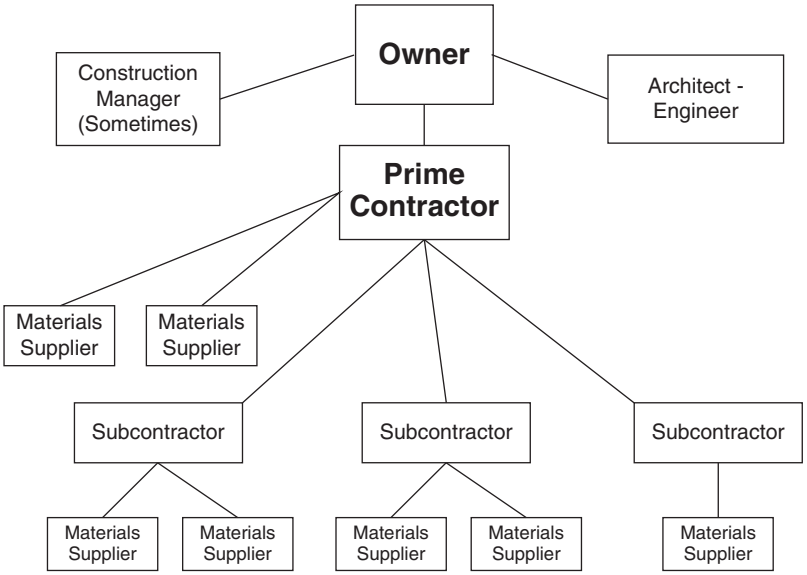



**Figure 6.1** Single-Contract System

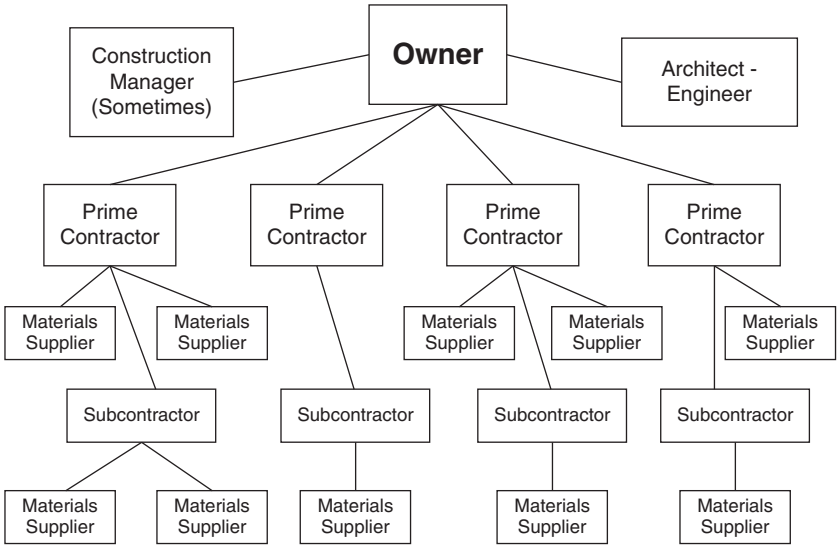



**Figure 6.2** Separate-Contracts System

be unenforceable. Obviously, the time for a thorough study and evaluation of all contract documents and provisions is while the project is being considered, not after the contract is signed. After he has executed the contract, the contractor is bound by all of its provisions.

Contractors must recognize that they are not attorneys and therefore are not competent to appraise the legal implications inherent in certain contract clauses. Should the contractor not understand any clause or provision of any part of the contract documents, or should he have any

| Competitive Bid | Negotiated | Competitive Sealed Proposals |
|---|---|---|
| | | |
| Lump sum | Lump sum | Lump sum |
| Unit price | Unit price | Unit price |
| | Cost plus a fixed fee | Cost plus a fixed fee |
| | Cost plus a percentage of cost | Cost plus a percentage of cost |
| | Cost plus a fixed fee or percentage of cost, with a guaranteed maximum | Cost plus a fixed fee or percentage of cost, with a guaranteed maximum |
| | Cost plus a fixed fee or percentage of cost, with a guaranteed maximum and a savings or incentive clause | Cost plus a fixed fee or percentage of cost, with a guaranteed maximum and a savings or incentive clause |

**Figure 6.3** Project Delivery Methods and Forms of Contract

uncertainty with regard to whether or not he fully understands the language and its implications, the contractor should immediately seek the assistance of his attorney. This should be accomplished before the contractor makes any binding commitments having to do with the bid documents or contract documents. The contractor's failure to do so can result in serious complications that often could have been avoided had legal advice been obtained.

During the time described in Chapter 4 as "making the decision to bid," and during the bidding period, the contractor must carefully analyze all of the language of all of the contract documents, in order to make the decision with regard to whether he is interested in entering a contract which contains these provisions. If the contractor perceives a level of risk or uncertainty he is uncomfortable with, he will typically make the decision not to invest in the time, energy, and dollars necessary for preparing a proposal for submittal. If he has made a decision to submit a proposal, during the bidding period, he will evaluate each clause with regard to its possible or probable contribution to the cost of construction. Upon becoming the successful bidder and expecting to be the contract recipient, the contractor must again examine the contract documents but with a different purpose in mind. Many provisions of the contract require specific actions, often at certain times or within specified time limits, on the part of the contractor during the life of the contract.

These clauses must be carefully examined and studied by the contractor so that the obligations to be assumed, along with their timelines, are thoroughly understood. When standard document forms are involved, such as those of the American Institute of Architects (AIA), the federal government, the Associated General Contractors of America, or the Engineers Joint Document Committee of the American Society of Civil Engineers, there is seldom a need for the contractor to concern itself unduly with ferreting out untenable provisions. These standard contract documents have well-established records of service and have become familiar to many practitioners in construction contracting. Many of them have received legal interpretation by the courts. However, the modifications to the conditions

**BID DOCUMENTS**

1. Advertisement for bids, notice to bidders, invitation to bid
   Instructions to bidders
   Proposal form

**CONTRACT DOCUMENTS**

1. Conditions of the contract
   - General conditions
   - Modifications to the general conditions
   - Supplementary general conditions
   - Special conditions
2. Drawings
3. Specifications
4. Addenda
5. Alternates
6. Agreement
7. Modifications
   - Amendment
   - Change order
   - Construction change directive
   - Written order for a minor change

**Figure 6.4** Bid Documents and Contract Documents for a Construction Project

of contract, the special conditions, or the supplementary conditions, inasmuch as they are typically written by the architect-engineer specifically for a project, certainly bear special scrutiny.

## 6.3 RIGHTS AND RESPONSIBILITIES OF THE OWNER

Construction contracts typically reserve a number of rights to the owner of the project. These rights will almost always be clearly set forth in the contract documents, usually in a special section of the general conditions titled "Rights and Responsibilities of the Owner." The AIA General Conditions of the Contract for Construction, included as Appendix D, contains such a section.

Depending on the type of contract and its specific wording, the owner may be authorized to award other contracts in connection with the work, to require contract bonds from the contractor, to approve the surety proposed by the contractor, to retain a specified portion of the contractor's periodic payments, to make changes in the work, to carry out portions of the work in case of contractor default or neglect, to withhold payments from the contractor for adequate reason, and to terminate the contract for cause. The right of the owner to inspect the work as it proceeds, to direct the contractor to expedite the work, to use completed portions of the project before project completion and contract termination, and to make payment deductions for uncompleted or faulty work are common construction contract

provisions. The owner is normally free to perform construction or operations at the site with its own forces or with separate contractors, as well.

At the same time, the contract between the owner and the contractor imposes certain responsibilities on the owner, which are also clearly called out in the general conditions. For example, construction contracts make the owner responsible for furnishing property surveys that describe and locate the project, granting the contractor timely access to the work site, securing and paying for necessary easements, providing certain insurance, and making periodic payments to the contractor. The owner is required to make extra payments and grant extensions of time in the event of certain eventualities as provided for in the contract. When there are two or more prime contractors on a project, the owner may have a duty to coordinate these separate contractors and their field operations.

It is important to note that the owner cannot intrude on the direction and control of the contractor's operations. By the terms of the usual construction contract, the contractor is known in the law as an *independent contractor*. Even though the owner enjoys certain rights with respect to the conduct of the work, he cannot issue direct instructions with regard to methods or procedures, nor unreasonably interfere with construction operations, nor otherwise unduly assume the functions of directing and controlling the work. If he were to do so, the owner could thereby relieve the contractor from many of the contractor's legal and contractual responsibilities. If the owner oversteps his rights, he may not only assume responsibility for the accomplished work but may also become liable for negligent acts committed by the contractor in the course of construction operations.

Under the laws of most states, the owner is responsible to the contractor for the adequacy of the design. If the drawings and specifications are defective or insufficient, the contractor can usually recover the resulting costs and extensions of time from the owner. Because the contractor must perform the construction in accordance with the contract documents, the owner implicitly warrants their accuracy and sufficiency for the intended purpose. The contractor is not responsible for the end results and is not liable for the consequences of design defects. In this regard, it should be noted that the contractor does typically have a duty to inform the owner and the architect-engineer if he knows or could reasonably have been expected to know of serious errors or insufficiencies in the design.

The responsibility of the owner for the design is not overcome by the usual bidding clauses requiring bidders to visit the site, to check the drawings and specifications, and to inform themselves concerning the requirements of the work. It must be noted, however, that the owner's responsibility for the design does not protect the contractor who does not fully comply with the contract. The implied warranty that the contract drawings are adequate for the purpose intended is limited to those cases where the contractor has followed and has complied with the drawings and specifications.

## 6.4 DUTIES AND AUTHORITIES OF THE ARCHITECT-ENGINEER

Other than cases in which both design and construction are performed by the same contracting party or in which the owner has an in-house design capability, the architect-engineer firm that has a contract with the owner is not a party to the construction contract and has no contractual relationship between itself and the contractor. The architect-engineer is a third party to the construction contract that derives its rights and authorities over the construction process from the general contract between the owner and the prime contractor. When private design professionals are utilized by the owner, the effect on the construction contract is to substitute the architect-engineer for the owner in many important respects.

However, the jurisdiction of the architect-engineer to make determinations and to render decisions is limited to and circumscribed by the terms of the construction contract.

The architect-engineer typically represents the owner in the administration of the contract and acts for the owner during the day-to-day construction operations. The architect-engineer advises and consults with the owner, and communications between owner and the contractor are made through the architect-engineer. Appendix D, "AIA Document A201–2007, General Conditions of the Contract for Construction" contains typical provisions regarding the architect-engineer's role in contract administration.

Construction contracts often impose many duties and bestow considerable authority on the design firm. All construction operations are conducted under its attentive observation, and it generally oversees the progress of the work. It has a direct responsibility to the owner to see that the workmanship and materials fulfill the requirements of the drawings and specifications. To ensure this fulfillment, the architect-engineer can exercise the right of observation of the work and approval of materials to be included in the work. The contractor is required to allow access by the architect-engineer to the project during the course of the work for this purpose. Also included may be the right of approval of the contractor's general program of field procedures and even the construction equipment the contractor proposes to use. Should the work be lagging behind schedule, the architect-engineer may reasonably instruct the contractor to speed up its activities. Many contracts bestow upon the architect-engineer the right to stop the project or any part thereof to correct unsatisfactory work or conditions. The specific language in this regard is widely variable, ranging from a very broad right to a more limited right.

The foregoing paragraph does not mean that the architect-engineer assumes responsibility for the contractor's methods, merely because he retains the right of approval. The rights of the architect-engineer are essentially concerned with verifying that the contractor is proceeding in accordance with compliance with the contract documents. It should be pointed out, however, that the architect-engineer cannot unreasonably interfere with the conduct of the work or dictate the contractor's procedures or work methods. Again, if the direction and control of the construction are taken out of the hands of the contractor and are assumed by the architect-engineer, the construction firm may be effectively relieved of many of its legal and contractual obligations.

The contract documents often authorize the architect-engineer to be the interpreter of the provisions and requirements of the contract and to be the judge with regard to acceptability of the work performed by the contractor. The architect-engineer occupies a position of trust and confidence in this regard and must act in good faith throughout the construction process. When this party provides for itself the right of acting as the official interpreter of contract conditions and as a judge of the contractor's performance, it must exercise impartial judgment and cannot favor either the owner or the contractor. Sometimes the courts have held that if the contractor made an interpretation of the language of the contract documents that is deemed to be reasonable, then the interpretation made by the contractor will prevail.

Some contracts provide that the architect-engineer's decisions are not final and that the owner and contractor can exercise their rights to arbitration or to the courts, providing the architect-engineer has rendered a first-level decision. Other contracts state that the architect-engineer's decisions are final and binding on both parties with regard to artistic effect only. Still other contracts give the architect-engineer broad authority to make final decisions concerning the quality and fitness of the work and to interpret the contract documents.

In matters where the architect-engineer is given final and binding authority, this is necessarily restricted to questions of fact. In the absence of fraud, bad faith, and gross mistake, the decision of the

architect-engineer can be considered as final, provided the subject matter falls within the proper scope of authority given to the design firm by the construction contract. With respect to disputed questions of law however, the architect-engineer has no jurisdiction. It cannot deny the right of a contractor to due process of law, and the contractor has the right to submit a dispute concerning a legal aspect of the contract to arbitration or to the courts, as may be provided by the contract. Matters pertaining to time of completion, extensions of time, liquidated damages, and claims for extra payment usually involve points of law.

Architect-engineers can be liable to the owner and third parties for damages resulting from their negligence or lack of care. Where the contractor has complied with the provisions of the drawings and specifications prepared by the architect-engineer, and these documents prove to be defective or insufficient, the architect-engineer will be responsible for any loss or damage resulting from the design defect. This rule is subject to the absence of any negligence on the part of the contractor, or any express warranty by the contractor that the drawings and specifications were sufficient or free from defects.

## 6.5 INDEMNIFICATION

The vulnerability of architect-engineers to third-party suits is discussed in other chapters of this book. Owners and architect-engineers endeavoring to protect themselves by use of indemnification clauses in the contract is included here because of its obvious significance as an important element of the contract for construction, In like manner, owners are subject to claims by third parties to the construction contract for damages arising out of construction operations.

The rule that one who employs an independent contractor is not liable for the negligence or misconduct of the contractor or its employees is subject to many exceptions. To protect the owner and architect-engineer from third-person liability, many construction contracts include indemnification or "hold-harmless" clauses. Indemnification means that one party compensates a second party for a loss that the second party would otherwise bear.

Hold-harmless clauses typically require that the contractor indemnify and hold harmless the owner and the architect-engineer, and their agents and employees, from all loss or expense occurring by reason of liability imposed by law on them for damages because of bodily injury or damage to property arising out of, or as a consequence of, the work. The present tendency is for parties who may have been injured by construction operations to bring suit against practically everyone associated with the construction. Additionally, the courts have shown a growing inclination to ascribe liability, in whole or in part, for such damages to the owner or architect-engineer. For example, owners and architect-engineers have been made responsible for damages caused by construction accidents where adequate safety measures were not taken on the project.

Hold-harmless clauses are by no means uniform in their wording. However, these clauses can be grouped into three main categories:

1. *Limited-form indemnification.* The limited form holds the owner and architect-engineer harmless against claims caused solely by the negligence of the prime contractor or a subcontractor.
2. *Intermediate-form indemnification.* The intermediate form includes not only claims caused by the contractor or its subcontractors but also those in which the owner and/or architect-engineer may be jointly responsible, regardless of degree of fault. This is the most prevalent type of indemnification clause, and is the type contained in the AIA Document A201–2007, General Conditions of the Contract for Construction, in Appendix D.

   It is to be noted in Appendix D that the obligation assumed by the contractor does not extend to liability arising out of certain acts of the architect-engineer.

3. *Broad-form indemnification.* The broad form indemnifies the owner and/or architect-engineer against all losses, even when the party indemnified is solely responsible for the loss.

When broad-form hold-harmless clauses are used, contractual liability coverage is expensive and some provisions may not be insurable. The effect is compounded when the general contractor logically requires the same indemnification from its subcontractors. Some courts frown upon the use of broad-form indemnification, but such clauses have frequently been upheld by the courts. Most states have enacted laws that make it impossible for a contractor to indemnify an architect-engineer from liability arising out of defects in plans and specifications, and many states have passed laws that make void and unenforceable, certain forms of indemnification clauses in construction contracts.

Indemnification clauses are also routinely included in subcontracts. By the terms of these provisions, the subcontractor agrees to hold harmless the general contractor, the owner, and perhaps the architect-engineer. In the presence of such language these indemnified parties are protected against liability that may devolve to them out of or as a consequence of the performance of the subcontract. Just as the general contract can relieve the owner and/or architect-engineer from liability even when they are at fault, a subcontract indemnity clause can be worded so that it acts to relieve the general contractor, owner, and architect-engineer from liability even when they may be at fault.

It is a principle of long standing that a party may protect itself from losses resulting from liability for negligence by means of an agreement to indemnify. However, the rule is restricted to the extent that contractual indemnity provisions will not be construed to indemnify a party against its own negligence unless such intention is expressed in unequivocal terms. When such a clause is to be included in subcontracts, it must explicitly provide that the subcontractor indemnifies the designated parties whether or not the liability may be caused solely by them.

## 6.6 RIGHTS AND RESPONSIBILITIES OF THE CONTRACTOR

The architect-engineer, who has privity of contract with the owner, typically writes the construction contract that the owner and contractor will sign, as part of his duties in fulfilling his contract with the owner. The contractor has some rights and many obligations under the typical contract. The primary responsibility of the contractor is, of course, to construct the project in conformance with the requirements of the contract documents.

Despite almost any events that may occur, the fundamental expectation of the contractor is that he will complete the work on the project on time and in the prescribed manner. Although some situations may justify allowing more construction time to complete, only severe contingencies, such as impossibility of performance, can serve to relieve the contractor from its obligations under the contract.

The contractor is expected to give his personal attention to the conduct of the work on the project, and the contract typically requires that a responsible company representative must be on the job site at all times during working hours. The contractor is required to conform to all laws and ordinances concerning job safety, licensing, employment of labor, sanitation, insurance, traffic and pedestrian control, explosives, and all other aspects of the work. Many contracts now include rules that are designed to decrease air and noise pollution on construction projects, imposing regulations and restrictions concerning such operations as demolition, trash disposal, pile driving, riveting, fences, lighting, dust, noise, and housekeeping.

The contractor is required to follow the drawings and specifications and cannot be held to a guarantee that the completed project will be free of defects or that the completed work will accomplish the purpose intended. However, if the contractor deviates from the design documents without

consent of the owner, the contractor does so at its own peril and assumes the risk of the variation. The contractor has the right to rely on the accuracy and adequacy of the contract documents. Unless the contract expressly requires such action, the contractor has no duty to review or verify the design. The contractor is responsible for and warrants all materials and workmanship, whether put into place by its own forces or those of its subcontractors, to be in accord with contract provisions. Contracts typically provide that the contractor shall be responsible for the preservation of the work until its final acceptance. Even though the contractor has no direct responsibility for the adequacy of the drawings and specifications, it can incur a contingent liability for proceeding with faulty work whose defects are apparent.

The contractor must call all obvious design errors and discrepancies to the attention of the owner and architect-engineer. Otherwise, the contractor proceeds at his own risk because a party who builds according to patently defective drawings and specifications can be held responsible for any resulting liability. Should an instance occur in which the contractor is directed to do something he believes is not proper and not in accordance with good construction practice, he should protect himself by writing a letter of protest to the owner and the architect-engineer, clearly stating his position before proceeding with the matter in dispute.

Insurance coverage is an important contractual responsibility of the contractor, both as to the type of insurance and the policy limits. The contractor is required to provide insurance not only for its own direct and contingent liability but frequently also for the owner's protection as well. Chapter 8 discusses insurance provisions in greater detail.

The contractor is expected to exercise every reasonable safeguard for the protection of persons and property in, on, and adjacent to the construction site. Where contract surety bonds are required by the owner, the contractor is responsible for furnishing them in the proper amounts before field operations commence. Sureties and surety bonds are further discussed in Chapter 7.

Additional important contractor rights set forth in the contract documents concern progress payments, recourse should the owner fail to make payments timely, termination of the contract for sufficient cause, right to extra payment and extensions of time, and appeals from decisions of the owner or architect-engineer. Subject to contractual requirements and limitations that may be set forth in the contract documents, the contractor is free to subcontract portions of the contract, and to purchase materials where it chooses, and to proceed with the work in any manner and in any sequence that it chooses.

## 6.7 SUBCONTRACTS

A subcontract is an agreement between a prime contractor and a subcontractor by which the subcontractor agrees to perform a certain specialized and defined portion of the work. As has been noted previously, a subcontract does not establish any contractual relationship between the subcontractor and the owner, nor between the subcontractor and the architect-engineer. A subcontract binds only the parties to the agreement, the prime contractor and the subcontractor.

Nevertheless, construction contracts frequently stipulate that all subcontractors shall be approved by the owner or architect-engineer. The bidding documents may require that a list of subcontractors be submitted with a proposal submitted by a prime contractor, or that a similar list be submitted by the low-bidding prime contractor for approval by the owner after the proposal has been accepted. When the owner is provided the right of approval, the general contractor is not relieved of any of its responsibilities by the owner's exercise of its prerogative.

If approval of subcontractors is required, such approval must be obtained before the general contractor enters into agreements with its subcontractors. This frequently presents a very awkward

situation, for both the prime contractor and the subcontractors. As discussed in other sections of this book, the relationship between prime contractors and certain of their subcontractors is often a special business relationship, frequently cultivated over a period of time. If one or more of the prime contractor's subcontractors of choice is not approved by the owner and architect-engineer, then, by definition, the prime contractor will be entering subcontract agreements with subcontractor specialists who were not their first choice. Additionally, if the second subcontractor submitted a price for its work that was higher than that of the first subcontractor who was disapproved, the matter of who is responsible for payment of the higher amount has sometime become a contentious issue.

In actuality, the disapproval of a subcontractor by the architect-engineer and owner is not a common occurrence. This is particularly true on public projects, where disapproval of a subcontractor may result in litigation and can be difficult to sustain by the public owner.

The prime contractor typically formalizes all of the elements of its contract with the subcontractors by use of a written document called the subcontract agreement. This document sets forth in detail the rights and responsibilities of each party to the contract. A well-prepared subcontract agreement can eliminate many potential disputes concerning the conduct of subcontracted work. The prime contractor may use a standard subcontract form, or it typically may develop its own special form to suit its particular requirements. Subcontract forms should be prepared with the exercise of extreme care and with the assistance of an experienced attorney. The Associated General Contractors of America has prepared a form of subcontract agreement for use on building construction projects that is presented in Appendix L.

A frequent area of disagreement between the general contractor and a subcontractor is the form and language of the subcontract agreement that is used for a project, and the terms and conditions that the form includes. Sometimes, when a subcontractor has previously done work for a general contractor, the subcontractor tacitly assumes that the same subcontract form that the general contractor previously used will again be employed. Consequently, the subcontractor's bid often includes, without specific reference, the standard contract terms and conditions previously used by that general contractor. Problems arise when the subcontractor submits a bid to a general contractor for the first time or when the general contractor makes some major revisions to its company subcontract form. Here, the contract terms contemplated by the two parties can be quite different.

A possible complication here is that if the general contractor presents a subcontract agreement for the subcontractor to sign that contains significant conditions not set forth in the bidding documents or contract documents, it can be considered as a counteroffer by the general contractor, and the bid of the subcontractor may not be binding. To avoid such difficulties, many general contractors require that subcontract bids be submitted on a standard bid quotation form that binds the parties to the use of a particular subcontract. Typically, this form will indicate that the subcontract agreement form to be used is available for examination by the subcontractor before their subcontract proposal is submitted.

After the subcontract agreement is signed and the work is under way, change orders to construction contracts often are issued and agreed to between the contractor and the owner. Frequently, these change orders involve modifications to subcontracted work. When this is the case, the general contractor and the subcontractor must execute a suitable change order to the subcontract agreement affected.

## 6.8 SUBCONTRACT PROVISIONS

Subcontract agreements are, in many respects, similar in both form and content to the prime construction contract between the general contractor and the owner. Two parties contract for a specific well-defined body of work that is to be performed in accordance with a prescribed set of

contract documents. Normally, the general contractor will include in its subcontract agreements express provisions that the subcontractor is bound to the prime contractor to the same extent that the prime contractor is bound to the owner by the terms of the prime contract. Provisions of this kind are commonly referred to as "pass-through clauses" or as "pass-through provisions."

Additionally, the subcontract must provide that the subcontractor assume all obligations to the prime contractor that the prime contractor assumes to the owner. This concept is illustrated in Appendix D. With such wording, provisions of the general contract such as changes, changed conditions, prevailing wages, warranty period, compliance with applicable laws, and approval of shop drawings that pertain to the prime contractor also extend to the subcontractors. Other owners require the general contractor to include in its subcontracts certain provisions or designated clauses that appear in the general construction contract.

Project specifications normally include a description of those work items for which warranties and guarantees are required. A common area of dispute between the general contractor and its subcontractors is whether these warranty and guarantee periods begin when the specific work is completed, or when the entire project is finalized. A common procedure in this regard is for all subcontract agreements to clearly state that the effective beginning dates of warranty and guarantee periods shall coincide with the completion of the total project and final acceptance by the owner.

In addition to the provisions of the general construction contract, there are many relationships that pertain to the conduct of the subcontracted work itself for which provision must be made. Many of these are in the nature of general conditions to the subcontract, which are made an integral part of the printed subcontract agreement form. Clauses pertaining to temporary site facilities to be furnished, insurance and surety bonds to be provided by the subcontractor, arbitration of disputes, extensions of time, and indemnification of the general contractor by the subcontractor, are typical illustrations.

A detailed description of the work to be accomplished by the subcontractor, referred to as a scope statement, must be included in the subcontract agreement. A statement concerning the starting time, and the schedule of the subcontracted work, as well as provisions relating to the contractor's overall scheduling of the work on the project, and inclusion of liquidated damages statements, are important. Subcontracts often contain a "no damage for delay" clause. This clause provides that, in the ease of delay caused by the general contractor, the subcontractor's sole remedy will be an extension of time to complete its work. Special conditions must often be included such as security clearances for workers, job site storage, laydown areas, work to be accomplished after hours, and other requirements that arise from the peculiarities of a given project. Some subcontracts provide that the subcontractor must waive its right to file a mechanic's lien against the project property site. However, some states have enacted statutes making such waivers void as against public policy. Liens are more fully discussed in Chapter 9.

Because the subcontractor has no contract with the owner, the subcontractor normally cannot sue the owner directly as a means of settling disputes or claims. Rather, the subcontractor must either initiate a claim in the name of the prime contractor or have the prime contractor prosecute the claim for the subcontractor. In addition, the subcontractor cannot submit a claim against the owner after the general contractor has finalized the project and released the owner by acceptance of final payment. Consequently, subcontracts sometimes include a clause obligating the prime contractor to pursue any subcontractor claims against the owner or allowing the subcontractor to pursue them in the name of the prime contractor. It is to be noted that owners are generally precluded from suing a subcontractor for a breach of the subcontract, not only because these two parties are not in contract but also

because the law generally regards the owner as an incidental beneficiary to the subcontract and not as a third-party beneficiary.

Terms of payment to the subcontractor and retainage to be withheld by the general contractor are, of course, especially significant. Payment to the subcontractor can be established as a lump-sum, unit-price, or cost-plus basis. Most subcontract agreements contain provisions to the effect that the subcontractor will be paid at 30-day intervals on an earned-value basis, in accord with the manner in which the prime contractor is paid by the owner.

A matter of continuing concern to all parties is payment to the subcontractor by the general contractor when, for some reason, the general contractor has not been paid by the owner. Different subcontract agreements contain significantly different provisions in this regard. All subcontracts stipulate that the general contractor shall pay its subcontractors promptly after payment is made by the owner to the prime contractor, although some obligate the contractor to pay the subcontractors only after owner payment. The subcontract agreement form in Appendix L provides that payment to the subcontractor is conditioned on receipt by the prime contractor of its payment from the owner.

Such contract provisions have raised many questions concerning the responsibility of the prime contractor to pay the subcontractor and have resulted in a great deal of litigation. Most courts now hold that the subcontract must be explicit with regard to the assumption of risk by the subcontractor concerning delay of payment by the owner, if the contractor is to be authorized to withhold payment from the subcontractor. If such contractual wording is not present, the subcontractor must normally be paid within a "reasonable time" for completed and acceptable work.

In addition, the courts note that delay in payment by the owner generally involves a dispute between the owner and the general contractor. If this dispute does not involve a particular subcontractor, the courts have ruled that the uninvolved subcontractor is entitled to payment within a reasonable time, even if the prime contractor has not been paid. It is to be noted that some subcontract forms do not contain a contingent payment provision but do provide that subcontractor payments are contingent on payment certificates being issued by the architect-engineer.

It is also to be noted that some general contractors operate by a management philosophy that holds that their subcontractors are to be paid for work they have properly installed and completed, without regard to whether the general contractor has been paid by the owner. This philosophy is translated into appropriate language to that effect in the subcontract agreements utilized by these general contractors.

Progress payments to subcontractors by the prime contractor are normally subject to the same retainage provisions as apply to payments made by the owner to the prime contractor. Such retainage is provided for by the subcontract instrument.

A matter that requires close attention by the general contractor is the possible lack of coordination between provisions of the prime contract and of the subcontract form used on a given project. Uncoordinated contract terms can lead to serious legal difficulties for the prime contractor. Again the point is to be emphasized that the wording and the formation of subcontract agreements for construction projects should command the complete attention of the general contractor, with the assistance of his legal counsel.

## 6.9 CONTRACT TIME

Time is an important element in the performance of almost every construction project. Owners typically include a statement in the contract documents for a project, usually in the general conditions,

which prescribes that time is of the essence in the performance of the construction contract. The AIA Document A201–2007, General Conditions of the Contract for Construction (Appendix D), contains the following provision: "Time limits stated in the contract are of the essence."

The contract documents will contain a duration, usually stated as a number of days, which is stipulated to be the time within which the contractor must satisfactorily complete all of the requirements of the contract documents. If he fails to do so, he is subject to some very unpleasant consequences, usually in the form of liquidated damages, to be discussed in the next section.

When the contract declares that "time is of the essence," this signifies that the stipulated completion date or time is considered to be essential to the contract and is an important element of the contractor's obligation. Failure by the contractor to complete the project within the time specified is considered to be a material breach of contract and is actionable by the owner.

Most construction contracts are explicit regarding construction time, designating either a completion date or a specific number of calendar days within which the work must be finished in compliance with the contract documents. The term *calendar days* including Saturdays, Sundays, and holidays is preferable, rather than the term *working days*. This language eliminates possible controversy concerning the effects of overtime, premium time, multiple shifts, and the like, when defining working days.

There also have been situations where the construction contract contains provisions whereby the contractor will receive a bonus for completing the contract ahead of schedule. Public agencies have sometimes used the early-completion bonus system where prompt completion of the project will be of special economic significance to the public. Private owners likewise have found that providing an incentive to the contractor for early completion of all of the requirements of the contract is, at times, of benefit to the owner.

When the duration, the contract time, is stated to be a given number of calendar days, the date on which the time begins is an important matter. Construction contracts usually state that the contract time shall begin on the date the contract is signed, or on the date the contractor receives a formal "notice to proceed" or "letter of intent" from the owner. These terms are defined in the sections that follow later in this chapter.

The contract typically establishes the contract completion date as being the date of the owner's issuance of the certificate of substantial completion. This document, and the accompanying procedures, are discussed in a subsequent section of this chapter. In general, substantial completion is related to the owner's capability of using the structure for its intended purpose, despite small defects to be corrected or minor items not yet accomplished—that is, substantial completion.

## 6.10 LIQUIDATED DAMAGES

Almost all construction projects are of such a nature that the owner will incur hardship, expense, or loss of revenue should the contractor fail to complete the work within the time specified by the contract. Where the contract makes time an essential part of the contract, failure on the part of the contractor to complete the project within that time is a breach of contract and can make the contractor liable to the owner for damages. The amount of such damages may be determined by agreement, or by litigation.

Compensatory damages of this sort are difficult to determine with exactness, and therefore in construction contracts it is common practice for the owner to provide that the contractor shall

pay to the owner a fixed sum of money for each calendar day of delay in satisfactory completion. Most contracts provide that such delay damages run only to the date of substantial completion or beneficial occupancy, although some specify the date that the architect-engineer certifies the project to be complete.

This assessment against the contractor, known as *liquidated damages,* is used in lieu of a determination of the actual damages suffered. The word *liquidated* in this instance merely signifies that the precise amount of the daily damages to the owner has been established by agreement. An advantage to the use of a liquidated damage provision in a construction contract is the possible avoidance of subsequent litigation between the owner and the contractor regarding the amount of actual damages. Liquidated damages, when provided for by contract, are enforceable at law, provided they can be shown to represent a reasonable measure of the actual damages suffered. The courts have ruled that a liquidated damages clause in a contract prevents the owner from recovering its actual damages, even where the actual damages suffered by the owner could be shown to exceed the amount provided by the liquidated damages provision.

The owner deducts any liquidated damages from the sum that is due the contractor at the time of final payment. Typical values of liquidated damages appearing in construction contracts vary from a few hundred dollars to many thousands of dollars per calendar day for each day the contractor requires to reach the point defined as satisfactory completion of the contract.

When the project delay was the fault of both the owner and the contractor, the owner's recovery of liquidated damages is generally precluded. However, in construction, the contractor may still be liable for a portion of the delay. It is to be noted that a liquidated damage clause normally works only one way. It conveys no automatic right to the contractor to apply the provision in reverse for owner-caused delay.

It must be emphasized that the courts enforce liquidated damage provisions in construction contracts only when their amount represents a reasonable forecast of actual damages the owner would be expected to suffer upon breach, and when it is impossible or very difficult to compute or make an accurate estimate of actual damages. When it has been established that the amount was excessive and unreasonable, the courts have ruled that such payment by the contractor to the owner constituted a penalty and the owner received nothing, or owner recovery was limited to the actual damages. Punitive damages (those intended to punish) are not ordinarily recoverable for breach of contract. It may be noted that construction contracts specifically provide that the sum named is in the nature of liquidated damages and not a penalty.

## 6.11 EXTENSIONS OF TIME

During the life of a contract, there are often occurrences that cause delay or add to the period of time necessary to construct the project. Just what kinds of delays will justify an extension of time for the contractor depends on the language and provisions of the contract. An extension of time relieves the contractor from termination for default, or from the assessment of liquidated damages by the owner, because of failure to complete the project on time. In the complete absence of any clause that defines an excusable delay, the contractor can normally expect relief only from delays caused by the law, by the owner, by the architect-engineer, or by an act of God.

For this reason, construction contracts usually contain an extension-of-time provision that defines which delays are excusable. The provisions of such clauses are quite variable. Because an

extension of time constitutes a revision to the original contract terms, it is formalized by a signed instrument, called a change order (discussed in Chapter 4) that constitutes a binding change to the contract.

The addition of extra work to the contract as formalized by a change order is a common justification for an extension of time. In this case, the additional contract time that is made necessary by the broadened scope of the work is negotiated at the same time the cost of the extra work is determined when the change order is formalized. Delay of the project caused by the owner or its representative is another frequent cause of contract-time extensions.

Many other circumstances arising from unforeseeable causes beyond the control of and without the fault or negligence of the contractor can contribute to late project completion. Contracts often list specific causes of delay deemed to be excusable and beyond the contractor's control. Certain causes are essentially of an undisputed nature, provided the contractor has exercised due care and reasonable foresight. These causes include flood, earthquake, fire, epidemic, war, riots, hurricanes, tornadoes, and similar disasters.

Other less spectacular causes of delay may or may not be defined as excusable delays in the contract. Included here are occurrences such as strikes, freight embargoes, acts of the government, project accidents, unusual delays in receiving ordered materials, and owner-caused delays. Language in the contract that the contractor deems unreasonable or untenable with regard to excusable delays must be given proper consideration by the contractor when he is making the decision as to whether to prepare a bid for the project or, if he has decided to submit a proposal, as an element of his consideration of risk when he prepares his bid or at the time when the contract is being negotiated.

As a general rule, claims for extra time are not considered when they are based on delays caused by conditions that existed at the time of bidding, and about which the contractor might be reasonably expected to have had full knowledge. Also, delays caused by failure of the contractor to anticipate the requirements of the work in regard to materials, labor, or equipment required usually do not constitute reasons for a claim for extra time. Normally, adverse weather does not justify time extensions unless it can be established that such weather was not reasonably foreseeable and was unusually severe at the time of year in which it occurred and in the location of its occurrence.

Previously discussed is the fact that on unit-price contracts actual quantities of work can vary from the architect-engineer's original estimates. Minor variations do not affect the time of completion stated in the contract. However, if substantial variations are encountered, an extension of contract time may very well be justified, and the contractor should promptly notify the architect-engineer, in writing, regarding the need for an extension of time.

Whenever a delay in construction is encountered over which the contractor has no control, the contractor must bring the condition to the attention of the owner and/or architect-engineer in writing within a designated period of time after the start of the delay. This time within which the contractor must let the architect-engineer know of his request for an excusable delay is called a notice provision and is typically specified in construction contracts. This communication should present specific facts concerning times, dates, and places and include necessary supporting data about the cause of delay. Failure by the contractor to submit a timely written request along with documentation within the notice period will typically seriously jeopardize the chances of obtaining an extension of time.

## 6.12 ACCELERATION

Acceleration refers to the owner's directing the prime contractor to accelerate its performance of the work so as to complete the project at an earlier date than the current rate of work advancement

will permit. If the project has been delayed through the fault of the contractor, the owner can usually order the contractor to make up the lost time without incurring liability for extra costs of construction. However, if the owner directs acceleration under the changes clause of the contract, requiring that the work will be completed before the specified contract completion date, the contractor can recover under the contract change clause for the increased cost of performance, plus a profit.

There is another instance of acceleration, however, where additional costs may or may not be recoverable by the contractor. This is often referred to as constructive acceleration. Such a case occurs when the owner either fails or refuses to grant the contractor a requested extension of time and still insists that the project be completed by the original contract date. The owner's action in this case compels the contractor to accelerate job progress in order to comply with the original completion date. This obviously increases the contractor's costs of construction. In such an instance, the contractor must be able to demonstrate certain key elements before being granted relief from these additional costs. Along with this implicit directive to accelerate by the owner, there must have been an excusable delay for which the contractor had originally requested an extension of time, and this request must have been denied. In addition, the contractor must have completed the contract on time, and must be able to show that he actually incurred extra costs in so doing as the result of the decision by the architect-engineer and the owner to deny his request for additional time.

## 6.13 DIFFERING SITE CONDITIONS

A "differing site conditions," "changed conditions," or "concealed conditions" clause in a construction contract refers to some physical aspect of the project or its site that differs materially from that indicated by the contract documents, or that is of an unusual nature and differs materially from the conditions ordinarily encountered. This includes unknown physical conditions of an unusual nature that differ materially from those ordinarily found to exist and are generally recognized as inherent in construction activity of the character provided for in the contract documents. The essential test is whether a given site condition is substantially different from that which the contractor should have reasonably expected and foreseen. Unexpected conditions resulting from hurricanes, floods, abnormal weather, or nonphysical conditions are not normally considered to be changed conditions.

The construction cost and time of many projects depend heavily on the proper analysis of local conditions at the site, conditions that cannot be determined exactly in advance. This applies particularly to underground work, where the nature of the subsoil and groundwater can have a significant influence on costs. At the time of bidding, the owner and its architect-engineer must make full disclosure of all information available concerning the proposed project and its site. The contractor uses the information as it sees fit and is responsible for its interpretation. The contractor is expected to perform its own inspection of the site and to make a reasonable investigation of local conditions.

The matter of who pays for the "unexpected condition" when it is discovered during construction of the project depends on the contract provisions, as well as on the exact nature of the different conditions which were encountered. Many disputes, and a great deal of arbitration and court action have resulted from claims of "unexpected conditions" or "unforeseen conditions."

No implied contractual right exists for the contractor to collect for unforeseen conditions. Any ability to collect extra payment and additional time for changed conditions must be provided by the terms of the contract. An exception is made, however, when the drawings and specifications contain incorrect and misleading information. In such cases, the courts generally rule that the owner warrants the adequacy of the contract documents and that the warranty is breached where errors or defects are present.

Many contracts provide for an adjustment of the contract amount and time if actual subsurface or latent physical conditions at the site are found to differ materially from those indicated on the drawings and specifications or from those inherent in the type of work involved. Delay-related expenses resulting from differing site conditions are also considered to be compensable. This provision is often expressed as a "differing site conditions" clause, and its objective is to provide for unexpected physical conditions that come to light during the course of construction. When such a contract clause is present, the financial responsibility for unexpected conditions is placed on the owner. The AIA General Conditions of the Contract for Construction in Appendix D contains such a provision.

It is the purpose of a changed-conditions clause to reduce the contractor's liability for the unexpected, and to mitigate the need for the contractor's including large contingency sums in the bid to allow for the risk of possible serious variations in site conditions from those described and set forth by the contract documents.

It must be clearly understood at this point that in order for a claim to be sustained under this clause, the unknown physical conditions must truly be of an "unusual nature" and must differ "materially" from those ordinarily encountered and generally regarded as inherent in work of the character provided for in the contract. The essential question is whether the conditions are different from those the contractor should have reasonably expected and whether these conditions caused a significant increase in the project time or cost.

Various disclaimers and exculpatory clauses denying liability and responsibility for actual field conditions frequently appear in construction contracts. A common clause provides that neither the owner nor the architect-engineer accept responsibility for the accuracy or completeness of subsurface data provided, and that all bidders are expected to satisfy themselves as to the character, quantity, and quality of subsurface materials to be encountered. However, where a differing site conditions clause has been in the contract, and where such conditions were discovered, disclaimers of this kind have not acted as a bar to the contractor receiving relief under the clause.

Instances of such exceptions occur when the site conditions were deliberately or negligently misrepresented on the contract documents, when the owner did not reveal all of the relevant information it possessed or that it had knowledge of, or when there was a breach of warranty of the correctness of the bidding information. Disclaimer clauses have also been denied when they were deemed by the courts to be too severe, when they were in direct contradiction with other specific representations, and on the basis that it was unreasonable to expect the contractor to make an extensive investigation of underground conditions during the bidding period.

It must also be noted that, regardless of the contract wording, if differing site conditions are discovered at the site and if the contractor intends to claim additional cost or time, it must promptly notify the owner in writing, and must also keep detailed and separate cost records of the additional work involved. Failure to do so will very likely make it impossible for the contractor to prevail and to recover any damages.

## 6.14 OWNER-CAUSED DELAY

There are some instances in which the work on a construction project is delayed by some act of omission or commission on the part of the owner, or on the part of someone for whom the owner is responsible such as the architect-engineer, or other contractors. Examples are delays in making the site available to the contractor, failure to deliver owner-provided materials on time, unreasonable delays in approval of shop drawings, delays caused by another contractor, delays in issuance of change orders, and suspension of the work because of financial or legal difficulties. Additionally, some of the

unaffected parts of the work can be prolonged or disrupted because of the discovery of changes or differing site conditions associated with other portions of the project.

Owner-caused delay is of concern to the contractor for two reasons. First, when the overall completion date of the project is affected, a suitable extension of time must be obtained. As a rule, contracts provide for extensions of time in the case of owner-caused delay, and this matter is seldom troublesome. The second and more difficult problem for contractors is the "ripple" effect of such delays, that is, the "consequential damages" or "impact costs" associated with unchanged work that can result from project delay. Examples of impact costs are standby costs of nonproductive workers, supervisors, and equipment; expenses caused by disrupted construction and material delivery schedules; start-up and stopping costs such as those incurred in moving workers and equipment onto and off of the job; and additional overhead costs.

It sometimes happens that work is delayed by owner-caused delays until the onset of conditions the contractor did not anticipate and that would not have influenced the project had the delay not occurred. Examples include the onset of cold weather, the rainy season, or the time of spring runoff, resulting in greatly increased operating costs. Owner-caused project delay can defer work until higher wage rates have gone into effect, until material prices have increased, or until bargains or discounts have been lost. Barring contractual provisions to the contrary, a contractor has the right to recover damages for its increased costs of performance caused by delays that are attributable to the owner.

Such claims are based on the owner's implied warranty that the drawings and specifications which the owner and the architect-engineer prepared and provided are adequate for construction purposes, and the implied promise that the owner and architect-engineer will not disrupt or impede the performance of the construction process. In order to recover damages, the contractor must prove the delays were caused by the owner and that the contractor was damaged as a direct result of the delays.

However, construction contracts may contain a variety of provisions concerning owner-caused delay. On federal projects the government has assumed responsibility for payment of the impact cost of changes and changed conditions as they affect unchanged work. Federal contracts and many others contain suspension-of-work clauses that provide for the contractor's recovery of the extra cost occasioned by owner-caused delay or suspension. However, by contrast, some contracts contain provisions that expressly limit contractor relief in cases of job delay, to time extensions only.

Many contracts, both public and private, contain "no-damage for delay" clauses whereby the owner is excused from all responsibility for damages resulting from owner-caused delay. Where such exculpatory or hold-harmless clauses are present, they are generally given effect by the courts, although they are strictly interpreted and limited to their literal terms. Exceptions that have allowed the contractor to collect increased costs are cases in which the delay was caused by active owner interference with the work, when the delay was of a type not contemplated by the parties, such as the owner not allowing the work to start on time, when the owner acted with malicious intent, when the delay resulted from bad faith or misrepresentation by the owner, when the delay was caused by owner failure to coordinate the work of other contractors on the site, when the delay was for an unreasonable period of time, or when the delay was caused by the owner's breach of a contractual obligation such as the nontimely delivery of owner-furnished materials. Even when consequential damages are awarded, they often reimburse the contractor for extra costs only, with no allowance for time-related additional costs, or for profit. It is to be noted that a few states have enacted statutes barring no-damage-for-delay clauses in construction contracts.

It is also noted that the contractor's careful review of all contract provisions, as recommended repeatedly in this text, would disclose clauses such as "no damages for delay." The contractor can them

make a determination with regard to whether or not he wishes to prepare a proposal for the project, or whether he is prepared to accept the risk which such a clause portends, if he enters a contract.

The contractor frequently is unable to recover delay damages because of an inability to prove the exact extent of the loss suffered. For this reason, when such a delay occurs, it is essential that the contractor keep careful and detailed records, and every element of supporting documentation, if it expects to recover extra costs from the owner. An additional point to be made is that many contracts require the contractor to notify the owner within a designated time after any occurrence that may lead to a claim for additional contract time or extra cost.

## 6.15 THE AGREEMENT

Although the agreement is defined and discussed in Chapter 4 as a typical element of the contract documents for a project, it is again included for reference here because of its obvious significance with respect to a construction project and also to present facts concerning this document within the context of important provisions and elements of the contract. The agreement is defined as a document specifically designed to formalize the construction contract between the owner and the construction contractor. It serves as a single instrument that brings together all of the contract documents by reference, and it functions for the formal execution of the contract.

The agreement serves the purpose of presenting a condensation of the elements of the contract documents, stating the work to be done and the price to be paid for it, and provides suitable spaces for the signatures of the parties. The agreement usually contains a few clauses that are closely akin to the provisions in the supplementary conditions, and which serve to amplify certain provisions that the owner and the architect-engineer may wish to emphasize. For example, it is common for the agreement to contain clauses that designate the completion time of the project, the fact that liquidated damages will be assessed for late completion and the amount of the liquidated damages. All of the elements that comprise the contract documents are typically listed, with a notation that each of these documents is incorporated by reference in the agreement. However, practice varies in this regard, with such clauses appearing sometimes in the supplementary conditions, other times in the agreement, and perhaps in both.

Standard agreement forms are normally used by both public and private owners, although on occasion the agreement may be especially prepared for a given project. Appendix G illustrates the use of AIA Document A101–2007, which is the agreement form that is often used by private owners for fixed-price building construction contracts. Document A101-2007 is designed for use with the AIA Document A201–2007, "The General Conditions of the Contract for Construction," as contained in Appendix D. Appendix H reproduces AIA Document A102–2007, a form of agreement between the contractor and owner that is frequently used for cost-plus-fee contracts.

## 6.16 LETTER OF INTENT

Occasionally, the owner may want the contractor to begin construction operations on the project before the formalities associated with the signing of the contract can be completed. However, the contractor must proceed with caution in such cases with regard to matters such as placing material orders, issuing subcontracts, or otherwise obligating itself before it has an executed and signed contract in its possession.

In cases where there is such urgency, and as a matter of protecting the interests of the contractor, it is common practice for the owner to authorize the commencement of work by the contractor with the owner's issuance of a letter of intent or letter contract. This letter is prepared for the signatures of both parties, and states their intent to enter into a suitable construction contract at a later date. When signed, the letter is binding on both parties, and furnishes the contractor with sufficient authority to proceed with construction in the interim, before the contract is formally executed. This interim authorization contains explicit information about settlement costs in the event the formal contract is not executed and will often limit the contractor to certain procurement and construction activities. The contractor should have his attorney examine a document of this kind before he signs such a letter of intent.

## 6.17 THE NOTICE TO PROCEED

The beginning of contract time is usually established by a written notice to proceed, which the owner dispatches to the contractor. The date of its receipt, or a date stipulated in the notice to proceed is normally considered to mark the formal start of construction operations.

This notice, usually issued in the form of a letter, advises the contractor that it may enter the owner's site, and directs the contractor to commence work. The date of receipt of the notice to proceed, or the date that it stipulates as the date when the contractor is authorized to enter the site and to commence construction operations, also typically marks the beginning of project duration. Contracts usually require that the contractor shall commence operations within some specified period, such as 10 days, following his receipt of the notice to proceed.

## 6.18 ACCEPTANCE AND FINAL PAYMENT

The making of periodic payments by the owner as the work progresses does not necessarily constitute the owner's acceptance of the work. Construction contracts generally provide that acceptance of the contractor's performance is subject to the formal approval of the architect-engineer, the owner, or both. Most contracts provide that mere occupancy and use by the owner also do not necessarily constitute an acceptance of the work or a waiver of claims.

Acceptance of the project and final payment by the owner must proceed in accordance with the terms of the contract. Procedure in this regard is somewhat variable, although inspection and correction of deficiencies are the usual practice.

On building construction projects, the contractor will normally advise the owner or architect-engineer when substantial completion has been achieved. An inspection is held and a list of items, called a *punch list,* requiring completion or correction is compiled. Usually the architect-engineer issues a "certificate of substantial completion" at the time of his completion of a reinspection after punch list items have been corrected or completed. This action by the architect-engineer certifies that the owner can now occupy the project for its intended use. A provision appearing in many contracts is that upon substantial completion, the contractor is entitled to be paid up to a specified percentage of the total contract sum (95 percent is common), less such amounts as the owner may require to cover remedial work required by the punch-list items plus unsettled claims and a contingency reserve. The certificate of substantial completion also serves other purposes including shifting the responsibility for maintenance, heat, utilities, and insurance on the structure from the contractor to the owner.

After the contractor has attended to the deficiency list, a final inspection is held and a final certificate for payment is issued. A common contract provision is that final payment is due the contractor within 30 days after substantial completion. This is applicable, however, only with consent of the surety and provided all work has been completed satisfactorily and the contractor has provided the owner with all required documentation. Final payment includes all retainage still held by the owner.

A legal question that frequently arises concerning final acceptance and payment involves the degree of contract performance required of the contractor. The modern tendency is to look to the spirit and not the letter of the contract. The vital question is not whether the contractor has complied in an exact and literal way with all of the precise terms of the contract, but whether it has done so substantially. Substantial completion may be defined as accomplishment by the contractor of all things essential to fulfillment of the purpose of the contract, although there may be inconsequential deviations from certain terms. Appendix D defines substantial completion as the stage at which the work (or designated portion thereof) is sufficiently complete that the owner can occupy or utilize the work for its intended purpose.

Certainly, the substantial performance concept does not confer on the contractor any right to deviate freely from the contractual undertaking, nor to substitute materials or procedures that it may consider equivalent to those actually called for by the contract. Only if defects are purely unintentional and not so extensive as to prevent the owner from receiving essentially what was contracted for, does the principle come into play.

## 6.19 TERMINATION OF THE CONTRACT

While the contract documents provide that the construction contract may be ended in a variety of ways, by far the most commonplace method of contract termination is satisfactory fulfillment of all contractual obligations on the part of both parties. However, there are other means of bringing a contract to an end that are of interest and importance to the construction industry. The conditions of the contract will typically contain a section or an article that defines reasons for, and methods of, termination of the contract. Some of the common reasons are discussed in the paragraphs that follow.

Material breach of contract by either party can be a cause for contract termination. Failing to make prescribed payments to the contractor or causing unreasonable delay of the project are probably the most common breaches by the owner. Other possible breaches could be failure or delay in performance, failure to coordinate the work, failure to provide the project site, or financial insolvency of owner. In such circumstances, the contractor is entitled to damages caused by the owner's failure to carry out its responsibilities under the contract.

Default, or failure to perform under the contract, is the usual breach of contract committed by contractors. Nonperformance, faulty performance, failure to maintain reasonable progress, failure to meet financial obligations, persistent disregard of applicable laws or instructions of the owner or architect-engineer also are examples of material default by contractors that convey to the owner a right to terminate the contract. When the owner terminates the contract because of breach by the contractor, the owner is entitled to take possession of all job materials and to make reasonable arrangements for completion of the work. It is worthy of note that when failure to complete a project within the contract time is the breach involved, the owner probably will not be awarded liquidated damages if he terminates the contract and does not allow the contractor to finish the job late when the contractor is making a genuine effort to complete the work. The legal record is subject to variation on this point, however.

A third way in which a contract can be terminated is by mutual agreement of both parties. This is not common in the construction industry, although there have been instances. For example, it sometimes happens that the contractor faces unanticipated contingencies such as financial reverses, labor troubles, or loss of key personnel that make proper performance under the contract a matter of considerable doubt. Under such circumstances, both the owner and the contractor may agree to terminate the contract and for the owner to engage another contractor. When little or no work has been done, termination of the contract by mutual consent can sometimes be attractive to both parties.

Construction contracts, particularly those that are publicly financed, normally provide that the owner can terminate the contract at any time it may be in its best interests to do so by giving the contractor written notice to this effect. When such a provision is present, the contractor has agreed to termination at the prerogative of the owner. However, in such an event, the contractor is entitled to payment for all work done up to that time, including a reasonable profit, plus such expenses as may be incurred in canceling subcontracts and material orders and in demobilizing the work. If the owner terminates the contract capriciously, it may become liable for the full amount of the contractor's anticipated profit, plus costs.

A contract may also be terminated because of impossibility of performance under circumstances beyond the control of either party. Impossibility of performance is not the case when one party finds it an economic burden to continue. To be grounds for termination of a contract, it must indeed be impossible or impracticable to proceed. For instance, unexpected site conditions may be found that make it impossible to carry out the construction described by the contract. Operation of law may render the contract impossible to fulfill. However, the doctrine of impossibility does not demand a showing of actual or literal impossibility. Impossibility of performance has been applied to cases in which, even if performance were technically possible, the costs of performance would have been so disproportionate to that cost reasonably contemplated by the contracting parties as to make the contract totally impracticable in a commercial sense. The deciding factor was that an unanticipated circumstance made performance of the contract vitally different from what was reasonably to be expected.

Other unusual, but possible, causes of contract termination can occur, such as destruction of subject matter. An example would be a contract to remodel an existing building that was destroyed by fire before the renovation was started. Frustration of purpose also can occur. To illustrate, a contract was awarded for the construction of a boat pier on a lake. Before the pier could be built, however, the lake was permanently drained.

## 6.20 THE WARRANTY PERIOD

Many construction contracts obligate the contractor to make good all defects brought to its attention by the owner during some warranty period after either the time of substantial completion or final acceptance, the point at which the period begins being variable with the form of contract. One year is a commonly specified warranty period, although periods of up to five years are sometimes required on certain categories of work, such as utility construction. During the specified warranty period the contractor is required, on notice, to make good at its own expense defects detected during this period. In most cases, the prescribed warranty period fixes the reasonable time and releases the contractor from further responsibility after its expiration. Warranty periods required by the contract are normally covered by the performance bond, and they do not operate to defer final payment.

An exception to the reasonable time and expressed warranty period concept occurs when a defect caused by the contractor's inadequate performance is latent in nature and could not have been detected

by the owner during ordinary use and maintenance of the structure. In such a case, the owner has a right of action against the contractor beyond the warranty period for such longer period of time as may be provided for by the contract or as prescribed by law. For example, the owner would ordinarily have a right of action against the contractor for faulty construction up until the end of the period designated by the applicable statute of limitations for breach of contract or any applicable special statute of limitations.

A contractor's warranty does not imply, however, that the contracting firm is liable for the sufficiency of the plans and specifications unless it prepared them or unless it guaranteed their adequacy. A contractor is required to construct in accordance with the contract documents, and when it does so it cannot ordinarily be held to a guarantee that the design will be free from defects or that the completed project will be sufficient or suitable for the purpose intended. The contractor is responsible only for improper workmanship, inferior materials, or other faults resulting from his failure to perform in accordance with the contract. Warranties normally exclude contractor responsibility for damage or defect caused by owner abuse, modifications not performed by the contractor, improper or insufficient maintenance, improper operation, or usual wear and tear under normal usage.

## 6.21 SUMMARY AND CONCLUSIONS

The construction contract, which constitutes the very basis for and essence of the practice of construction contracting, and some of the typical and important provisions of construction contracts, have been discussed in this chapter. It should be abundantly clear that construction contractors, whose very name for themselves includes the word *contract,* must know and understand the kinds of contracts that are used for construction projects, and also must thoroughly understand the typical key provisions of those contracts. The imperative is repeated one additional time in this chapter, for emphasis: it is absolutely essential that construction contractors read and understand all of the elements of content of every contract, before they bind themselves to its terms by their signatures on those contracts.

### CHAPTER 6 REVIEW QUESTIONS

1. A contractor is usually required to provide a one-year warranty following his completion of the work on a project. When does the warranty period begin and what, specifically, is the contractor required to warrant?
2. Define *pass-through provisions* in a subcontract agreement.
3. If a contractor does not complete a construction project within the specified duration, the contract often requires that he pay to the owner a specified sum of money for each day past the specified completion date that he requires to fulfill all of the requirements of the contract. Explain why these dollars paid by the contractor are properly referred to as *liquidated damages*.
4. State the two methods by which the beginning of project time may be designated, as discussed in this chapter.
5. According to usual contract language, who is designated as the interpreter of the contract documents, in the event a difference of opinion arises? Explain how this is sometimes not the case.
6. If, during the course of the construction of a project, the contractor discovers an element in the drawings or the specifications that, based on his experience and judgment, render the design inadequate, what should he do? Be complete and specific.

7. What is the most common basis for termination of a construction contract? Name two other typical bases for termination of a construction contract.
8. What is the name given to the occurrence where the owner and/or the architect-engineer direct the contractor to speed up his work and his progress, so as to complete the project earlier than the completion date stated in the contract documents? What should the contractor do upon receiving such a request? Be complete and specific.
9. While the general contractor is constructing a project, the subcontractor who is drilling the underreamed piers for the building foundation approaches the contractor and urgently informs him that his drilling rig has struck what he feels sure is a ledge of stone 40 feet beneath the surface. The specified depth of the drilled piers is 45 feet below benchmark elevation at the surface. No stones, boulders, or underground stone ledges or strata are indicated on any of the geotechnical engineering information provided by the owner. List the steps the contractor should take to solve the problem, beginning with his response to the drilling subcontractor.
10. Define *indemnification*. Explain why the contractor should read very carefully, and be sure he understands, the indemnification provisions in the contract documents.

# Chapter 7

# Contract Surety Bonds

## 7.1 INTRODUCTION

Surety bonds are very widely used in construction contracting, on both public and private construction projects. The use of surety bonds is, however, not unique to the construction industry; rather, surety bonds are used frequently in many applications in business and commerce.

In the law, a surety is a party that assumes liability for the debt, default, or failure in duty of another. A *surety bond* is the term for the contract that describes the conditions and obligations pertaining to such an agreement. It should be understood that a surety bond is not an insurance policy. Rather, it serves as an extension of credit by the surety, not in the form of a financial loan, but in terms of an endorsement whereby the surety company makes certain guarantees with regard to the actions or omissions of a contractor. Insurance protects a party from the risk of loss, while a surety guarantees the performance of a defined contractual duty.

Construction surety bonding involves three parties. By the terms of a construction surety bond, the surety agrees to indemnify the owner, who is called the obligee, against default or failure in duty of the prime contractor, who is called the principal. When the contractor has properly fulfilled all of its obligations, and following the expiration of any warranty period defined by the contract and covered by the bond, the bond itself expires, and the bond agreement is discharged and is no longer of any force or effect. Regardless of the reason, however, if the prime contractor fails to fulfill its obligations as defined by the bond, the surety must assume the obligations of the contractor and must see that the contract is completed, with the surety paying all costs up to the face amount of the bond.

It should also be noted that dual obligee bonds are sometimes used. Such bonds protect both the owner and the lending institution that advances construction funds to the owner. The need for surety bonds is in large measure a consequence of the fact that construction is a very risky business, with failures of construction enterprises, both prime contractors and subcontractors, a commonplace occurrence.

## 7.2 BASIC ELEMENTS OF UNDERSTANDING

Every construction bond has three components: the bond instrument itself, the face amount of the bond, and the premium for the bond. Understanding these terms, and a few others included in this section, will facilitate understanding of surety bonds.

The bond instrument is the actual contract that is entered into between the bonding company and the principal, who is the general contractor. Each bond instrument has a name and a defined function. The bond instrument contains the terms and provisions as required by the owner, the obligee, and as

set forth in the contract documents for the project. While subsequent sections will describe other types of bonds that may be used, the three most common forms of bonds are the bid bond, the performance bond, and the payment bond. The purpose, content, and provisions of these bonds will be discussed in sections to follow.

The face amount of the bond is the maximum dollar amount for which the surety is liable in fulfilling the guarantees of the bond instrument. The owner will typically set forth, in the contract documents, what the required face amounts will be, for each of the bonds the owner requires the contractor to provide.

The bond premium is the dollar amount the contractor pays to the bonding company in return for the surety taking the risk in behalf of the contractor, and for writing the bond instrument as required for the project. This bond premium is a nonrefundable dollar amount the contractor pays to the bonding company. Bond premiums vary with a number of factors, which will be discussed in sections that follow.

*Default* is the term used for the contractor's failing to fulfill one or more of the provisions of the bond instrument. In the event of default by the contractor, the bonding company, upon notification by the obligee, is then required to make remedy to the owner in accord with the provisions of the bond instrument, up to a maximum of the face amount of the bond.

The term *bonding capacity* generally refers to the maximum amount of uncompleted bonded construction contract work the bonding company will allow the contractor to have in progress at a point in time. The bonding company will establish this bonding capacity amount based on its evaluation of a large number of factors. These factors will be further discussed in a subsequent section of this chapter. When the contractor has reached the limit of his bonding capacity, the bonding company will write no more bond instruments for him. This means that the contractor must complete some of the construction projects he has underway before submitting a proposal for any additional work.

## 7.3 FORMS OF CONTRACT BONDS

By the terms of the construction contract with the owner, the prime contractor accepts two principal responsibilities: to perform all of the requirements of the contract documents and to pay all costs associated with the work. Both of these obligations can be included within a single bond instrument, and combined performance and payment bonds are written on a few projects, almost all of these being privately financed. However, it is usual practice for construction contracts to require two separate contract bonds, one bond covering performance of the contract and the other guaranteeing payment for labor and materials. The separate forms bear the endorsement of the American Institute of Architects (AIA), and virtually all statutory bonds on public work are in separate performance bond and payment bond forms.

Under the single type of bond, there is a potential conflict of interest between the owner and persons furnishing labor and materials. Because the owner has priority, the face value of the bond can be entirely consumed in satisfying its claims. Thus, in many instances, the single bond form has afforded little or no protection for material dealers, workers, and subcontractors. In addition, there have been serious problems with the priority of rights of the persons covered. The double form of bond covers separately the interest of the owner and that of subcontractors, material suppliers, and workers. The premium cost of the bond protection is not increased by furnishing two separate bonds rather than one.

## 7.4 BID BONDS

Bid bonds are often required by owners in competitive bid contracting. The owner typically stipulates that the bid bond provide four guarantees to the owner:

1. A valid bid in good faith by the contractor.
2. The contractor will, if selected by the owner to be the contract recipient, actually enter a construction contract with the owner.
3. The amount of the contract will be the same as the amount of the contractor's proposal.
4. At the time the agreement is to be signed, the contractor will provide such other bonds the owner may have specified in the contract documents, usually a performance bond and a payment bond.

The first guarantee, a valid bid in good faith, is intended to demonstrate the owner's seriousness of purpose in receiving proposals from general contractors, and to serve notice that frivolous proposals are unacceptable. Coupled with the second guarantee in the bid bond, this provision also connotes the fact that the owner is engaging in this process for the purpose of entering a construction contract.

The second and third guarantees of the bid bond are straightforward and direct. If the owner selects a contractor to be the contract recipient, he expects that contractor to sign an agreement, that is, to enter a construction contract within the time period stipulated in the contract documents, with the contract amount to be the same as the amount of the contractor's proposal. If the contractor is unwilling or unable to fulfill both of these conditions, unless he has a valid legal excuse, he is declared to be in default of the bid bond.

The fourth requirement is usually fulfilled by the surety providing the contractor a statement to submit in accompaniment with his proposal on bid day. This statement certifies that the bonding company will provide the other bonds that are required. Appendix I, "AIA Document A310–2010, Bid Bond," written by the AIA, contains a sample bid bond form.

Face amounts of bid bonds vary somewhat, but are usually stipulated to be on the order of 5 to 10 percent of the contractor's proposal amount. The usual language of the bid bond requires that in the event of contractor default, the surety must then pay the owner the difference between the contractor's proposal amount and the next higher valid proposal that the owner accepts, up to the face amount of the bond, whichever is less. A bid bond that contains this provision is referred to in bonding vocabulary as a "bid spread" form of bid bond.

Sometimes owners elect to require the bonding company to structure the bid bond language in terms whereby the bonding company is required to pay the entire face amount of the bond to the owner in the event of default by the contractor. A bid bond that contains language of this kind is referred to as a forfeiture bid bond.

Premiums for bid bonds vary by contractor, and by the exact nature of the language the bond is to contain. Most bonding companies have established very low premiums for bid bonds, with the premium frequently being little more than a handling charge. This is due to the fact that the risk is relatively low, coupled with the fact that if the contractor is selected as the contract recipient, the bonding company will be submitting performance and payment bonds, and the premium for these bonds is much higher. Contractors rarely default on bid bonds.

## 7.5 PERFORMANCE BONDS

The basic guarantee of the performance bond is that the contractor will fulfill all of the requirements of the contract documents in his performance of the project for the owner. It guarantees that the contract will be performed in its entirety and that the owner will receive its structure, built in substantial compliance with the terms of the contract documents. A performance bond incorporates by reference the terms of the contract, and the responsibility of the contractor is the measure of the surety's obligation.

The contractor is in default of the performance bond if, for any reason, he is unwilling or unable to complete the project and to fulfill all of the requirements set forth in the contract documents. In the event of default of the contractor, the burden of contract performance becomes that of the surety.

A performance bond also typically covers any warranty period that may be required by the contract. The warranty period is most often one year from the time of substantial completion by the contractor and acceptance by the owner.

Performance bonds have a face value that acts as an upper limit of expense the surety will incur in finishing the contract should that action become necessary. This face value is established by the owner and is usually expressed as a fixed sum of money based in a percentage of the total contract price. It is not uncommon for owners to require performance bonds to be written with a face amount equal to 100 percent of the contract amount.

Appendix J is a copy of AIA Document A312–2010, "Performance Bond," published by the AIA. This document is widely used as the performance bond form for building construction projects in private construction work, and its provisions are similar to those written by other surety bonding companies. The standard form of performance bond used by the federal government for its building construction projects provides that the bond shall apply to all contract modifications and that the life of the bond must include all extensions of time and any guarantee period required.

## 7.6 PAYMENT BONDS

A payment bond acts primarily for the protection of third parties to the contract, and guarantees payment for labor and materials used or supplied in the performance of the construction project. However, the owner frequently requires the contractor to provide a payment bond because ultimately this bond provides a protection for the owner that is very important to him. Specifically, the language of the payment bond provides that if there are any bills or debts incurred by the contractor in conjunction with any aspect of the performance of the construction project, the payment bond will assure that they are paid. In private construction, this means there can be no lien filed against the owner's property by workers, subcontractors, material vendors, or other unpaid parties to the work.

Although a private owner ordinarily decides for itself whether or not to require contract bonds from the contractor, it is noteworthy that there are a few state statutes that require payment bonds on privately financed work. It is typical for public construction projects to require payment bonds.

Appendix K presents AIA Document A312–2010, "Payment Bond," published by the AIA. Payment bonds exclude from their coverage parties who are remote from the general contractor. It is to be noted that the bond form in Appendix K includes only those claimants who have a direct contract with the prime contractor or one of the subcontractors.

This bond, which is typical of common-law payment bonds utilized by corporate sureties for privately financed projects, provides the following:

- The claimant must have had a direct contract with either the general contractor or a subcontractor.
- Labor and materials include water, gas, power, light, heat, oil, gasoline, telephone, and rental of equipment directly applicable to the contract.
- Written notice must be given by the claimant, other than one having a direct contract with the general contractor, to any two of these: general contractor, owner, or surety, within 90 days after claimant performed its last work or furnished the last of the materials.
- The owner is exempted from any liabilities in connection with such claims.
- Claims must be filed in the appropriate court.
- No claims shall be commenced after the expiration of one year following the date on which the general contractor stopped work, barring a statute to the contrary.

It is noteworthy that a subcontractor's supplier may have the right to recover payment under a general contractor's payment bond, even though the general contractor had made payment in full to the subcontractor. In many areas, the prime contractor is, under its bond, subject to double payment obligations if a subcontractor has not paid its suppliers. When the general contractor does not require payment bonds from its subcontractors, it must use special procedures, called releases of lien, when paying these parties. Releases of lien are discussed in another chapter of this book.

## 7.7 STATUTORY AND COMMON-LAW BONDS

Payment bonds are either statutory or common-law in form, and there are important differences between the two. The bonding requirements on public projects are prescribed by law, and a statutory bond, at least by reference, contains the provisions of the statute that make the bond a requirement. Private projects use common-law bonds whose coverage and language are based entirely on the provisions contained in the bond instrument itself.

The distinction between statutory and common-law bonds is an important matter to the parties for whose protection the payment bond is written. On public projects, the action of claimants to obtain protection under the bond must be taken in accordance with the language of the applicable statute. This applies whether or not the statutory requirements are contained in the language of the bond itself. When payment bonds are required by statute on public projects, the right to recover on the bond is limited by the conditions of the statute to the same extent as though the provisions of the statute were fully incorporated into the bond instrument. If a claimant fails to comply with the statutory requirements applying to enforcement of rights under the bond, it will not be permitted to recover.

A common-law bond is used when there are no statutory requirements. It is a contract that stands by its own language and that is enforced in the usual manner for contracts. In this case, a claimant must proceed as described on the face of the bond.

On private projects the use of the standard common-law payment bond as published by the various surety companies or professional associations is the usual practice. This form is standardized nationally and is approved by professional groups such as the AIA. When statutory bonds are required, most public agencies that have substantial building programs have developed standard bond forms that conform to the applicable statute. Because the laws pertaining to bonding requirements differ somewhat from one jurisdiction to another, bond forms for public contracts are not

standardized nationally. The federal government and many states and municipalities use their own bond forms.

Whether specific instances of workers providing labor, material suppliers, or sub-subcontractors on public projects are protected by statutory payment bonds depends on the language of the related statute. Because liens cannot be filed against public property, the payment bond may well be the only protection that vendors, workers, and subcontractors have, to assure their payment on public projects.

The standard payment bond used by the federal government is written to comply with the provisions of the Miller Act, which is discussed in the following section. This statutory bond protects laborers, material vendors, and subcontractors who perform work or supply materials for the project, although the extent of this protection depends on how far removed the unpaid party is from the general contractor.

## 7.8 THE MILLER ACT

The Miller Act is a federal statute that prescribes the requirement of performance and payment bonds used in conjunction with federal construction projects. Enacted in 1935 and subsequently amended, this statute provides that on all federal construction contracts of more than $100,000, the contractor shall furnish a performance bond for the protection of the United States and a payment bond for the protection of persons supplying labor and materials in the prosecution of the work. A 1994 amendment also specified that a bid bond should be submitted on all projects that require payment and performance bonds.

The act provides that the performance bond be written in such amount that, in the opinion of the contracting officer, the interests of the United States are adequately protected. Under issued regulations of the comptroller general, federal agencies customarily require a performance bond in the amount of 100 percent of the contract amount. Payment bond amounts are established in accordance with the following sliding scale: 50 percent of the contract amount if the contract is $1 million or less; 40 percent if the contract is more than $1 million and not in excess of $5 million; and a fixed sum of $2.5 million if the contract price is above $5 million. In order to ensure that such bonds are supplied to the U.S. government by a financially responsible surety, the U.S. Department of the Treasury maintains a list of surety companies acceptable for providing federal bonds. This list is published annually in the Federal Register.

The Miller Act provides workers, subcontractors, and material vendors who deal directly with the prime contractor the right to sue on the prime contractor's payment bond if payment is not received in full within 90 days after the date on which the last of the labor was done, or the last of the material was furnished. The law further provides that any person having a direct contractual relationship with a subcontractor but no contractual relationship with the prime contractor shall have a right of action on the prime contractor's payment bond provided the claimant gives written notice to the prime contractor within a 90-day period. There is no requirement for notice in the case of a party who deals directly with the prime contractor.

Under the Miller Act, first-tier subcontractors and material suppliers and second-tier subcontractors and material suppliers are protected, but the payment protection of this federal statute extends no further. In addition, second-tier parties must deal with first-tier subcontractors. A subcontractor under the Miller Act has been held to mean one that performs for the prime contractor a specific part of the labor or material requirement of the project. Thus, the term *subcontractor* has been construed by the courts to include a party who supplied custom-made materials but did not install them. An unpaid bond claimant cannot sue on the payment bond until 90 days after the last of the labor was performed

or the last of the material was delivered. However, suit must be brought within one year after the last work or delivery. Suits authorized by law are brought in the name of the United States, for the use of the party suing, in the appropriate district court. Suit is brought and prosecuted by the unpaid party's own attorney.

Since passage of the Miller Act, all 50 states have followed with the enactment of their own statutes that apply to projects financed by the states and establish contract bond requirements similar to those imposed by the Miller Act. These state bonding statutes do differ, however, with regard to which parties can recover under the payment bond.

## 7.9 CLAIMS FOR PAYMENT

An unpaid party to the construction process that looks to the prime contractor's payment bond for compensation must process its claim in accordance with the terms of the bond instrument on private projects or by the provisions of the governing statute on public work. The processing of such a claim is a technical procedure requiring the services of an attorney. However, attorney's fees cannot normally be collected by a Miller Act claimant. To perfect a claim, the claimant must be generally aware of the notice and time requirements involved. On a private project, the unpaid party can obtain a copy of the payment bond from the owner, surety, or architect-engineer. Public owners or surety companies can provide information concerning statutory claim requirements.

The party seeking compensation may be required to provide written notice of the outstanding debt. However, the notice requirement varies with the type of owner involved, and also with the form of payment bond used. On most private projects, no notice is required from an unpaid party who is in contract with the principal (general contractor) on the payment bond. Notice to any two of the bond principal, owner, or surety is needed if the unpaid party has no contract with the principal. Under the Miller Act that prescribes bonding requirements on federal government construction, a person or firm who has privity of contract with the prime contractor has no notice requirement. Otherwise, notice must be given to the prime contractor.

Where written notice of an unpaid debt is required, this notice must be provided within a specified time period. Under the Miller Act, as well as under the usual bond forms used on private work, a claimant who was not in contract with the prime contractor must give notice within 90 days after furnishing the last work or material for which the claim is made. An unpaid party must bring suit on the payment bond within the time limits specified by the bonding statute on public works or by the bond instrument itself on private jobs.

## 7.10 CONTRACT CHANGES

Construction contracts typically provide the owner the right to make changes in the work after the formation of the contract for construction, and while the work on the project is under way. Because the contract comes before the bond, and the bond guarantees the contract amount, it is commonly assumed that extension of the contract bond to include changes in the contract is automatically provided for. However, because the construction contract is made between the owner and the contractor, and the surety bond is a contract between the contractor and the bonding company, in the event of changes, the surety is placed in the position of being obligated by the terms of a contract to which it is not a party. Common law does not allow two contracting parties to bind a third without its consent.

Additionally, the premium that the contractor pays to obtain a bond is, at least in part, a function of the face amount of the bond, which is in turn a percentage of the contract amount. For these reasons,

it is always advisable for the owner to obtain the prior written consent of the surety as a part of the change order process, when making any change or modification of the contract. To illustrate this point, it is standard practice for a completed consent-of-surety form to be attached to each project change order. Approval of a contract change in writing is needed because of the application of statutes of frauds to contracts of suretyship, as noted earlier.

Another aspect of the matter of contract modifications worthy of consideration is that it may be possible for the surety to be exonerated from its original obligation, regardless of any provision that may be in the construction contract, stating that changes to the contract do not release the surety under any bond previously provided. Some courts have held that when the changes in the contract have constituted a material departure from the original contract, or have substantially changed the manner of payment, or the manner in which the contract is to be performed, or the time allotted for performance in such a way as to make the contract significantly more difficult or costly to complete than it was originally, then the surety can be released from its obligation on the basis that the contract was not the one the surety originally underwrote and agreed to be bound by. For relief in such cases it is necessary to show that the contract change was made without the consent of the surety, and a showing is required that the change in the contract substantially increased the risk for the surety and for the contractor. As a broadscope and general rule of thumb, changes in the contract that increase the amount of the contract by more than 10 percent are considered to be significant.

A second consideration in obtaining written consent of the surety for a contract change is that the surety is not obligated to provide bond guarantees for any additional or modified work unless the surety has expressly waived the right of notice. In this regard the AIA performance bond form in Appendix J provides that the surety waives notice of any alteration or extension of time made by the owner. However, the payment bond in Appendix K, also published by the AIA, contains no such waiver clause. Some bond forms used by the federal government stipulate that the surety waives notice of all extensions or modifications to the contract. However, a number of these bond forms now also contain a provision that limits the value of changes that can be made in a bonded contract without the consent of the surety, to a maximum of 10 percent of the amount of the contract.

## 7.11 BOND PREMIUMS

The amounts of the premiums that contractors pay for surety bonds are subject to many variables. In summary, the premium the surety company will charge the contractor is a function of the risk the company sees in the contractor, as well as in the project itself. Some of the variables which affect the contractor's bond premium include the following considerations: number of years the contractor has been in business; experience history of the contractor on bonded and unbonded construction projects in the past; financial strength of the contractor, as indicated by financial statement, balance sheet, and a number of financial ratios; adjudged competence and capability of the contractor and key management personnel; number and kind of projects the contractor presently has in progress; size of the project for which the current bond is being written; the type of work and special considerations in the project for which the current bond is being written (e.g., high-rise building, underground construction); the form of contract being employed for the current project; the amount of time allocated for the completion of the current project; time of year and climate in which the work will be conducted; warranty provisions of the contract for the current project; and so on. Further discussion of the factors evaluated by surety in determining whether it will write bonds for a contractor, and if it chooses to do so, what the contractor's bond premiums will be, is presented in another section of this chapter. It

is highly unlikely that two different contractors would pay exactly the same premium amount, even for the same bond to be provided for the same project.

As a very broad guideline, for companies having a fine record of proven performance and a strong financial position, bond premiums might be on the order of 1 to 3 percent of the face amounts of the bonds. For companies with a poorer track record and/or a weaker financial position, bond premiums may range from 5 to 15 percent of the bond face amounts. It can be clearly discerned, therefore, that contractors having outstanding records of proven performance and a strong business financial structure accrue significant advantages with regard to the premiums they pay for bonds. Since bond premiums are a cost of doing business, and are incorporated into the amounts of estimates and proposals, contractors with good business acumen place themselves in a better competitive position when their proposals are evaluated by owners.

As will be further discussed in sections to follow, construction surety companies are regulated by the several states in the same manner as are insurance companies. They operate under charters and file their schedules of premium rates with designated public authorities. The individual states must approve basic advisory rates that are submitted by surety companies and associations to state insurance commissions. These rates can vary somewhat with the surety company, and there are many deviated rates that may be used. Such rates are typically adjusted up or down periodically, in order to reflect loss experience.

When a contractor decides he wishes to include in his business plan the performance of projects on which bonds are required, he will seek out a surety bonding company and establish a business relationship with that firm. The bonding company will subject the contractor and all of his history and assets and credentials to a very rigorous examination. This is for the purpose of the surety company's assessing the amount of risk it perceives it will experience if it elects to write surety bonds for the contractor. That determination will yield the decision as to whether the surety approves the contractor to be a bond customer. Then, when the contractor plans to prepare a proposal for a project on which bonds are required, the bonding company will calculate the bond premium he will pay.

The premiums for contract bonds are payable in advance, and the contractor includes the bond premiums in his estimates and in his proposal price for projects. The bonds, except for the bid bond that accompanies the proposal when it is submitted, are typically delivered to the owner at the time the contract is signed. The premium payment that the contractor has made is subject to later adjustment, based on the ultimate contract amount, reflecting final work quantities on unit-price contracts, and including all change orders and contract adjustments on lump sum projects.

## 7.12 THE SURETY

Essentially all contractors utilize the services of national corporate surety companies whose specialties are the writing of construction bonds for contractors. As noted earlier, these firms are subject to public regulation in the same manner as are insurance companies. They operate under charters and file their schedules of premium rates with designated public authorities.

Because the true worth of the bond is no greater than the surety's ability to pay, and because there are numerous companies that write construction bonds, the owner typically reserves the right to approve the surety company and the form of bond. The federal government requires that corporate sureties proposed for use on government projects be approved by the U.S. Treasury Department. This list of surety companies that have been approved for federal projects can be a valuable reference for private owners when faced with approval of a contractor-proposed surety. Another source of information in this regard is a report called Best's Insurance Reports

(www.ambest.com/), which provide financial ratings for insurance and surety companies. Additionally, the Small Business Administration maintains a listing of preferred surety bonding companies (www.sba.gov/content/preferred-surety-bond-companies).

On very large construction projects, which seemingly are becoming ever more common, a single surety may seek protection for itself by enlisting other sureties to underwrite a portion of the contract. The original surety remains completely responsible for guaranteeing the proper performance of the contract. If the bond is invoked, it is up to the original surety company to get its underwriting sureties to stand behind it in the completion of the contract.

Similarly, in some instances the owner will require that the contract bonds be provided by co-sureties, which means that two or more sureties divide the total contract obligation among them. On very large contracts, this practice spreads the risk over the participating co-sureties and correspondingly reduces the magnitude of the risk to which any one of them is exposed. This procedure also affords the owner a measurable degree of protection against possible financial default or failure by a single surety. Occasionally, it is necessary to have co-sureties on large federal contracts because of limits established by the U.S. Treasury Department on the maximum amounts of single contract bonds that a given surety is authorized to execute.

## 7.13 INDEMNITY OF SURETY

It is important to recognize that by the terms of the bond contract between the general contractor and the surety bond provider, the contractor must agree to indemnify the surety against any claim that may be brought against the surety because of the contractor's failure to perform in the manner prescribed by the bond. Legal fees incurred by the surety because of claims under the bond are also recoverable from the principal, that is, the contractor. In summary, if the contractor defaults on a bond, the surety will make payment to the obligee in accord with the provisions of the bond instrument. Thereafter, the surety will collect from the contractor the amount of any damages that the surety paid in his behalf, plus any associated legal fees.

Before the surety will provide bond service, it will require the contractor to sign a formal application form or contract of indemnity. The net result is that the contractor agrees to indemnify the surety and to hold it harmless from expenses of every nature that the surety may sustain by reason of the invocation of the bond.

When the application to obtain a bond is signed by an individual contractor or a partnership, each principal in the firm is obligated to the entire extent of his personal fortune. If a corporation makes application, only the corporation assets are pledged. However, the corporate officers and company shareholders often submit their personal contracts of indemnity to the surety in order to increase the firm's bonding capacity.

## 7.14 INVESTIGATION BY SURETY

Before a surety will furnish a new or unknown contracting firm with a bid bond or with contract bonds, a thorough program of investigation is carried out to establish the past record and current condition and commitments of the company. To establish a bond relationship between a contractor and surety is a time-consuming, costly, and laborious process for the contractor.

The experience, character, reputation, financial standing, equipment, integrity, personal habits, and professional ability of the firm's owners and key personnel are carefully examined by the surety. A track record of satisfactorily completed projects, owner satisfaction, and prompt payment of financial

obligations is essential. The surety checks to see that the construction company is well managed, has a history of meeting its financial obligations promptly, is reliable, deals fairly, and performs its work in a timely fashion. An attempt is made to identify the key employees of the company, and to evaluate their experience, education and credentials. The bonding company will seek to determine whether the company has adequate estimating, scheduling, construction, and administrative experience to accomplish the proposed construction work.

The surety also checks the adequacy of the contractor's financial assets, its construction equipment, and physical facilities. Company financial statements, both for the current period and for some years past, are subject to study and analysis. The firm's bank credit is verified, together with its relations with its sources of credit and with its sources of supply. Detailed information must be provided to the surety regarding the company cost management and accounting systems. The information outlined above assists the underwriter in evaluating the ability of the contractor to complete work undertaken in accordance with contract terms and to meet the resulting financial obligations. In summary, the bonding company will investigate every aspect of the contractors past and current operations, in order to assess the amount of risk it perceives in the event the surety makes a decision to write surety bonds for the contractor.

The provision of bonding services to a contractor is a highly individual matter. An exception to this general rule, however, can be found in the surety bond guarantee program that has been used by the Small Business Administration to assist qualified small businesses and minority-owned businesses to obtain construction bonds that they could not otherwise obtain. Under this program, the U.S. government guarantees to repay the participating sureties 80 percent of any loss caused by the default of a covered contractor. The Small Business Administration will guarantee bonds only for firms with average annual revenues under $3.5 million working on projects worth less than $1.25 million.

Once a contractor has firmly established a business relationship with a bonding company, the contractor's bonding capacity becomes reasonably well established, and future investigations by the surety underwriter are concerned primarily with keeping the contractor's records current and investigating the individual bond requests as they are submitted. If the contractor's workload is well below its limit and contracts of the usual variety are being proposed, a bond application is generally approved without delay. However, when the maximum bonding capacity is to be approached, or when an unusually large or completely new type of construction project is proposed, approval of the bond application may require a considerably longer period of time or may not be forthcoming at all.

When the contractor makes application for a bond for a new project, it will find the surety is interested in many aspects of the work that is proposed and for which it is being asked to write a bond. The following presents a summary of some of the most common and most important subjects of investigation by the bonding company:

1. The essential characteristics of the project under consideration, including its size, type, and nature. Evaluation of the hazards of construction cannot proceed until the surety is apprised of the work. Included here would be the identity of the owner and its ability to pay for the construction as it proceeds. The surety will seek to assure itself that the contractor has adequate equipment, expertise, experience, and resources to perform a project of the type and size proposed.
2. The total amount of uncompleted work the contractor presently has in progress, of both the bonded and the unbonded type. This must, of necessity, include work that has not yet been awarded. The obvious point of concern here is to prevent the contractor from becoming overextended with regard to working capital, equipment, capability, and organization.

3. The adequacy of working capital and the availability of credit. The contractor can assist its own cause by keeping the surety fully apprised regarding all of its activities, and by keeping the bonding company informed regarding its financial condition, with up-to-date financial reports.
4. The amount of money the contractor "left on the table," that is, the spread between the low bid and the next highest, on its most recent proposal submittals and contract awards. Competitive conditions in the construction industry are such that a spread of more than 5 to 10 percent between the two lowest bidders can be the cause of some concern on the part of the surety. The surety is endeavoring to assure that the contractor's estimating and bidding procedures are sound.
5. The largest contract amount of similar work the contractor has successfully completed in the past. Inexperience in a new field of construction has been the cause of a great many contractor failures. The surety would like to see the contractor remain with a pattern of performing the kind of work in which it is most experienced, and with which it has been the most successful. If the contractor wishes to change to another type, the surety will urge that the first steps be small ones until the contractor acquires the necessary experience with the new type of work. If the contractor is not properly equipped for performance of the new type of work, the surety will demand that the contractor provide assurance with regard to how the equipment problems are to be solved.
6. The terms of the contract and bonds to be required, details regarding how payment will be made to the contractor, retainage provisions, time for project completion, liquidated damages amounts, and the nature of project warranties, all will be scrutinized by the surety. Analysis of all of these factors will influence the surety's appraisal of the contractor's ability to successfully perform the work on the project.
7. The amount of work, as well as the specific items of work, the contractor will perform by subcontracting and the qualifications and financial condition of the subcontractors. The surety's concern here is that the prospective subcontractors possess the necessary organization, experience, and financial resources to successfully complete their portion of the work on the project.

Following the completion of each bonded project, the surety typically sends a request for information to the owner asking for a final report on the contractor's performance. The owner is asked to submit to the surety a statement concerning the contractor's management and conduct of the project, and the contractor's handling of changes that were made in the work, and the final total contract amount. This latter figure is used as a basis for any final adjustment of the bond premium.

## 7.15 RATIONALE FOR REQUIRING CONSTRUCTION BONDS

Certainly, owners wish to avail themselves of the specific protections that are provided to them by the provisions of the bond instruments they require contractors to provide for their projects. Given the risks that are inherent in construction contracting, owners can moderate their own exposure by requiring contractors to provide bonds.

From the discussion in the previous sections, however, it can also be clearly ascertained that a surety company will conduct a comprehensive and detailed analysis of every aspect of a contractor's construction company, as well as all of the operations of the company, past and present. The intent of

the surety company is to write construction bonds only for contractors who have the necessary track record, competence, financial capacity, expertise, manpower, equipment, and management ability to successfully and profitably complete construction projects they undertake. In summary, surety companies perform a detailed risk analysis on every aspect of the construction enterprise before they will agree to write bonds in behalf of that company.

Owners are acutely aware of this intense scrutiny and analysis on the part of the bonding company. It can be said that this is another of the reasons for which owners require bonds to be furnished for their contracts for construction—the fact that a contractor can obtain the necessary bonds indicates that in all likelihood the construction firm is capable and well managed and that it is therefore a good business risk for the owner.

## 7.16 BONDING CAPACITY OF CONTRACTORS

A concept widely used by the construction industry is the term *bonding capacity* or *bonding line*. These terms have no precise definition but generally refer to the maximum dollar value or contract amount of uncompleted work the surety will allow the contractor to have on hand at any one time. A contractor's bonding capacity is a function of its net worth and cash liquidity, and can vary depending on the volume of work on hand, accumulated retainage on current projects, type of work involved, time durations of outstanding contracts, and other considerations.

Bonding capacity, or the amount of surety credit that will be extended to a given contractor, is commonly obtained as a multiple of the contractor's net quick worth, perhaps augmented by the amount of money the contractor could realize by liquidating its fixed assets such as real estate and equipment. Net quick worth is obtained as quick assets minus current liabilities (see Chapter 9). A contractor's quick assets are those that are immediately convertible to cash. The multiple applied to net quick worth can vary substantially with the individual contractor and the field of construction involved, along with the bonding company policy. On building construction, where 75 to 80 percent of the contract is normally subcontracted, this factor may be 10 to 20 or more. In heavy construction contracting, where few subcontracts are involved, but large amounts of expensive equipment are required, and the work is often in isolated areas, the multiple is likely to be somewhat smaller. New contractors will have a smaller value than older and more experienced firms. When a surety grants a line of credit to the contractor, it may require that no one contract shall exceed a certain percentage of the total work on hand.

The difference between a contractor's bonding capacity and its current total of uncompleted work, both bonded and unbonded, is a measure of the additional work for which the surety will consider bonding the contractor. There are, of course, other factors involved, such as the type of new work being considered and the size of the project.

## 7.17 THE SURETY AGENT

The local representative of the surety company is the surety agent. This is the person with whom the contractor will first deal with regard to all matters pertaining to bonding provided to his company generally and to specific bonds required by owners for the projects the contractor performs. Most contractors consider it extremely important to establish and maintain a good business working relationship with this person.

There are many advantages to be gained by the contractor in selecting a thoroughly qualified and experienced agent who has bona fide surety company affiliations that enable the agent to act on

behalf of the surety company he represents, and to provide prompt and effective bonding service. The surety agent is a very important member of the construction process and is one who can contribute significantly to the success or failure of a contractor's business. The agent is a trained observer of the construction industry who has a detached point of view and whose advice is therefore particularly valuable to the contractor.

Most bonding agents are sincere and astute representatives of large corporate sureties whose businesses are solidly based on long experience and competent service. From the foregoing sections it is easy to understand how the contractor may sometimes form the impression that the surety representative is unduly meddling in its affairs or is overly limiting its volume of work. In all fairness, however, the contractor should realize that the surety is interested in helping the contractor avoid the many pitfalls associated with the management of a construction firm. The contractor must realize that both he and the surety are working toward the common goal of a prosperous and successful contracting business. Some surety agents are, of course, more conservative than others. It is the responsibility of the contractor to select a bonding representative who is responsive to the needs of the contractor within the limits of responsible practice and competent service.

## 7.18 DEFAULT BY THE CONTRACTOR

When a contractor fails to fulfill one or more of the provisions that a surety bond guarantees, he is said to be in default of the bond. When the obligee, who is in most cases the owner, notifies the bonding company, the surety bonding company will fulfill its obligations as set forth in the bond instrument. After the surety has fulfilled this duty, it will vigorously seek to recover from the contractor (principal) the amount of any dollars which the bonding paid in fulfilling the provisions of the bond.

In the case of a performance bond, if for any reason the contractor is unwilling or unable to fulfill all of the requirements of his contract with the owner, and provided the owner has not defaulted on his obligations under the contract, the bonding company assumes the duty of completion of the contract requirements for the owner. The bond instrument will stipulate the options by which the surety bonding company may fulfill this obligation.

The performance bond included as an example in Appendix J provides that in the event of contractor default on the performance bond, and upon fulfillment of certain requirements by the owner, the bonding company may:

- With the consent of the owner, arrange for the contractor to complete the project.
- Undertake to complete the project itself, with its agents or by the use of independent contractors.
- Obtain bids or negotiate proposals from qualified contractors who are acceptable to the owner, and arrange for preparation of a contract to be signed by the owner and the new contractor selected with the owner's concurrence, this new contract secured with performance and payment bonds, and pay the owner the difference between the new contract and the original contract.
- Waive its right to complete the contract, and after investigation, determine the amount for which it may be liable to the owner, and then make payment to the owner in this amount.

Contract bonds can sometimes offer the contractor a genuine advantage when its ability to proceed has been temporarily curtailed by legal or financial difficulties. If the financial condition of the contracting firm is basically sound, the surety may choose to help it get back on its feet and into

business again. It may elect to advance the contractor credit in sufficient amount for the contractor to proceed with its work. If claims have tied up the contractor's capital, the surety may furnish bonds to discharge these claims, thereby enabling the contractor to proceed on its own. Such arrangements are made privately, while the surety is fulfilling its fundamental responsibility to the owner under the terms of the bond.

When the contractor defaults and the surety undertakes to complete the work, the surety becomes entitled to all of the remedies the owner has against the contractor under the contract. In addition, the surety is entitled to receive from the owner the balance of the contract price, which is defined in the bond example in Appendix J as "the total amount payable by Owner to Contractor under the Contract and any amendments thereto, less the amount properly paid by Owner to Contractor." Provisions of the governing statute apply to this matter when a statutory bond is used. The surety may also press any claims against the owner that the defaulting prime contractor might have had. Regardless of the bond wording, the surety often finds that it must compete with other claimants for the retainage withheld by the owner.

The surety also has another right in its relationship with the owner. If the owner defaults, for example, by not making progress payments, the contractor is released from liability under the contract. Because the responsibility of the surety to the owner is the same as that of the contractor to the owner, any act of the owner that would release the contractor from its contractual obligation also releases the surety.

When the owner is performing a construction project through use of the separate contracts system and there is more than one prime contractor on the project (as discussed in Chapter 1), each prime contractor is normally required to provide the owner with a performance and a payment bond. When one prime contractor fails to perform in accordance with its contract, there may be a question as to whether the defaulting contractor's surety is liable to the other prime contractors for interference or disruption to their work. The majority rule in this regard is that the surety of the defaulting contractor is not liable to the other prime contractors for additional costs that they may have suffered by reason of the disruption. Most jurisdictions deny that one prime contractor is a third-party beneficiary of the bonds provided by another prime contractor.

## 7.19 CONTRACT BONDS AND TYPE OF CONTRACT

The preceding sections of this chapter have presented the basic workings of surety bonds. The face values of performance and payment bonds are dictated by provisions of the construction contract in private work and by governing statutes in public work, with 100 percent of the contract amount being the typical face amount for each bond type. The details of such bonding are quite variable with the type of contract however, and can become very complex in some instances.

It should be noted that when the owner contracts with an architect-engineer for project design, the owner receives a professional service and no contract surety bond is involved. The owner's interests are protected, not by a surety bond but by the architect-engineer's professional liability insurance (see Chapter 8).

The general bonding procedures normally utilized with the usual construction contract types are as follows.

*Single prime contractor, fixed-price (lump-sum) contract.* With this traditional contract arrangement, the single prime contractor provides the owner with the required performance and payment bonds. In the case of a lump-sum contract, the face values of the bonds are determined

from the original contract amount. The premium paid is adjusted at project completion to reflect any change in contract price caused by change orders. When the contract is unit-price, the same procedure is followed, with the bond amounts being based on the estimated total project cost. Here, again, the bond premiums are adjusted at contract completion to reflect the final contract price.

*Multiple prime contractors, fixed-price contract.* In this type of contract arrangement, each prime contractor provides the owner with bonds whose provisions pertain only to that contractor's work on the project and whose face values are based on that individual contractor's contract amount. In the usual instance, each of the prime contractors is free to use the services of its customary surety company. Where multiple prime contractors are involved and one of the contractors defaults, the bonding company of the defaulting contractor can be held liable to the other prime contractors for delay damages they may have incurred as a consequence of the default.

*Cost-plus-fee contract.* In this contractual arrangement, the contractor provides the owner with contract bonds whose face values are determined from the initial target price established for the work to be done by that contractor. As in other types of contracts, the bond premium amount is finalized when the work on the project has been completed and the final contract price of the project has been determined.

*Joint venture.* In a joint venture agreement, each participating contractor normally undertakes a specific amount or percentage of the total contract. Accordingly, each of the contractors bonds its proportionate share of the contract price. The normal procedure is that the usual sureties of each of the joint venturing contractors will jointly underwrite the project, and will sign bonds provided to the owner as co-sureties. Each surety provides its contractor's share of the contract bonds provided to the owner.

*Construction management.* The construction manager, acting as an agent of the owner, manages the project from its inception through the construction process. The construction manager is typically paid a professional fee of a percentage of the total cost of construction as compensation for its managerial services. In so doing, the construction manager actually carries out many of the duties ordinarily performed by the architect-engineer, especially during the construction process. These functions of the construction manager are in the area of professional services, where contract bonds are not used. The construction manager also performs many management duties usually done by the general contractor. In the usual construction management arrangement, the owner contracts directly with a series of prime trade contractors who perform the actual construction. The construction manager coordinates, schedules, and controls the work of these contractors.

In the standard agency form of CM, the construction manager does not provide contract surety bonds to the owner, on the basis of the rationale discussed in the paragraph above. Rather, these bonds are provided to the owner by each of the prime contractors who actually perform the work on the project. Protection for the owner from CM negligence is provided by professional liability insurance provided by the CM.

*Design-construct.* When the design-construct concept is used, the owner receives professional design services and project construction services from a single contracting party. As previously discussed, project design is a professional function and is not bonded. Consequently, the design-construct contractor provides the owner with contract surety bonds to cover only the construction process. A complication here is that the final cost of construction is often not

accurately known at the time the design-construct contract is consummated and the construction bonds are procured. As a result, the initial face amounts of the contract bonds are typically based on an initial, approximate cost of construction. The amounts of the bonds and their premiums are adjusted at a later date when the design is complete and the final construction cost has been determined.

## 7.20 SUBCONTRACT BONDS

Previous discussions in this chapter have pointed out that the general contractor is responsible for the job performance of the subcontractors with whom he enters subcontract agreements. In addition, the general contractor can also be held liable if a subcontractor fails to pay for materials, labor, or sub-subcontract amounts pertaining to that project.

Sometimes a general contractor, to protect itself against subcontractor debt and default, or if the prime contractor believes that there is risk in entering a subcontract agreement with a particular subcontractor, may, at his election, require certain or all of the subcontractors to provide performance and payment bonds to the general contractor. In this instance, the subcontractor is the principal and the prime contractor is the obligee.

A factor of major importance to be emphasized at this point is that such a bond serves in no way to replace honesty, integrity, and competence on the part of the subcontractor. With or without a bond, an inferior subcontractor on a project means trouble for the general contractor. Although the bond will afford the general contractor some measure of protection against financial loss directly attributable to a particular subcontract, it does not and cannot cover all of the costs in time and dollars caused by work stoppages, delays, and disruptions of the overall construction program that inevitably result from subcontractor default.

## 7.21 CONTRACT BOND ALTERNATIVES

If a prime contractor is not able to obtain the customary surety bonds from a commercial surety company, alternatives are occasionally used. Under the Miller Act, such bonds on federal construction projects can also be provided by personal or individual sureties, or they may take the form of U.S. bonds or notes, certified or cashier's checks, bank drafts, Postal Service money orders, or cash. A personal surety can be a company principal or stockholder who pledges personal assets, or any other individual or group that agrees to answer for the debt or default of the contracting party. Such personal sureties must provide evidence of having a specified net worth or collateral sufficient to back up their surety obligation. The bonding statutes of many states, and some private owners as well, also permit prime contractors to use such alternatives for the usual commercial surety bonds. Additionally, sometimes prime contractors permit their subcontractors to furnish similar forms of securities.

The Office of Federal Procurement Policy contains a rule that allows contractors to use an irrevocable letter of credit in lieu of payment and performance bonds on federal construction contracts. This policy is designed to give more flexibility and contracting opportunities to smaller firms that may not be able to secure bonds. Such letters of credit are called "guaranteed letters of credit," as distinguished from the usual commercial letters of credit that are commonly used in sales transactions. These guaranteed letters of credit are backed by the contractor's funds being held by the bank that writes the guarantee letter.

It is to be noted that certain legal aspects of letters of credit differ greatly from the usual surety bonds. With letters of credit, for example, the bank's obligation to pay is not conditioned on the

mutual performance of the terms of the construction contract by both the owner and contractor. The bank is obligated to pay the owner if the owner presents the proper documentation regarding contractor default, even if the owner has failed to perform as required by the construction contract. If the owner presents the documentation specified by the letter of credit to the issuing bank and if these documents conform with the letter of credit requirements, the bank will pay the owner. The bank will then seek reimbursement from its customer, the contractor, for the amount paid. However, a contractor who disputes that it is in default can file suit to enjoin the bank from paying the owner on the letter of credit.

Letters of credit, unlike surety bonds, place the financial burden of a default dispute on the contractor rather than the owner. With a surety bond, if there is a dispute about whether a contractor is in default, the owner must wait until the dispute is resolved in its favor if it is to get its money from the surety. With a letter of credit, the owner gets its money immediately and the contractor must then sue the owner if it disputes the default. Contractors must be aware of the risks involved with letters of credit before making use of them.

## 7.22 ADDITIONAL SURETY BONDS

In addition to bid, performance, and payment bonds, surety bonds of various kinds may be written in certain situations. Some of the additional variations of bonds that may be used include the following:

### 7.22.1 Maintenance Bonds

Most building construction projects contain a warranty provision that requires the contractor to warrant or guarantee errors for which it is responsible for a period of one year following completion of the project and acceptance by the owner. When the owner requires a performance bond, this bond almost always provides that if the contractor is for any reason unwilling or unable to fulfill the warranty provisions of the contract, then the bonding company will see that the warranty requirements of the contract are fulfilled.

However, the owner may wish to require protection of portions of the construction for a period of more than 1 year. For example, the contract may require the contractor to guarantee the asphalt paving for 5 years or the roofing for 20 years. Manufacturer's or applicator's warranties are also sometimes required to guarantee the performance characteristics of machinery, processes, or materials.

A maintenance bond, which may also be referred to as a warranty bond, provided by the responsible party to the owner, binds the surety, if necessary, to correct defined defects in the contracted work that appear within a specified time after job completion.

When a maintenance bond is provided to the owner covering some aspect of the work, the owner must first look to the principal if defects materialize. If the principal refuses, or is unable to remedy the situation, the owner can invoke the bond, and the surety must make good the warranty as guaranteed by the bond.

### 7.22.2 Fidelity Bond

A fidelity bond indemnifies the contractor for loss of money or other property caused by dishonest acts of its bonded employees. This includes losses sustained through larceny, theft, embezzlement, forgery, and other fraudulent or dishonest acts. Under this form of surety bond, the employer is the obligee and the employee is the principal. Most contractors utilize what is called blanket form coverage under

the fidelity bond, which covers dishonest acts by all employees. In the event of loss under this form of policy, the contractor need only prove that it was caused by an employee or employees unknown.

### 7.22.3 Bonds to Release Retainage

Where a construction contract provides for the owner's retainage of a given percentage of the prime contractor's progress payments, the owner will sometimes make full payment to the contractor without deducting retainage if the contractor will post a surety bond with the owner as obligee for the amount of the accumulated retainage involved.

### 7.22.4 Bonds to Discharge Liens or Claims

Persons who have not received payment for labor or materials supplied to a construction project are entitled to file a mechanic's lien against the property of a private owner or against moneys due and payable to the general contractor in the case of a public contract. Such actions can freeze capital needed by the contractor to conduct its operations. A surety bond in an amount fixed by an order of the court can be used to discharge a mechanic's lien. The bond functions as a financial guarantee to the owner and releases money that has been withheld from the contractor.

### 7.22.5 Bonds to Indemnify Owner Against Liens

The contractor may be called on to post a bond in advance that indemnifies the owner against any impairment of title or other damage that may be suffered by reason of liens or claims filed on its property. In this situation, bond is required before any such liens are filed, rather than being used to discharge liens after they are filed in the way described in the previous paragraph.

### 7.22.6 Bonds to Protect Owners of Rented Equipment and Leased Property

During the course of his construction operations, the contractor may find it desirable to rent or lease equipment, parking lots, access roads, storage installations, and similar facilities. The owner of such property often requires the contractor to post a bond that guarantees proper maintenance of the property, and guarantees payment of rental charges, and indemnifies the owner against loss, damage, or excessive wear of the property.

### 7.22.7 Judicial or Court Bonds

When the contractor is the plaintiff in a legal action, it sometimes is required to furnish security for court costs, possible judgments, and similar financial eventualities. Such security is often provided in the form of judicial or court bonds. This legal requirement is commonly applied when the contractor institutes court proceedings in states or jurisdictions other than its own.

### 7.22.8 License Bond

Also known as a permit bond, this is a bond required by state law or municipal ordinance as a condition precedent to the granting of a contractor's license or building permit. License bonds guarantee compliance with statutes or ordinances and make provision for payment to the obligee or members of the general public in the event that the licensee violates its legal or financial obligations.

### 7.22.9 Termite Bond

This form of bond is given by manufacturers or applicators of substances intended to prevent damage caused by termites. The bond protects the property owner in the event that termite damage occurs after treatment is applied.

### 7.22.10 Subdivision Bond

This bond, given by the developer to a public body, guarantees construction of all necessary improvements and utilities.

### 7.22.11 Self-Insurers' Workers' Compensation Bond

This bond, given by a self-insured contractor to the state, guarantees payment of all statutory benefits to injured employees.

### 7.22.12 Union Wage Bond

This bond, given by a contractor to a union, guarantees that the contractor will pay union wages and will make proper payment of fringe benefits required by union contract.

## 7.23 SUMMARY AND CONCLUSIONS

Surety bonds are a vital component of the construction contracting environment. While not all owners and contractors will elect to utilize bonds on their projects, certainly construction contractors must be aware of the existence of surety bonds, and their variations and key provisions. Many contractors make a business decision early in the life of their business enterprises to develop a bonding capacity for their companies, and thereby to become qualified to tender proposals and to enter construction projects where the owner requires bonds. Other construction company owners may elect initially not to develop a bonding capacity for their company, and therefore to perform only those construction projects where bonding is not required, but may decide at a later date to develop the capacity to perform bonded construction projects.

## CHAPTER 7 REVIEW QUESTIONS

1. Define the term *surety*.
2. What is a contractor's bonding capacity, and how is it determined?
3. State three key provisions of a typical bid bond.
4. Explain why an owner will often require that the contractor provide a payment bond. Why does the owner care whether all parties who have furnished materials, supplies, or labor for a construction project have been paid?
5. When there is a 100 percent performance bond on a project and the contractor serves notice that he cannot complete the project, what are the owner's options, as typically stated in the provisions of the bond?
6. What is the term for the occurrence where the contractor fails to fulfill one or more of the provisions guaranteed by a bond? Explain why a contractor will typically do almost anything in his power to

prevent having the owner notify the bonding company that the contractor has failed to fulfill some of the provisions guaranteed by a bond.

7. Explain two key similarities and the major element of difference between bonds and insurance policies.
8. State three reasons why the bond premiums might be different for Contractor A and Contractor B, for the same bonds on the same construction project.
9. State the key provisions of the Miller Act as they relate to construction bonds.
10. Explain why, if there is a performance bond on a project, the bonding company needs to be notified when change orders are being considered.

# Chapter 8

# Construction Insurance

## 8.1 INTRODUCTION

The business environment in general, and the construction business environment in particular, are fraught with risks of all kinds. An assessment of all of the elements of risk to which contractors and the construction projects they perform are exposed, would comprise a voluminous listing. Consequently, contractors must be resourceful, and diverse, and comprehensive in the management methods they devise to manage the risks to which they may be exposed.

Insurance is one form of risk management. Insurance does not eliminate the risks involved in construction contracting, but it does shift most of the financial threat to a professional risk-bearer and a company whose business it is to protect others from risk.

In devising the best risk management program for themselves and their companies, contractors quickly come to the conclusion that obtaining the correct kinds and the optimum combination of forms of commercial insurance is the keystone to adequate financial protection. Since the risks in construction are so numerous and so diverse, the variations in types of insurance policies that may be written by a risk underwriter and are available for purchase by contractors is a very lengthy compilation. This chapter is directed primarily toward a comprehensive discussion of standard commercial insurance coverages that are utilized in the construction industry.

## 8.2 RISK MANAGEMENT

Risk management may be defined as a comprehensive approach to handling exposures to loss. Any peril that can cause financial loss or impairment to the business enterprise is the subject of risk management. The following are four steps that a contracting firm can follow in applying risk management to its business:

1. Recognize and identify the varied risks that apply to the construction process. These may arise as a consequence of the people involved in the process, contract provisions, the nature of the work, site conditions, or the operation of law.
2. Measure the degree of exposure presented by the risks identified. This involves establishing the frequency of losses and the potential severity of the losses that may occur.
3. Decide how to protect against those risks that have been identified. If the risk cannot be eliminated by an alternative procedure or by contractual transfer to another party, such as hold harmless/indemnity provisions or waivers of subrogation, the choice may be to purchase commercial insurance, to optimize deductible amounts in policies, to self-insure, or to assume the risk.

4. Conduct a company-wide program of loss control and prevention. Project safety programs discussed in Chapter 15 constitute an important part of this procedure.
5. Monitor the results, and then make a decision to stay the course, or to modify the risk management plan.

## 8.3 CONSTRUCTION RISKS

Construction work by nature is hazardous, and accidents can occur frequently and can be severe. The annual toll of deaths, bodily injuries, and property damage in the construction industry is extremely high. The potential severity of accidents and the frequency with which they occur require that the contractor protect itself with a variety of complex and costly insurance coverages. Without adequate insurance protection, the contractor would be continuously faced with the possibility of serious or even ruinous financial loss.

As has been discussed previously in this book, construction projects usually have in force several simultaneous contractual arrangements. Contracts are in existence between the owner and architect-engineer, between the owner and the general contractor, between the general contractor and its several subcontractors, and between general contractors and subcontractors and their vendors or materials suppliers. Contracts that provide for design-construct and construction management services, and the use of separate prime contracts, introduce additional considerations regarding risks. Viewed as a whole, these contracts and their numerous individual provisions establish a complicated structure of responsibilities for damages that may arise during the course of construction operations.

Liability for accidents can devolve to the owner or architect-engineer, as well as to the prime contractor and subcontractors whose equipment and employees perform the actual work. Construction contracts typically require the contractor to assume the owner's and architect-engineer's legal liability for construction accidents or to provide insurance for the owner's direct protection. Consequently, a contractor's insurance program normally must include coverages to protect parties other than itself, as well as coverages to protect it from liabilities not legally its own.

The matter of risk and insurance for the construction contractor is rendered even more difficult on large projects by confusion as to which party is responsible for a given loss or liability. The matter of how the responsibility should be divided among owner, architect-engineer, construction manager, general contractor, subcontractors, vendors, and fabricators has become a tangled and extremely complex legal matter. Modern project delivery methods such as fast-tracking, alternate designs, shop drawings, design-construct, and construction management have blurred the lines that divide the multiple participants involved with today's construction projects. The proper division of responsibility in such cases can be very problematic.

## 8.4 THE INSURANCE POLICY

An insurance policy is a contract whereby the insurer promises, for a consideration, to assume financial responsibility for a specified loss or liability in behalf of another, who is called the insured. The insured pays the consideration in the form of a premium. Under the terms of the insurance contract, which is called a policy, the insurer has a duty to indemnify the insured (the contractor) from loss covered by the terms of the policy. The policy will typically contain numerous detailed provisions pertaining to the loss against which it affords protection.

Because of its intimate association with the public welfare, the insurance field is controlled and regulated by federal and state statutes. Each state has some form of an insurance regulatory agency that administers that state's insurance code, a set of statutory provisions that imposes regulations on insurance companies concerning investments, reserves, annual financial statements, and periodic examinations. Insurance companies are controlled as to their organizational structure, financial affairs, and business methods. In most states, insurance policies must conform to statutory requirements as to form and content.

A loss suffered by a contracting firm as a result of its own deliberate action cannot be recovered under an insurance policy. However, negligence or oversight on the part of the contractor is generally covered by the terms of the insurance contract. The contractor pays a premium as the consideration for the insurance company's promise of protection against the designated loss. Most types of insurance require that the premium be paid in advance before the policy becomes effective. In the event of a loss covered by an insurance policy, the contractor cannot recover more than the loss; that is, a profit cannot be made at the expense of the insurance company.

The premiums for many types of insurance are adjusted upward or downward according to the contractor's loss experience record. For some types of insurance, when annual premium payments reach a certain level, the contractor becomes eligible for experience rating. Under this process, credits or debits determined for the individual contractor are applied to the manual rates in accordance with how the premiums that have been paid in compare with the losses paid out over a period of time. A manual rate is a standard premium charge based on a probable loss experience for a given class of risks. These rates are published by the insurance industry and are used for general insurance cost information. A contractor whose loss experience is low can enjoy a considerable savings on the costs of its experience-rated coverages. This becomes part of the payback for the contractor's investment of time, dollars, and other resources in his risk management program. These remarks also illustrate the fact that a contractor does well by following a practice of continuing to do business with an insurance company with which it has established a considerable background of favorable business experience.

It is also worthwhile for contractors to have some background knowledge with regard to the insurers who underwrite the policies the contractor is interested in. The next several paragraphs will develop some of the basic elements of understanding of the insurance industry and its companies.

Insurance companies can be organized as stock companies or as mutual companies. Stock companies are organized in a manner similar to that of a bank, and company ownership is vested in stockholders. The purchaser of an insurance policy has no ownership in the company, and assumes no risk of assessment if the insurance company encounters financial reverses.

A mutual company is one in which the policyholders themselves constitute the membership of the insuring company or association. Thus, every policyholder of a mutual company is, at the same time, an insurer and an insured. When it happens that the premiums collected by the company are in excess of the losses, the excess is returned to the policyholders as "dividends." By the same token, if losses outweigh income, assessments of the policyholders are sometimes made. State laws permit mutual companies that satisfy certain tests to limit or eliminate the assessments that can be levied against the members. Consequently, the policies of many mutual companies are said to be nonassessable. This varies considerably with the bylaws and policies of the individual mutual company, as well as with the laws of the several states.

In the field of property and casualty insurance, a field of insurance that is especially important to contractors, several mutual insurance companies are among the largest companies that provide property and casualty insurance. In life insurance, probably a majority of the largest companies are mutual companies.

## 8.5 CONTRACT REQUIREMENTS

With the many hazards that confront a construction business and the multiple types of insurance that can be purchased, one might wonder how a contractor decides exactly what insurance is really needed. In reality, at least with regard to some types of insurance coverages, the contractor actually has no choice. For example, it is standard practice that construction contracts require the contractor to provide certain insurance coverages. As will be discussed in subsequent sections of this chapter, other insurance coverages are required by law.

Construction contracts typically require the contractor to purchase insurance coverages such as workers' compensation insurance (which is also required by law), employer's liability insurance, and comprehensive general liability insurance. The contract documents will also define, for many insurance policies the contractor is required to purchase, the minimum levels of coverage which are required.

Property insurance to protect the project, and liability insurance to protect the owner may be designated in the contract documents to be the responsibility of either the owner or the contractor, depending on the contract. The American Institute of Architects (AIA) Document A201–2007, "The General Conditions of the Contract for Construction," included as Appendix D, defines the owner as being responsible for obtaining both of these insurance coverages. Other forms of contract documents make the contractor responsible for purchasing these coverages.

There are, of course, many examples of special insurance being required by contract when the construction involves unusual risks or conditions. When the contract designates specific responsibility to the contracting firm for obtaining certain insurance, it is customary that certificates of insurance from the insurance company be submitted to the owner or to the architect-engineer as proof that the coverage stipulated has, in fact, been provided and that it provides for the required level of coverage.

As was discussed in Chapter 6, construction contracts frequently require the contractor to hold the owner and architect-engineer harmless by accepting any liability that either of them may incur because of operations performed under the contract. Most contract documents that contain such indemnity clauses are explicit in requiring the contractor to procure appropriate contractual liability insurance. The language of Appendix D contains provisions to this effect.

With regard to project insurance requirements, it is considered good practice for a contractor to submit a copy of the contract documents to its insurance company before construction operations commence. The contracting firm is not an insurance expert and is not usually competent to evaluate the risks and liabilities placed on it by the contract. Its insurance agents or brokers are qualified to critically examine the documents and then to advise the construction firm concerning the insurance needs required by the language and requirements of a given construction contract.

## 8.6 LEGAL REQUIREMENTS

Certain types of insurance are required by law, and the contractor must therefore provide them whether or not they are called for by the contract. Workers' compensation, automobile, unemployment, and Social Security are examples of insurance coverages that are required by statute. While it may be said that unemployment and Social Security insurance payments made by the contractor are more in the nature of a tax than of insurance premiums in the usual sense, both unemployment and Social Security are treated as forms of insurance for the purpose of discussion in this chapter.

The law makes the independent contractor liable for damages caused by its own acts of omission or commission. In addition, the prime contractor has a contingent liability for the actions of its subcontractors. Therefore, whether or not the law is specific concerning certain types of insurance, the contractor as a practical fact must procure several different categories of liability insurance to protect itself from liability for damages caused by its own construction operations as well as those of its subcontractors.

## 8.7 ANALYSIS OF INSURABLE RISKS

Aside from coverages required by law and those required by the construction contract, it is the contractor's business management decision to decide what insurance the company will carry. This speaks to the matter of company management making a determination as to the optimum method of managing risks, as discussed at the beginning of this chapter.

Such elective insurances coverages that the contractor will consider pertain principally to the contractor's own property or to property for which it is responsible. It is not economically possible for the contractor to carry all of the insurance coverages that are available. If it were to plan to purchase insurance protection against every risk that is insurable, company management would quickly discover that the cost of the resulting premiums would likely outweigh the cost of the losses the company was endeavoring to protect against and would most certainly impose an impossible financial burden on the business.

The extent and magnitude of a contractor's insurance program can properly be decided only after careful study and deliberation. If company management identifies a risk that is insurable, the cost of the premiums to insure against that risk must be balanced against the realistic potential or probability for the risk to occur and the possible loss that would result.

There are, of course, some risks that are not insurable, or for which insurance is not economically practicable. The typical management determination is that any losses associated with these types of uninsurable risks must be regarded simply as ordinary business expenses.

At times, management will determine that careful planning and meticulous construction procedures can mitigate a risk at less cost than the premium of a covering insurance policy. Thus, the contractor may choose to assume a calculated risk rather than pay the premium for insurance. Sometimes reliance on the skill of the people in the company, taking extraordinary precautions, putting protective measures and/or equipment into place, providing extra training, and other similar actions so as to accomplish construction procedures that have high degrees of risk can get the job done without mishap and can avoid the cost of insurance premiums.

## 8.8 CONSTRUCTION INSURANCE CHECKLIST

When a contractor considers his options with regard to insurance, he discovers that available insurance coverages are numerous and complex. With the additional thought that each new construction contract presents its own risks to be managed, the contractor can easily become confused or overwhelmed.

The contractor should make a business decision to select a competent insurance agent or broker who is experienced in construction work and familiar with the risks that contractors experience, and one who can provide competent advice with regard to coverages available. Without such capable advice and assistance, the contractor may either incur the needless expense of overlapping protections

or expose itself to the danger of vital gaps in insurance coverage. The contractor can often reduce insurance costs by keeping its agent or broker advised in detail as to the nature and conduct of its construction operations.

In the long list of possible construction insurance coverages, not every policy is applicable to a given firm's operations. The following list of insurance coverages available is not represented as being complete, but it does provide an overview of the more commonly used insurance policies that are available to, and utilized to a greater or lesser extent by, construction contractors.

**Property Insurance on Projects during Construction**

1. *All risk builder's risk insurance*. This insurance protects against all risks of direct physical loss or damage to the project or to associated materials, caused by any external effect, with noted exclusions.
2. *Named-peril builder's risk insurance*. Provides protection for the project, including stored materials, only against direct loss by fire or lightning. A number of separate endorsements to this policy are available that add coverage for specific losses.
   a. *Extended coverage endorsement*. Covers property against all direct loss caused by windstorm, hail, explosion, riot, civil commotion, aircraft, vehicles, and smoke.
   b. *Vandalism and malicious mischief endorsement*.
   c. *Water damage endorsement*. Indemnifies for loss or damage caused by accidental discharge, leakage, or overflow of water or steam. Included are defective pipes, roofs, and water tanks. This does not include damage caused by sprinkler leakage, floods, or high water.
   d. *Sprinkler leakage endorsement*. Provides protection against all direct loss to a building project as a result of leakage, freezing, or breaking of sprinkler installations.
3. *Earthquake insurance*. This coverage may be provided by an endorsement to the builder's risk policy in some states. Elsewhere a separate policy must be issued.
4. *Bridge insurance*. Insures inland marine bridges during construction, and is often termed the *bridge builder's risk policy*. It affords protection during bridge construction against damage that may be caused by fire, lightning, flood, ice, collision, explosion, riot, vandalism, wind, tornado, and earthquake.
5. *Steam boiler and machinery insurance*. A contractor or owner may purchase this form of insurance when the boiler of a building under construction is being tested and balanced, or when it is being used to heat the structure while construction is underway. Unlike other property insurances listed here, this type of policy typically includes some liability coverage. This policy usually covers any injury or damage that may occur to or be caused by the boiler during its use by the contractor.
6. *Installation floater policy*. Provides named-peril or all-risk protection for property of various kinds, such as project equipment for installation in the project (e.g., electronic data processing equipment) from the time that it leaves the place of shipment until it is installed on the project and tested. Coverage terminates when the insured's interest in the property ceases, when the property is accepted, or when it is taken over by the owner.

**Property Insurance on Contractor's Own Property**

1. *Property insurance on contractor's own buildings*. Affords protection for offices, sheds, warehouses, and contained personal property. Several different variations of this insurance are available, which vary in the protections they provide.
2. *Contractor's equipment insurance*. Often termed a *floater,* this type of policy insures a contractor's construction equipment regardless of its location.
3. *Motor truck cargo policy*. Covers loss from named hazards to materials or supplies carried on the contractor's own trucks from supplier or manufacturer to warehouse or building site.
4. *Transportation floater*. Provides coverage against damage to property belonging to the contractor or others while it is being transported by a public carrier. This coverage may be obtained on a per-trip, project, or annual basis.
5. *Crime insurance*. Protects the contractor against the loss of money, securities, office equipment, and similar valuables through burglary, theft robbery, destruction, forgery, disappearance, or wrongful abstraction. Also insures against loss of valuables caused by safe deposit burglary and robbery.
6. *Valuable papers destruction insurance*. Protects the contractor against the loss, damage, or destruction of valuable papers such as books, records, maps, drawings, abstracts, deeds, mortgages, contracts, and documents. It does not cover loss by misplacement, unexplained disappearance, wear and tear, deterioration, vermin, or war.
7. *Computer insurance*. Provides protection for electronic computing equipment and software against a variety of perils including fire, water, smoke, theft, and vandalism.
8. *Aircraft insurance*. For contractors who own or lease aircraft, a variety of coverages are available to cover the aircraft, as well as to cover the associated liabilities.

**Liability Insurance**

1. *Contractor's public liability and property damage insurance*. Protects the contractor from its legal liability for injuries to persons not in its employ, and for damage to the property of others, if the property is not in the contractor's care, custody, or control, when such injuries or damage arise out of the operations of the contractor.
2. *Contractor's protective public and property damage liability insurance*. Protects the contractor against its liability imposed by law arising out of acts or omissions of its subcontractors.
3. *Completed-operations liability insurance*. Protects the contractor from damage claims stemming from its faulty performance on projects already completed and handed over to the owner. This form of insurance is often required because the usual forms of liability insurance provide protection only while the contractor is performing the work on the project, but no longer provide protection after the work has been completed and accepted by the owner.
4. *Contractual liability insurance*. Required when one party to a contract, by terms of that contract, assumes certain legal liabilities of the other party. The usual forms of basic liability insurance do not afford this coverage.

5. *Professional liability insurance*. Protects the contractor against damage claims arising out of design and other professional services rendered by the contractor to the owner.
6. *Workers' compensation insurance*. Provides all benefits required by law to employees who are injured or killed in the course of their employment.
7. *Employer's liability insurance*. This insurance is customarily written in combination with workers' compensation insurance. It affords the contractor broad coverage for the bodily injury or death of an employee in the course of his employment, outside of and distinct from any claims under workers' compensation laws.
8. *Director and officer liability insurance*. Protects the company CEO and other named executives from liability actions.
9. *Fiduciary liability insurance*. Protects the company and certain named officers and executives from liabilities arising from the company's fiduciary responsibility to its employees, and sometimes to its stockholders.
10. *Owner's protective liability insurance*. Protects the owner from its contingent liability for damages arising from the operations of the prime contractor or its subcontractors.

**Employee Insurance**

1. *Social Security*. This all-federal insurance system operated by the U.S. government provides retirement benefits to an insured worker, survivor's benefits to his family when the worker dies, disability benefits, hospitalization benefits, and medical insurance.
2. *Unemployment insurance*. This is a joint federal-state insurance plan that provides qualified workers with a weekly income during periods of unemployment between jobs.
3. *Disability insurance*. This insurance, required by some states, provides benefits to employees for disabilities caused by non-occupational accidents and disease.
4. *Employee benefit insurance*. Provides employees with designated fringe-benefit insurance such as medical, dental, optical, hospital, surgical, life insurance, and similar coverages.

**Vehicle Insurance**

Various forms of insurance are available in connection with the ownership and use of the contractor's motor vehicles. Liability coverages protect the contractor against third-party claims of bodily injury or property damage involving the contractor's vehicles, or by nonowned vehicles that are used in its interest. Physical damage coverage indemnifies the contractor for damage to its own vehicles.

**Business, Accident, and Life Insurance**

1. *Business interruption insurance*. This insurance is designed to reimburse the insured for losses suffered because of an interruption of its business.
2. *Crime insurance*. Protects company officers and executives, as well as company property, from the results of a crime that may be committed against them.
3. *Sole proprietorship insurance*. A policy of this type provides cash to assist heirs in continuing or disposing of the business and its assets without sacrifice in the event of death of the owner of a sole proprietorship.

4. *Key person life insurance*. Reimburses the business for financial loss resulting from the death of a key person in the business. In many policies, this type of insurance also builds up a sinking fund to be available to the identified key person on retirement.
5. *Corporate continuity insurance*. In the event of a stockholder's death, this insurance provides cash for the purchase of his corporate stock. This provides liquidity for the decedent's estate and prevents corporate stock from falling into the hands of people whom the other stockholders would not wish to have it.

The next several sections of this chapter will present a more detailed discussion of the types of insurance that are of major importance to the construction industry.

## 8.9 PROJECT PROPERTY INSURANCE

Construction contracts typically make the general contractor responsible for the construction project until the requirements of the contract documents have been fulfilled and the owner has accepted the project from the contractor. Consequently, it becomes a responsibility of the contractor to take all reasonable steps necessary to protect the work on the project from loss or damage and to see that suitable insurance is provided for this purpose.

Most construction contracts require that project insurance shall be purchased and maintained on the entire project to the full insurable value thereof, including all subcontracted work. The possibilities of property damage to the project itself and to materials stored on the site, can depend considerably on the nature of the work, its geographical location, and the season during which the work will be performed. On building construction projects, the loss potential is usually large and diverse, and can include fire, smoke, explosion, collapse, vandalism, water, wind, freezing, and physical damage from a wide variety of causes. Marine structures are vulnerable to wind, ice, wave action, tides, water currents, collision, and collapse. In a general sense, the highway contractors face comparatively few hazards to project property during the course of construction, with the forces of nature probably constituting the source of greatest risk.

The contract documents for a project, typically in the conditions of contract, will usually designate that by the terms of the contract, the project property insurance may be provided either by the owner or by the prime contractor. Regardless of who purchases the insurance, however, the intent is to protect the interests of the owner, the prime contractor, the subcontractors, and the lending institution in the event a loss occurs during construction, and to provide funds for repairs or rebuilding.

In a very real sense, project insurance must be procured that is tailored to meet the specific risks intrinsic to the work. Builder's risk policies are typically used on building construction. An all-risk installation floater policy is commonly used on projects such as water and sewer projects, where there is little or no exposure to fire and extended coverage hazards. Policies that are designed for the specific construction hazards associated with the construction of bridges, tunnels, radio and television towers, and other special construction types are available. Highway, reclamation, and other engineering contractors often carry no project insurance of this kind, unless required to do so by the contract, choosing to self-insure the small risks and relying on "acts of God" contract clauses to protect them from major damage to the project while construction is under way.

A typical clause of this type provides that the contractor will make good all damage to any portion of the work, except those damages due to unforeseeable causes beyond the control of and without the fault of the contractor including "acts of God," or extraordinary action of the elements. An "act of God" has been defined as a natural occurrence of extraordinary and unprecedented proportions,

whose magnitude and destructiveness could not have been provided against by the exercise of ordinary foresight.

## 8.10 BUILDER'S RISK INSURANCE

It is quite impractical for this chapter to discuss every type of insurance a contractor might typically purchase and use in the conduct of his business. Instead, several of the key types of policies that would be used by almost all contractors, will be discussed in more detail in this and the sections that follow.

Builder's risk insurance, is the term for a type of insurance policy that is purchased for nearly every building construction project. Builder's risk insurance provides coverage against loss of or damage to the building throughout the time of its construction, up until the time of its acceptance from the contractor at the time of completion of the contract. This insurance covers the interest of the owner and the contractor, and is usually required by lending institutions as a condition of the construction loan. This type of insurance policy provides property coverage only, and does not include any form of liability coverage.

On building construction projects, where builder's risk insurance normally constitutes the basic project policy, it is customary to insure the entire completed value of the building, as reduced by the costs of land preparation and site work, landscaping, excavation, underground utilities, and foundations below the lowest basement floor. The rationale behind this practice is that these portions of the project are not directly susceptible to loss by fire or other usual hazards.

Premium rates for builder's risk insurance can vary considerably with the type of construction and the availability of firefighting facilities. Premium rates are higher for unprotected areas and for the more combustible classes of construction.

There are two types of builder's risk policies, the all-risk form, which is the one most generally used, and the named-peril form, usually with endorsements. The all-risk form is much broader in scope than the named-peril form and provides insurance protection for all losses not specifically excluded in the policy. Both types of builder's risk policies normally provide that the structure shall not be occupied nor used by the owner in the course of construction without obtaining the consent of the insurance carrier.

Builder's risk policies routinely contain coverage exclusions of one kind or another, a matter that requires careful study before construction operations commence. A usual exclusion is coverage for the cost of correcting faulty workmanship, materials, construction, or design, as well as loss or damage caused by error, omission, or deficiency in design specifications, workmanship, or materials. Some policies exclude losses caused by the testing of project machinery, although this exclusion can normally be removed for additional premium. Losses caused by floods or earthquakes are similar examples of risks that are typically excluded but can be added by special endorsement and additional premium.

The builder's risk policy should be checked to see that job materials are covered, not only while stored at the job site but also while in transit to the job site, or when they are stored at an offsite location such as a warehouse. As a general rule, any loss to specifications, drawings, records, documents, accounts, deeds, currency, notes, securities, or designs is specifically excluded from a builder's risk policy.

Builder's risk policies can be written in such a way as to reimburse the insured on an actual cash value or a replacement cost basis. Replacement cost is the usual form that is utilized. Additionally, builder's risk insurance can be purchased on a specific or blanket basis. With the specific form, the contractor purchases a separate policy for each project the contractor performs, on an individual basis.

Under blanket coverage, all projects acquired by the contractor during the policy period are included under the terms of the same policy. The blanket form may be preferable where the contractor has an appreciable volume of business, especially if most projects are of a similar kind.

Builder's risk policies are very flexible and can include many kinds of protective provisions other than merely covering the direct expense of physical loss or damage to the project. For example, should there be fire, storm, or other damage to the project, and if the necessary repairs that follow cause a delay in project completion or interfere with the use of the premises by the owner or tenant, the repair cost is obviously covered by the project property insurance. However, consequential loss coverage is also typically available under the policy as an additional coverage, and for additional premium, to protect the parties from the consequences of business interruption, loss of rents, or extra expense.

Very broad coverage under builder's risk policies can also be written for certain classes of projects. For example, project property insurance can sometimes be written to include performance and process guarantees to ensure that a project will meet specified output or service requirements. Completion guarantees are available that will cover debt service and penalties for liquidated damages in the event the project is completed after the completion date designated in the contract requirements.

## 8.11 ALL-RISK BUILDER'S RISK INSURANCE

This policy, widely used for building construction projects, covers the project building under construction itself, as well as temporary structures at the jobsite. Materials and supplies pertaining to the construction are protected while these materials are held temporarily in storage prior to delivery, while in transit to the jobsite, and after their delivery to the jobsite and while awaiting installation. If not otherwise designated by the policy, the contractor's tools and construction equipment are also usually protected while they are on the premises.

The policy insures against all direct physical loss or damage from any external cause to the property covered, except for stated exclusions. There typically are many such exclusions, with some of the more commonplace including the following: certain damages due to freezing, explosion of steam boilers or pipes, glass breakage, subsidence and settling, artificially generated electrical currents, rain and snow, earthquake, floods, and nuclear radiation. There may well be others listed as well. Many of these exclusions can be removed or modified if the contractor wishes, by use of special endorsements and for additional premium.

All-risk policies provide for varying deductible amounts that apply to various defined loss categories. So the contractor should analyze with his agent whether the deductible amounts for various contingencies listed in the policy are consistent with the amount of risk the contractor wishes to assume. The all-risk policy is very flexible and can be tailored to meet the needs of the contractor.

## 8.12 NAMED-PERIL BUILDER'S RISK INSURANCE

Named-peril builder's risk insurance, unlike the all-risk form that protects the project against all losses except those that are specifically named as excluded, affords coverage for only those risks or loss that are specifically listed. The basic policy of this type usually protects building projects only against direct loss caused by fire or lightning. Such insurance ordinarily covers the cost of the facility itself, as well as materials connected to or adjacent to the structure insured, including temporary structures, materials, machinery, and supplies of all kinds incidental to the construction of the building. This type of policy typically also protects construction equipment and tools owned by the contractor, or the similar property of others for which the contractor is legally responsible. All property is protected

that is a part of or contained in the structure, in temporary structures or on vehicles, or is stored on the premises adjacent to the project.

There are, of course, many possible causes of physical loss or damage to a construction project in addition to fire and lightning. Other significant risks the contractor or owner may wish to have covered can be insured against by purchasing various endorsements to the basic named peril policy. The extended coverage endorsement provides protection against damage or loss caused by windstorm, hail, explosion, riot attending a strike, civil commotion, aircraft, vehicles, and smoke. Another common endorsement covers vandalism and malicious mischief. It is to be noted that each endorsement protects against only the hazards named and that each additional endorsement is accompanied by an additional premium. Many other special endorsements to named peril builder's risk policies are available, including protection against water damage, sprinkler leakage, early occupancy by the owner, and earthquake. Each of these additional endorsements will, of course, be accompanied by additional premium.

## 8.13 BUILDER'S RISK POLICY PREMIUMS

There are two ways in which the premiums for builder's risk insurance can be paid. One payment method is the reporting form, which establishes the insurable value of the structure, and hence the face value of the policy, in accordance with periodic progress reports submitted to the insurance company by the contractor. The other payment method is the completed-value form. This policy is written for the full amount of the project value, which is the contract price less the cost of the foundations and other excluded work. The contractor and his insurance agent will discuss each payment method, and the potential advantages and disadvantages of each, in order that the contractor can make a well-informed decision regarding the method of paying the premium.

## 8.14 PROVISION OF BUILDER'S RISK INSURANCE BY THE OWNER

The standard conditions of the contract documents of the AIA stipulate that, unless otherwise provided, the owner shall purchase and maintain the builder's risk policy (see Appendix D). When other contract forms are used, however, it is common practice for the general contractor to provide this coverage, especially on public projects. In general, it can be said that most contractors would prefer to provide the builder's risk insurance themselves, rather than having the owner purchase the policy. This is true because owners, who are not usually closely familiar with this type of insurance, and who may not be closely familiar with the risks on a project, sometimes procure insurance policies that do not provide all of the necessary coverage, or that have very high deductible amounts.

There are, however, certain types of projects that do lend themselves well to the provision of builder's risk by the owner. One such example is a project that involves several prime contractors.

Another example occurs in the case of a remodeling project or an addition to an existing building. If the contractor is to provide the builder's risk insurance, there is always considerable uncertainty with regard to the proper amount of protection for the existing structure. In such circumstances the contractor may make an arrangement with the owner to add the additional coverage to the owner's existing policy, although this matter can become involved from an insurance standpoint. It is certainly simpler and perhaps less costly for the owner in such cases to obtain the insurance. Notwithstanding this however, a contractor's-interest form of builder's risk insurance can be purchased for alteration or remodeling projects, for the purpose of protecting only the interests of the contractor. If the owner

does purchase the builder's risk insurance, the inverse of the situation mentioned previously now pertains. Now the contractor must determine that the policy provides the proper coverage to protect his interests. If the coverage is not adequate, the contractor can request the owner to obtain broader coverage, or the contractor can usually arrange additional coverage on its own behalf.

## 8.15 SUBROGATION

An important aspect of builder's risk insurance, and also of some other types insurance policies as well, is the subrogation clause. The workings of subrogation may be illustrated by an example. If the owner of insured property should sustain a loss to this property, the insurance company will pay the insured for the damage suffered, up to the face amount of the policy. However, by the terms of the subrogation clause that may be written into the policy, the insurance company acquires the right of the insured to recover from the party whose negligence was the cause of the loss.

This process of subrogation gives the insurance company the right to sue the offending party in the insured's name for recovery of the insurance company's loss. In the case where the owner provides the builder's risk insurance for a project, and the general contractor's operations cause or contribute to damage to the property during construction, the contractor may be exposed to action by the builder's risk carrier for recovery of the insurance company's loss under the policy. Alternatively, if a subcontractor or sub-subcontractor causes or contributes to a loss on the project, this party may be subject to suit by the insurance company. If the general contractor has purchased the builder's risk insurance, subrogation applies to its subcontractors or sub-subcontractors in the event they cause a loss on the project. It is easy to see that application of the subrogation clause by the insurance company could defeat the entire purpose of the project property insurance.

One means of at least partially avoiding the undesirable effects of subrogation is to make the owner, prime contractor, and all of the subcontractors and sub-subcontractors named insureds under the policy. Subrogation cannot usually be employed against parties who are insured under the policy. However, this exemption may apply only to damage that a contractor does to its own work and not to damage caused to the work of others where the contractor has no insurable interest.

Another approach, much more commonly employed, is for the owner and all of the contractors to waive all rights against each other for damages caused by fire or other perils while the building is under construction. This is the language employed in the AIA Document A201–2007, "General Conditions of the Contract for Construction" (see Appendix D). However, there are some builder's risk forms that contain provisions which state that the policyholders cannot waive such rights unless written permission of the insurance company has been received.

## 8.16 TERMINATION OF BUILDER'S RISK INSURANCE

Builder's risk policies may be canceled on a pro rata basis at any time requested by the policyholder. If the contractor is providing this insurance, the time at which it can terminate the policy is an important consideration. On the one hand, the premiums are costly, and the contractor quite naturally wishes for his expenditure for premiums to cease at the earliest possible moment. On the other hand, the contractor cannot afford to dispense with the protection afforded by the builder's risk policy until such time as the owner is legally responsible for the project. When the contract is silent in this regard, the courts have repeatedly found that the contractor remains responsible for the project until the owner has definitely made formal acceptance.

## 8.17 CONTRACTOR'S EQUIPMENT FLOATER POLICY

The insurance that a contractor procures in order to protect the construction equipment owned by the company from loss or damage is commonly referred to as an equipment policy, or as an equipment floater policy. A policy of this kind provides protection against physical loss or damage by external means that may occur to the contractor's portable equipment while the equipment is on the job, in transit, or on the contractor's own premises. This type of insurance policy is very flexible, and can be written in such a way as to provide the best fit for the specific needs of the contractor. As a general rule, a contractor's floater policy does not provide any liability coverage for loss of or damage to leased or rented equipment. However, an endorsement is usually available to cover this liability exposure.

There are no standard premium rates for an equipment floater policy. Each construction company is rated by the insurance company on the basis of the type of work performed, past loss experience, company reputation, and dispersion of risk.

Equipment insurance can be obtained on a named-peril or all-risk basis. With named-peril coverage, the policy provides coverage only for equipment losses that are specifically named in the policy. Such coverage typically includes such hazards as fire, transportation, upset, landslide, theft, collision, tornado, flood, explosion, windstorm, and overturn. The all-risk form protects equipment against all losses other than those that are specifically excluded in the policy. Such exclusions commonly include loss of equipment loaned to others, equipment overload, loss resulting from maintenance or repair, and waterborne equipment. Deductible amounts typically apply to most or all losses. The cost of the all-risk form is normally higher than that for the named-peril, and the size of the deductible amounts can have a substantial effect on the premiums.

The equipment floater policy is available to the contractor on either a schedule or blanket coverage basis. Under the schedule form, each item of equipment must be listed in the policy to be covered, and a specified value must be provided for each covered piece of equipment. For contractors with large equipment spreads, the maintaining of an up-to-date schedule becomes a burdensome task, and therefore coverage is usually maintained on a blanket basis. With blanket coverage, the contractor submits a listing of all owned equipment and the value of each item at the beginning of the policy period. A similar listing is presented at the end of the policy period. In this way, policy coverage is automatically adjusted to reflect the acquisition or sale of equipment units. Equipment is normally insured for its actual cash value, which is defined as its replacement cost less reasonable depreciation.

Should a key piece of the contractor's equipment be damaged or destroyed, a rental cost reimbursement endorsement is normally available. This endorsement will pay the cost of renting replacement equipment on a temporary basis until repairs can be made or a new unit obtained.

Equipment insurance, like many other forms of property insurance, is usually sold on a 100 percent co-insurance basis. This means the contractor is required to carry insurance to the full value of the equipment. If this is not done, the contractor becomes a co-insurer with the insurance company on any loss that may occur. For example, if a contractor is carrying insurance coverage at only 80 percent of the actual value of the equipment, compensation by the insurer will be for only 80 percent of any loss, subject to overall policy limits. The contractor will have to make up the remaining 20 percent.

## 8.18 PROPERTY INSURANCE

Property insurance is purchased by the contractor to protect its offices, warehouses, and other buildings from physical damage. Such a policy is designed to cover buildings and the business personal

property of the contractor, as well as the personal property of others that is in the contractor's care, custody, or control. This insurance includes protection for the contents of buildings and can be made to provide coverage for a wide variety of loss possibilities. The basic form policy typically includes coverage for direct loss by fire, lightning, vandalism, sprinkler leakage, hail, smoke, aircraft, vehicles, riot, explosion, windstorm, and other named hazards. This policy can be expanded to a broader form of coverage that includes several other named loss possibilities. Another option is the special form of property insurance that covers all risks of physical loss except those perils specifically excluded in the policy.

The property policy can be a specific policy in which the dollar value of coverage for each building and the value of personal property covered at each location are specified. An alternative to this is blanket coverage where a single policy amount covers the entire schedule of property. In either case, a co-insurance provision is usual, which requires the insured to either maintain insurance equal to at least a specified percentage of the property's value (e.g., 80 percent) or to act as a co-insurer with the insurance company. In this later event, the contractor will receive a reduced payment in case of a loss.

A property insurance policy can be written to reimburse the contractor for property loss on an actual cash value basis or on a replacement cost basis. The property policy normally covers only direct loss to the insured property caused by covered perils. However, the policy can be written to include coverage of indirect losses such as business interruption, rental value, and extra expense. The cost of this insurance is derived, based on the values of the property insured.

## 8.19 CRIME INSURANCE

Crime insurance is available in many different forms to cover a wide variety of losses the contractor may suffer. Almost every type of crime peril, and almost every property subject to crime, can be covered under a separate crime insurance policy. However, contractors usually obtain package coverage plans that include various forms of crime coverage. These include employee dishonesty, theft, disappearance, and destruction, in addition to premises burglary, computer fraud, forgery and alteration, safe deposit box burglary and robbery, and many others.

## 8.20 LIABILITY INSURANCE

Liability is an obligation imposed by law. In the course of conducting the business of the enterprise, the contractor may incur liability for damages in any of a number of different ways, including the following:

1. Direct responsibility for injury or damage to the person (not an employee) or property of third parties, caused by an act of omission or commission by the contractor.
2. Contingent liability, which involves the indirect liability of the general contractor for the acts of parties for whom it is responsible, such as subcontractors.
3. Liability that arises out of a project after the work has been completed and the structure has been accepted by the owner.
4. Contractual liability, whereby the contractor has assumed the legal liability of the owner, or other party, by the terms of a contract.
5. Liability that may devolve to the contractor as a result of the operation of its motor vehicles.

6. Liability that arises from design and associated professional services rendered by the contractor to the owner.
7. Liability to injured employees, both those covered and those not covered by worker's compensation laws.

Liability insurance is also sometimes referred to as defense coverage, and serves to protect the contractor against claims brought against it by third parties. Insurance of this type will pay the costs of the contractor's legal defense, as well as paying judgments for which the contractor becomes legally liable, up to the face value of the policy.

In the settlement of liability claims against the contractor, the insurance company has the right to settle as it sees fit, without the approval or consent of the contractor. Liability insurance provides no protection to the contractor for loss of or damage to its own property. It is important to note that many forms of liability insurance customarily include subrogation clauses, as discussed in a previous section of this chapter, which give the insurance company the right to file suit to recover its losses.

While design-construct and construction management contracts are very widely used today, these business arrangements impose the requirement for special liability insurance coverage. The precise nature of the liability insurance needed by a practitioner engaged in these functions, becomes a matter of the exact nature of the company organization, and the specific wording of the contract between the insured and the owner, and the exact nature or the functions being performed by the insured, as well as the type and nature of the authority and control exercised on the project by the insured. The liability coverage needed for design-construct and construction management professional practice is a matter requiring specialized expert advice.

It should also be noted that when contractors affiliate together to form a joint venture, which is defined as a legal entity separate from its constituent members, the liability coverages of the individual contractors will not apply to claims arising from a joint venture project. Separate policies must be obtained with the joint venture indicated as the named insured.

For a variety of good reasons, a contractor should consider obtaining all of its liability insurance from a single insurance company. This arrangement usually offers the possibility of substantial premium discounts because of the larger total premium amounts involved, as well as a better overall loss rating, and importantly, the fact that a single liability insurance carrier helps to avoid gaps and overlaps in coverage and eliminates the possibility of disagreements between insurance companies regarding the responsibility for losses.

## 8.21 COMMERCIAL GENERAL LIABILITY INSURANCE

Because most contractors require similar basic liability coverages, certain of these are typically packaged together by insurance companies into a single commercial general liability policy. Such a policy protects contractors against third-party liability claims arising from its own operations, from the operations of independent contractors, from completed operations, as well as contractual liability, personal injury, and certain other named hazards. The liability coverages just named will be discussed in greater detail in subsequent sections of this chapter.

Commercial general liability policies are written to cover bodily injury and property damage caused by "occurrences." An occurrence in this context is defined as an accident, which may include continuous or repeated exposure to the same harmful conditions. Thus, it can be seen that liability coverage is not limited to a single event, and the occurrence need not be sudden, but may be produced over a period of time.

Consequently, in construction, bodily injury and property damage caused by pile driving, water leakage and water seepage, dust, settlement, inadequate shoring, and other instances of injurious exposure are normally covered by the policy. To be covered, an occurrence must be unforeseen, unexpected, and not intended by the insured. Thus, if a loss occurs and the insurance company covers the loss, a failure by the insured to correct the condition that caused the loss may permit the insurer to deny coverage for a second event, on the grounds that it logically could have been foreseen.

The term *occurrence* is also used in a different manner from that just discussed with regard to general liability insurance. This has to do with the event that must happen during the policy period in order to "trigger" the insurance coverage. With liability insurance written on an "occurrence" basis, the insurance covers bodily injury and property damage that occurs during the policy period, even though the claim may not be made until after the policy has expired. Under the "claims-made" form of liability insurance, the injury or damage is covered by the policy in effect at the time claim is made, even though the loss may have occurred prior to the present policy. If a claim is made when no policy is in effect, the contractor has no insurance protection. However, with claims-made coverage, this restriction can be altered somewhat by retroactive coverage; by extended reporting period coverage, also referred to as tail coverage; and by special exclusion endorsements.

## 8.22 BODILY INJURY AND PROPERTY DAMAGE LIABILITY INSURANCE

The basic form of this liability coverage, which is often referred to simply as public liability insurance or premises-operations insurance, protects the contractor against its legal liability to third persons for bodily injury and property damage arising out of its own operations. Excluded from coverage are injuries to the contractor's own employees as well as all forms of automobile liability; these risks are covered by different insurance. The contractor's buildings and premises, whether owned or leased, are included, as well as its construction operations in progress anywhere in the United States.

Normally included in the property damage liability coverage, either as a part of the basic policy or by broad-form property damage endorsement, is damage to the property of other contractors (including subcontractors). Consequently, if the operations of Contractor A cause damage to the work of another contractor on a construction project, the public liability insurance of Contractor A will pay the cost. Not covered, however, would be any damage that Contractor A did to its own work.

Also normally included in this public liability insurance is an elevator liability clause that covers the insured's legal liability for bodily injury or property damage arising from ownership, maintenance, or use of elevators owned, controlled, or operated by the contractor. The term *elevators,* in this context, includes material and personnel hoists. Contractors must ordinarily carry very high limits of coverage (bodily injury and property damage) for this type of insurance, either as required by contract or simply as a matter of being adequately protected. This is often done through the use of umbrella excess liability coverage, discussed in a subsequent section of this chapter.

Standard typically used forms of this insurance include personal coverage for individual proprietors, partners, executive officers, and directors of companies, and stockholders of corporations while acting within the scope of their duties. For an additional premium, the policy may be endorsed to extend coverage to company employees as additional insureds while carrying out their company duties. This affords protection to employees who are named as individuals in lawsuits together with their employers. Premiums for public liability insurance are based on the contractor's payrolls.

With respect to a contractor's liability for injury to third parties, the concept of "attractive nuisance" is an important consideration. The doctrine of attractive nuisance establishes a special obligation on the part of the possessor of land to children and others who trespass on the property because of

the fact that buildings under construction, and the materials and equipment that are used to construct them, are attractive to the interest and curiosity of some people. When a contractor is in possession of land, such as a job site, its operations frequently attract children, and other trespassers as well. Because that person may not realize that he or she is entering on the land of another, or may not appreciate the hazards involved on a construction jobsite, the contractor has an additional responsibility to protect against trespassing. These standards of due care, however, apply only to artificial conditions on the land, such as the building itself, and the construction equipment, or scaffolding on the job site, and not to natural features such as trees, cliffs, or bodies of water which may be on the site. The courts have held that a contractor who maintains a dangerous appliance, or hazardous premises which could be construed to be an attractive nuisance is expected to exercise reasonable care to eliminate the danger or otherwise to protect the site by use of security guards, fences, or other appropriate protective measures.

## 8.23 CONTRACTOR'S PROTECTIVE PUBLIC AND PROPERTY DAMAGE LIABILITY INSURANCE

Often called contractor's contingent liability insurance, the contractor's protective public and property damage liability insurance policy protects the contractor from its contingent liability imposed by law because of injuries to persons or damage to property of others arising out of the acts or omissions of independent contractors (e.g., subcontractors). This includes protection for the general contractor if the subcontractor's insurance is inadequate or nonexistent. A claimant alleging damages caused by a subcontractor may sue not only the subcontractor but the prime contractor as well. This situation arises from the fact that the prime contractor exercises general supervision over the work and is responsible for the conduct of construction operations, including those of the subcontractors. Contingent liability insurance not only covers accidents arising out of operations performed for the contractor by an independent subcontractor but also protects the contractor from liability it may incur because of any supervisory act by its own supervisory people in connection with a subcontractor's work. If a subcontractor further subcontracts portions of its work, it will also need this form of protection.

The premiums for contractor's contingent liability insurance are derived from the subcontract amounts and do not generally vary with the work classifications. Insurance companies writing this form of insurance may require that the prime contractor obtain from its subcontractors certificates of insurance verifying that they have purchased public liability and property damage insurance to cover their own direct liability.

## 8.24 COMPLETED-OPERATIONS LIABILITY INSURANCE

There are some cases where a contractor can be held liable for conditions or events on a project he has constructed, even after the project has been completed. Completed-operations liability insurance protects the contractor from liabilities arising from projects that have been completed or for projects that may have been abandoned.

In a limited sense, the contractor is not liable for damages suffered by a third party by reason of the condition of the work after the project has been completed and accepted by the owner. According to the "completed and accepted" rule, once the owner accepts the work, then the owner generally becomes the party responsible for any defects in the work or for conditions that may be the cause

of injury or damage. When a dangerous condition exists that is obvious or readily discoverable on inspection, and the owner allows this condition to continue, the owner is substituted for the contractor as the party answerable for damage to a third party even though the dangerous condition may originally have been created by the contractor. Additionally, the contracting firm is generally not liable if it merely carries out plans, specifications, and directions given to it by another (typically the owner and architect-engineer), unless the information is so obviously faulty that no reasonable person would follow it.

However, there are many exceptions to these rules, and the courts now increasingly hold contractors at least partially liable to anyone who might be injured because of their negligence. A contractor who creates a dangerous condition on the property of another may be held responsible to parties injured thereby, even after the owner has accepted the project, if the parties so injured could reasonably have been expected to come into contact with the dangerous condition, and provided the contractor knew or should have known of the hazard and did not exercise reasonable care to warn of or to eliminate the dangers.

The rule of owner responsibility does not apply to dangerous conditions that are of a latent nature so that their existence would not be discovered by the owner during the exercise of ordinary care and usage. Indeed, courts have imposed liability on contractors without requiring a showing of fault in cases involving latent defects in completed projects. This is an extension to construction of the doctrine of manufacturers' or product liability, whereby builders of mass-produced homes and other contractors as well, have been held subject to strict liability for damages to third parties, even in the absence of contractor negligence. This follows from the legal theory that a producer of goods is strictly liable for injuries or damages resulting from a product defect. Consequently, a contractor's responsibility does not necessarily end with project completion and owner acceptance. Rather, the contractor's liability for completed operations continues for the full period of the applicable state statutes of limitations.

When contractors obtain completed-operations liability insurance, they are protected against loss resulting from damage to persons or to the property of others arising from any completed project, regardless of its completion date. This is true, of course, in the absence of any specific exclusion to the contrary. The protection under this policy starts with the effective date of the insurance, and continues as long as the insurance is kept in force. The date of injury or damage however, must fall within the policy period.

Protection under this type of policy extends only to liability to damaged parties, and does not apply to damage to the work that was performed by the contractor. This exclusion can be relieved to some extent by a broad-form property damage endorsement applied to the completed-operations policy.

## 8.25 CONTRACTUAL LIABILITY INSURANCE

The liability coverages discussed to this point protect the contractor only with respect to its liability as imposed by law. There are many instances in construction, however, where the contractor, by terms of a construction contract, or purchase order, or other form of agreement, assumes the legal liability of another. This form of liability is called contractual liability and refers to the contractor's acceptance by contract of another party's legal responsibility. The contractor is protected from such assumed liability by contractual liability insurance. This coverage provides protection from the tort liability of another for bodily injury or property damage caused to a third party, such liability being assumed by

the contractor through a business contract. The premium for contractual liability insurance is based on the contract amounts involved.

Routine purchase agreements can impose serious contractual liability obligations on the contractor. For example, the purchase orders used by some transit-mix concrete companies contain a clause whereby the contractor agrees to hold harmless the concrete dealer from all liability that may arise out of any accident involving the transit-mix trucks or their drivers while on a job site. Upon signing such a purchase order, the contractor assumes a legal responsibility normally belonging to the ready-mix supplier. In the absence of contractual liability coverage, the contractor will be unprotected should such a loss occur.

Contractual liability policies often have a number of important exclusions. A common exclusion pertains to bodily injury or property damage occurring within 50 feet of railroad property, or involving a railroad bridge, trestle, tracks, road beds, tunnel, underpass, or crossing. Third-party beneficiary losses (discussed in the section that follows), as well as explosion, underground damage, collapse, and other such losses may be exempted from the contractual liability policy. Also typically excluded is contractual liability associated with the operation, ownership, maintenance, or use of automobiles. Such coverage must be provided by separate automobile insurance policies.

## 8.26 THIRD-PARTY BENEFICIARY CLAUSES

Contractual liability insurance policies usually stipulate that the policy coverage does not apply to an action on a contract by a third-party beneficiary arising out of a project. Therefore, the contractor may wish to insure himself for this risk. A third-party beneficiary contract is a contract where two parties enter into an agreement whereby one of the parties to this agreement is to perform an obligation for a third party. In such a contract, if the obligated party does not perform as promised for the benefit of the third party, the third party can enforce its rights under the contract even though it is not a party to the contract.

To illustrate this point, contracts with public agencies may require that the contractor be responsible for all damage to property, however caused, by the construction operations. Such clauses often refer specifically to blasting. This is the natural result of the desire of governmental bodies to protect adjoining property owners from the hazards of construction operations on the property of the government body or public agency. However, when the contract wording states that the contractor assumes direct liability to third parties, a citizen can assert rights as a third-party beneficiary even though he is not a party to the contract, and even though the contractor was not negligent in its operations. In other words, a party whose property has been damaged by the contractor's operations can sue for damages on the basis of breach of contract without having to prove contractor negligence. This contingency is not covered under usual contractual liability coverage. Third-party beneficiary coverage can be added for an additional premium, usually on a specific exposure basis.

It is of interest that special provisions are now being included in some public construction contracts to limit the risk of third-party beneficiary suits. Called *no third-party liability* clauses, they provide that the contracting parties do not intend to make the public or any member thereof a third-party beneficiary under the contract for construction, or to authorize anyone who is not a party to the contract to maintain a suit for bodily injury or property damage pursuant to the terms or provisions of the construction contract. The intent of such a clause is, of course, to remove the construction

contract as a vehicle for third-party suits, and to ensure that the duties, obligations, and responsibilities of the parties to the contract remain as imposed by law.

## 8.27 PERSONAL INJURY

Bodily injury, as used in an insurance context, refers to physical injury to the body, including shock, mental anguish, mental injury, sickness, disease, or death. Personal injury refers to intangible harm, and the usual commercial general policy covers personal injury liability. There are a number of reasons why this type of insurance coverage can be important to the contractor.

Personal injury liability insurance protects the contractor from liability it may incur for:

- False arrest, malicious prosecution, willful detention, or false imprisonment;
- Libel, slander, or defamation of character.
- Wrongful eviction, invasion of privacy, or wrongful entry.

Such protection might be needed, for example, if the contractor caused the arrest of someone it suspected of theft or damage to its property and was sued for false arrest. In another illustration, it could happen that a contractor's security guard might detain someone in the course of performing his duties. Personal injury liability coverage is normally written subject to the exclusion of the contractor's own employees from coverage, but the policy can be written so as to include them.

## 8.28 EXCLUSIONS FROM COMMERCIAL GENERAL LIABILITY POLICY

Those liability coverages that are usually contained in a contractor's commercial general liability insurance have been discussed in the previous sections. However, despite its name, this policy is not all-inclusive in its coverage, and there typically are in fact many exclusions. Important examples of these exclusions include the following:

- Exclusions from property damage liability.
- Automobile, watercraft, or aircraft liability.
- Professional liability.
- Liability for injury to contractor's own employees.
- Liability arising from pollution.

Most of the items listed are insurable at additional cost, either by means of endorsements to the commercial general liability policy, or by means of separate policies. The first four of the exclusions listed above are discussed in the following sections.

## 8.29 PROPERTY DAMAGE LIABILITY EXCLUSIONS

A contractor's commercial general liability policy excludes coverage for liability arising from damage to:

- Property owned by, leased to, or rented to the contractor.
- Personal property in the contractor's care, custody, or control.

- Property damage to premises sold, abandoned, or given away by the contractor.
- Property loaned to the contractor.

During the course of construction, the following property damage is typically excluded:

- That particular part of real property on which the contractor, or subcontractor working on the contractor's behalf, is performing operations, if property damage arises out of these operations.
- That particular part of any property that must be restored, repaired, or replaced because of faulty workmanship.

These exclusions mean that the commercial general liability policy does not protect the contractor for damage done to another person's property while the contractor is working on it or with it. Additionally, coverage typically excludes damage to the insured's own property. This is consonant with the general rule that liability insurance is not intended to cover damage to one's own property.

The effect of these exclusions can be mitigated somewhat by obtaining the appropriate form of property insurance, or by the use of a broad form of property damage endorsement that restricts application of the exclusions to some degree. Actually, this endorsement uses more explicit language with respect to the exclusions, thereby covering more damage situations and providing somewhat broader protection for the contractor. Although it does not completely eliminate the property damage exclusions, it does cover more claims.

It can be readily seen that much of the property damage that is exempted in the commercial general policy is normally insured by other standard property policies. Builder's risk, equipment floater, installation floater, and other types of policies cover much of the property that is excluded in the liability coverage.

## 8.30 AUTOMOBILE INSURANCE

The operation of automobiles exposes the contractor to two broad categories of risk. One form of risk comes from loss or damage to the contractor's own vehicles caused by collision, fire, theft, vandalism, and similar hazards. The other form of risk is liability for bodily injury to others, or damage to the property of others, caused in some manner by the operation of the contractor's automobiles. Many states have statutory requirements concerning the purchase of liability insurance by owners of motor vehicles. In an insurance context, automobiles or vehicles are construed to include passenger cars, trucks, truck-type tractors, trailers, semi-trailers, and similar land motor vehicles designed for travel on public roads. Many statutes make it mandatory that the contractor obtain liability insurance on its vehicles. The contractor may also elect to insure some or all of his vehicles for physical damage.

Automobile liability insurance provides financial protection when the contractor is legally obligated to pay for bodily injury or property damage arising out of the ownership, maintenance, or use of a covered vehicle. This includes liability coverage for over-the-road hazards for self-propelled motor vehicles used for the sole purpose of providing mobility to construction equipment such as pumps, power cranes, air compressors, electric generators, welders, and drills. The insurer also provides the contractor with legal defense against liability actions.

Automobile liability coverage has several exclusions such as the injury to an employee, as well as property owned or transported by the contractor, and others. The insurance carrier will pay all damages resulting from an accident up to the liability limits specified in the policy. In view of the recent history of large awards in cases of bodily injury, as well as the claims consciousness of the

public in general, the contractor must maintain high limits of motor vehicle liability coverage. The contractor's umbrella liability insurance, defined and discussed in a subsequent section of this chapter, normally provides liability limits above those in the automobile policy.

Physical damage automobile coverage is available in three major forms: collision, specified perils, and comprehensive coverage. Collision pays for loss to a covered vehicle resulting from a collision with another object or its overturn. If only a few motor vehicles are involved, collision coverage is often purchased by the contractor. However, many contractors who have large fleets of vehicles prefer to self-insure the collision exposure because of the high premium costs for collision insurance. Collision insurance customarily provides for a specified deductible for each collision loss occurrence. This deductible amount can be varied, correspondingly changing the premium rate for the insurance.

Specified perils coverage pays only for losses caused by hazards listed in the policy such as theft, fire, earthquake. explosion, flood, vandalism, wind, hail, and others not including collision or overturn. Comprehensive coverage pays for damage to or the loss of a covered automobile for any cause except collision and overturn. The specified coverage is normally less costly than the comprehensive form, and many contractors choose to obtain the specified perils coverage to reduce premium expense. In addition, it is normally possible for a contractor to place some vehicles under comprehensive coverage and others under specified perils coverage.

There are a variety of endorsements that the contractor should consider when purchasing its motor vehicle insurance. One provides protection when an employee uses his private automobile in taking care of the contractor's business. In this regard, the contractor can purchase an "employees as insured" endorsement. When this endorsement is added to the contractor's policy, it will provide coverage if an employee is found liable for an accident that occurs while the employee was using a private vehicle on company business. Other endorsements are available to provide the contractor protection when using leased or hired units. Medical payments coverage for persons occupying an insured vehicle, and uninsured motorists coverage are additional examples of endorsements that are available.

## 8.31 PROFESSIONAL LIABILITY INSURANCE

Professional liability insurance provides protection from liability arising out of errors, omissions, or negligent acts of the insured in performing design and other professional services. When the contractor's responsibilities to the owner include professional as well as construction duties, professional liability insurance must usually be obtained. While this risk applies primarily to design-construct contractors and construction managers, other contractors can have varying exposure in this area.

Professional liability may devolve to the design-build contractor in two ways. Direct responsibility may arise out of design performed by in-house architect-engineers. In addition, contingent professional liability is possible where professional design services are subcontracted to an outside architect-engineer firm, or under a design-construct contract to a subcontractor.

Liability exposure of a construction manager arises out of its involvement in the feasibility and design phases of the project and the supervision of work forces other than those of the construction manager itself. Most professional liability policies are written on a claims-made basis, a topic previously discussed in this chapter. In addition, such policies generally provide for relatively large deductible amounts. Professional liability coverage can be obtained on a project basis or on a blanket basis.

When professional liability insurance is obtained, it should include contingent professional liability coverage where design work is subcontracted to outside professionals or subcontractors.

The total design liability exposure of the contractor is actually covered by a combination of professional liability insurance, the comprehensive liability policy, and the builder's risk policy. While the contractor may have each of these policies, and while he may believe that these cover professional liability, he must understand that the usual form of commercial general liability, umbrella excess, and builder's risk policies may specifically exclude professional liability protection. Insurance protection for contractors in the area of design liability is a very complex matter, and the contractor is well advised to seek expert advice with regard to this matter.

## 8.32 UMBRELLA EXCESS LIABILITY INSURANCE

Because of the numerous and substantial hazards that its operations present, and due to the high awards that are frequently made in bodily injury cases, the contractor may very well be concerned regarding the adequacy of the liability insurance it carries. A common solution for managing this risk is to purchase insurance called umbrella excess liability insurance. This type of insurance provides excess coverage above the underlying commercial general liability, automobile liability, and employer's liability policies.

Although the coverage of a policy of this type is not at all standardized, such an insurance policy serves several purposes. One is to cover liability claims that might otherwise fall between the coverages carried under the separate underlying liability policies the contractor has.

A second purpose is to raise the policy limits of the contractor's existing liability insurance to values that are high enough to provide protection against any foreseeable loss or combination of losses. The umbrella coverage does not take the place of the existing policies; it merely provides substantially greater protection for the same hazards insured against under the primary coverages. If the contractor incurs a liability beyond the limits of a primary policy, then the umbrella coverage is invoked. Umbrella coverage is sold on either an occurrence or claims-made basis.

In addition, an umbrella policy can provide some protections that are not provided in the underlying liability policies. These losses are normally subject to a specified deductible amount per occurrence. To illustrate how an umbrella policy works in this instance, suppose that a contractor has an umbrella policy with a $25,000 self-insured deductible. If the contractor's operations should cause damage to adjoining property, a form of loss not covered by its underlying insurance, the contractor pays the first $25,000 of the loss, and the umbrella coverage pays the remainder, up to the face amount of the policy.

Umbrella policies do contain a number of exclusions. Among these are damage to property owned or controlled by the insured, damage to the work of the insured, contractual liability, explosion, collapse, and a number of others.

## 8.33 WRAP-UP INSURANCE

Sometimes, especially on large construction projects, all of the work on the project can be performed under a coordinated or wrap-up insurance program that is provided by the owner. In such cases, the owner elects to furnish certain insurance coverages for the entire construction team of owner, architect-engineer, construction manager, prime contractors, and all subcontractors. On such projects, the contractors are required to accept the coverages provided by the owner if the owner has made this requirement a provision of the contract.

The usual procedure is for a single insurance company to provide all of the workers' compensation and employer's liability, general liability, umbrella, and builder's risk insurance for the

entire project. When the wrap-up insurance method is used, the owner buys and pays for all of the insurance stipulated. The general contractors and the subcontractors bid on the project without including the cost of the insurance in their proposals.

The prime attraction of the wrap-up form of insurance coverage is the reduced cost to the owner, both in terms of the direct cost of the premiums and potentially in the saving of the contractors' and subcontractors' markup on the cost of the premiums. Lower premium rates often result through the owner's volume purchase from a single insurance carrier.

Wrap-up insurance also eliminates much of the administrative detail involved when each contractor and subcontractor on a project purchases its own insurance. Under these conditions, layer upon layer of hold-harmless clauses can increase the cost of the public liability insurance.

There seems to be little question that on large projects the direct cost of insurance can be reduced through use of the wrap-up insurance concept. In addition, a single carrier can provide concentrated safety inspections and quick claims service. Gaps and overlaps in coverage can be minimized, and disputes between insurance carriers can be eliminated.

It is to be noted, however, that wrap-up plans of this kind upset the normal business arrangements that contractors have with their usual agents and insurance companies. Additionally, when the owner uses insurance of this kind, the contractors find that they must deal with a different set of safety engineers, underwriters, claims adjusters, and auditors for each different wrap-up insurer. Additionally, repeated audits of the contractor's accounting records by different insurance companies can seriously disrupt a contractor's normal office routine, and can certainly add to administrative costs. And, certainly, the contractor will need to closely examine the wrap-up insurance policy, in order to assure that all of its interests are adequately protected.

## 8.34 OWNER'S LIABILITY INSURANCE

The owner is responsible for procuring its own general liability insurance that applies to its normal operations and that protects it from liability that may arise because of its own negligent acts or those of its employees. It may also choose to obtain owner's protective liability coverage, either as a part of its general liability policy or by having the protective coverage furnished by the general contractor.

The owner's protective liability insurance protects the owner from injury or damage claims caused by the operations of the general contractor or any of the subcontractors. Despite the fact that the general contractor and the subcontractors are directly and legally responsible for liabilities arising out of their operations, the owner is often made a party to legal actions arising from acts or omissions connected with their construction activities.

To protect the owner from this source of liability, owner's protective liability insurance is available. This insurance, with the owner as the named insured, covers its contingent liability for personal injury, including death, or property damage that may occur during the construction operations, as well as covering any liability it may incur as a result of its direction or supervisory acts in connection with the work being performed, or through the omission of a duty that cannot be lawfully delegated to an independent contractor.

Where the contractor is made responsible for obtaining protective liability insurance for the owner, this insurance is normally obtained as a separate policy, although in some instances the owner can be added as an additional insured on the contractor's commercial general liability policy. When a construction contract requires that the contractor provide protective liability insurance for both the owner and the architect-engineer, both parties can be named insureds on the same protective policy for an additional premium.

If the construction contract contains an indemnity clause in favor of the owner and also requires that the contractor provide protective liability coverage for the owner, there is some duplication of coverage. The protective liability coverage is considered to be the primary policy, which then entitles the contractor to a substantial reduction in the premium for the contractual liability coverage on that project.

## 8.35 SUBCONTRACTORS' INSURANCE

By the terms of its subcontracts, the prime contractor normally requires each subcontractor to provide and maintain certain insurance coverages. Appendix M, AIA Document A401–2007, "Standard Form of Agreement between Contractor and Subcontractor," contains this requirement.

For the most part, prime contractors require their subcontractors to have the same coverages and limits as required by the prime contractor's construction contract with the owner. The insurance carried by its subcontractors is a matter of serious importance to the prime contractor. The subcontractors' coverages play an important role in the total insurance protection of the prime contractor and often, either of themselves or in conjunction with the prime contractor's own insurance, these policies of the subcontractors will provide direct protection for the prime contractor. Many prime contractors require their subcontractors to name the prime contractor as an additional insured party in the subcontractors' employer's liability, commercial general liability, and automobile liability policies.

Subcontractors' insurance is also of great concern to prime contractors due to the fact that in cases where the liability insurance coverage of a subcontractor proves to be faulty or inadequate, responsibility can devolve to the prime contractor from the subcontractor. In addition, when the subcontractor does not provide insurance coverage required by law, such as workers' compensation insurance, for example, the general contractor may be held responsible. Workers' compensation insurance will be discussed more fully in subsequent sections of this chapter.

To illustrate, most of the states have what are called "subcontractor-under" provisions in their workers' compensation statutes. The effect of these provisions is that a prime contractor (or subcontractor who further subcontracts) is considered to be the statutory employer of the employees of any subcontractor that does not procure the required workers' compensation insurance. In such an instance, an injured employee of the subcontractor may be able to recover under the insurance of the prime contractor. Construction subcontracts may provide that if the subcontractor does not procure the insurance required, the prime contractor has the right to obtain such insurance for the subcontractor and to charge the account of the subcontractor with the premium cost involved, or to terminate the subcontract.

## 8.36 GROUP INSURANCE PLANS

In most cases, general contractors purchase the insurance they need for their company on an individual basis from commercial companies of their choice. However, it is not uncommon for contractor groups or members of trade associations to associate together for the purpose of obtaining certain insurance coverages from a common source. Potential benefits include possible premium savings, readily available coverage to members in a tight insurance market, and possible investment income for member contractors in some cases. A number of different organizational methods have been devised to provide contractor members of groups with a variety of insurance types.

A common group insurance arrangement occurs where member contractors form a group purchase pool, called a risk retention group (RRG). This pool serves effectively as a co-op in the purchase

of designated insurance types for contractor members from a selected commercial carrier. Such a pool assumes no risk but uses the group's purchase volume to negotiate better coverages at less cost.

A more ambitious arrangement is one where the members of a construction group establish themselves as a self-insured pool. Members of the pool invest capital into the company and make premium payments into a trust fund. The plan is implemented by the group forming an insurance subsidiary that provides only member contractors with designated insurance coverages. Such subsidiaries are often referred to as group-owned insurance companies or group-owned captive insurance companies. Programs of this type are often formed and used when a certain type of insurance becomes very expensive or difficult to obtain.

To cite a specific example, several local chapters of the Associated General Contractors of America now have self-funded workers' compensation insurance programs. (Workers' compensation insurance is further discussed in subsequent sections of this chapter.) In such a plan, the contractor members pool their funds and insure themselves. This enables the plan participants to save on this line item of operating cost, and to become more cost competitive. The self-insured trusts formed by the group are directed and controlled by their own trustees and pay losses covered by the insurance provided. Some of these companies prepare their own policies and handle their own claims and underwriting. Such companies function as small, self-contained insurance firms.

It is more common practice for captive companies to engage the services of a commercial insurance company to perform the normal duties and activities of a typical insurance firm. Participating contractors pay premiums into a trust fund, and this fund is used to policy losses. The trust distributes any dividends back to the member contractors after paying claims and maintaining a reserve to meet future claims and expenses. The trust often purchases reinsurance to protect itself against catastrophic loss.

There are also so-called offshore captive insurance companies. This is a case where the group-owned company is located in another country, such as Bermuda, where taxes and other conditions are favorable to private business.

## 8.37 EMPLOYEE BENEFIT INSURANCE

Construction firms, like other businesses, very often provide their employees with certain forms of insurance coverage as fringe benefits. Major medical, hospital, surgical, dental, vision, life, accidental death, disability, and weekly income coverages are examples. Group coverage can be arranged between a construction company and an insurance carrier where certain benefits are made available to all employees of that company, or to all employees in a specified class or category. As a result of the seasonal nature and labor mobility in the construction industry, an employee must normally serve with the company for a prescribed minimum time and must work at least a specified number of hours per week or per year in order to be eligible for company group insurance coverage. Most group insurance is sold on a yearly term basis, with the rates being recalculated annually by the insurance carrier.

There are also group insurance plans that provide such benefits, not for an individual employer but for all company members of a trade association or other body. This is a broad-scale arrangement where all eligible firms can obtain selected group coverages from the same source. Such benefits are often provided by a multiple-employer insurance trust underwritten by a large national insurance company.

Group insurance is a useful management device in attracting and keeping company personnel. The group insurance package can be a valuable recruiting device, and is a vital component of

employee compensation, as well as being important for enhancing company loyalty, as well as the morale of company employees. This is very important to company personnel because the contractor ordinarily pays all or a substantial part of the premium cost of such insurance coverages.

## 8.38 CERTIFICATES OF INSURANCE

An insurance certificate, also referred to as a certificate of insurance (CI), is a printed form which is executed by an insurance company certifying that a named insured has policy coverage in effect for the insurance designated by the certificate. Such certificates are addressed to the party requiring the evidence of insurance, and the certificates list the types and amounts of insurance the insured has purchased. These certificates typically contain the limits of the coverage in effect, and note the expiration dates of the policies, and typically contain a statement to the effect that the party in whose favor the certificate is drawn will be informed in the event of cancellation or change of the insurance described.

The general contractor is often required to submit certificates of its insurance to owners and other parties. Construction contracts usually contain the provision that the contractor shall submit suitable insurance certificates to the owner or the architect-engineer at the time the contract is signed or, at least before field operations are commenced (see Appendix D). Many municipal building departments require proof that certain insurance is in effect, by way of the appropriate CIs, before they will issue building permits.

It is standard practice for a general contractor to require suitable and up-to-date certificates of insurance from all of its subcontractors. A management axiom of many general contractors, as well as a requirement frequently included in subcontractor agreements, is a statement that no work by the subcontractor may be performed unless and until the appropriate CIs have been furnished to the general contractor. A properly maintained file of such certificates is maintained by the general contractor to ensure that each subcontractor provides and maintains the insurance coverages and amounts required by law and by subcontract agreement.

## 8.39 THE PRINCIPLES OF WORKERS' COMPENSATION

Before the present era of workers' compensation laws, an employer was obligated to protect its employees only to the extent of providing a safe place to work. If an employee was injured in the workplace, in order to obtain redress in the common law, the injured employee had to file suit against the employer and prove that the injury was due to the negligence of the contractor. For the defense of such suits, the employer had available the accepted common-law defenses of contributory negligence of the injured employee, assumption of risk by the injured employee, and negligent acts of fellow employees.

Under the contributory negligence doctrine, the employee could not obtain redress if he were found to have been negligent in any manner or to any degree, regardless of the employer's negligence. The assumption-of-risk doctrine denied recovery if the worker knew or should have known about the fact that the work was accompanied by inherent risks. The defense of negligent acts of fellow employees followed a fellow-servant doctrine which held the employer liable for its own actions, but not for those of a fellow worker of the injured party. This trinity of common-law defenses made it very difficult for an injured or disabled worker to prove employer responsibility and negligence. The process was slow, and costly, and uncertain at best, for the employee.

The social and economic consequences of this system were instrumental in providing impetus for the development of workers' compensation laws. New York was the first state to enact a state

workers' compensation law, which became effective in 1910. Since that time, workers' compensation legislation has been passed by the federal government, and by every state and territory of the United States, as well as by each dominion of Canada. Workers' compensation statutes apply to most private employment and much public employment (with federal civil service and the military being notable exceptions).

The underlying economic principle of workers' compensation is that the costs associated with an on-the-job injury or death of an employee, regardless of fault, is a cost of production and should therefore be borne by the industry. The expense incurred by employers in providing suitable protection for their employees is considered to be another cost of doing business and, as such, is presumably reflected in the selling price of the products or services of that company. The fundamental objective of all of the workers' compensation statutes is to ensure that an injured worker receives prompt medical attention and monetary assistance for injuries sustained in connection with his work. Such support is provided by the employer and involves a minimum of legal formality.

Another basic principle in workers' compensation is the strict liability of the employer, regardless of any fault of the injured employee. Contributory negligence of the employee, such as failure to wear a company-provided safety helmet or to conform with posted safety regulations, will not usually affect the employer's liability. As a matter of fact, about the only exceptions to the payment of compensation benefits occur when the worker deliberately inflicts the injury on himself, when the injury occurs when the worker is intoxicated, when the injury is sustained in the course of committing a felony or misdemeanor, or when the injury is intentionally caused by a co-employee or third person for reasons not associated with the employment.

Secondary objectives of workers' compensation laws were to free the courts from the tremendous volume of personal injury litigation, and to eliminate for the injured, the expense and time involved in court trials. Additionally, it was believed that workers' compensation statutes could serve as motivating or instigating factors for contractors and other businessmen in the development and administration of effective safety programs.

## 8.40 WORKERS' COMPENSATION LAWS

Although all of the various workers' compensation laws embody the same general principles, they differ considerably in their working details, and no two of them are exactly alike. The contractor who performs work in more than one state must be especially careful to purchase the proper workers' compensation insurance so as to be in compliance with the legal requirements of the workers' compensation statutes of each state in which the contractor performs work.

Every law makes certain exclusions to its workers' compensation coverage. For example, most of the acts exclude domestic servants, farm labor, casual employees, independent contractors, and workers in religious or charitable organizations from the requirement to be covered by workers' compensation. Businesses that employ fewer than a specified number of employees are exempted in some states. Interstate railway workers and maritime employees are not covered by the workers' compensation acts, but are protected by separate federal legislation. Clearly, the contractor must avail himself of expert legal counsel, in order to assure that he is complying with the requirements of the statute in the locale where he is performing or planning to perform work.

Every employer whose employees are covered by a compulsory workers' compensation law must accept the act and must provide for the benefits specified. Failure to comply with the prescribed provisions can result in severe penalties, as well as the payment of damages to injured workers, and possible imprisonment. In most states, the presumed-acceptance principle applies, whereby in the

absence of specific notice to the contrary, the employer is presumed to have accepted coverage by the compensation act. Workers in excepted or excluded employments can usually be brought into workers' compensation coverage through voluntary action on the part of their employers.

An injured employee who files a claim for and accepts assistance under a workers' compensation statute ordinarily forfeits the right to sue his employer for damages. Compensation statutes have historically provided that a workers' compensation claim is the only remedy the employee has against his employer. According to law, the employer is strictly liable, and the injured employee is guaranteed the benefits as prescribed by law. The employer avoids the danger of unpredictably large jury verdicts for bodily injury caused by employer negligence.

However, during recent years there has been a gradual erosion of the employer's no-fault immunity from suit when an injured employee accepts workers' compensation benefits. In many states, injured workers can now sue their employers for tort damages in addition to receiving state compensation benefits. For an injured worker to have this right, there usually must be a subjective realization on the part of the employer that injury or death could occur because of an unsafe condition. The usual basis for suit by the employee is some form of gross negligence on the part of the employer.

Workers' compensation statutes normally protect the general contractor from tort liability to employees of its subcontractors. Such statutes also protect project supervisors and managers from lawsuits for negligence or tort where they are acting within the scope of their employment. States vary as to whether an injured employee or the workers' compensation insurance company can sue third parties who may have caused the injury. In most states, an injured construction worker can recover from the employer's workmen's compensation insurance, and then can sue a third party who caused the injury.

In some areas, the worker cannot collect further compensation from *fellow employees*. This term is considered to include other contractors and other workers on the project. However, several states do allow co-employee suits, some of these only when the injury involved an intentional act, intoxication, a reckless act, willful and malicious conduct, unprovoked aggression, gross negligence, or when the accident involved a motor vehicle. In most states however, an injured employee has considerable latitude in suing third persons for negligence. This contributes appreciably to the number of third-party suits filed against owners and architect-engineers. To be successful, of course, the injured employee must demonstrate that the party sued was negligent and that this negligence caused or contributed to the injury which the worker sustained. In some states, however, statutes now provide that an injured worker cannot proceed against the architect-engineer after receiving state workers' compensation benefits. Exempted from this protection, however, are claims based on negligent design on the part of the architect-engineer.

Additionally, all of the states, territories, and the District of Columbia have enacted child labor laws that regulate the conditions under which minors may be employed. Workers' compensation laws cover legally employed minors. In some jurisdictions, double compensation or added penalties are provided in cases of injury to illegally employed minors. Minors also enjoy special benefit provisions in workers' compensation policies.

As was noted earlier, it is imperative for a construction contractor to avail himself of expert assistance in order to assure that he fully understands, and is fully compliant with, the workers' compensation statutes and child labor statutes in the jurisdictions where he will be performing work. Being properly informed, and making good decisions with regard to this type of insurance is a critically important component of the contractor's risk management program.

## 8.41 ADMINISTRATION OF WORKERS' COMPENSATION LAWS

Workers' compensation laws are generally administered by commissions or boards that are created by law. A few states provide for court administration. Statutory provisions relating to administration vary somewhat from one state to another, but each of the laws contains certain typical regulations pertaining to its implementation. Notice to the employer of the injury by the injured worker is required within stipulated time limits unless the contractor or its agent had actual knowledge of the injury. A claim must be filed by the injured worker within a statutory period. Such claims are normally settled by agreement, subject to approval of the administrative body.

Review and appeal of the compensation award to the injured worker, as well as regulation of attorney's fees, are also provided for by the provisions of the various acts. Requirements vary concerning the keeping of accident records by the employer, but all states require that the employer report injuries to a designated authority. Failure to report in accordance with the applicable statute can result in fines and, in some jurisdictions, even imprisonment. Except for preliminary reports, the contractor's insurance company usually makes the formal reports required by law except in states with monopolistic funds.

Benefits to an injured worker are only those provided by the law and approved by the administrative authority. Should the injured party not be satisfied with the award as specified by law, he can appeal to the court designated by the act. Such appeal must be initiated within a statutory period. In some jurisdictions, the employee can file suit against his employer under the compensation act for alleged failure to provide safety devices. Some states allow this practice, if the employee can show gross negligence on the part of the contractor.

## 8.42 WORKERS' COMPENSATION BENEFITS

All workers' compensation laws provide various forms of benefits for the disabled employee or his dependents for job-related injury, death, or sickness, without regard to how the disability or death may have been caused. The monetary value of such benefits varies substantially from one state to another. These benefits include medical treatment, hospitalization, and income payments for the worker during his disability. In the event of a fatality, funeral expenses and survivor death benefits are also paid. Many jurisdictions include special benefits such as a lump-sum payment for disfigurement, rehabilitation services, and extra benefits for minors injured while illegally employed.

Most statutes now stipulate that medical benefits shall be provided without limitation as to maximum total cost and that wage compensation shall be paid for as long as the worker is disabled. In those states where benefits are limited by statute, either in terms of dollars or period of time, the contractor may purchase an endorsement to its workers' compensation insurance policy that provides additional benefits beyond those required by law for its injured employees.

Most states require a waiting period before a worker can collect certain benefits, seven days being typical. However, these states normally allow a worker who has been off the job for a specified length of time to receive benefits for the waiting period retroactively.

Four classifications of work injuries are used in conjunction with workers' compensation benefits. These are:

1. Temporary-total
2. Permanent-partial

3. Permanent-total
4. Death

Other than medical assistance, the usual benefits provided by workers' compensation laws are quite modest, especially when compared with the worker's usual earning capacity. The idea is, of course, to give the worker sufficient monetary help so that he will not become a burden to others.

The great majority of compensation cases involve injuries of the temporary-total classification, meaning the worker is temporarily unable to work but ultimately recovers fully from his injuries and returns to employment. Income benefits payable during the period of convalescence are determined as a percentage of the worker's average wages. Most states limit the minimum and maximum benefits payable weekly as well as the number of weeks and the total dollar amount of benefit eligibility.

Permanent-partial disability connotes a continuing partial disability, although the worker is eventually able to return to work. This form of disability is classified either as a schedule injury, meaning the loss, or loss of use of, a thumb, eye, leg, or other part of the body, or a nonschedule injury, which is of a more general nature. Compensation acts provide additional benefits for schedule injuries.

A permanent-total disability injury prevents the worker from future employment in his former craft. Most of the state workers' compensation laws provide that specified benefit payments shall be made for life in cases of permanent-total disability. Rehabilitation services are also provided to train disabled people in new skills or occupations.

In the event of the accidental death of a worker, all states provide for the payment of death benefits to his family or other dependents. A few acts provide for payment of benefits to the widow for life or until remarriage, and to children until they reach a prescribed age. Most states place a limitation on the time period or total amount of such payments.

## 8.43 ADDITIONAL PROVISIONS OF WORKERS' COMPENSATION LAWS

Workers' compensation statutes now include occupational diseases within their coverage. Provisions vary, but compensation benefits are generally the same as those for other forms of disability. Many states have provided for extended periods of time during which claims may be filed as a result the discovery of certain latent, slowly developing occupational diseases.

Claims under the name of occupational disease have increased greatly, stemming from certain practices, and the use of many substances common in construction. A commonplace example is the growing number of claims made because of the effects of asbestos. Claims are often for very large sums of money, reflecting the long periods of time between the first exposure and discovery of the disease, as well as the attendant disability.

New products are coming into use and the attendant effects of different substances, alone or in combination, are only now being discovered. There are serious questions concerning who should pay, how much should be paid, and who is eligible to receive such payments.

In addition to the increasing incidence of occupational disease, the definition of what constitutes an occupational disease is being broadened. Benefits are now being awarded for illnesses caused by mental stress in the workplace, as well as for cumulative injury such as loss of hearing, and cardiovascular problems. More and more claims under workers' compensation are coming from older workers as the result of more diseases being found to be occupational and therefore compensable.

Second-injury or special-disability funds have been developed to meet problems arising when an employee, previously injured, suffers a second injury that, together with the first, results in a combined disability much more severe than that caused by the second injury alone. Historically, the employer in

whose employ the second injury took place was required to provide benefits as indicated by the total resulting disability. However, this interpretation has sometimes resulted in employers being reluctant to hire previously injured persons. All states now provide that the employer is responsible for payments required by the second injury only. Additional compensation to the injured employee as called for by the combined effects of his injuries comes from second-injury funds, which were created at the time the second-injury provisions were enacted into law.

## 8.44 WORKERS' COMPENSATION INSURANCE

A workers' compensation statute requires the contractor to provide its injured workers with all benefits as may be required by law in that state. The usual way in which a contractor does this is through workers' compensation insurance, although almost all states allow the contractor to carry its own risk as a self-insurer, provided it can provide satisfactory evidence of its financial ability to do so.

Monopolistic state funds have been established in some states and the provinces of Canada. Under the laws of these jurisdictions, employers whose operations are covered by their compensation laws are required to insure in the state funds, although in some instances employers can qualify as self-insurers. A number of other states have competitive state funds, whereby the employer may purchase compensation insurance either from a private insurance carrier or from a state fund. In the remaining states, private insurance companies provide all workers' compensation insurance. Workers' compensation insurance provides benefits only as prescribed by state laws. Claims made under federal compensation laws can be covered by an endorsement to the contractor's workers' compensation policy.

Workers' compensation insurance has unlimited policy limits and will pay the medical costs and provide the benefits required by law. This insurance also provides legal defense for the insured and pays any court awards in jurisdictions in which an injured worker can bring suit against his employer under the compensation act. If injury to sole proprietors, partners, or corporate officers of the company is to be covered, a specific policy endorsement to that effect is required in some states. In other states, those parties are automatically included in coverage.

The contractor must have workers' compensation insurance in force for each state in which its employees may be performing work. The workers' compensation policy applies only to obligations imposed on the insured by compensation laws of those states listed in the policy. If a claim against the contractor originates in a state not listed, there is no coverage. It is possible for the policy to list some or all of the states except the monopolistic fund states that do not permit private workers' compensation insurance.

## 8.45 WORKERS' COMPENSATION INSURANCE RATES

There are two components to the calculation of a contractor's workers' compensation insurance premium. The first is called the base rate, and the second is the experience modifier rating (EMR). The base rate is calculated on the basis of the work classifications of the contractor's employees (concrete formwork carpenters, trim and cabinet installation carpenters, cement finishers, etc.), as listed in the workers' compensation classification guide published by the state.

The manual rate is stated as the cost of insurance per $100 of payroll for that craft, or as a percentage of payroll for that craft. For example, in one state the manual rate for formwork carpenters might be $21.30 per $100 of payroll for that craft, while in another state the manual rate might be expressed as 19.4 percent of payroll for that craft. The manual rate applies uniformly to a particular

craft classification in the entire state. The manual rates for the various crafts are calculated for each state based on the loss history for that craft in that state. This explains why different states may have markedly different manual rates for the same craft.

The manual rates for workers' compensation insurance are set by rating bureaus of the various states and are adjusted annually. Basic premium costs are computed by multiplying each employee's total wages, exclusive of overtime pay, by the rate specified for his classification.

The second component of workers' compensation premiums is the EMR, which is employer specific. Each contractor's EMR is calculated by a state rating bureau. While the details of the calculation vary slightly from one state to another, the principle is consistently the same. A contractor's EMR is a numerical value, expressed as a percentage, which is applied to the contractor's workers' compensation manual rate premiums, based on the contractor's loss history over a three-year period of time. The bureau makes a comparative analysis of the company's claims history to that of other companies in the same industry performing the same type of work, taking into account both incidence rate and severity in each case. Based on this information, a contractor's EMR is calculated and then assigned to the contractor. If a contractor has an EMR of 1.0, his loss history is statistically the same as that of others in performing the type of work he does, during the three year period considered. If the EMR is below 1.0, the contractor's loss history is better than average, and if it is greater than 1.0, the loss history is worse than average.

The EMR value serves as a multiplier to the manual rate component of the workers' compensation premium. If the contractor's manual rate premium for a certain craft is $28.80, and his EMR is 1.3, the actual premium for insurance for that craft is now $37.44 ($28.80 ×1.30 per $100 of payroll for that craft). If the contractor's EMR is 0.72, that contractor will pay $20.74 per $100 of payroll for the same craft.

When the EMR calculation is performed, three years of the contractor's loss history are examined, specifically a three-year period that does not include the immediately preceding year. To illustrate, the contractor's EMR for year 2014, would include consideration of his loss history for years 2012, 2011, and 2010. Additionally, the determination and analysis of the contractor's loss history is done in such a way that a large loss in a single year will not by itself have a catastrophic effect on the EMR. In fact, the data analysis that determines the EMR is performed in such a way that a single large loss will not affect the EMR as severely as will a large number or regular pattern of smaller losses. The rationale of the loss control industry is that a history or numerous or regularly occurring small losses is an indication that a large loss will soon happen.

In practical terms, the EMR value is significant with regard to the contractor's safety record, safety program, and thus to his overall focus on safety. In economic terms, this means that if a contractor has an EMR of 1.0, he is paying 20 percent less for his workers' compensation insurance premiums than his competitor who has an EMR of 1.2. This is a significant competitive advantage.

The following example illustrates the magnitude of savings in the cost of workers' compensation insurance that can result from an effective company safety program that reduces accident incidence rate and severity, and thus results in a lower EMR. Assume that a contractor performs an annual volume of $10 million of work. Considering a typical amount of subcontracting and the cost of materials, this general contractor's annual payroll might be about $2.5 million. If its worker's compensation manual rates average about 20 percent, and if the contractor has an EMR of 1.0, the annual premium cost will be about $500,000. Now consider the case of a competitor with a similar volume of work and similar payroll whose EMR is 0.7. This company's annual premium cost for its worker's compensation insurance is $350,000, a difference each year on the order of $150,000 in the cost of this one insurance coverage alone. A direct result of this is the improved competitive position of the second contractor. Lower insurance premiums mean lower bids.

EMR values, in addition to their direct implications as illustrated in the examples above, are widely used by contractors for comparing their operations, and the results of their safety programs, with those of others, and to incentivize their managers and workmen to take the matter of safety seriously. Additionally, it is common practice today, for owners to require contractors to include their EMR rating in materials to be considered by the owner and the architect-engineer in selecting the contract recipient for a project. In similar fashion, it is commonplace for owners to include statements in advertisements for bid, or in invitations for bid, or in contractor prequalification forms, that if a contractor has an EMR greater than a specified value, he will not be considered for contract award for the project.

Workers' compensation insurance is an expensive coverage whose premiums can constitute one-half or more of the total cost of a contractor's insurance program. In addition, as has been illustrated, the EMR component of the workers' compensation premium has a profound effect on the contractor's operations. These considerations often serve to incentivize construction businesses to redouble their efforts in striving to achieve loss reduction through more comprehensive company safety programs, strict enforcement of safety policies, more selective hiring, more effective employee training, and better safety planning.

Workers' compensation insurance, as well as other liability coverages, is also sold on a retrospective basis. When the retrospective rating plan is used, the contractor pays manual premium rates during the life of the policy. The insurance carrier periodically evaluates the contractor's losses under the policy. The contractor receives a rebate if its loss experience was good, and is required to pay additional premium if its loss experience was unfavorable. Compensation insurance sold on a retrospective basis stipulates both a minimum and a maximum premium rate under the policy. Several different retrospective plans are available, each plan specifying a different set of minimum and maximum premium rates and providing for different possible ranges of final premium adjustment. Retrospective-rated insurance is truly a cost-plus form of insurance subject to a guaranteed maximum price but is not suitable for all contractors. Expert advice is highly desirable. As a usual rule, larger contractors with good safety programs stand to gain most from this arrangement.

## 8.46 WORKERS' COMPENSATION DEDUCTIBLE PLAN

In some states, a plan called the workers' compensation deductible plan is offered by insurance companies. Under this plan, if the contractor assumes personal responsibility for paying a prescribed portion of a workers' compensation claim, the premiums for the contractor's workers' compensation insurance coverage are reduced. For example, if the per-accident deductible credit applied to insurance company payments to a given claimant is made $5,000, the contractor's workers' compensation insurance premium payments are reduced by, say, 15 percent. Under this plan, the insurance company pays the entire claim and then looks for reimbursement from the contractor, generally through monthly or quarterly billings. Since the contractor holds the funds until the insurance company actually pays the claim, the insurance company usually requires financial protection from the contractor in the form of a letter of credit, surety bond, or premium trust fund.

## 8.47 WORKERS' COMPENSATION SELF-INSURANCE

A large majority of the compensation acts allow an employer to act as its own insurer, provided it can satisfy certain minimum financial requirements as stipulated by the various state insurance departments. Self-insurance is limited in a practical sense to large companies having such a large spread of risks that they can assume their own liability on workers' compensation to their financial advantage.

For complete self-insurance, the contracting firm must establish its own services of claim adjustment, claim investigation, safety engineering, and other services, similar to those provided by insurance companies. To qualify as a self-insurer with state officials, a contractor may be required to furnish a surety bond in an amount fixed by law or by the administrative agency.

Self-insurance programs have been devised between employers and insurance companies whereby the employer is self-insured up to certain maximum amounts. Payments in excess of this amount are guaranteed by excess insurance purchased from the insurance company. Under such plans, the employer deposits a percentage (e.g., 75 percent) of the usual workers' compensation insurance premiums in a bank. This establishes a fund for the payment of workers' compensation benefits. The remainder of the premium (25 percent in our example) is paid to the insurance company. This payment goes in part to purchase the excess insurance coverage. The remainder of the payment to the insurance company provides the contractor with the usual insurance company services pertaining to claims, safety inspections, auditing, accident reports, and medical and legal services.

## 8.48 EMPLOYER'S LIABILITY INSURANCE

Employer's liability insurance is written in conjunction with workers' compensation insurance and affords the contractor broad coverage for bodily injury or death of an employee arising out of or occurring in conjunction with his employment but not covered under workers' compensation law. Employer's liability insurance applies to the contractor's operations only in those states listed in the contractor's workers' compensation policy and to those operations in other states that are necessary and incidental to operations in the listed states.

There are instances when an injury to an employee can fall outside the coverage of workers' compensation insurance. For example, if the employee is injured through the failure of the contractor to provide safety appliances or working conditions required by state law, the employee may elect not to receive workers' compensation benefits but to sue the contractor for damages under common law. The contractor may have an employee injured on a minor operation in another state where the contractor does not have workers' compensation insurance in effect. An injured employee of the contractor may collect workers' compensation benefits from the contractor's insurance company, and then file suit against a third party such as the owner or a subcontractor. In this event, it is usual for the owner or subcontractor to make the contractor a party to the action. In each of the instances just cited, workers' compensation insurance provides no direct protection for the contractor. However, employer's liability insurance will pay the legal costs incurred in the contractor's defense as well as any judgment, up to the face amount of the policy.

As previously discussed, a contractor doing business in a monopolistic fund state must purchase workers' compensation insurance from that state fund. These state funds, however, do not include employer's liability insurance with the workers' compensation coverage. Here the contractor must obtain a "stop gap endorsement" that will provide employer's liability insurance in the monopolistic states. This endorsement can apply to the commercial general liability coverage or to the workers' compensation policy.

## 8.49 NONOCCUPATIONAL DISABILITY INSURANCE

Disability benefit laws in a few states require employers to provide insurance protection for their employees for disability arising from accidents or diseases not attributable to their occupation.

This type of disability insurance pays a weekly benefit when an eligible wage earner is disabled by an off-the-job injury or illness. Such an occurrence would not be covered by workers' compensation insurance.

Workers' compensation insurance does not apply in such instances and does not provide any benefits, thus the rationale for nonoccupational disability insurance. Usually, a waiting period of seven days must elapse before benefits begin, thus eliminating claims for minor disabilities. All state plans provide for maximum weekly benefits and a maximum number of weeks that benefits are paid.

In some states, nonoccupational disability insurance may be obtained through either a private or a state plan. In others, all of the disability insurance required by law must be acquired through the state. State-administered plans are supported by payroll taxes levied against both the employer and the employee.

Private plans are acceptable in some states, particularly if they are underwritten by a reputable, well-established insurance carrier. State statutes require that benefits provided by private plans must be at least equal those in the state plan, and contributions from the employee must be no greater. The cost of disability insurance usually is shared by employer and employee. Some employers, however, regard these benefits as essential to their employee relations programs and underwrite the entire cost of this insurance.

In some areas, the contractor's legal obligation for providing disability benefit insurance to its employees can be satisfied by contributions to union welfare funds that provide disability benefits substantially equivalent to those required by state law. Protection for nonunion employees and for union members who are not covered by such union welfare funds must be acquired through other sources.

## 8.50 UNEMPLOYMENT INSURANCE

Unemployment insurance is a hybrid type of insurance coverage, involving both federal and state laws, that provides weekly benefit payments to a worker whose employment is terminated through no fault of his own. The cost of the unemployment compensation system is paid for by employers through federal and state taxes. Each state has some form of unemployment compensation law that works in conjunction with the Federal Unemployment Tax Act.

Also, each state has established its own administrative agency that works in partnership with the Bureau of Employment Security, which is an agency of the U.S. Department of Labor. The federal government sets minimum benefit standards for the states. Each state specifies its own qualifications, the amount of the benefit, the duration of payments, and the employment covered. Excluded from most state laws are railroad workers; domestic workers; federal, state, and municipal workers; workers in nonprofit educational, religious, or charitable organizations; agricultural workers; casual labor; and those who are self-employed.

Unemployment insurance is intended to provide workers with a weekly income to assist them during periods of unemployment. There is no intent to provide benefits to those who cannot or will not work. Only persons who have been working for a specified period of time on jobs covered by their state unemployment compensation law, who are able and willing to work, and who become unemployed through no fault of their own, are eligible to receive benefits. However, some states do provide unemployment benefits under certain circumstances to workers on strike.

All employers who come under the provisions of the state unemployment insurance laws must pay taxes based on their payrolls, up to a prescribed amount per calendar year for each employee. In a few states, a portion of the unemployment tax is also assessed against employees.

The tax applies to a contractor's entire workforce, including both field and office employees. The employer pays a part of such payroll taxes to the federal government and a larger share to the state in which the employment takes place. Federal law imposes on all covered employment, a basic payroll tax whose rate is variable from year to year, depending on the financial condition of the national fund. With certain restrictions, the employer can take credit against its federal unemployment tax for its payments to the state fund and for amounts that it is excused from paying to the state because of its favorable claim experience.

Each state has an established tax rate that is adjusted up or down for a given employer, depending on its experience. A separate account is set up by the state for each employer covered. Each account is credited with tax payments made, and is charged with benefits paid to former employees. The extent to which the tax credits exceed or are less than the benefits charged, determines by how much the employer's rate is adjusted above or below the basic tax rate. A contractor who finds it possible to offer a maximum amount of steady employment to its workers can enjoy a substantial reduction in its state unemployment tax rate. Conversely, if a company has a large turnover, its tax rate can be raised. The state tax rate can also vary with the solvency of the state unemployment benefit fund.

When a worker files a claim for benefits, the employee's last employer is sent a notice. If the employer replies that the worker was separated from the firm for a reason other than lack of work, the benefits may not be chargeable against that employer's account. In addition, an unemployed worker may disqualify himself from unemployment benefits by voluntarily quitting his last job without good cause, being discharged for misconduct, being directly engaged in a strike or other labor dispute, failing to apply for or accept an offer of suitable work, and for a variety of other causes. Under the existing compensation program, the states pay jobless benefits for a defined number of weeks. If the state unemployment level reaches a defined "trigger" point, the states and federal government split the cost of additional benefits for an additional series of weeks. Federal supplemental compensation can provide benefits in some areas beyond the original maximum weeks and at federal expense, during periods of high national unemployment. The total amount of unemployment payments a worker can receive, varies from one state to another.

## 8.51 INSURANCE CLAIMS

Every loss or liability for which a contractor's insurance may be responsible must be brought to the attention of the insurance carrier, and perhaps to other parties as well, through the submittal of a written notice or report regarding the claim. State workers' compensation statutes require that accident reports be submitted covering all compensable accidents to employees. In the event of accidental injury to a person not an employee, the contractor should, for its own protection, submit a complete report of the matter to the company carrying its commercial general liability insurance. Motor vehicle accidents must usually be reported both to the insurance company and to law enforcement agencies on special forms provided. Property damage is reported on a proof-of-loss affidavit, although final settlement is usually made on the basis of a detailed schedule of costs.

To ensure that claims are properly made and followed up, it is wise for the contractor to designate one person in its organization to assume complete responsibility for matters pertaining to insurance. In addition to the filing of reports and claims, this individual must be familiar with all aspects of the various insurance policies of the contractor and of the subcontractors. This person should keep a checklist of all coverages, have all new or potential construction contracts examined for insurance requirements, make necessary cancellations and renewals, keep a file of subcontractors' insurance certificates, and generally oversee the contractor's insurance program.

## 8.52 SOCIAL SECURITY

Social Security, a program operated by the federal government through the Social Security Administration, provides four basic types of benefits for the workers covered. Monthly cash payments are provided after a wage earner reaches a certain age and retires. When a qualified worker reaches the age of 65, hospitalization benefits are provided and supplementary medical insurance is available on application and payment of a small monthly premium. Survivor benefits are provided for the dependents of a worker should that worker die at any age. Benefits are made available to a worker who suffers a disability that renders him unable, for a period of 12 calendar months or longer, to do any substantial gainful work for which he is qualified by age, experience, training, and education. The Social Security Administration also administers the Supplemental Security Income program, which provides financial assistance to people who are blind, disabled, or who are 65 years of age or older and who can establish a genuine financial need. Since the passage of the original Social Security Act in 1935, benefits have been liberalized and the number of workers covered has grown substantially.

Employees and employers share the cost of Social Security by paying special taxes into a fund in the U.S. Treasury, from which Social Security benefits are paid. The employer must contribute for each employee the same amount that is deducted from the employee's pay. The tax rates paid by employer and employee are statutory, as is the annual amount of wages subject to the tax. Both the tax rates and taxable earnings have been increased several times by Congressional action.

The Social Security Administration keeps a record of each worker's wages received while in employment covered by the act. This record is maintained as a separate account for each worker, under his name and identifying number, the Social Security number. Each individual must have his own Social Security number, which he can obtain from any local Social Security office. Any worker can check on his Social Security account by writing to the Social Security Administration and asking for a statement of his wage credits. Account balances can also be checked, and additional social security information of all kinds obtained, by contacting the social security administration online at www.socialsecurity.gov.

## 8.53 SUMMARY AND CONCLUSIONS

As can be readily discerned from the foregoing discussion, insurance is at once a very simple and an extremely complex topic for construction contractors. Simple, because construction company management formulates a risk management policy, and then develops means and methods for managing risk. One of the methods for accomplishing this risk management objective is to purchase insurance policies for those risks that the law requires and for those risks the enterprise does not wish to accept.

Insurance is a complicated topic because insurance policies exist in so many types, and in so many variations, and with so many features such as special endorsements, and exclusions, and limits, and deductibles. Because of this complexity, the principle has been repeated several times in this chapter: it is imperative for the construction contractor to apply his own judgment, and also to obtain expert guidance and assistance with regard to all of the elements of his risk management through his use of insurance policies.

## CHAPTER 8 REVIEW QUESTIONS

**1.** Define EMR as it relates to worker's compensation insurance, and discuss three major reasons why it is important.

2. Is the purchase of unemployment insurance optional for a construction contractor or subcontractor? Explain.
3. What is a CI, and what is its significance with regard to contractors and subcontractors commencing work on a construction project?
4. What are they key provisions of professional liability insurance?
5. State four key elements of coverage of a typical builder's risk insurance policy.
6. Define subrogation and state its application to construction insurance.
7. Describe an equipment floater policy and discuss the type of contractor most likely to carry this coverage.
8. Define *contractual liability insurance,* and describe its significance for a general contractor.
9. Define *wrap-up insurance policies,* and discuss their significance for a general contractor.
10. What is the primary underlying principle behind workers' compensation insurance?

# Chapter 9

# Business Methods

## 9.1 INTRODUCTION

The purpose of this chapter is to discuss selected accounting and business procedures that are commonly utilized in the conduct of a construction business. While the popular conception of construction contracting is visualized as pouring concrete and erecting structural steel, there is far more to a construction business than the contractor's construction operations. The business aspects of operating a construction company are of critical importance to the success and continuance of the enterprise. While it is certainly true that the owners and managers in a construction firm are vitally concerned with the field operations conducted in the performance of the contracts the company has entered, it is also true that the financial, business, and accounting functions which are performed by the company home office are an indispensable component of the successful operation of the construction company.

## 9.2 FINANCIAL RECORDS

The failure of many otherwise well-managed construction companies is frequently caused by the lack of accurate, detailed, and timely information concerning all aspects of the company's financial affairs. Financial records of several different kinds absolutely must be maintained to serve a number of business and management purposes in the company. This, in turn, means that company management must have established a structure for defining the records and documents that must be developed, maintained, and properly stored, as well as a system of policies and procedures for the business operations of the company. In addition, of course, people having the requisite talents and skills must physically build, and operate, and maintain this financial structure and its documentation system.

One of the most basic and important reasons why construction contractors, like other businessmen, must keep accurate records is that many such records are required by law. An assortment of governmental agencies require data pertaining to taxes, payrolls, and other company financial information, along with a structure and a system of accounts to serve the purpose. Additionally, the contractor's financial records must provide the basis for financial statements and reports which are required for the construction firm's interaction with owners, bankers and other lenders, as well as sureties, insurance companies, public agencies, and others.

Beyond these considerations lies the imperative of the contractor having and maintaining a financial structure and record-keeping structure to serve the purposes of effective company management. The contractor's accounting system must serve to effectively and in timely fashion provide the information necessary to assist company management in controlling company operations and in utilizing its available capital to the greatest possible advantage. Without proper records, and the structure and

policies for developing and maintaining these records, it is impossible for a contractor to establish and maintain a solid financial base, or to estimate construction costs accurately, or to control costs on current projects, or to keep the company in a fluid cash position, or to be able to make sound judgments concerning the acquisition of equipment, or to perform the numerous and varied additional functions associated with the financial management of the business enterprise.

The functions of a construction company's accounting system are not limited merely to producing and maintaining financial information and keeping records. Although such information is basic and essential to the conduct of company operations, it is also necessary for company management to analyze and summarize this data in order that it can be used to best effect. It can be said that the success of the entire process, and ultimately the success of the company itself, absolutely depend on the continuous generation, maintenance, and analysis of financial information that is critical to the successful operation and management of the company. The methods that are employed, the information generated, and the use that is made of this information in this process are the subject of the remainder of this chapter.

## 9.3 ACCOUNTING METHODS

Although the details of record keeping vary considerably among construction firms, there is a basic accounting logic and a set of fundamental accounting procedures that are common to companies in the construction industry. The primary basis of a contractor's accounting system centers on the determination of income and expense from each of its construction projects and the cost of the operations of its office staff and management. That is, the performance of each construction project is treated as a separate profit center. In an accounting sense, a profit center is any group of associated activities whose profit or loss performance is separately measured and analyzed.

In a construction company, the original estimate of costs pertaining to each contracted construction project becomes the basis for a budget for that project. As costs are incurred on the project, they are accounted for and are charged against the project activities or work items to which they pertain. Cost summaries and reports are regularly generated throughout the life of a project, and costs incurred are compared to the project budget. Management analysis follows and forms the basis for management action to assure insofar as possible that the project will be completed within the budget. Figure 9.1 illustrates the cycle of cost estimating, cost accounting, and cost control, and the record-keeping functions that accompany.

It is customary that the keeping of most of a contractor's business accounts be concentrated in the home office. However, on large projects and on some cost-plus contracts, a subsidiary set of accounts is frequently maintained in a field office where the record keeping pertaining to that project is accomplished. In this process however, the controlling accounts or master accounts for such projects are incorporated into a master set of accounting records that are maintained in the contractor's central office.

The two basic accounting methods employed by contractors in the conduct of their business are the cash method and the accrual method. In the cash method, income is taken into account only when cash is actually received, and expense is taken into account only when cash is actually expended. The cash method is a simple and straightforward form of income recognition, and no attempt is made in this method to match individual revenue payments received with the accompanying expenses.

The cash accounting method is used principally by small businesses, nonprofit organizations, and by some professional people for their personal records. Many small construction contractors use the cash method because of its simplicity, and because of the fact that tax liability for contract profits

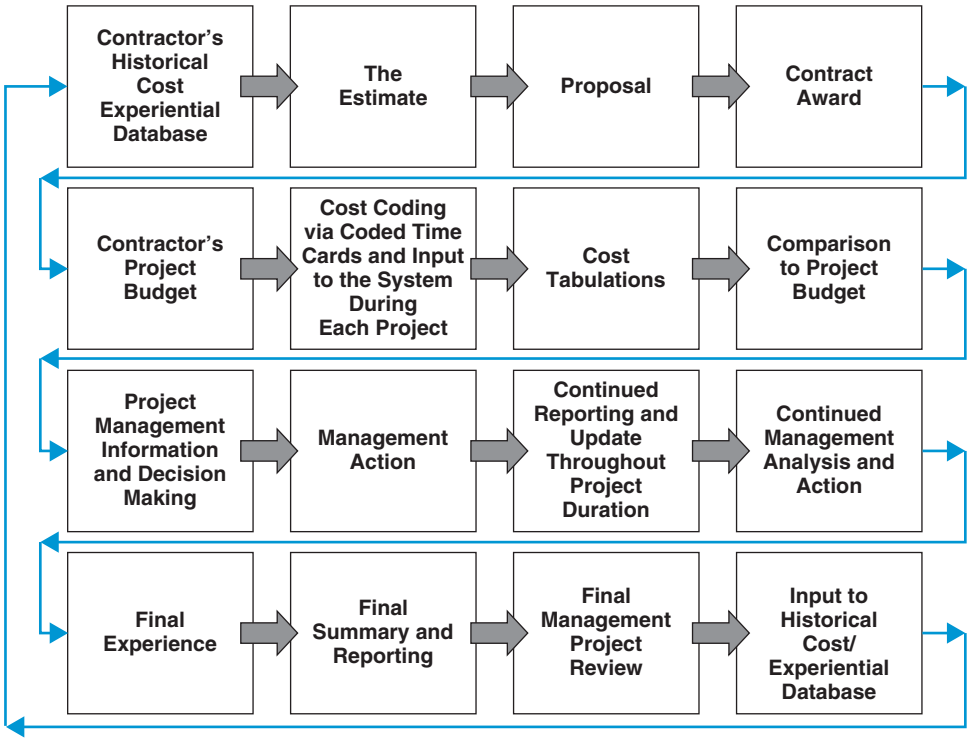



**Figure 9.1** The Cycle of Cost Estimating, Cost Accounting, and Cost Control

is recognized only when payment has actually been received. If a construction company performs only small projects, and maintains little or no materials inventory, and owns no capital equipment of consequence, the cash method is usually adequate.

However, for most construction companies the cash method does not work to the advantage of the contractor. For example, the cash method of accounting does not recognize depreciation of equipment and other capital assets because depreciation involves no recognition of cash income or outgo. Additionally, and importantly, income that has been earned but not received and expenses that have been incurred but not paid as of the end of a reporting period are not recorded or reflected in the company records in the cash method of accounting. An income statement, which is a summary document showing the company's revenue and expenses for a certain period of time, with profit or loss expressed as the difference between the expenses and revenue that is prepared on a cash accounting basis, will not present a realistic indication of true profit or loss for the company.

Similarly, a balance sheet, which is a summary of the company's assets, liabilities, and net worth at a certain point in time that does not reflect income earned but not yet paid and expenses incurred but not yet paid, does not accurately reflect the company's true financial condition. Income statements and balance sheets absent this information are therefore of limited value to management in assessing the financial condition of the company, and are entirely inadequate for use by lenders, sureties, and others outside the company who have an interest in a depiction of the company's financial position.

The accrual method is the second basic accounting procedure, and is the one most commonly used by all but the smallest construction companies. Under the accrual method of accounting, income

is actually taken into account in the fiscal period during which it is earned, regardless of whether payment has actually been received. Similarly, items of expense are entered into the accounts as the expenses are incurred, whether or not they have actually been paid during the reporting period. The accrual method of accounting and income recognition is also more complicated, because by this method a connection is maintained on a continuous basis between the revenues earned and the associated expenses. The accrual accounting method requires a more elaborate system of accounting procedures and records. However, the accrual method is generally accepted as the accounting method that provides the most accurate and realistic portrayal of the financial condition of a business enterprise at any moment in time.

## 9.4 ACCOUNTING FOR LONG-TERM CONTRACTS

A long-term contract is defined for tax purposes as one that is not completed within the taxable year in which the contract was formed. Tax codes mandate that one of three methods of accounting must be applied by contractors to their long-term construction contracts: the percentage-of-completion method; the percentage-of-completion capitalized cost method; or the completed-contract method. The three methods differ in the manner in which costs and expenses are matched to project revenue; they also differ in the identification of the period in which the income from a project is taken into account. The basic elements of each of these procedures will be discussed in the sections that follow.

## 9.5 PERCENTAGE-OF-COMPLETION METHOD

The percentage-of-completion method recognizes income and expenses from long-term projects as the work on the project advances. Thus, the profit is distributed and taxes are paid over each of the fiscal years during which the construction project is underway. This method has the advantage of recognizing project income periodically on a current yearly basis, rather than awaiting a summary of income and expenses until projects are completed.

Under this method, gross project income is recognized in accord with the percentage of the project that has been completed during a given fiscal year. The percentage which is used in this regard is the ratio of project costs incurred during the fiscal year to the total estimated contract cost, including any revised amounts (as from change orders), to complete the work. Applying this percentage of completion to the total contract price and then deducting the applicable project costs incurred to this point yields the net project income or loss for the fiscal year involved. The major weakness of this procedure is its dependency on estimates of costs that will be incurred to complete the work, a value that can be subject to considerable uncertainty at times.

## 9.6 PERCENTAGE-OF-COMPLETION CAPITALIZED COST METHOD

An alternative to the percentage-of-completion method of reporting income from long-term construction projects is the percentage-of-completion capitalized cost procedure. When this method is used, 90 percent of the revenues and expenses for the contract are accounted for using the percentage-of-completion method as described in the preceding section. The remaining 10 percent of the project costs are taken into account using the completed-contract method, which will be discussed in the following section. Thus, it can be seen that the percentage-of-completion capitalized cost method of accounting is a hybrid between the percentage-of-completion method and the completed-contract accounting methods. There are regulations in the tax code that prescribe the conditions pertaining to the contractor's use of this accounting method.

## 9.7 COMPLETED-CONTRACT METHOD

The completed-contract method of accounting recognizes project income and expenses only after the completion of the construction project. When this accounting method is employed, project costs are accumulated during construction, using what is referred to as extended-period cost capitalization, meaning that construction costs are capitalized over the duration of the project. The scope of contract costs that must be capitalized includes not only the costs directly related to the project but also indirect costs (overhead costs) that are attributable to the project. Costs such as general and administrative expenses and interest expense related to the performance of the contract are also included in the costs that must be capitalized.

By definition, the use of the completed-contract method of accounting requires clear delineation of project completion. What actually constitutes the completion of a contract for income-reporting purposes has been the subject of varying interpretations by the courts. Present practice tends largely to establish completion as having taken place when all of the work has been finalized and accepted by the owner. However, other interpretations have held that a contract is complete when the point of "substantial completion" has been reached.

No matter how the completion of the project is defined, however, the tax code stipulates that the completion of a contract may not be delayed by the contractor if the principal purpose is to defer federal income tax and/or other taxes. Additionally, federal tax regulations apply definitions and restrictions with regard to when and in what manner a contractor may use the completed-contract method.

The completed-contract method can be advantageous when, on long-term contracts, the contractor cannot accurately predict the economic results of its future contract performance. Frequently, project uncertainties preclude the making of accurate estimates of profits to be earned. Another advantage of the completed-contract method is the fact that payment of income taxes is deferral until the contract has been completed and final payment has been collected. By the same token, however, recognition of losses from the performance of a project is also deferred.

A disadvantage of the completed-contract method is that it does not reflect current performance for long-term contracts, and may result in irregular recognition of income. In some instances, this may result in greater income tax liabilities. Another potential disadvantage of this accounting method is that the year of completion of a project can be subject to considerable uncertainty if the end of the project coincides with the end of the accounting period, or especially if there are disputed claims remaining unsettled at the end of that year.

## 9.8 FINANCIAL STATEMENTS

At intervals of time called accounting periods, a determination can be made of the financial condition of a business enterprise. Accounting periods can be of variable length, such as one month, one quarter, or one year. The length of the accounting period is determined by company management policy, by management needs for this information, and by standard accounting practice, as well as by the need of external agencies to be informed concerning company financial strength.

Accounts are closed (summarized) at the end of each accounting period, and relevant statements are prepared that depict the financial position of the company at that time. Several forms of financial statements are typically derived from the company books of account. It is the purpose of such statements to group together and organize significant facts in a manner that will enable the person reading them to form an accurate judgment concerning some aspect of the company operation, such as the

overall financial condition of the organization, or the profit-loss results of its operations. As would be expected, much of the usage of a company's financial statements is made by company management itself. These reports are invaluable for determining current status, as well as for the advance planning of company operations. Additionally, these documents reflect the company's borrowing capacity and bonding capacity. In addition, they provide a great deal of information concerning company policies with respect to elements of company operation such as purchasing, equipment ownership, and office overhead.

Additionally, these financial statements serve many important functions with respect to a number of external agencies that have an interest in the company and need this information. Bankers, sureties, insurance companies, equipment dealers, credit-reporting agencies, and clients and potential clients of the construction firm are all concerned with the contractor's financial status and profit experience. Stockholders, partners, and others having a proprietary interest in the company and its operations use these statements to obtain information concerning both the company's financial condition and the status of their investment. The two financial statements that are of primary importance are the income statement and the balance sheet. Each will be defined and discussed in the following sections.

## 9.9 THE INCOME STATEMENT

The income statement is an abstract of the nature and amounts of the company's income and expense for a given period of time, usually a quarter or full fiscal year. This document may also be known by the following terms: profit and loss statement, statement of earnings, statement of loss and gain, income sheet, summary of income and expense, profit and loss summary, statement of operations, and operating statement. This statement shows the profit or loss as the difference between the income (revenue) received and the expenses paid out during the period. Figure 9.2 is an example of an income statement for the Blank Construction Company, Inc., for the fiscal year ending December 31, 20—. The following paragraphs, keyed to the lowercase letters in parentheses as they appear in Figure 9.1, explain the various items.

**(a)** This statement has been prepared on a completed-contract basis.

Project income is the total contract value of all projects completed during the period covered by the statement.

The total is obtained from a supporting schedule that shows the income figures for each completed project.

**(b)** Project costs include all materials, labor, equipment, subcontracts, project overhead, and other expenses that have been charged to the completed projects.

A supporting schedule of job costs lists these expenses for the individual projects.

Included with job costs is the general overhead expense that has been allocated to the completed projects.

General overhead is periodically distributed among the various projects in proportion to the costs incurred by those projects during the period.

**(c)** Subtracting project costs from project income yields net project income for the statement period.

**(d)** Other income lists the net income received from other sources.

**(e)** Total net income before taxes is the amount realized from all operations during the statement period.

The Blank Construction Company, Inc.

Portland, OHIO

INCOME STATEMENT

For the year ending December 31, 20-

| ITEM | | TOTAL |
|---|---|---|
| (a) Project Income: | $8,859,138.39 | |
| (b) Less Project Costs, including office overhead expense of $239,757.04 | $8,705,820.15 | |
| (c) Net Project Income | $153,318.24 | $153,318.24 |
| (d) Other Income: | | |
| Discounts Earned | $23,064.93 | |
| Equipment Rentals | $23,758,93 | |
| Miscellaneous | $12,882.64 | |
| Total Other Income | $59,706.50 | $59,706.50 |
| (e) Net Income Before Taxes on Income | | $213,024.74 |
| (f) Less Federal and State Taxes on Income | | $97,616.66 |
| (g) Net Income After Taxes on Income | | $115,408.08 |
| Retained earnings: | | |
| (h) Balance, January 1, 20- | $106.127.24 | |
| (i) Dividends Paid | $36,880.00 | |
| Total Retained Earnings | $69,247.24 | $69,247.24 |
| (j) Balance, December 31, 20- | | $184,655.32 |
| (k) Earnings Per Share on Net Income | | $40.06 |

**Figure 9.2** Income Statement for the Blank Company

**(f)** Net income after taxes is the amount available for company expansion or for distribution to stockholders.

**(g)** This sum is the earnings accumulated as of the start of the statement period.

A corporation can retain its earnings for business purposes or distribute them as dividends to the stockholders.

However, there is an accumulated-earnings tax that is a penalty tax applicable to corporate earnings which are accumulated for the purpose of avoiding income tax to its shareholders by permitting profits to accumulate in the corporation.

The allowable amount of retained earnings accumulation for use in meeting business needs, and the tax rate applicable to amounts exceeding this sum, are determined by the tax code.

**(h)** Dividends paid represent distribution of earnings made to stockholders in the form of dividends on common stock during the statement period.

This construction company has 4610 shares of common stock outstanding. A dividend of $8 per share was declared and paid during the fiscal year just ended.

**(i)** The balance represents the total retained earnings of the corporation through the end of the report period.

**(j)** In a corporate form of business, it is usual for the income statement to show net earnings for the year (after taxes) per share of outstanding stock.

It should be recognized that an income statement has several limitations. Concentrating as it does on past events, the income statement reports only the company's profit or loss experience during the reporting period. It does not show the present overall financial condition of the firm. Additionally, it should be understood that in the highly competitive and unpredictable construction industry, the profit or loss reported on the income statement at any point in time, is not always indicative of the management quality of the company.

## 9.10 THE BALANCE SHEET

The balance sheet presents a summary of the assets, liabilities, and net worth of the company at a particular point in time. Balance sheets are commonly prepared at the close of business on the final day of a fiscal year, but can be prepared at any time to meet the needs of company management or an external entity. Balance sheets are universally used to describe the financial condition of business concerns of all kinds.

The basic balance sheet equation may be stated as follows: Assets = Liabilities + Net Worth. The balance sheet presents in analytical form all assets, including company-owned property, or interests in property, and the balancing claims of stockholders or others against this property. The foregoing equation expresses the equality of assets to the claims against these assets. Assets are defined as anything of value, tangible or intangible. Liabilities involve obligations for the payment of assets, or obligations to render services to other parties. Net worth is obtained as the excess of assets over liabilities, and represents the contractor's equity in the business. The term *contractor* is used here in the broad sense, meaning proprietor, partners, or stockholders.

The balance sheet may also be referred to by other names: statement of financial condition, statement of worth, or statement of assets and liabilities. A representative example of a contractor's balance sheet is depicted in Figure 9.3, the balance sheet for Blank Construction, Inc., on the last day of the year. Company assets are shown on the left side of the balance sheet and liabilities and net worth on the right side.

The major headings of Figure 9.3 are further discussed in the paragraphs that follow, in terms of reference to the parenthesized alphabetical characters such as (a) in the balance sheet.

**(a)** Current assets include cash, materials on hand, and other resources that may reasonably be expected to be sold, consumed, or realized in cash during the normal operating cycle of the business.

When the business has no clearly defined cycle, or when several operating cycles occur within a year, current assets (and current liabilities) are construed on a 12-month basis.

This one-year-cycle rule applies to most contractors.

Prepaid expenses represent goods or services for which payment has already been made and which will be consumed in the future course of operations.

**(b)** Noncurrent notes receivable are in the nature of deferred assets, representing the value of notes that become receivable at some future date or dates.

**(c)** Property represents the fixed assets of the business.

These assets are more or less permanent in nature and cannot readily be converted into cash, at least not in amounts commensurate with their true values to the contractor.

These assets generally have a useful life of several years, although assets such as buildings, equipment, vehicles, and furnishings do wear out gradually.

THE BLANK CONSTRUCTION COMPANY, INC.

PORTLAND, OHIO

BALANCE SHEET
December 3, 20-

| ASSETS | | LIABILITIES | |
|---|---|---|---|
| (a) CURRENT ASSETS: | | (f) CURRENT LIABILITES: | |
| Cash on hand and on deposit | $389,927.04 | Accounts payable | $306,820.29 |
| Notes receivable, current | $16,629.39 | Due subcontractors | $713,991.66 |
| Accounts receivable, including retainage of $265,686.39 | $1,222,346,26 | Accrued expenses and taxes | $50,559.69 |
| | | Equipment contracts, current | $2,838.60 |
| Deposits and miscellaneous receivables | $15,867.80 | Provision for income taxes | $97,616.66 |
| | | Total | **$1,171,826.90** |
| Inventory | $26,530.14 | | |
| Prepaid expenses | $8,490.68 | (g) DEFERRED CREDITS: | |
| TOTAL CURRENT ASSETS | **$1,679,791.31** | Income billed on jobs in progress on December 31, 20- | $2,728,331.36 |
| (b) NOTES RECEIVABLE, NONCURRENT | **$12,777.97** | Costs incurred to Decemeber 31, 20- on completed jobs | $2,718,738.01 |
| (c) PROPERTY: | | Deferred credits | $9,593.35 |
| Buildings | $55,244.50 | TOTAL CURRENT LIABILITIES | $1,181,420.25 |
| Construction equipment | $388,289.80 | EQUIPMENT CONTRACTS, NONCURRENT | $7,477.72 |
| Motor vehicles | $97,576.04 | (h) TOTAL LIABILITIES | **$1,188,897.97** |
| Office furniture and equipment | $23,596.18 | | |
| TOTAL PROPERTY | $564,706.52 | NET WORTH: | |
| (d) Less accumulated depreciation | $422,722.51 | (i) Common stock, 4,610 shares | $461,000.00 |
| NET PROPERTY | **$141,984.01** | Retained earnings | $184,655.32 |
| | | (j) TOTAL NET WORTH | **$645,655.32** |
| (e) TOTAL ASSETS | **$1,834,553.29** | (k) TOTAL LIABILITIES AND NET WORTH | **$1,834,553.29** |

**Figure 9.3** Balance Sheet for the Blank Company

These assets are capitalized at their purchase prices, or in accordance with appropriate cost appraisals in standard accounting practice.

**(d)** Accumulated depreciation represents the total decrease in value of the property as a result of age, wear, and obsolescence.

Depreciation is more fully discussed in sections to follow in this chapter.

**(e)** Total assets is the sum of everything of value that is in the possession of or is controlled by the company.

**(f)** Current liabilities are debts that become payable within a normal operating cycle of the business [see Item (a)].

It is presumed that payment will be made from current assets.

**(g)** In the example, the Blank Construction Company, Inc., is using the completed-contract method of reporting income.

Deferred credits represent the excess of project billings over related costs on current contracts that have not reached completion by the end of the reporting period.

This is treated as a current liability because the company is required to render services in the future, and payment has already been made for these services.

If the contractor had underbilled, that is, if the billings were less than related costs, the resulting amount would be treated as a current asset.

**(h)** Total liabilities is the sum of every debt and financial obligation of the company.

**(i)** This is the capital stock account, showing the classes and amounts of stock that have actually been issued and paid for by the stockholders.

In the example, 4,610 shares of $100 par-value common stock have been purchased by the owners.

**(j)** This represents the net ownership interest the corporation "owes" to the stockholders.

In the example, this amount is calculated as the sum of the common stock investments plus retained earnings (also called earned surplus).

The book value of the common stock as of December 31, 20—, is obtained by dividing $645,655.32 (the total net worth of the firm) by 4,610 (the number of shares of common stock sold), which yields a value of $140.06 per common share.

The determination of the book value of common stock excludes intangibles of all kinds that would have no value on liquidation.

The market value of this common stock, that is, the price for which the stock can be sold, may differ substantially from the book value of the stock.

What shares of stock are truly worth in a closely held corporation can be very difficult to determine. Yet such a value may be needed for estate, gift, or income tax purposes. The Internal Revenue Service has issued guides to assist in determining the value of closely held shares.

**(k)** The equality of (e) to (k) illustrates that Total Assets = Total Liabilities + Net Worth.

The balance sheet is of considerable analytical value for those who wish to determine the financial condition of a firm. It discloses the nature and composition of a company's assets and shows how these assets are financed. The sources of funds tell a great deal about the quality of management and the stability of a contractor. The balance sheet also provides a good indication regarding the liquidity of a firm, that is, its ability to meet its short-term financial obligations. A comparison of balance sheet values over time discloses trends in the company's management policies and in the company's financial position.

There are also some shortcomings associated with balance sheets. The balance sheet information applies as of a specific date, and may not be representative of the normal company financial condition. Additionally, some asset values may be approximate determinations, and the person reading the balance sheet is left to determine the true value in his or her perception. It is also true that the accounting method used for the preparation of a balance sheet can appreciably influence the data presented.

## 9.11 FINANCIAL RATIOS

Financial ratios of various kinds are frequently utilized, both by company management internally and by external constituents of a company, as quantitative guides for the assessment of a company's financial and earning position. A number of different ratios can be used to extract further information from, and to further analyze, a company's income statements and balance sheets.

It is not as much the absolute size of the figures in the income statement and balance sheet documents that is meaningful to the financial analyst, but rather the relationships or ratios among the different values. By comparing the same ratios over a series of financial reports, the interested person can extract very significant information, and can paint a very accurate picture, regarding a company's financial performance over a span of time. Additionally, when such ratios are compared

with the similar figures of other contractors, a comparative financial picture of the businesses is obtained.

A number of different ratios can be used to provide company management as well as external analysts with guidance concerning the financial condition of the firm, and to point to areas that need attention. Four different types of ratios are in widespread usage:

1. *Liquidity ratios*. These measures reveal a company's ability to meet its short-term financial obligations.
2. *Activity ratios*. These ratios indicate the level of investment turnover and provide information with regard to how well the company is using its working capital and other assets.
3. *Profitability ratios*. These values relate overall company profits to various parameters such as contract volume or total assets.
4. *Leverage ratios*. These ratios compare company debt with other financial measures such as total assets or net worth.

Some financial ratios that are commonly used by construction contractors are illustrated in Figure 9.5. The value of each ratio has been computed for the Blank Construction Company, Inc., using data from the company's income statement and balance sheet. The values taken from the income statement and balance sheet for the calculation of the ratios illustrated are summarized in Figure 9.4.

This company is represented to be a building contractor whose overall financial condition is relatively good. In brackets next to each ratio obtained for the Blank Construction Company, Inc., national median ratios for commercial building contractors as reported by the Risk Management Association, are indicated. The Risk Management Association (www.rmahq.org) is an organization that works as a consultant to banks and lending institutions. Such median values change from year to year and vary with the size of the contractor and the type of construction involved, so the values given are for illustrative purposes only.

The data in Figure 9.4 are taken from the documents illustrated in Figures 9.2 and 9.3.

The ratios and values cited in brackets at the far right in Figure 9.5 above are illustrative of contractors' financial experience in general, on a national average basis. The ratios for an individual contractor can, and often do, vary substantially from these median values. Nonetheless, to the trained eye such financial ratio tells a great deal about the business, and its financial condition, and the quality of its management.

| | | |
|---|---|---|
| Current Assets | = | $1,679,791.31 |
| Inventory | = | $26,530.14 |
| Quick Assets = Current Assets Minus Inventory | = | $1,653,261.17 |
| Current Liabilities | = | $1,181,420.25 |
| Total Assets | | $1,834,553.29 |
| Total Liabilities | = | $1,188,897.97 |
| Fixed Assets | | $141,984.01 |
| Net Worth | = | $645,655.32 |
| Net Working Capital = Current Assets Minus Current Liabilities | = | $498,371.06 |
| Net Project Income (Before Taxes) | | $153,318.24 |
| Project Income | | $8,859,138.39 |

**Figure 9.4** Information from Income Statement and Balance Sheet Used for Calculating Financial Ratios

| | | | | | |
|---|---|---|---|---|---|
| 1. | Quick ratio<br>Current assets to current liabilities | $\frac{\$1,653,261.17}{\$1,181,420.25}$ | = | 1.40 | [1.20] |
| 2. | Current ratio<br>Current assets to current liabilities | $\frac{\$1,679,791.31}{\$1,181,420.25}$ | = | 1.42 | [1.30] |
| 3. | Total liabilities to net worth | $\frac{\$1,188,897.97}{\$645,655.32}$ | = | 1.84 | [2.0] |
| 4. | Project income to net working capital | $\frac{\$8,859,138.39}{\$498,371.06}$ | = | 17.8 | [17.9] |
| 5. | Project income to net worth | $\frac{\$8,859,138.39}{\$645,655.32}$ | = | 13.7 | [9.9] |
| 6. | Fixed assets to net worth | $\frac{\$141,984.01}{\$645,655.32}$ | = | 0.22 | [0.30] |
| 7. | Percent net project income (before taxes) to project income | $\frac{\$153,318.24}{\$8,859,138.39}$ | = | 1.73 | [1.60] |
| 8. | Percent net project income (before taxes) to net worth | $\frac{\$153,318.24}{\$645,655.32}$ | = | 23.70 | [19.1] |
| 9. | Percent net project income (before taxes) to total assets | $\frac{\$153,318.24}{\$1,834,553.29}$ | = | 8.5 | [5.5] |

**Figure 9.5** Financial Ratios for the Blank Company

## 9.12 SIGNIFICANCE OF RATIOS

Each of the various financial ratios conveys its own message. The significance of the ratios determined in the previous section is further discussed next.

- *Quick assets to current liabilities (quick ratio)*. This ratio shows the number of dollars immediately available to cover current debt of the enterprise. When this ratio is 1.0 or larger, the business is said to be liquid, and the ratio is usually considered to be adequate.
- *Current assets to current liabilities (current ratio)*. This ratio is widely considered to be the most significant short-term financial measure. It is a test of the firm's ability to meet its current obligations. The higher the ratio, the greater the assurance that short-term debts can be paid. In the construction industry, a Current Ratio of at least 1.5 is generally regarded as being favorable.
- *Total liabilities to net worth (debt to equity ratio)*. Indicates the relative amounts that creditors and owners have invested in the business. Values of 1.0 to 2.0 for this ratio are usually considered to be acceptable in the construction industry.
- *Project income to net working capital and project income to net worth*. Both of these ratios convey the same general message. These ratios measure the rate of capital turnover, showing how actively the firm's capital is being put to work. If capital is turned over too rapidly, liabilities can build up at an excessive rate. If the ratios are too low, funds become stagnant and profitability suffers. In construction, these ratios are typically higher than in most other industries. These relatively high values partially explain why entry into the construction business is

so easy. A construction contractor can perform more work per dollar of invested capital than is possible for workers in most other industries.

- *Fixed assets to net worth*. This ratio is one that can vary greatly from one construction type to another, being much higher for engineering construction than for building construction. In general, a higher value in this ratio is undesirable because heavy investment in fixed assets (principally equipment for an engineering construction firm) indicates the firm may have low net working capital, or may indicate that the company has incurred substantial funded debt to supplement working capital.
- *Percent net project income (before taxes) to project income*. This ratio reveals the average profit margin realized on the field work that is performed by the company. This figure is typically small in the construction industry and reveals why the rate of contractor business failures is as high as it is. It does not require much of a change to raise the cost of a project by a percent or two, and to change the project from being profitable to incurring a loss for the contractor.
- *Percent net project income (before taxes) to net worth*. This is perhaps the most important of the long-term ratios because it reflects the efficiency with which invested capital is employed. Considering the risk, the contractor should expect to earn more on its investment than it could realize from current market dividend or interest rates.
- *Percent net project income (before taxes) to total assets*. This ratio relates company profits to the level of assets available to earn a profit. Smaller construction corporations may have somewhat lower profitability ratios that can be at least partially explained by the respectable salaries of company officers.

In most companies, a significant proportion of company gross profits is often taken in the form of personal salaries.

## 9.13 CONSTRUCTION EQUIPMENT ACQUISITION

For contractors such as highway and heavy construction contractors, whose business operations require substantial spreads of construction equipment, the manner in which the necessary units of equipment are acquired is an important business determination. Likewise, for building construction and industrial contractors who have need for large cranes and materials handling machinery, a very careful analysis is likewise important for the business.

Construction equipment of all kinds is very expensive. Additionally, this equipment operates on a construction site in an environment that requires major support in the form of maintenance, repairs, and parts. Deliberate management analysis and decision-making are necessary in order to maximize the contractor's investment or expense in the acquisition of the equipment that is needed for the performance of the work.

The historical pattern of equipment acquisition in the construction industry has been for the contractors to purchase and own the machines and equipment necessary for the conduct of their business. However, many contractors are coming to the realization that construction equipment is a very costly business asset that must be carefully managed in all of its aspects. Frequently today, many contractors are analyzing their equipment needs more carefully, and are availing themselves of other alternatives in addition the purchase option for their equipment.

For contractors whose construction equipment consists of units that receive regular and substantial usage in the contractor's field operations on construction projects, purchase of new or used

equipment is the most common method of acquiring the machines that are needed. Considerations such as the nature of the contractor's present and anticipated future need for a piece of equipment, first cost and ownership cost, operating cost, production rate, unit size and capacity, model reliability and ruggedness, risk of obsolescence, and how the unit will fit in with the inventory of the contractor's existing equipment, all are important aspects of the determination. A major consideration in the purchasing decision is how the acquisition is to be financed.

When purchasing equipment, the contractor is well advised to investigate the source from whom to buy the equipment. Most contractors have found that equipment obtained from full service, factory-authorized distributors will usually cost more on a first-cost basis, but can offer added value in terms of customer support, service and parts support, product warranties, trade-ins, and other purchase options. It is common for most major equipment manufacturers and distributors to offer financing plans, sometimes at very attractive rates.

Most construction firms that have a relatively stable volume of work within a limited geographic area continue to find it desirable and economical to own their own fleets of construction equipment. However, contractors are increasingly finding that renting or leasing their construction equipment is economically preferable to ownership. Equipment management now requires that the contractor treat his equipment as an independent profit center, and to carefully evaluate every aspect of equipment acquisition and utilization.

Although the direct cost and short-term costs of equipment rental can be substantially higher than for either ownership or leasing, renting construction equipment can have advantages. For example, rental can provide an advantageous way in which to keep the work progressing when there is an equipment breakdown on a project, or to meet specialty job requirements or times of peak demand on the project. Rental can also prove to be a very efficient option in situations where there will be low-percentage utilization of a machine, and for short-term peak or seasonal use. Rental can be a valuable option when the job site is far removed geographically from the contractor's other operations, or for providing specialized items that the contractor may have limited use for in the future.

Rentals may also be considered as a method by which the contractor can evaluate equipment for consideration for possible subsequent purchase. Because of the high purchase price and investment cost of large equipment, rental can conserve company capital and can result in a better ratio of assets to liabilities.

When equipment is rented, it is usually not rented for a guaranteed period and therefore can be returned at any time. Equipment maintenance and repair are the responsibility of the dealer or rental yard, resulting in savings in time and expense for the contractor. These savings can offset, at least to a degree, the higher cost per unit of time for a rental.

Numerous equipment centers now specialize in the rental of construction equipment. Rental rates normally vary with the length of time the unit is needed, with short-term rates typically being higher than long-term rentals. Additionally, many rental centers can arrange rental-purchase programs where the contractor has an option to purchase.

Leasing provides another commonplace and widely used means of a contractor's acquiring construction equipment. Most construction equipment leases are written for a term of one year or longer.

Leasing equipment offers a number of potential financial advantages for the contractor. Leasing can be a useful step between renting and buying. Usually, the cost of leasing is considered as an operating expense, not a liability as with a bank loan for equipment purchase. Leasing can improve a contractor's working capital position by avoiding having funds tied up in expensive fixed assets. An equipment lease can be structured so that there is no initial cash outlay, enhancing the contractor's liquidity position. Additionally, certain tax advantages can accrue with leasing. Under certain

circumstances, lease payments may compare favorably with ownership costs. Additionally, many leases provide that at the expiration of the lease period, the contractor has a purchase option, if there is a continuing need for the machine, and if he believes the machine to be worth the additional payment.

## 9.14 EQUIPMENT MANAGEMENT

Many contractors own extensive spreads of equipment, or major pieces of equipment that they use to accomplish the work on their construction projects. As noted earlier, construction equipment is very expensive, in terms of first cost and also in terms of ownership and operating costs. The contractor's investment in his equipment inventory can easily run into the millions of dollars.

Equipment purchase is economically justified only when the purpose of the equipment is to make money for the contractor. However, equipment will produce the expected income only if it is properly managed. Equipment ownership must be carefully analyzed and managed in the same manner as any other capital investment.

In the case of construction equipment, effective management involves making informed judgments about equipment acquisition and financing, establishing a comprehensive preventive maintenance program, and maintaining accurate and current records of equipment income, expense, usage, and production rates. Additionally, the contractor will find it necessary to establish appropriate company policies with regard to equipment operation and usage, and maintenance and repairs. In addition, the contractor will need to establish policies with regard to equipment replacement.

A rigorous preventive maintenance program is essential to profitable equipment utilization and management. Equipment downtime has a serious detrimental effect on project costs and schedules. A contractor's preventive maintenance program must be tailored to its own equipment specifications as well as to the job site conditions where the equipment is in operation. Special attention must be given to those machines that are critical to a project, that is, those machines whose downtime would have a particularly severe impact on production, and costs, and schedules. Therefore, proper maintenance is essential so as to minimize unanticipated equipment downtime.

Once equipment has been purchased, the contractor attempts to recover the acquisition costs by using it in order to perform work and generate revenue, and by realizing the residual value of each machine upon its final disposition. The accounting procedures that are used to allocate or to "charge" equipment costs to the construction projects where the machinery is utilized, vary substantially from one contractor to another. However, a common procedure is to establish an internal rental rate for each piece of equipment, a topic discussed previously in this chapter and also in Chapter 5.

In basic terms, the contractor will account for the ownership and operating costs of each machine he owns, with operating costs including an allowance for maintenance and repairs. These calculations produce an "internal rate," dollars per day, or week, or month for the contractor's owning and operating the machine.

During the progress of work in the field, a charge equal to the internal rental rate multiplied by the number of equipment hours, weeks, or months the equipment is used on the project is entered as an equipment cost against the project. At the same time, an equal but opposite credit is made to the contractor's central ledger account for that equipment unit. This is the same equipment accounting procedure previously discussed, where all items of expense, exclusive of operating labor, and hours of usage are continuously maintained for that equipment item.

In a business sense, what the contractor is doing is establishing in his accounting procedures a system that is similar to a separate company that owns, services, and maintains all of his major

equipment and rents it to the contractor at predetermined rates. This equipment accounting procedure provides a cumulative record of expense and earnings for each major equipment unit.

Analyzing how these figures compare from one piece of equipment to another, as well as how these costs compare to other equipment acquisition options such as renting or leasing, provides company management with invaluable information concerning the management of the company's equipment assets. In short, the company knows which machines are paying their way and which are not. Many construction firms have a company policy that provides that when the annual cost of an equipment item exceeds its annual earnings, it is to be either replaced or sold.

A number of construction companies treat their equipment division as a separate profit center within the company. This simply means that the equipment investment is treated as a separate business, with the return on the investment required to be commensurate with the risk. Whether a contractor expects a breakeven performance or a profit on its equipment investment is a matter that depends on company management philosophy and is translated into company policy.

The replacement of a large equipment item is a major decision on the part of the contractor, and one that requires careful analysis and considerable study. Deciding on the replacement life and the replacement time for a piece of equipment is accomplished by construction contractors in different ways. However, it is a well-established axiom of equipment ownership that the replacement life for a piece of equipment is not the age at which the machine is no longer able to produce, but rather, replacement life is the equipment age that optimizes its advantage to the owner.

Methods of analysis are available to assist contractors in determining the point in time where the production costs of the machine are at a minimum. Another form of study can establish when profits earned by the equipment item are at a maximum. Various forms of discounted cash flow models are also available. Financial analysts and consultants are also available, who can assist contractors in making these determinations.

Associated with the replacement of certain equipment types, is the possibility of rebuilding a presently owned unit rather than replacing it. The cost of rebuilding a machine is normally one half or less of the purchase price of new equipment. This can provide an efficient way to extend the life of older machinery and restore its original productivity. This procedure may be an attractive alternative for contractors who may have difficulty supporting the financing of new equipment models.

In summary, it can be said that every construction firm that owns significant amounts of equipment needs to have some formal system of analysis in order to indicate the most advantageous time to replace or to rebuild a given major piece of equipment. In a general sense, when the average time rate of expense for a given machine exceeds the historical rate of similar machines, it needs replacement or rebuilding.

## 9.15 EQUIPMENT DEPRECIATION

From the day of its acquisition, most business property, including construction equipment, steadily declines in value because of age, usage, wear, and obsolescence. This reduction in value is called depreciation and represents a cost of doing business for the contractor. Depreciation pertains to the physical depletion of capital assets the contractor owns, such as offices, warehouses, vehicles, computers, furniture; and it certainly pertains to construction equipment of all kinds as well. Because of the continuing decline in the value of such property, its cost must be amortized over its useful life so that the contractor recovers his investment cost and has capital available when replacement of the property becomes necessary. This entire process is referred to as depreciation and depreciation analysis.

Equipment depreciation is an especially important matter for contractors who own large fleets of equipment, and/or individual pieces of expensive equipment. The average contractor specializing in heavy and highway work may well have an equipment investment of $15 million or more, which may be 20 times that of a building contractor who has a comparable contract volume.

Depreciation costs for equipment-oriented contractors account for an appreciable portion of their annual operating expense. Basically, depreciation systematically reduces the value of a piece of equipment on an annual basis. The sum of these reductions at any time is called a depreciation reserve, which, when subtracted from the initial cost of the equipment, yields the current book value for the asset.

The initial cost of an asset, for depreciation purposes, includes not only the sale price, but also the costs of taxes, freight, unloading, assembly, delivery, and setup or rigging expenses. The book value represents that portion of the original cost that has not yet been amortized. As previously noted, depreciation costs represent a cost of doing business for the contractor, and in accrual accounting, these costs correspondingly reduce company earnings. At the same time, the depreciation reserve represents capital that is retained in the business, ostensibly for the ultimate replacement of the capital assets being depreciated.

## 9.16 STRAIGHT-LINE DEPRECIATION

The simplest and most straightforward method of determining depreciation is called straight-line depreciation. This method writes off the depreciable value of an asset at a uniform rate throughout its service life. Straight-line depreciation assumes, for record-keeping purposes, that the amount of value loss is constant from one year to the next, throughout the service life of the asset.

Some have criticized the use of the straight-line method as being unrealistic, on the grounds that the value decline of the capital item never actually follows such a course. It can certainly be said that most assets decrease in value more rapidly during the early years of their life.

In reality, few would say that the straight-line depreciation procedure accurately measures the actual decline in asset value over a span of time. In this regard, however, it is to be recognized that accurate appraisal of the value of an asset is not the objective of depreciation accounting. Rather, depreciation accounting is concerned with spreading the cost of an asset over its useful life in a systematic and rational manner, rather than attempting to gauge depreciation charges in such a way as to parallel physical decline.

Depreciation accounting should be viewed as a process of allocation, rather than one of valuation. Straight-line depreciation is a method that is widely applied by contractors to their equipment, for internal purposes such as estimating equipment costs, and for equipment cost control on ongoing projects.

Figure 9.6 illustrates the workings of the straight-line depreciation method for a ditching machine whose purchase price was $57,000, which has an expected service life of five years, and whose salvage value is zero. It should be noted that the depreciation for the first and last years of ownership is half the annual rate for five years of ownership (10 percent rather than 20 percent) because tax codes require that in the year in which a piece of capital equipment is purchased and disposed of, its depreciation rate for that year is one half its straight line rate. This figure also illustrates year-by-year depreciation for this machine by the Modified Accelerated Cost Recovery System (MACRS) and MACRS SDA (special depreciation allowance) depreciation methods, which are accelerated depreciation methods to be discussed in the following section.

TRENCHER DEPRECIATION
5-year property
Original Cost = $57,000 Depreciable Value = $57,000

| Placed in Service During | End of Year | MACRS<br>Annual Depreciation Calculation | Accumulated Depreciation | Book Value |
|---|---|---|---|---|
| 2005 | 2005 | 20.00% ($57,000) = $11,400 | $11,400 | $45,600 |
| | 2006 | 32.00% ($57,000) = $18,510 | $29,640 | $27,360 |
| | 2007 | 19.20% ($57,000) = $10,944 | $40,584 | $16,416 |
| | 2008 | 11.52% ($57,000) = $6,566 | $47,150 | $9,850 |
| | 2009 | 11.52% ($57,000) = $6,566 | $53,717 | $3,283 |
| | 2010 | 5.76% ($57,000) = $3,283 | $57,000 | $0 |

| Placed in Service During | End of Year | MACRS Special Depreciation Allowance (SDA)<br>Annual Depreciation Calculation | Accumulated Depreciation | Book Value |
|---|---|---|---|---|
| 2005 | SDA | 30.00% ($57,000) = $17,100 | $17,100 | $39,900 |
| | 2005 | 20.00% ($39,900) = $7,980 | $25,080 | $31,920 |
| | 2006 | 32.00% ($39,900) = $12,768 | $37,848 | $19,152 |
| | 2007 | 19.20% ($39,900) = $7,661 | $45,509 | $11,491 |
| | 2008 | 11.52% ($39,900) = $4,596 | $50,105 | $6,895 |
| | 2009 | 11.52% ($39,900) = $4,596 | $54,702 | $2,298 |
| | 2010 | 5.76% ($39,900) = $2,298 | $57,000 | $0 |

| Placed in Service During | End of Year | Straight-Line Alternative<br>Annual Depreciation Calculation | Accumulated Depreciation | Book Value |
|---|---|---|---|---|
| 2005 | 2005 | 10.00% ($57,000) = $5,700 | $5,700 | $51,300 |
| | 2006 | 20.00% ($57,000) = $11,400 | $17,100 | $39,900 |
| | 2007 | 20.00% ($57,000) = $11,400 | $28,500 | $28,500 |
| | 2008 | 20.00% ($57,000) = $11,400 | $39,900 | $17,100 |
| | 2009 | 20.00% ($57,000) = $11,400 | $51,300 | $5,700 |
| | 2010 | 10.00% ($57,000) = $5,700 | $57,000 | $0 |

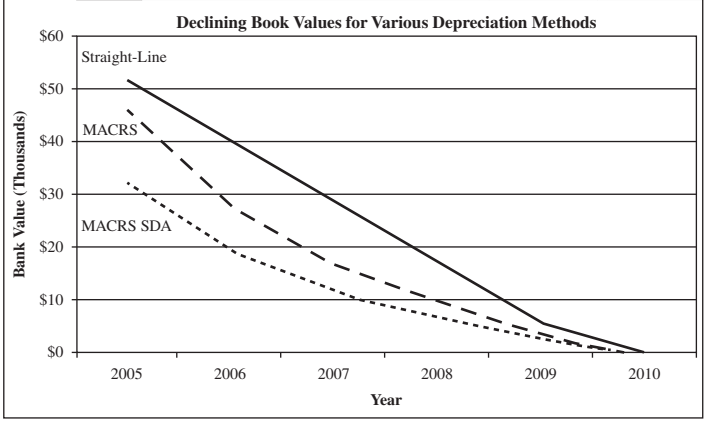



**Figure 9.6** Annual Depreciation of a Trenching Machine by Three Different Methods

## 9.17 ACCELERATED DEPRECIATION

Accelerated depreciation provides the advantage for the contractor of a faster write-off of asset cost during the first years of its life than in the later years. There is considerable opinion that a better matching of revenue and expense is achieved by applying accelerated depreciation methods to construction

equipment, because new equipment is generally more productive than old, and frequently the productivity declines very rapidly after the first few years of use.

The use of procedures that afford larger depreciation deductions during the earlier years of asset ownership may also have other important tax and financial advantages for a contractor. For example, rapid initial depreciation causes cash to be retained in the business, ensuring that cash is available, and enhancing the liquidity of the business. Additionally, larger depreciation charges against regular income in a given year causes a reduction of income taxes for that year.

In addition, accelerated depreciation methods also provide for faster recovery of equipment value, thereby offering the contractor some measure of protection against unanticipated contingencies later in the life of the equipment, such as obsolescence, excessive maintenance, rapid wear, or the need for equipment of a different size or capacity. Additionally, rapid depreciation amortizes the contractor's equipment investment more quickly, and simultaneously decreases the book value at the same rate. Speedy reduction of book value leaves the contractor with much greater latitude to dispose of unsatisfactory equipment and, to some degree, can also assist in combating the problem of obsolescence, or of replacing equipment during periods of inflation. In the usual case, many contractors favor using accelerated depreciation of their equipment and other business assets within the bounds allowed by the tax codes, for purposes of income tax reporting.

## 9.18 MODIFIED ACCELERATED COST RECOVERY SYSTEM (MACRS)

The Economic Recovery Tax Act of 1981 established a detailed depreciation system for business property and has gone through several subsequent revisions. It is currently known as the Modified Accelerated Cost Recovery System (MACRS). This method is required for business income tax reporting and is, basically, an accelerated depreciation procedure with the provision that the owners of an asset can elect straight-line depreciation if they wish. This system is a relatively simple and easy procedure to use. By the provisions of this legislation, equipment life and salvage value are a matter of law rather than negotiation. This system makes it possible to depreciate construction equipment to zero salvage value over time periods that are much shorter than the typical useful life of the equipment.

MACRS identifies several classes of property and defines the allowable depreciation amounts that are calculated as a stipulated percentage of the asset's adjusted cost. The personal property classes of interest to contractors are three- and five-year assets, with the year classification depending upon the property type involved. For example, three-year property includes automobiles and light-duty trucks, while five-year property includes essentially all other contractor equipment.

Using the MACRS procedure, the value of each piece of equipment is decreased annually by the depreciation charge calculated. The sum of these charges at any point in time is a depreciation reserve that, when subtracted from the initial cost of the equipment, yields the current book value of the equipment. The initial cost of an asset, for depreciation purposes, includes not only the sale price but also the cost of taxes, freight, unloading, assembly, delivery, and setup. The book value represents that portion of the original cost that has not yet been charged off or amortized in depreciation. As previously stated, depreciation charges are a cost of doing business and correspondingly reduce company earnings. At the same time, the depreciation reserve represents capital that is retained in the business, ostensibly for the ultimate replacement of the capital assets being depreciated.

Ordinarily, a contractor favors writing off construction equipment as rapidly as possible. This is done by using the prescribed MACRS deduction rates. However, contractors also have the option of using either MACRS accelerated rates or straight-line depreciation for three- or five-year property. Additionally, there are provisions allowing the contractor as taxpayer to depreciate three- and

five-year property over longer periods using straight-line depreciation. These MACRS options seemingly would rarely work to the advantage of a construction firm for income tax reporting.

It is permissible by Internal Revenue Service regulations to employ different depreciation methods for internal financial reporting and tax reporting purposes. Contractors may use straight-line depreciation (or any other conventional procedure) for the preparation of their usual financial statements, and the MACRS accelerated rates for income tax purposes.

Figure 9.6 illustrates how recovery values are obtained using MACRS depreciation. The new $57,000 ditcher is used for purposes of illustration. Under MACRS, the ditcher is classified as five-year property. The depreciation values for both MACRS and straight-line depreciation for the first and last years represent the one-half-year convention rule. This rule mandates one-half year of depreciation for the first year of service, regardless of the time of year service is started. There are numerous other rules and regulations associated with MACRS. The contractor should seek advice on matters pertaining to real property, disposition of property, partial expensing, and other depreciation tax matters from tax specialists and financial advisors.

## 9.19 PROCUREMENT

Procurement, which can be defined as the process by which the contractor obtains the goods and services needed for company operations, is a function of primary importance in a construction contractor's organization. This activity actually includes quite a number of different functions, each playing an indispensable role in the contractor's obtaining what he needs for the performance of projects he constructs, as well as for the functioning of the company.

The procurement function may be structured in several different ways by company management. In some companies, the project manager is responsible for the procurement function for all of the company projects in his or her portfolio. In other companies, project managers and superintendents share in this responsibility. In other firms, procurement is a centralized company operation, sometimes handled by the company operations officer, or by a vice president, or by a person known as an expediter who handles this responsibility.

In some companies, especially larger firms, the procurement function may operate as a separate department within the company structure. Centralizing all procurement functions in one department can be economical in terms of both time and money. It concentrates the expertise necessary to perform this important function, and can afford protection against improper and unnecessary purchasing expenditures of many kinds.

Whatever their title and position in the structure of a construction company, procurement personnel occupy a position of great responsibility within the organization, and typically perform a number of different duties. Performing procurement functions involves the preparation and use of a number of standard document forms such as requisitions, purchase orders, and subcontracts. The principal procurement functions in a typical construction company are discussed in the following paragraphs.

### 9.19.1 Purchasing

Essentially, purchasing is the obtaining of equipment, tools, materials, stores, supplies, fuel, parts, motor vehicles, and services of every sort that are needed by the office organization, the storage yard and warehouse, and the projects which the company is performing. This involves the processing of requisitions, obtaining and analyzing bids, and preparation and issuance of purchase orders. The preparation of purchasing specifications is often involved with regard to the purchase of goods and services that are not related to the company's construction projects.

### 9.19.2 Expediting and Receiving

After an order has been placed, contact must be maintained with the vendor to ensure effective communications which will result in timely delivery. This is particularly important with regard to materials needed for the projects that are under way.

The designation of a required delivery date in a purchase order is no guarantee that the vendor will deliver on schedule. Continuous and energetic follow-up action is a necessity if schedules and delivery dates are to be maintained.

When the needed goods are shipped, adequate arrangements must be made for their receipt, unloading, handling, and proper storage.

### 9.19.3 Inspection

When goods are delivered, they must be inspected immediately so as to assure that they are the correct materials or products and to verify quantity, quality, and other essential characteristics. In the event of shortage, or loss or damage in transit, or erroneous goods shipped, immediate and proper corrective action is required, along with the appropriate documentation. If quality control verification tests are called for, samples must be taken for that purpose, and the tests conducted. A written receiving report should be prepared and filed for each delivery.

### 9.19.4 Shipping

The contractor's purchase order, in most instances, will designate the method by which goods are to be shipped. This is an important aspect of procurement and requires detailed knowledge concerning the different shipping alternatives, and the time and cost implications of each.

In the event of strikes or other disruptive events that can affect the transportation industry, expeditious and innovative changes in shipping arrangements are sometimes needed. Shipments lost or misplaced in transit must be traced and suitable claims made where goods are damaged or lost.

### 9.19.5 Subcontracts

In some companies the procurement function includes the preparation and processing of project subcontract agreements. The essential information needed to do this comes from the estimator or the estimating department. When a general contract change order affects subcontractors, suitable changes to the subcontracts affected must be prepared and processed.

## 9.20 DISCOUNTS BY VENDORS AND SUPPLIERS

Discounts are frequently extended to contractors by material dealers and other vendors as an inducement to attract or to reward their trade or as an incentive for their early payment of statement amounts. Some of these discounts take the form of trade discounts and are often referred to as professional discounts.

Trade or professional discounts typically allow contractors to purchase products at a price less than that which a nonconstruction person would pay at retail. In providing these discounts, vendors are encouraging the trade of the contractor professionals, and are recognizing the quantity in which contractors typically purchase, and the relative ease and effectiveness with which the vendor can

complete a sale with a construction professional. Additionally, trade discounts often include quantity discounts, where the larger the quantity being purchased, the lower the unit price.

Cash discounts are frequently extended in the form of a discount in the statement price, given in exchange for the payment of an invoice before it becomes due. A number of different forms of cash discounts are in commercial usage, and several variations are presented here. The expression "2–10, Net 30" is an example of one of these practices, and is, in fact, fairly commonplace. With this expression the seller is indicating that the buyer can deduct two percent from the invoice or statement amount if payment is made within 10 days of the statement date; otherwise, full payment of the net amount is due in 30 days.

Materials dealers normally date their invoices the day the goods are shipped. If the customer's location is nearby, he has time to take delivery and to check the goods prior to paying within the discount period. A customer who is far removed geographically, however, may not be able to take advantage of the discount unless he pays before the goods are actually received. To overcome this disadvantage to distant customers, some vendors will mark their invoices "ROG" or "AOG" to indicate that the discount period begins upon "receipt of goods" or upon "arrival of goods."

Another form of cash discount provision similar to the previous, is termed *prox,* which means the discount period is expressed in terms of a specified date in the month which follows the shipments being made or billed. The expression "2–10 Prox Net 30" means a 2 percent cash discount is allowed if the invoice is paid not later than the 10th day of the month following the purchase. The net due date of the account is 30 days from the first of that month.

Another common way of expressing this discount structure is "2–10, EOM," which indicates that a 2 percent discount can be taken if the invoice is paid by the tenth day of the month after the purchases are shipped. If the buyer does not make payment within this period, the net amount of the bill is considered to be due at the end of the month thereafter.

For accounting purposes, cash discounts are treated as income, and appear as "discounts earned" on the income statement. This is illustrated in Figure 9.2.

As one considers cash discounts, a two percent discount may at first glance appear to be inconsequential. However, if a contractor purchases a million dollars worth of materials in a year's time, and pays promptly so as to avail himself of the cash discounts, he has increased his earnings in the amount of $20,000. Additionally, when an auditor, a surety company, or a creditor analyzes a contractor's income statement and recognizes that the contractor has not availed himself of discounts offered by vendors, they may view this as a demonstration of inattentive management practices, or as an indicator of cash flow problems or other financial difficulties.

The status of cash discounts is a matter of sufficient importance that it is often called out in cost-plus contracts. While agreement on this point can be negotiated in different forms, it is fairly common in such agreements for the contract language to provide that all cash discounts accrue to the contractor, except when the owner has advanced money to the contractor from which to make payments to the supplier. Cost-plus contract documents written by the American Institute of Architects (AIA) reflect this policy. However, some forms of cost-plus contracts stipulate that the reimbursable cost of materials shall be decreased by the amount of any cash discounts taken, without regard to who provides the funds to make payment.

## 9.21 TITLE OF PURCHASES

Most contractors regularly purchase appreciable quantities of construction materials. During the process of transport, delivery, unloading, handling, and storage of these materials, a variety of loss or

damage can and does occur. When such difficulties arise, the mutual rights and responsibilities of the buyer and of the seller are largely controlled by the Uniform Commercial Code. Normally, the risk of loss or damage as related to personal property rests with the person holding title. When a loss occurs, the responsibility for the loss, and the rights of each party as buyer or seller, are based on whether title of the goods has passed from seller to buyer at the time the loss occurred. For this reason, the time at which the title of a purchase passes from the vendor to the contractor is a matter of considerable importance.

In a fundamental legal sense, title to personal property that is the basis of a sale passes from seller to buyer at the time when the parties intend for it to pass. If the sales contract or purchase order states or clearly implies at what time title is to pass, the terms of the agreement will prevail. It is seldom, however, that the parties to a sales agreement insert specific provisions concerning the point at which passage of title occurs.

Consequently, the Uniform Commercial Code has established a standard set of rules for application to matters of this kind. In the absence of any expressed intention to the contrary, title passes in accordance with the following general rules.

### 9.21.1 Cash Sale

Agreements that call for delivery and payment to take place concurrently are called cash sales. Title of the goods passes when the goods are paid for and delivery takes place.

### 9.21.2 On-Approval Sale

When goods are delivered to the buyer on approval or trial, title changes when the buyer indicates acceptance, when the goods are retained beyond the time fixed for their return, or when the goods are retained beyond a reasonable time.

### 9.21.3 Sale or Return

Title passes when goods are delivered to the buyer. However, the buyer has the option to return the goods within a fixed period of time.

### 9.21.4 Delivery by Vendor

If the purchase order requires the seller to deliver the goods to the buyer's destination and delivery is made by the seller himself, the seller retains title until the goods are delivered.

### 9.21.5 Shipment by Common Carrier

There is a general rule that when the goods are shipped by common carrier to the buyer, title passes to the buyer when the seller delivers the goods to the carrier for transportation.

However, the following exceptions apply:

- When the seller fails to follow shipping instructions given by the buyer, such as the buyer naming a particular carrier and the seller shipping by another.
- When the seller is required to deliver at a particular place, such as the buyer's dock or railroad siding.

- When the seller is required to pay freight up to a given point, as in FOB agreements.
- When the seller is required by purchase order or by custom to make arrangements with the carrier to protect the buyer, as by declaring the value of the shipment or as in CIF agreements (see definition below), and fails to do so.
- When the goods shipped do not correspond in both quality and quantity to those ordered.
- When the seller reserves title by retaining the bill of lading.

There are several terms that are commonly used in purchase contracts and purchase orders, which relate both to terms of the sale, as well as indicating when title transfers. Definitions of some of the commonplace terminology include the following:

- *FOB*. Standing for "free on board," or "freight on board," FOB indicates that the seller shall put the goods on board a common carrier free of expense to the buyer, with freight paid to the FOB designated point. For example, contractors' purchase orders frequently specify delivery as "FOB jobsite," or "FOB storage yard." Under an FOB agreement, title goes to the buyer when the carrier delivers the goods to the place indicated.
- *CIF*. Standing for "cost, insurance, freight," CIF indicates that the purchase-order price includes the cost of the goods, customary insurance, and freight to the buyer's destination. Title passes when the seller delivers the merchandise to the carrier and forwards to the buyer the bill of lading, insurance policy, and receipt showing payment for freight.
- *C & F*. Indicates the same shipping arrangement as described above, except that no insurance need be obtained by the vendor.
- *COD*. Meaning "collect on delivery," or "cash on delivery," COD indicates that title passes to the buyer, if he is to pay the transportation, at the time the goods are received by the carrier. However, the seller reserves the right to receive payment before surrender of possession to the buyer.

## 9.22 A CONTRACTOR'S RIGHT TO CHECK ON PROJECT FINANCING

Many of the construction contract forms in commonplace usage provide that the contractor can request and receive reasonable evidence from the owner that suitable financial arrangements have been made by the owner to pay for the construction contract amount. The AIA General Conditions of the Contract for Construction contains this provision (see Appendix D).

It may be a good business practice on the part of a contractor to obtain advance information concerning a private owner's finances and credit rating. Just as the owner is concerned with the financial capacity and capabilities of the contractor so too, the contractor must be assured that the owner has the necessary financial means to fulfill contract requirements and to pay for the construction.

Case studies are on record where contractors have experienced serious financial difficulties when they failed to investigate the capability or integrity of the owner, and later discovered that the owner was unable or unwilling to make payment timely in accord with the provisions of the contract. This matter cannot safely be ignored, since the contractor must usually invest a substantial amount of his own money into a project before any monies are payable by the owner to the contractor. A default by the owner in meeting his payment obligations under the contract can have a very serious impact on the contractor's financial well being, and on the very survival of his business. The appreciable risks assumed by the contractor in the performance of construction contracts need not be increased by the chance of a default in owner payments.

Before obligating itself by bid or contract to a private owner, the construction firm does well to make some investigation and evaluation concerning the financial integrity of the owner, and the source of the owner's financing for the project. This step should be taken whether or not the owner is required by the terms of the contract to provide evidence, upon request, that he has the means to pay the amounts indicated in the construction contract. Especially if the owner is unknown to the contractor, additional credit information can be obtained from sources such as financial and credit rating services, industry trade groups, other contractors who may have previously dealt with the owner, or with the assistance of the contractor's banker.

There are also cases where the contractor must make certain determinations with regard to the owner entity with whom it is dealing. An illustrative example is the case where the owner is a shell, dummy, or subsidiary corporation that has been especially formed for the sole purpose of getting the project constructed and minimizing the liability of the principals or parent company. An owner corporation of this kind would have very limited assets, and would be a poor credit risk. Until any new corporation has had time to establish a record of financial stability, the contractor should be advised to assure that the principals or parent company must verify their capability for project funding or personally guarantee to make good on contractual debts. When dealing with a substantial corporation, the contractor must know whether it is dealing with that corporation or with a subsidiary that might be undercapitalized. Additionally, when the contractor is dealing with an agent of an owner, the contractor must insist on being provided written assurance that the agent has authority to bind the principal to the contract.

When the owner is a public agency, the contractor is generally assured that funds required to pay for public works will be available. However, there can be exceptions to this rule, especially in the case of quasi-governmental "corporations" being created by state or local governments to perform various construction functions. Such entities may not possess the full faith and credit backing of the governmental entity. Once the construction monies of these corporations have been exhausted, the contractor can find himself without recourse for payment. Therefore, some analysis regarding the reliability of the funding for these types of agencies should be performed by the contractor before bidding such projects.

On public contracts, it is a statutory requirement that all of the requirements for entering and fulfilling the contract must be fulfilled by the responsible public officials in order for a valid contract to exist. In most jurisdictions, the omission of any required procedural step by a public owner can leave the contractor without remedy to obtain payment for work performed. If a government body enters into a contract without complying with the statutory requirements pertaining to the bidding and awarding of public construction contracts, the contract is considered beyond the power of the public agency and may be declared void. There is a growing body of legal precedent however, that when an imperfect public contract was entered into in good faith by the contractor, and is devoid of fraud or collusion, the contractor is entitled to relief based on the equitable doctrine of unjust enrichment. A contractor who does business with a public entity must be aware of the laws governing its administration and the limitations on the powers and authorities of the public officers involved.

## 9.23 PAYMENT TO THE GENERAL CONTRACTOR

Construction contracts typically provide that partial payments of the contract amount will be made to the prime contractor at regular intervals during the course of a project as the work on the project progresses. The exact procedure to be followed can vary considerably, depending on the wishes of the owner of the project, and may also vary with the type of work being performed.

For example, in residential and some other types of construction, it is customary for specified payments (specific in terms of amount or percentage of the total contract amount) to be made by the owner to the contractor at the completion of certain well-defined stages of construction. In residential construction, these payments are often referred to as "draws" and are made at defined points of progress, such as upon completion of site work, when the foundation is complete, upon completion of framing, when the structure is enclosed (referred to as being "dried in"), when plumbing and mechanical and electrical rough-in has been performed, at completion of the interior finish, and at full completion. Each of these payments is made to the contractor by the owner, or the mortgage company, or by the bank that is providing the interim financing for the project, following inspection of the project and receipt of necessary documentation from the contractor.

In commercial, institutional, heavy/highway, and industrial construction, the typical payment procedure that is defined in the contract is for periodic payments to be made by the owner to the prime contractor at monthly intervals. The general conditions of the contract for construction, and/or the supplementary conditions, and/or the special conditions of the contract will define and describe in detail all of the elements of the periodic payment process. The contractor should carefully analyze all of the contract language relating to payment, in order to assure that he understands each element of the payment process.

Typically on these types of projects, the general contractor will prepare a periodic payment request, also known as an application for payment, once each month on the dates specified in the contract, throughout the life of the project. Each periodic pay request is based on the work that has been accomplished since the last payment was made. This means that field progress and work performed during a payment period must be quantified by means of measurement, or by calculation, or sometimes by estimation, at each 30-day interval. A payment form is used that clearly identifies the units of work and quantities of work which have been completed, along with a notation regarding amounts that have previously been paid for each defined work item, so that the current amount due is the difference between the two.

Typically, the architect-engineer will define the format in which the application for payment is to be completed and frequently will prescribe or provide the actual form which the contractor is to complete and submit for each periodic payment request. Sometimes, however, the owner or the lending institution that is providing the construction financing may require the use of its own prescribed payment requisition form.

When the pay request has been compiled by the general contractor, it is transmitted to the architect-engineer and sometimes to the owner or the lending agency, or contracting officer. The usual contract between the architect-engineer and the owner provides that the architect-engineer will examine and approve each of the contractor's payment requests, and will certify the request on behalf of the owner and will authorize the owner to make payment to the contractor.

Approval of contractors' pay requests most certainly represents an important responsibility for the architect-engineer. In acting in the best interests of its client, the owner, it is incumbent upon the architect-engineer to see that the periodic payments that are made to contractors represent reasonable measures of the work actually accomplished. Additionally, it is the responsibility of the architect-engineer, representing the interests of the owner, to provide reasonable assurance to the owner that the work has been performed properly, that is, in compliance with the requirements of the contract documents.

The results of some recent court cases indicate that an architect-engineer may be held responsible if its negligence results in the owner's improper payment to the contractor. An example of this occurrence took place on a large project on which the contractor went bankrupt during the course of performing the construction on the project. The bonding company completed the project in accord

with the terms of the performance bond (see Chapter 7). The dollar value of the work in place when the bonding company took over the work in order to see to the completion of the project proved to be substantially less than the payments the contractor had received. The bonding company sued the architect-engineer for negligence in permitting overpayment to the contractor, and the architect-engineer was found liable for the amount of the overpayments.

Additionally, all of the elements of time associated with periodic pay requests are set forth in detail in the conditions of the contract, including the dates when the contractor is authorized to submit a payment request, the amount of time within which the architect-engineer must make approval of the payment request and authorize the owner to make payment, and the amount of time the owner has, following the architect-engineer's authorization for payment, to make payment to the contractor. In like fashion, the contract documents address themselves to actions the architect-engineer can take if a payment request is not submitted timely, as well as to timelines and actions for the contractor in the event he does not receive payment within the times prescribed.

## 9.24 PAYMENT REQUESTS FOR LUMP-SUM CONTRACTS

The periodic once-per-month payment to the prime contractor by the owner on a lump sum contract, which is the most common type of contract utilized in building construction work, is defined and described in the conditions of the contract. The process begins when, following formation of the contract between the general contractor and the owner, the contractor prepares and submits to the architect-engineer for approval a document called the schedule of values. This document, when it has been approved by the architect-engineer, will stand unchanged throughout the duration of the project, except insofar as it might be affected by change orders and will form the basis for all payments made to the contractor by the owner throughout the project.

The schedule of values consists of line-item descriptions of the major activities or items of work to be completed in the performance of the contract requirements on the project, in the approximate sequence in which they will be performed. Both the self-performed work of the general contractor and the subcontract amounts for the specialty work items to be performed by subcontractors on the project will be included by the contractor in the schedule of values. For the elements of the work the general contractor will perform by subcontract, he will notify the each subcontractor whom he has selected for the performance of a specialty item, that they are to prepare and submit to the general contractor, a schedule of values for their part of the work, with their schedule of values to equal the amount of their subcontract. This forms the basis for the general contractor's entries on the schedule of values, which he submits to the architect-engineer and owner, for items of work he will perform by subcontracting.

The architect-engineer will typically have included in the "Payment" section of the conditions of the contract, a provision requiring that all of the activities or work items that are listed on the schedule of values be clearly identifiable, as well as being quantifiable. Along with each activity, a dollar sum is indicated on the schedule of values, which the contractor represents to be the approximate value of his performance of that part of the work and the amount of money that he expects to be paid for its completion.

The total of the schedule of values amounts for all of the activities to be performed on the project will equal the contract amount for the project. It should be noted that there will be no line item on the schedule of values for the contractor's general overhead or project overhead, for bond premiums or insurance premiums, or for the contractor's markup on the project. The dollar amounts for these elements are embedded by the contractor in the dollar amounts he submits for the activities on the project.

Additionally, because positive cash flow is of such critical importance, and due to the fact that the general contractor is typically financing the project for the first 30 days, inasmuch as he must perform work, and pay for materials, equipment, labor, and overhead costs in order to accrue earned value before he submits a payment request form at the end of 30 days, contractors will often "front load" or "front-end load" the schedule of values. This means the contractor will ascribe values somewhat higher than the true value of the work, to those activities or items that will be completed early in the life of the project.

While the architect-engineer and owner will be at least tacitly aware of this consideration on the part of the contractor, their concern is exactly the inverse of that of the contractor. Cash flow is as critically important to the owner as it is to the contractor. While the owner has a contractual obligation to pay the monies due to the contractor as set forth in the contract, the owner is usually completely unwilling to disburse any funds beyond the earned value accrued for completed work in place. Usually, this matter comes to be resolved by means of architect-engineer and owner allowing some degree of increase in the contractor's "contract amounts" or "earned value amounts" on the contractor's schedule of values, realizing that the earned value amounts are not a precisely accurate determination, inasmuch as the contractor will have his overhead expenses and his markup amount distributed throughout all of the earned value amounts for the project.

Following its submittal by the general contractor, the schedule of values will be examined for approval by the architect-engineer, and sometimes by the owner as well. In the interests of protecting their cash flow, the architect-engineer and owner will examine the schedule of values in order to ensure that the dollar amounts that accompany the earned value amounts for the work item activities bear a reasonable resemblance to the actual value of the work. Additionally, the architect-engineer and owner will examine the activity descriptions to assure that they are definitive and clear. Sometimes there will be an iterative process, wherein the architect-engineer returns the schedule of values to the contractor for revision of dollar amounts and/or activity descriptions, and this process continues until the point is reached where the architect-engineer grants approval of the schedule of values.

When the schedule of values has been approved by the architect-engineer and owner, it will stand unchanged for the duration of the project, except as it may be affected by change orders. It will form the basis for all payments made by the owner, and for all revenue received by the contractor throughout the project. Figure 9.7 depicts a representative schedule of values for a building construction project with a lump-sum contract in use.

When the schedule of values has been approved, and when the contractor submits his pay request for his first 30 days' work on the project at the time designated in the contract documents, the payment request form or application for payment that is employed for this purpose will be based on the schedule of values. Additional columns will be added to the right on the original schedule of values, having the titles "Percentage Complete," "Gross Amount Currently Due or Earned Value Currently Due," "Less Amounts Previously Paid," and "Net Amount Currently Due." Or the application for payment can contain the same information, presented in the format illustrated in Figure 9.8.

For each activity on which the contractor has performed work during the past 30 days, he will enter his percentage complete for that work item. This completion percentage will be determined and entered for each activity and may be determined for some activities or work items by counting, and for others by measurement or calculation, and for others by estimation. The "Gross Amount Currently Due" for each activity, or the "Completed to Date" column, is its contract value amount, or total cost amount, multiplied by its percentage complete.

For each activity, running totals are typically maintained throughout the project for amounts previously paid, and this amount is subtracted from the gross amount currently due to derive the

THE BLANK CONSTRUCTION COMPANY, INC.

1938 CRANBROOK LANE
PORTLAND, OHIO

SCHEDULE OF VALUES

MUNICIPAL AIRPORT TERMINAL BUILDING
PORTLAND OHIO
CITY OF PORTLAND PROJECT NUMBER 9669

| ITEM NUMBER | ITEM DESCRIPTION | PAYMENT AMOUNT |
|---|---|---|
| 1 | CLEARING AND GRUBBING | $22,508 |
| 2 | EXCAVATION AND FILL | $67,559 |
| 3 | CONCRETE FOOTINGS | $108,572 |
| 4 | CONCRETE GRADE BEAMS | $108,898 |
| 5 | CONCRETE BEAMS | $65,960 |
| 6 | CONCRETE COLUMNS | $21,306 |
| 7 | CONCRETE SLABS | $383,093 |
| 8 | CONCRETE WALLS | $59,566 |
| 9 | CONCRETE STAIRS | $43,380 |
| 10 | CONCRETE SIDEWALKS | $35,662 |
| 11 | MASONRY | $734,584 |
| 12 | ROUGH CARPENTRY | $57,025 |
| 13 | MILLWORK | $129,284 |
| 14 | REINFORCING STEEL | $129,218 |
| 15 | WELDED WIRE FABRIC | $28,382 |
| 16 | STRUCTURAL STEEL BAR JOISTS | $140,334 |
| 17 | STRUCTURAL STEEL COLUMNS AND BEAMS | $269,908 |
| 18 | THERMAL INSULATION | $38,782 |
| 19 | CAULKING AND WEATHERSTRIPPING | $8,667 |
| 20 | LATH, PLASTER, AND STUCCO | $296,270 |
| 21 | CERAMIC TILE | $33,651 |
| 22 | ROOFING AND SHEET METAL | $312,079 |
| 23 | RESILIENT VINYL FLOORING | $19,046 |
| 24 | CARPET AND PAD | $20,335 |
| 25 | ACCOUSTICAL TILE | $48,771 |
| 26 | PAINTING | $145,071 |
| 27 | GLASS AND GLAZING | $108,478 |
| 28 | TERRAZZO | $138,859 |
| 29 | MISCWLLANEOUS METALS | $120,238 |
| 30 | FINISH HARDWARE | $83,304 |
| 31 | PLUMBING | $213,800 |
| 32 | HEATING, VENTILATING, AIR CONDITIONING | $725,350 |
| 33 | ELECTRICAL | $592,057 |
| 34 | GLASS CLEANING | $4,873 |
| 35 | PAVING, CURB, AND GUTTER | $123,381 |
| | TOTAL CONTRACT AMOUNT | $5,438,251 |

**Figure 9.7** Schedule of Values for a Building Construction Project

net amount currently due for the current payment request. Figure 9.8 provides an illustration of the payment request form with these additional columns added, and this additional information entered.

It should be noted that at the bottom of the periodic payment request form, there is an entry called "Retainage." Retainage, which is also sometimes referred to as retention, is a percentage, which is stipulated in the contract documents, that the owner will withhold from each payment made to the contractor throughout the life of the project, pending the contractor's satisfactory completion of all of the work on the project. The typical retainage percentage utilized is 10 percent, although amounts vary with the owner, and with the architect-engineer, and with the project.

Usually, contracts provide that, at the conclusion of the project, when the contractor submits his application for final payment, the retainage that has been withheld throughout the course of the project will be paid to the contractor. At this time, the contractor will have completed all of the work in fulfillment of the contract requirements, perhaps excepting punch list items and warranty work.

Additionally, the payment request form also typically includes an entry to the effect of "Payment for Materials Delivered and Properly Stored." The amounts entered in this category are usually itemized in a schedule that is attached to the payment request form. Typically-used contract documents provide that the contractor and subcontractors can request payment on the periodic payment request form, for materials that are designated for use on this project and have been purchased, delivered, and properly stored. The documents usually stipulate that the architect-engineer is the final arbiter

**PERIODIC ESTIMATE FOR PARTIAL PAYMENT**

PROJECT: MUNICIPAL AIRPORT TERMINAL BUILDING

PROJECT NUMBER: 9669

PERIODIC PAYMENT REQUEST NUMBER: 4

FOR THE PERIOD: SEPTEMBER 1, 20__ - SEPTEMBER 30, 20__

| ITEM NUMBER | ITEM DESCRIPTION | SCHEDULE OF VALUES AMOUNT |
|---|---|---|
| 1 | CLEARING AND GRUBBING | $22,508 |
| 2 | EXCAVATION AND FILL | $67,559 |
| 3 | CONCRETE FOOTINGS | $108,572 |
| 4 | CONCRETE GRADE BEAMS | $108,898 |
| 5 | CONCRETE BEAMS | $65,960 |
| 6 | CONCRETE COLUMNS | $21,306 |
| 7 | CONCRETE SLABS | $383,093 |
| 8 | CONCRETE WALLS | $59,566 |
| 9 | CONCRETE STAIRS | $43,380 |
| 10 | CONCRETE SIDEWALKS | $35,662 |
| 11 | MASONRY | $734,584 |
| 12 | ROUGH CARPENTRY | $57,025 |
| 13 | MILLWORK | $129,284 |
| 14 | REINFORCING STEEL | $129,218 |
| 15 | WELDED WIRE FABRIC | $28,382 |
| 16 | STRUCTURAL STEEL BAR JOISTS | $140,334 |
| 17 | STRUCTURAL STEEL COLUMNS AND BEAMS | $269,908 |
| 18 | THERMAL INSULATION | $38,782 |
| 19 | CAULKING AND WEATHERSTRIPPING | $8,667 |
| 20 | LATH, PLASTER, AND STUCCO | $296,270 |
| 21 | CERAMIC TILE | $33,651 |
| 22 | ROOFING AND SHEET METAL | $312,079 |
| 23 | RESILIENT VINYL FLOORING | $19,046 |
| 24 | CARPET AND PAD | $20,335 |
| 25 | ACOUSTICAL TILE | $48,771 |
| 26 | PAINTING | $145,071 |
| 27 | GLASS AND GLAZING | $108,478 |
| 28 | TERRAZZO | $138,859 |
| 29 | MISCELLANEOUS METALS | $120,238 |
| 30 | FINISH HARDWARE | $83,304 |
| 31 | PLUMBING | $213,800 |
| 32 | HEATING, VENTILATING, AIR CONDITIONING | $725,350 |
| 33 | ELECTRICAL | $592,057 |
| 34 | GLASS CLEANING | $4,873 |
| 35 | PAVING, CURB, AND GUTTER | $123,381 |
| | TOTAL CONTRACT AMOUNT | $5,438,251 |
| TOTAL EARNED VALUE TO DATE | | |

**Figure 9.8** Application for Payment on a Lump-Sum Project

regarding the definition of "properly stored," but usually this is interpreted to mean stored in a dry, secure, and locked location on the project premises.

After the general contractor submits the payment request form, the architect-engineer will closely examine the document in order to assure accuracy, as well as to assure for the owner that the percentages complete properly reflect the amount of work satisfactorily completed and in place on the project. The architect-engineer may ask the contractor to revise and resubmit if an error is discovered, or if the designer believes the percentages complete, and therefore the amounts due to the contractor, are not accurately reflective of the actual amount of satisfactorily completed work in place.

In addition, the architect-engineer and owner may sometimes require submittal of additional supporting information to accompany the payment request from the contractor, such as materials invoices, and/or copies of the statements the contractor has received from suppliers, and sometimes certified labor payroll records. The objective on the part of the architect-engineer and owner is to further assure themselves that the amount of money requested by the contractor in the payment request realistically reflects the actual earned value of the work that has been satisfactorily performed.

This submittal of the payment request form and the approval process will repeat every 30 days throughout the life of the project. The contract documents will stipulate the amount of time within which the architect-engineer is required to approve the contractor's payment request, and to authorize the owner to make payment. The owner then has a specified amount of time within which to make payment to the general contractor.

It should be pointed out that a cost breakdown that the contractor has compiled for payment purposes cannot be used by either party to the contract as a basis for, or to establish a precedent for, the pricing of change orders that may be issued during the course of construction of the project. Items of general expense have been prorated into the various periodic payment request items whether or not they apply directly to a given item of work. Additionally, as has been discussed, these cost breakdowns are usually unbalanced to some degree. Therefore, these periodic payment amounts are not satisfactory for pricing change order work; each component of the work in every change order will be priced separately and included in the change order documentation.

Although the pay request procedure for lump-sum contracts as described here has been in general use for many years, it has one serious defect. As shown in Figure 9.8, the project is divided for payment purposes into relatively few activity or work item classifications, most of which actually involve extensive work on the project that often extends over appreciable portions of the construction period. This situation can make it difficult to determine with any real degree of accuracy the percentages completed in the various work categories and activities. Actual measurement of the work quantities accomplished to date is the key to accurate percentage figures, but this can become very laborious, and therefore most of the percentages are established by visual appraisal or other approximation procedure.

This circumstance continues to produce vexing problems for both the contractor and the owner. If it is difficult for the contractor to estimate the completion percentages accurately, it is at least equally difficult for the architect-engineer or owner to verify these reported values. This presents the architect-engineer with a difficult problem because, in the interest of his client, he must make an honest effort to see that the monthly payments made to the contractor are reasonably representative of the actual progress of the project.

However, as has been noted, this process has been in use for many years on many projects and has usually worked to the general satisfaction of all concerned. While there is some degree of imprecision inherent in the process, no satisfactory solution to this matter, nor an alternative method for periodic payment requests has been put forward.

## 9.25 PAYMENT REQUESTS FOR UNIT-PRICE CONTRACTS

For projects on which unit-price contracts are employed, the contract documents also typically provide that the contractor is to be paid at 30-day intervals based on payment requests submitted in accord with the time schedule in the conditions of the contract. In this form of contract, the amounts set forth in the payment request and the payment to the contractor are based on the amount of each of the work items or activities described on the contractor's proposal form and then listed on the contract pay request form, which has been satisfactorily completed during the most recent 30-day period. Payment is based on the quantity of the bid item installed or completed during the period, multiplied by the contract unit price for that item. Figure 9.9 illustrates a typical payment request form as it might be used on a unit price project.

**PERIODIC PAYMENT REQUEST**

**THE BLANK CONSTRUCTION COMPANY, INC.**

PROJECT: BRAZOS BRIDGE PROJECT

FOR THE PERIOD ENDING: JULY 31, 20__

| BID ITEM NUMBER | BID ITEM DESCRIPTON | ESTI-MATED QUANTITY | UNIT | CON-TRACTED UNIT PRICE | QUANITITY | AMOUNT |
|---|---|---|---|---|---|---|
| 1 | Excavation, Unclassified | 1,667 | CY | $3.83 | 1,667 | $6,384.61 |
| 2 | Excavation, Structural | 120 | CY | $50.72 | 120 | $6,086.40 |
| 3 | Backfill, Compacted | 340 | CY | $17.77 | 0 | $0.00 |
| 4 | Piling, Steel | 2,240 | LF | $66.46 | 2,240 | $148,870.40 |
| 5 | Concrete, Footings | 120 | CY | $195.62 | 120 | $23,474.40 |
| 6 | Concrete, Abutments | 280 | CY | $380.87 | 140 | $53,321.80 |
| 7 | Concrete, Deck Slab, 10' | 200 | SY | $153.03 | 0 | $0.00 |
| 8 | Steel, Reinforcing | 90,000 | LB | $1.05 | 57,150 | $59,721.75 |
| 9 | Steel, Structural | 65,500 | LB | $1.73 | 0 | $0.00 |
| 10 | Bearing Plates | 3,200 | LB | $2.49 | 0 | $0.00 |
| 11 | Guardrail | 120 | LF | $93.59 | 0 | $0.00 |
| 12 | Paint | JOB -- | SUBCT | $12,140 | 0 | $0.00 |
| | | | | | | |
| | | CONSTRUCTION PERFORMED TO DATE | | | | $297,859.36 |
| | | MATERIALS STORED ONSITE | | | | $0.00 |
| | | TOTAL, WORK PERFORMED AND MATERIALS ONSITE | | | | $297,859.36 |
| | | LESS 10% RETAINAGE | | | | $29,785.94 |
| | | NET WORK PERFORMED AND MATERIALS ONSITE | | | | $268,073.42 |
| | | LESS AMOUNT OF PREVIOUS PAYMENTS | | | | $1,141.00 |
| | | | | | | |
| | | AMOUNT DUE THIS PAYMENT | | | | $266,932.42 |

**Figure 9.9** Unit-Price Payment Request Form

The determination of quantities accomplished in the field is accomplished in several different ways, depending on the nature of the particular bid item. When cubic yards of aggregate, or tons of asphaltic concrete have been established as bid items, the quantities of these items are usually measured and recorded as they are delivered to the work site. Delivery invoices or fabricators' certificates are used to establish tons of reinforcing steel or structural steel. For other work classifications, such as cubic yards of excavation, linear feet of pipe, or cubic yards of concrete, quantities satisfactorily installed are measured or computed from field dimensions. Survey crews of the owner and of the contractor often make their measurements independently of one another, and adjust any differences when the payment request is submitted, and before it is approved by the architect-engineer.

It is not uncommon on this type of work, for owners to use their own standard forms for monthly pay requests. On such projects, the owner or architect-engineer often prepares the pay request form and sends it to the contractor for checking and verification before payment is made.

On unit-price projects that involve a substantial number of bid items, each monthly pay request is a sizable document consisting of many pages. In essence, the total amount of work accomplished to date on each bid item is multiplied by its corresponding contract unit price. All of the bid items are totaled and the value of materials stored on the site is then added. The resulting figure represents the entire amount due the contractor for his work to date. From this total is subtracted the amounts previously paid, and the retainage amount set forth in the contract documents. This yields the net amount of money payable to the contractor for his work during that month. This process then continues for each monthly payment request throughout the life of the project.

## 9.26 PAYMENT REQUESTS FOR COST-PLUS CONTRACTS

When a negotiated cost-plus contract is used on a project, there are numerous methods that may be employed for determining the amount of each periodic payment to the contractor. Typically, the payment interval is 30 days.

In many cases on these types of projects, contractors provide their own capital to pay the costs associated with the project, and receive periodic reimbursements from owners for costs incurred, plus whatever amount or fee has been negotiated. Other contracts provide that owners will advance money to the contractor for the purpose of the contractor's meeting his payroll, and paying other expenses associated with the work. Periodically, as designated in the contract, a reconciliation is performed, and the contractor is paid his fee or percentage as has been agreed.

In another method, the contractor prepares estimates of his outlay for the coming month and receives that amount of money in advance. Then, at month's end, the contractor prepares an accounting of his actual costs incurred. Any difference between the estimated expenses and actual expenses is adjusted with the issuance of the next monthly estimate.

Other contracts provide for constant-balance bank accounts, where checks are written by the contractor for project costs and reimbursing funds are provided by the owner. Again, the contractor is required to make periodic accountings to the owner of the cost of the work, either to receive direct payment from the owner or to obtain further advances of funds.

A periodic payment to the contractor under a cost-plus type of contract is not usually based on quantities of work performed, but rather on reimbursement of costs incurred by the contractor during the preceding pay period. Consequently, such pay requests consist primarily of the submittal of cost records by the contractor. Copies of invoices, payrolls, statements, and receipts are submitted in substantiation of the contractor's claims. In addition to cost records of payments made by the contractor to third parties, the periodic pay requests customarily include documentation for

equipment expenses and a pro rata share of the negotiated fee. If the contractor is furnished funds in advance by the owner to pay for construction costs, the owner is customarily credited with all cash discounts.

Because of the sensitive nature of cost reimbursement, it is common practice to maintain a separate set of accounting records for each cost-plus project. When the size of the project is substantial enough to justify it, a field office is sometimes established where all matters pertaining to payroll, purchasing, disbursements, and record keeping for the project are performed. All project financial records are either routed through the owner's representative or are available for inspection at any time. This is often referred to as an *open books policy* and is a typical component of the matters that are agreed to in a cost-plus contract. This procedure does much to eliminate misunderstandings, and facilitates the final audit of all costs incurred during the project, which likewise is a typical component of cost-plus contracts. Cost-plus contracts with public agencies customarily impose additional special conditions on the contractor pertaining to form of payment, payment application, affidavits, and preservation of project records.

## 9.27 FINAL PAYMENT

The procedural steps leading up to acceptance of the project and final payment by the owner vary somewhat with the nature of the work and the specific provisions of the contract. On building construction projects, the process typically commences when the contractor, nearing the point of substantial completion of the project, requests a preliminary inspection. The owner or its authorized representative, usually the architect-engineer, in company with the general contractor and key subcontractor personnel, inspect the work. A list of deficiencies to be completed or corrected is prepared by the architect-engineer. This listing is referred to as the punch list, and is defined as a listing of all errors or deficiencies requiring correction in the work that is in place, as well as a list of items of work remaining to be completed, before the project will be accepted by the owner from the contractor.

The contractor and subcontractors will then address themselves to completion of the required work, and to correction of deficiencies. When this has been done, the general contractor will request an additional inspection (usually the final inspection). If, in the judgment of the architect-engineer, the work is satisfactorily complete, he will issue a certificate of substantial completion.

The architect-engineer and owner also commonly require the contractor to provide a certificate of occupancy (CO) prior to their issuance of the certificate of substantial completion. The CO is a certification from city government that all of the building code and zoning ordinance requirements of the city have been fulfilled, and authorizing the owner to occupy the building.

Following the issuance of the certificate of substantial completion by the architect-engineer, the contractor will make an application for final payment. The contract documents typically require that the general contractor's request for final payment be accompanied by a number of different documents. For example, releases or waivers of lien executed by the general contractor, all subcontractors, and materials suppliers are common requirements on privately financed projects. An affidavit that the releases and waivers furnished include all parties who might be entitled to lien may also be required. Liens are defined and discussed in sections to follow in this chapter.

Other contracts call for an affidavit certifying that all payrolls, bills for materials, payments to subcontractors, and other indebtedness connected with the work have been paid or otherwise satisfied. Claims and disputes still unresolved at the time of final payment should be expressly identified in writing by the contractor as unsettled, and reserved in the final payment application and in the final lien waivers and releases.

Additionally, construction contracts typically require the contractor to provide the owner with as-built drawings, various forms of written warranties for equipment in the building, maintenance bonds, as well as owner's manuals, parts lists, and sometimes spare parts, and literature pertaining to the operation and maintenance of equipment and machinery in the building. Consent of surety to final payment is a common prerequisite. Sureties are defined and discussed in Chapter 7. The language of the general conditions of the contract for construction in Appendix D contains the contractual provisions concerning documentation required for final payment to the contractor.

When the work is determined by the architect-engineer to be complete and acceptable, and when all of the required documents and information have been submitted by the general contractor, the architect-engineer issues a certificate for final payment to the contractor. This payment will include the retainage that has been withheld by the owner throughout the project. The final payment and the issuance of the certificate of substantial completion mark the completion of the general contractor's contractual requirements, with the exception of warranty provisions, and are usually defined as marking the termination of the contract between the owner and the prime contractor.

On a project where a unit-price contract is in use, the closeout of the project likewise begins with inspection, punch list, corrections and completion of work per punch list listing, and final inspection. A reconciliation is made, of final total quantities of all work items on the bid form/contract form. The final contract amount is determined, and the contractor makes application for final payment. Releases of liens and as-built drawings are commonly required on these projects as well. Final payment, including all retainage withheld to date, is authorized by the architect-engineer, and final payment is made by the owner to the contractor. This usually marks the termination of the contract between the owner and the contractor, pending warranty requirements.

## 9.28 PAYMENTS TO SUBCONTRACTORS

When the owner makes payment to the general contractor during the course of a construction project, it is expected that the general contractor will then make prompt payment to his subcontractors. Subcontractors submit their payment requests or invoices for work performed during the past 30 days to the general contractor, in accord with a time schedule established by the general contractor, in advance of the date when the general contractor's payment request is to be submitted to the architect-engineer. The general contractor will carefully check each monthly pay request from each subcontractor to ensure accuracy, and to assure that it represents a fair measure of the work that has actually been performed by the subcontractor. The general contractor may require verification of portions of the subcontractor's payment request by counting, measurement, or calculation. The general contractor will then include the amounts of the subcontractor's request for payment in the appropriate line items within his application for payment to the architect-engineer and owner, and the general contractor will subsequently make payment to the subcontractors in accord with the subcontract agreements he has executed with the subcontractors.

Depending on his experience history with the subcontractor and his confidence in the subcontractor, as well as the management philosophy of the company, the general contractor may or may not elect to withhold retainage from the payments he makes to the subcontractors. This matter will be defined in the subcontract agreement with each subcontractor.

While the matter of payment to the subcontractors by the general contractor can be and frequently is a routine matter, sometimes there are problems associated with this matter. Sometimes general contractors are slow in paying subcontractors' payment requests. This can occur for a variety of reasons, but when it occurs it is always a source of great consternation to the subcontractors.

Subcontractors sometimes receive payment from a general contractor and then apply the funds to pay the bills for other projects on which they are working, or to finance other portions of their operation, leaving their suppliers on the first project unpaid. When the general contractor makes payment to a subcontractor, it is understandable that he wishes to have assurance that the subcontractor is meeting his financial obligations on that project. In this regard, the contractor should use certain precautions to protect itself from the hazard of a subcontractor's failure to pay his bills and meet his payrolls. Joint checks issued by owners and general contractors to pay subcontractors and their suppliers is a practice sometimes employed. Joint checks generally protect the owner and the general contractors from liens and payment bond claims.

When the prime contractor furnishes the owner with a payment bond, he has a liability to those unpaid parties within the coverage of the bond who comply with the notice provisions of that bond. Even though the contractor has paid a subcontractor in full, an unpaid creditor of that subcontractor can still file a claim on the payment bond. Contractors have been required to pay twice for the same item of work because of their payment bond liability. As a consequence of this possibility, general contractors frequently are obliged to take steps to obtain appropriate releases of lien, receipts, or affidavits of payment when payments are made to subcontractors. The general contractor can also indicate on the check the application of proceeds desired and include a letter of transmittal that specifically states the purpose for which the payment is being made. If a general contractor makes payment to a subcontractor's supplier by a check payable to both the supplier and subcontractor, specific instructions on how the payment should be credited by the payees should be provided. Another possibility for the general contractor in this regard is to require that subcontractors furnish payment bonds to the prime contractor.

Some states have construction trust-fund statutes that declare that the funds paid to a prime contractor by the owner are trust funds held by the contractor as trustee for the benefit of his subcontractors and material suppliers. Such statutes afford subcontractors an additional avenue of recovery from the general contractor. A few states now have statutes that provide for fines when contractors on public or private projects fail to pay their subcontractors on time. Additionally, some conditions of contract for projects, and many subcontract agreement forms, now provide the subcontractor the right to request directly from the architect-engineer or owner, information about percentages of completion or the payment amount to the prime contractor certified by the architect-engineer or owner for work performed by the subcontractor. In this way, the subcontractor will know the amount of money he should have been paid by the general contractor.

The American Subcontractors Association (ASA) is a national trade association with a membership consisting of subcontractors of all kinds. The ASA has authored standard subcontractor agreement forms that are more subcontractor-friendly than the subcontract agreements utilized by many general contractors. Additionally, the ASA has established a national reporting network to provide member subcontractors with information about the business practices of specific general contractors, including data concerning the matter of periodic and final payments.

As a matter of good management, and also as a matter of sound and beneficial business practice, general contractors who make it a priority in their business to assure prompt and proper payment to their subcontractors, can achieve significant business advantages. Such practices consistently attract the business of the best subcontractors, and also elicit the best prices from subcontractors. Especially in the construction world of today, particularly in building construction work, where most or in some cases all, of the work on a project is performed by subcontractors, this becomes a matter of significant importance to general contractors.

## 9.29 DIRECT PAYMENT

There has been considerable effort over the span of a number of years by the ASA to change the method by which payments are made by general contractors to subcontractors. The ASA maintains that the traditional procedure of the owner paying the general contractor and the general contractor then paying his subcontractors exposes subcontractors to slow payment, cash flow problems, and an assortment of other problems. One method that has been suggested by the ASA to speed up and facilitate payments is to have a third party act as paymaster under the terms of a common agreement between the owner, lender, general contractor, and subcontractor. In this proposed method, owners would make periodic payments intended for the subcontractors into an escrow account from which subcontractors would be paid directly in amounts approved by the general contractor.

The concept of direct payment to subcontractors has been stoutly resisted by general contractors and their professional associations on the basis that it would be detrimental to the general contractor's overall control of the project. They maintain that the present system is not defective so long as the general contractor and the subcontractors conduct their affairs on a project in a responsible, prudent, and businesslike manner. The basic position of general contractors is that the advantages and benefits to the owner of the single-contract method of construction would be adversely affected by a direct payment system. The direct pay procedure has been used in this country on a very limited basis to date, on some public and private projects.

Additionally, there have been times when the owner and general contractor have agreed to have the owner make progress payments and/or final payment directly to the project subcontractors and material suppliers. In such a case, the owner deducts the amounts paid to these parties from the payments he makes to the general contractor. While there are various reasons for which such an unusual arrangement could be made, a commonplace basis is the owner's wish to assure that the subcontractors and suppliers are paid promptly and in full, for their contributions to the work on the project. This can protect the owner from claims and liens. There sometimes have also been situations where general contractor-subcontractor relationships have become strained, and direct payment by the owner to the subcontractor may improve subcontractor performance. Although a direct payment arrangement of this kind is not generally desirable, it can at times be employed in order to ameliorate risk of claims, liens, or subcontractor default.

## 9.30 BACKCHARGES

Occasionally in the course of the performance of the work on a construction project, situations occur where the general contractor will incur or assume an expense that is chargeable to a subcontractor. For example, the general contractor may pay some of the subcontractor's bills, or may temporarily provide the subcontractor with labor, or equipment, or materials, or facilities for use in performing the subcontractor's work. Or the general contractor may perform cleanup or hauling services on behalf of the subcontractor or because of the subcontractor's failure to do so.

The usual way for the general contractor to recover these expenses is to subtract them from payments made by the general contractor to the subcontractor. Such a deduction is called a *backcharge*. Backcharges can be a source of disagreement and dispute, unless provisions in this regard have been written into the subcontract arrangements and timely notice as provided in the subcontract agreement has been given.

## 9.31 PAYMENTS TO MATERIAL SUPPLIERS

A contractor's payments to his vendors or material suppliers are made in accordance with the terms of the applicable purchase order or materials purchase contract. Whether payment is made by the contractor to the vendor upon purchase or the goods are purchased on account, the vendor expects timely payment in accord with the terms of the purchase order, without regard to whether the contractor has received payment from the owner. Most contractors have accounts with vendors whereby payment is due and payable in full 30 days after the invoice date, upon receipt of materials, at the end of the month in which delivery was made, or in accord with other stipulations that may be included in the purchase order. As noted in a previous section, such payment terms frequently include provisions for professional discounts, or quantity discounts, or cash discounts, in order to encourage early payment by the contractor. Payments to material dealers are made in full by the contractor, since retainage provisions do not apply to purchase order payments.

Almost all well-managed construction firms have company policies in place whose purpose is to provide for management verification and control with regard to materials purchases. To illustrate a typical procedure established by policy in many construction companies, a purchase order is required to be issued for all project materials purchases of any consequence. Such a purchase order not only assigns the materials purchase to a specific project and specifies the cost of the materials, but also serves as an internal control document for the contractor. As deliveries are made, the responsibility is assigned for inspection of the materials, verification of quantities, and for the performance of any quality control or tests as pertinent. After inspection and testing, a receiving report is sent to the disbursement section of the contractor's office listing the materials received, identifying the vendor, and describing any shortages, damage, or variations from specified quality. No payment is issued on the vendor's invoice until a receiving report has been received from the project or the contractor's warehouse, attesting to proper materials provided and proper delivery made, and the quantity and dollar amount on the invoice has been verified against the purchase order.

## 9.32 CASH FLOW

Maintaining positive cash flow is a critically important matter for all contractors, general contractors and subcontractors alike. It is a fact that most construction contracting concerns that fail do so not because total liabilities exceed total assets, but rather because current liabilities exceed cash or quick revenue. When payroll for labor cannot be met, and/or when creditors' claims for payment cannot be fulfilled, contractors sometimes have no choice but to close the business.

Cash flow refers to a contractor's income and outgo of cash. The net cash flow is the difference between disbursements and income over a period of time. A positive cash flow indicates that cash income is exceeding disbursements, and a negative cash flow signifies just the opposite. Cash is the fuel that operates the construction business enterprise, and a contractor must maintain a cash balance sufficient to meet payrolls, pay for materials, make equipment payments, and meet emergencies, as well as to satisfy other financial obligations as they become due.

In itself, however, cash is not a productive asset; it must be invested in some way in order to make it productive. Therefore, good business management means having sufficient cash and liquid assets readily available to meet needs as they occur but keeping excess cash suitably invested. Likewise, if a contractor must borrow funds to use as operating capital, it wishes to recognize this need as early as possible and seeks to manage liquid assets in such a way as not to borrow any more than is necessary.

The management of cash flow and cash on hand are especially important for determining a company's working capital requirements. Likewise, knowing the present and future cash position

of a construction firm is of great importance to its management. This matter will be discussed in the following section.

## 9.33 CASH FORECASTS

Because of the critical importance of maintaining a positive cash flow and effectively managing cash in hand and other liquid assets, some contractors have a policy whereby their accounting and finance departments prepare periodic forecasts of cash needs. A cash forecast is defined as a schedule that summarizes the estimated cash receipts, estimated disbursements, and available cash balances for some defined period into the future.

The forecast begins at a point in time with a known beginning cash balance, and then produces estimates of cash income and disbursements, either on a weekly or monthly basis, thus yielding an estimated cash balance at the end of each period. These figures will indicate when the available cash balance will be below the minimum needs and when it will be above. This, in turn, provides advance warning that additional finds must be obtained by borrowing, or that excess funds will be available for investment or company growth. For the most part, only short-term future cash predictions are optimally useful for contractors because of the unpredictability of new contract acquisition, as well as the variability of other financial matters generally.

The preparation of a cash forecast begins with the collection of detailed information regarding expectation for future cash income and expenditures. For a construction contractor, this must usually first be done for each individual project, based upon its proposed progress schedule and schedule of values. The resulting cash flow figures (the net result of cumulative cash income and outgo on a time basis) are then combined with the company's general and administrative disbursements to develop a total cash flow forecast for the given planning period. The computational process is complicated somewhat by the fact that both project earnings and expenses occur on a discrete basis, and these are normally not on the same time frequency. To illustrate, project income is received in some regular and periodic way, typically in monthly payments that are keyed to the earned value (percentages complete) on activities in the schedule of values. Project expenses, however, are more variable in their timelines for payment. For example, payrolls are costs that are paid on a weekly basis, whereas disbursements to material suppliers and subcontractors are made on a monthly basis. Payment of taxes, insurance premiums, and certain equipment expenses are payable on timelines that are largely independent of the physical progress of the work.

When done properly, however, the preparation of a cash forecast is a valuable management tool, providing information that makes the expense and time of the effort well worthwhile. After the forecast estimates are made, they are periodically reviewed by management in order to assure their continued validity. When significant variations occur, new estimates are prepared and the forecast is revised.

## 9.34 THE MECHANIC'S LIEN

A mechanic's lien is a right created by law to secure payment for work performed and materials furnished in the improvement of real property, that is, land and improvements on land. This lien attaches to the deed or title of the land itself. The purpose of a lien statute is to permit a claim on the premises where the value or condition of real property has been increased or improved, and where suitable payment has not been received by the person providing the material or service. Maryland was the first state to adopt such a law in 1791, and since then every state has enacted some form of

mechanic's lien law. While all of the various state statutes are similar in their basic intent, specific language and provisions of the statutes vary considerably from one state to another.

These statutes are referred to as mechanic's liens, based in the use of the term mechanic in days past, to describe a construction craft worker. These lien statutes are also sometimes referred to as mechanic's and materialmen's laws.

Lien laws are based on the theory of unjust enrichment and are designed to protect workers, material suppliers, and, under certain conditions, general contractors and subcontractors, who have furnished labor, expertise, or materials for the improvement of real property but have not been paid. Rights accruing to general contractors and subcontractors within the provisions of these statutes are generally the same, but there are differences in the details, such as requirements regarding notices required of the two parties. Legal counsel is recommended for the construction contractor, for understanding the specific elements of the lien laws in the state where the contractor is performing work, or planning to perform work in the future.

For a general contractor to file a lien, a usual requirement is that the owner has agreed to have the work done and to pay for it. In some states, a written contract must exist. In case of default by a private owner on a construction contract, the general contractor actually has two remedies available. He can file suit against the owner for breach of contract, or he can exercise his right of filing a lien. In some cases, the contractor can take both courses of action.

Architect-engineers are also provided protection by lien laws in some states. However, for a lien right to be available, work usually has to commence on the property. Design service, in and of itself, may not be sufficient basis for a lien filing, unless construction has actually proceeded. Because there is significant variation in the provisions of state laws, regarding the lien statutes and the rights they may provide designers, architect-engineers also must familiarize themselves with the specific provisions of the statute in the states where they are working or plan to be working.

Additionally, it should be realized that public property is not subject to a statutory lien. However, many states allow unpaid workers, subcontractors, and material dealers to establish lien claims against contract funds that are still held by a contracting public agency. This type of claim is referred to as a municipal mechanic's lien, and applies to contract funds, and not to the real property. Under such liens, when a payment claim is filed, disbursements to the prime contractor are stopped and the unpaid funds are preserved for payment to the claimant. The right to recover from a public owner is limited to contract funds that are still in control of the agency.

The lien statutes of certain states restrict the lien rights of unpaid parties where a private owner has required the general contractor to furnish a payment bond. In those states, upon receipt of the bond, the owner is exempted from liabilities for mechanic's liens filed by unpaid claimants other than the general contractor. The payment bond takes the place of the owner's real property as security for the lien. The bond exempts the owner's property from the possibility of lien foreclosure.

For any party who contracts directly with the owner to be able to file a lien, the statutes typically require that party to record a notarized claim for public record with a county authority within the prescribed time set forth in the statute. In most jurisdictions, this lien claim is considered sufficient if it names the owner, describes the project, contains appropriate allegations as to the work performed or materials furnished, and states the unpaid amount and from whom it is due. The time for filing differs from state to state. Many states require, in addition to the filing of a lien claim, that written notice also be given to the owner or its agent within a specified time. In some cases, notice to the owner must precede the filing of the claim. The advice of a local attorney is imperative when filing, or when considering the filing of, a claim of lien.

Laborers, subcontractors, or material dealers who contract with the general contractor rather than directly with the owner are also entitled to the protection of liens, but the statutory requirements for

these parties are often different from those for the general contractor. Typically, they must not only file a notice of lien for the public record but also are usually required to give notice in writing to the owner or its agent. The time limit for such filing is prescribed by statute and is frequently different from that required of parties contracting directly with the owner. In addition, the statutory time for filing a claim may begin with the date when the last labor or materials were furnished, rather than at the time of project completion.

Once a lien claim is filed and no payment has been made, proceedings must be brought to enforce the lien, usually within 90 days after filing. The court procedure by which the claim is judicially determined is known as a foreclosure action; it varies from one state to another but is highly technical and requires the services of an attorney. If the evidence substantiates the claim under the mechanic's lien and the court finds that there is a sum of money due and owing, the court can order the property to be sold and the proceeds used to satisfy the indebtedness. The sale of the property is made at auction by the sheriff, and a certificate of sale is executed to the successful bidder. The holder of the lien is paid from the proceeds of the sale. Most lien statutes provide the original owner a prescribed period of time to redeem its property by payment of the judgment, interest, and costs, before foreclosure action is taken.

Although the logic and benefits of lien laws are easy to appreciate, because they vary greatly in their details from one state to another, it is important for contractors, subcontractors, materials suppliers, and construction craft workers to familiarize themselves with the provisions of the lien statute in the state in which they are performing work. Legal counsel is recommended, both for gaining understanding of the lien provisions of the state, and for filing a lien if this becomes necessary.

## 9.35 RELEASE OF LIEN

Because liens place an encumbrance upon the owner's title to his property, or may force a foreclosure action, owners will understandably typically take a variety of different actions, seeking to ensure that no lien is filed in conjunction with the performance of a construction project on their property. Some owners require contractors to furnish payment bonds, so that if there is a claim regarding any debt incurred in conjunction with the improvement of the owner's property that remains unpaid, the bonding company can see to payment of the outstanding debt, thus precluding the possibility of a lien.

Owners also can, and frequently do, require the submittal of waivers of lien by contractors and subcontractors. The right to file a lien may be released or waived in a number of different ways, depending on the particular state statute. Construction contracts with private owners sometimes include a clause whereby the general contractor agrees not to file or place any liens against the owner's premises and waives its right in this regard. After the contract has been signed, this clause becomes binding on the contractor. The courts have long held that a contractor, by the terms of a contract, may release its right of lien. However, some states have enacted legislation that makes the waiver of a mechanic's lien void on the basis of being against public policy and hence unenforceable.

A broader form of release of lien that is sometimes used in construction contracts provides that no liens shall be filed by the general contractor or any subcontractor or material dealer. This provision can be made binding on the subcontractors and material dealers provided it is permitted by the state statute, and provided that certain actions are taken by the general contractor. For example, the contractor may be required to give timely notice of the waiver of lien before the purchase orders and subcontracts are signed, either by direct notification in writing to the subcontractors and material dealers, or by making the release agreement a matter of public record. Additionally, the subcontracts and purchase orders may have to include a clause that expressly provides for the release of lien by the subcontractors and

material dealers. This is a consequence of the fact that lien statutes often provide that the right of lien may be waived only by an express agreement in writing specifically to that effect.

Rather than the contractor releasing its right of lien through the medium of a contract clause to that effect, the owner very often will require the contractor to submit a signed waiver of lien form to the owner as a condition of his receiving final payment, or in some cases, each time the contractor requests a progress payment. Similar releases are often also required from the subcontractors and material vendors.

## 9.36 ASSIGNMENT OF CONTRACTS

As a general principle of contract law, practically all rights arising out of contracts are assignable. A common contractual right is receiving payment in exchange for the performance of a stipulated contractual duty. Assignment means the transfer of such a right from the party to whom the right belongs by contract to a third party. For example, to provide security for a loan, or to pay off an impatient creditor, a contractor may assign funds due or to become due under a construction contract to a lending institution, or to the creditor.

After notice of the assignment has been given to the owner, the owner must then make payments to the assignee. Basically, the assignee acquires the same but no greater rights than its assignor had, and the owner is required only to make payments as required by contract. The owner cannot be placed in a worse position than it would have been if the assignment had not been made. For example, payment by the owner to the assignee can be excused by the contractor's failure to perform properly.

However, freedom of assignment can be, and often is, regulated by the terms of the contract itself. Construction contracts usually contain provisions that expressly forbid the owner or the general contractor from assigning the contract as a whole to third parties without the written consent of the other. The AIA General Conditions of the Contract for Construction, included in Appendix D, contains just such a provision.

Subcontract agreement forms used by general contractors typically include a restriction of assignment as well (see Appendices L and M, subcontract agreements). The general contractor is often requested by subcontractors to approve an assignment of moneys due or to become due to the subcontractor under a subcontract agreement. By assignment of such funds to a bank, for example, the subcontractor may be able to obtain a loan from the bank to provide capital to finance its operations. Upon receipt of notice of such an assignment, the general contractor generally has the duty to pay the assigned, whether or not the general contractor has accepted the assignment. It is important to note that the failure of the general contractor to honor a subcontractor's assignment of funds has resulted in liability of the general contractor to the assignee. This follows from the Uniform Commercial Code, which provides that if an assignment is made as security for a loan, consent of the other party is not required, despite any contract clause to the contrary.

## 9.37 MARKETING

For many construction contractors, one of the most neglected aspects of good management of the construction contracting enterprise is the development of a vigorous and comprehensive company marketing plan. Marketing efforts can serve the contractor well when there is a need to acquire additional work, or when management has expressed a desire to expand the firm's operations geographically, or to include new work types, or to perform larger projects. In an era where owners and architect-engineers are increasingly employing project delivery methods other than lump-sum

competitive bid for their projects, it is becoming ever more important for contractors to reach out and inform potential customers with regard to their capabilities, and their qualifications, and their proven track record of performance.

In its most basic form, marketing involves identifying a target audience that needs or might potentially need construction services, and then developing a strategy and the necessary materials and media for reaching and influencing this target group. This can be done by means of the contractor analyzing his own operations, and by identifying market needs and trends, and by determining what types of work the company can perform most effectively and most profitably, based on its strengths and capabilities. From this analysis, the company's target markets can be identified, remembering that the construction customer is very sensitive to price, time, and quality of product.

The company then communicates its capabilities to its potential clients as a means of attracting additional contracts. A formal marketing program is an investment by the contractor that is aimed at achieving long-term success, and it strives to establish a positive image of the firm's capabilities in the minds of those in a position to influence the procurement of construction services. For many firms, the existence of an effective marketing plan has meant the difference between success and failure for the firm.

When the management of a construction company makes a decision to undertake an active marketing program, a detailed plan of action should be developed by management in order to define what is to be done, how it is to be done, and who is to do it. Initially, an analysis is typically made of company strengths and weaknesses, along with a determination regarding what markets should be pursued, accompanied by a finding made as to how the firm is perceived by outsiders. The marketing plan should define company goals and objectives, should instill a sense of trust in the company, and should broadcast the message that the company is interested in pursuing certain types of business. The message should underscore the point throughout, that the contractor is the most qualified firm available, and can do top quality work at competitive prices, along with meeting all of the project objectives of a potential owner and designer. It is also noted that consulting firms are available to assist the contractor with any aspect of developing a marketing strategy, or forming a marketing plan, and for assisting with the particulars of the marketing effort itself, including the development of suitable marketing materials.

Many companies have found that two of the best sources of new business can be repeat business from previous customers, and referrals from previous customers. If the contractor serves owners well and provides excellent service in everything the contractor does, and if he unfailingly accomplishes all of the owner's project objectives, those owners will continue to bring their return business, and importantly, will also recommend the contractor to others.

It is certainly an established fact that the users of construction services rank trust as one of the most important criteria when selecting a construction contractor. When previous owners again utilize the services of a contracting firm because of the trust developed on a previous project, or when previous owners convey their trust in a contractor to their circle of business associates and acquaintances, then the construction firm has acquired an extremely powerful asset.

The marketing plan and marketing initiatives of a construction firm might include all or some of the marketing components listed below.

### 9.37.1 Web Site

A robust and comprehensive web site, which is kept constantly updated, is a marketing asset that can be of incalculable value, especially in today's business and communication environment.

### 9.37.2 Social Media Sites, Especially LinkedIn

Like web sites, the contractor's presence, and that of his key personnel, on social media sites, especially LinkedIn, which is at the present time primarily a forum for the exchange of information among professional people, is of inestimable value for networking, and for publicizing the company and its personnel, and its capabilities.

### 9.37.3 Project Signs

The contractor should erect suitably placed signs on all of its construction projects. These signs should contain the name, address, and telephone number, along with e-mail addresses of key company personnel, as well as the URL for the company web site. Key branding information for the company, such as logos and management philosophies, should also be incorporated onto the signs. Job signs can be an extremely effective public relations and public information medium, and serve both to convey information and to keep the name of the company before the public.

### 9.37.4 Company Brochure

This type of publication is a basic and effective marketing tool and typically will include information and photographs describing completed projects, as well as the names and credentials of key company personnel, and company equipment assets, along with a statement regarding company philosophy, and company quality control program. A history of the company, a description of the types of work the company engages in, specialties the company has developed, company facilities, and testimonials from customers are also typically included. Such a brochure can be sent to a select mailing list and should emphasize company competence, resourcefulness, professionalism, dedication to quality, commitment to safety, and credibility.

### 9.37.5 Advertising

Advertising can be placed in a variety of media, including trade publications and other business publications, such as those of chambers of commerce, and local, regional, and national trade associations.

### 9.37.6 Newsletters

Newsletters are a company in-house publication that contains current information regarding new employees, special awards or recognitions achieved by the company and its employees, stories and news events from jobsites, best practices, company developments, project completions, new contracts awarded, and a host of similar topics. Copies of this publication can be distributed to a select mailing list as well as to company personnel. Apart from its role in marketing, a company newsletter can also decidedly improve a firm's general operation, in terms of information being shared, and morale being improved. Newsletters provide a personal touch to company employees at all levels, they are a valuable mode of increased internal communication, and they have been shown to foster team spirit, and to enhance morale and motivation among company employees.

### 9.37.7 Publicity

Many companies produce news releases and conduct press conferences concerning new contract awards, project completions, company and employee news, anniversaries, special events, employee and/or company awards and recognitions, service projects of all kinds, and other newsworthy items.

Distinctive company hardhats; company shirts and jackets; and a well-thought-out, professionally produced, and eye-catching logo can be very useful in promoting the image of the company with the public, as well as for enhancing company pride and spirit.

### 9.37.8 Public Involvement

The regular and widespread involvement of company personnel in various public affairs can be extremely valuable to the creation and maintenance of a favorable company image and is encouraged by company management in many companies. Participation in service clubs, civic groups, as well as in seminars, and forums, as well as membership on public bodies, committees, task forces, and other public participation in can be very beneficial to the company's marketing objectives.

### 9.37.9 Contractor and Architect-Engineer Professional Associations

Membership and participation in professional associations at the local, regional, and national levels serves not only to promote the professionalism and public image of the company but also to keep the people in the company participative and well informed regarding current events and current developments in professional practice in the construction industry. Membership and participation of this kind is encouraged by many construction companies, with some companies paying for membership dues and conference registrations for their employees.

## 9.38 EMPLOYEE MOTIVATION

An important aspect of the operation of a successful and cost effective construction contracting firm is the motivation of company employees. The ability of a contractor to motivate its workforce, craft workers and management workers alike, and to maintain the workers' motivation on a continuing basis, largely determines its success in constructing projects on time and within budget. Studies have repeatedly shown that motivated workers are more productive, and work more safely, than those who are not motivated. Unfortunately, motivation is a somewhat nebulous concept, and it is often difficult to understand just what stirs an individual to put forth his best effort. Nevertheless, there are some guides in this regard that can be very effective.

Fundamental to motivation is giving the worker the sense that the company is a good place to work and instilling the belief that the worker is part of a team effort, the company effort. This can be done by involving the employees in two-way communication with their managers and supervisors. The employee will have a greater interest in contributing to company success, the more he knows about the company, and how it functions, and the role that he plays in the overall picture of the operation of the company.

An effort by management in getting to know the workers and maintaining open lines of communication with them prevents feelings of isolation and detachment on the part of the workers. Soliciting their ideas and suggestions, and taking action on them when the ideas are good ones, can create feelings of belonging, let the workers know that their thoughts and opinions matter, and generate interest on their part in contributing toward achieving a common goal.

There needs to be an established procedure for workers to voice their grievances, as well as a mechanism to cultivate the feeling that management genuinely wishes to ensure that the workers are treated fairly. Maintaining open lines of communication between supervisors and workers, and preserving an established communication system can be very effective in improving worker attitudes and morale.

The opportunity for growth and advancement within a company, as provided for by company personnel policies and by formal training programs at all levels, can be a powerful stimulant. Facilitating workers' participation in training and continuing education programs can pay huge benefits, some of which are direct, and many of which are indirect.

A variety of incentives can be used to foster team spirit, and to reward employees for creative thinking and for work well done. Profit sharing, bonuses, and public recognition can be effective motivators. Company newsletters and individual awards can be used to recognize outstanding performance. Money is important, but it is not by any means the only motivator to productive performance. A company's ability to communicate with its workers, to understand their viewpoints and their problems, and to work as a team toward a common goal can be one of the firm's greatest assets.

## 9.39 SUBSTANCE ABUSE PROGRAMS

Construction companies should address themselves to developing and maintaining company policies and procedures relating to substance abuse. Alcohol and drug abuse have grown to epidemic proportions, a national problem that is shared by the construction industry. Substance abuse poses a definite and severe threat to the safety, productivity, and image of construction. It presents the contractor with major problems in the form of decreased productivity, absenteeism, job accidents, damage and destruction of property, increased insurance claims, lower quality of workmanship, employee turnover, increased cost of insurance, low employee morale, low motivation of employees, and reduced efficiency of company operations. To combat this threat, contractors must establish company substance abuse programs.

The basis for the company position in all of its aspects with regard to substance abuse must be a written company policy which is definitive and clearly written, and which is communicated to all employees. The policy should include clear and concise guidelines for supervisory personnel. The contractor should obtain assistance and input from legal counsel, and substance abuse experts, as well as human relations experts when formulating the company policy.

Most companies conduct a preliminary employee orientation program where the language and workings of the company's substance abuse program is discussed, along with the reasons for the company's position. Those who are conducting these orientations should provide copies of the company policies for the new employees to keep. Employees are usually required to sign consent forms indicating that they are aware of and intend to comply with the company substance abuse policy, as a condition of their initial employment as well as their continued employment with the company.

The everyday functioning of the company procedure may involve aspects such as undercover investigations on job sites, urine screening tests for prospective and present employees, supervisor training, searches, counseling programs, and internal employee assistance programs geared to rehabilitation. A common company policy requirement is that any employee suffering an injury on the worksite must immediately be given a urine test. Employees are informed and reminded that failure of any employee to conform to the company policies regarding substance abuse can result in termination.

The preparation and implementation of such a company policy is a difficult task and, as previously noted above, requires competent legal advice, as well as input from substance abuse experts and human relations experts. Contractor trade organizations can also provide valuable assistance in this regard. There are now reasonably safe legal guidelines that allow a contractor to establish substance abuse control programs based on legitimate business interests.

With regard to union contractors establishing programs that include drug or alcohol testing for current employees and for job applicants, the National Labor Relations Board has ruled that this is

a mandatory subject of collective bargaining and is not a unilateral management prerogative. The contractor must notify the union of its intent to initiate such testing, and upon request, to bargain to an agreement or good faith impasse before implementing such a program for union employees.

Private owners have added considerable impetus to the establishment and use of substance control efforts by contractors. It is now a common contractual requirement set forth by the owner that the contractor must demonstrate to the owner that a program for controlling drug and alcohol abuse has been established and is in effect on the projects which the contractor constructs. Some private owners require that all contractor employees be tested for drugs before they are allowed to enter the construction job site. The prime contractor conveys this requirement to all of the subcontractors on the project by including a similar provision in all of the subcontract agreements. Construction labor unions have also adopted substance abuse programs and also provide drug and counseling services to their members.

## 9.40 JOB SITE CRIME

Job site theft and vandalism have been and continue to be a major source of financial loss to construction contractors across the country. Job site crime can take many forms, ranging from malicious damage done by trespassers, to the theft of tools and materials by employees or others on the job site, to the theft of heavy equipment by organized criminals. In addition, losses from job site theft and vandalism can cost the contractor many times more than the value of what is actually stolen or vandalized. This is true because when theft or damage occurs at a job site, the work is disrupted, being slowed or brought to a halt when the necessary tool or material is not available when it is needed. Additionally, as has been pointed out previously, such disruptions in the flow and progress of the work also become employee motivation and morale issues. Such delays are very expensive in terms of their dollar effect, and also can cause serious delays in the construction time schedule. In addition company insurance rates are often increased.

While there are no foolproof procedures that can be followed, there certainly are some effective steps that a contractor can take to combat this problem. Certainly, crime prevention must become a part of company policy and a component of how the contractor conducts his business.

In order to minimize losses from jobsite crime, company management must establish a crime prevention program, and must commit itself to administering, and adhering to, and enforcing the program. The details of such a company policy and program will obviously vary with the wishes of company management, the type of equipment owned by the company, the type of work normally performed, and the general location of company projects. It has been demonstrated repeatedly that the cost, effort, and time devoted to designing and implementing such a crime prevention program can be recovered many times over by reducing the direct and indirect costs caused by theft and vandalism. Company employees should be given to understand that such a program is for the purpose of reduction of company losses and is essential for the protection of the best interests of the company and its employees.

## 9.41 EMPLOYEE TRAINING PROGRAMS

Many construction contractors today have realized the benefits of providing opportunities for training and professional development for their employees. Such training is invaluable for both the craft workers and also for the management workers in the company. These companies have come to realize that the expense and time associated with development and presentation of such programs, and

facilitating employees' participation in programs of this kind, is clearly beneficial, as demonstrated by the increased skill, efficiency, and productive capacity, as well as the motivation and morale of the construction team.

Open shop contractors, who do not have construction unions and the union apprenticeship and training programs as a ready source of skilled craftsmen, often find that they must train their own craft workers. Additionally, all contractors are concerned with the need to train their supervisory and middle management personnel with regard to enhancing their professional development, as well as providing them the tools and skills with which to perform their job responsibilities in a more capable and productive fashion.

Today, there is a wide variety of programs available for instructing construction craftsmen who do not have access to formal apprenticeship programs like those which the unions have developed. Some contractor and subcontractor professional associations are conducting programs of this kind at the national, state, and local level. Additionally, there are special programs available at both the federal and local levels, which are designed specifically to provide training to minorities, women, and unemployed workers. In addition, many vocational and technical schools today are providing construction craft training.

Privately supported and conducted trade skills development programs are largely concentrated in the open shop sector of the construction industry. In addition, some contractors conduct their own in-house training programs. Many local chapters of contractor and subcontractor professional associations sponsor and conduct programs to instruct craft workers. These efforts include all types of training in programs of varying style and scope. Many involve specialized instruction to create craftsmen highly skilled in a particular class of work. Classroom instruction, on-the-job training, and home study are all used in varying degree by different training programs.

Many of the programs of this kind train workers to be craft worker helpers. These programs usually consist of providing training in on-the-job procedures that prepare workers to fill jobs in support of skilled craftsmen, and thereby provide them the opportunity to learn the skills of the craft, with the potential to advance into the role of a skilled craft worker or journeyman.

Some programs offer both task-specific and cross-craft instruction. These training plans stress the efficiency of competency-based, task-oriented, on-the-job training, and craft worker mobility for workers who can then advance to more highly skilled jobs.

Certainly, training for supervisory and middle management personnel is no less important than providing training for the trade skills. Contractor and subcontractor professional associations, and an assortment of other professional groups, and a variety of consulting firms, as well as continuing education programs conducted by colleges and universities, are sources of customized training and education programs for current and aspiring management workers in construction companies. Such training programs typically may take the form of providing books and manuals, as well as audio tapes, videotapes, and CDs; providing resource materials; conducting or participating in teleconferences and webinars; and providing for the conduct of in-person presentations and programs of instruction of all kinds. Additionally, a number of contractors have developed their own in-house programs for providing training for their supervisory and management employees.

## 9.42 SUMMARY AND CONCLUSIONS

From accounting, documentation, and record-keeping functions, through managing accounts receivable and accounts payable, to understanding and managing the transformation of contract amounts into revenue for the business, and understanding the consequences that can follow when creditors do

not receive payments for monies owed to them as the result of their furnishing materials or labor on a project, to marketing and motivation—numerous and varied are the business functions the construction contractor must understand and effectively manage if the business enterprise is to be successful. As many would-be contractors have discovered, successful construction contracting entails far more than having the technical knowledge and skills necessary for the building of a construction project. In the highly complex and highly competitive world of construction contracting, business and management knowledge and acumen are vital ingredients for the operation, and for the continuance, and the success of a construction contracting enterprise.

## CHAPTER 9 REVIEW QUESTIONS

1. Define *schedule of values*. Include discussion of who prepares it, and what its significance is for a construction project.
2. What are the key provisions of mechanic's liens?
3. Name and discuss five key components of an effective marketing program for a contractor.
4. Name and define the two most basic financial documents for assessing the financial strength of a contractor.
5. Define the key elements of difference between cash accounting and accrual accounting. State which accounting method is preferred by most construction contractors, and discuss two reasons why this is the case.
6. Name and define three different methods of depreciation. Discuss the common use and application of each.
7. Name and define three financial ratios which are very widely used to assess the financial position of a construction business.
8. Explain why a contractor might elect to utilize straight-line depreciation for internal purposes and accelerated depreciation methods for external reporting.
9. Describe the payment request processes for lump sum, and unit price, and cost-plus projects, and how they are alike and how they are different.
10. Define *cash flow,* and describe its significance for a construction contracting firm.
11. Define *releases of lien,* and discuss when they are executed and their significance.
12. Discuss why training programs for craft workers and for management workers are important to the success of a construction firm.

# Chapter 10

# Project Management and Administration

## 10.1 INTRODUCTION

The essential focus of a construction contracting company is the satisfactory completion of the construction contracts for the projects it builds. This is the reason for the existence of the business enterprise.

Of course, the over-arching requirement for every project is to fulfill all of the requirements of the contract documents. Additionally, for every project the company constructs, it will have five objectives that it seeks to fulfill:

1. Completion of the project on time.
2. Completion at or under the project budget.
3. Completing the project safely.
4. Providing quality in all aspects of the project.
5. Leaving the customer, the owner, a satisfied client.

If these objectives are to be fulfilled, effective management by the contractor's field management staff is essential. The construction process is a complex undertaking, and is by no means self-regulating. To the contrary, careful management control must be applied throughout the project if the project objectives are to be fulfilled. Great emphasis must be placed on accomplishment of the five functions of management—planning, organizing, directing, controlling, and staffing—if the project is to be satisfactorily completed and if project objectives are to be accomplished.

It is to be remembered that construction projects are one-time and largely unique efforts of limited time duration, which involve work of a nonstandardized and variable nature. Field construction work can be greatly affected by events of all kinds that are difficult, if not impossible, for the contractor to anticipate. Under such uncertain and changing conditions, the field management staff of the contractor must apply good management practices and effective decision-making skills if the project objectives are to be fulfilled. Skilled and unremitting management is not only desirable but absolutely essential for a satisfactory result. This is the function of the construction contractor's field management staff and its two key managers, the project manager and the project superintendent.

## 10.2 PROJECT ORGANIZATION

All construction projects require an effective field management organization. Larger projects will obviously require considerably larger organizations than smaller jobs. The terminology that describes

the contractor's field management staff varies somewhat from one construction firm to another, and to a degree, from one project to another. However, the following description can be said to be representative of current construction industry practice.

The management of field construction operations is conducted primarily on a project basis, with a project manager being responsible for all aspects of satisfactory project completion. Project management cuts across the functional lines of the parent company organization, and the central office of the construction contractor acts in a service and support role to the management of the projects in the field.

Maintaining effective working relations with a variety of outside organizations, including architect-engineers, owners and owner representatives, subcontractors, material and equipment dealers, regulatory agencies, and possibly labor unions, are an important aspect of managing a project to successful completion. Project management is directed toward uniting all the diverse elements and inputs into a functional venture with the common focus of project completion and fulfillment of project objectives.

The form and extent of the organization of a project depends upon the nature of the work, the size of the project, the type of construction contract, and the policies of company management. A firm whose projects are not particularly large or extensive will have essentially all office support functions, such as accounting, payroll, and purchasing, concentrated in its main or area office of the company. Larger projects can justify the additional overhead necessary to carry out the required office tasks in a field office on the job site. Extensive projects frequently support a substantial field management team, whose composition depends on the nature of the work, its geographical location, and the type of contract. For example, a large cost-plus contract might well have all associated office functions performed at the project site. In these instances, a project management staff is customarily developed along much the same lines as the contractor's primary operating organization.

## 10.3 THE PROJECT MANAGER

The project manager organizes, plans, schedules, and controls the field work on construction projects and has overall responsibility for satisfactory completion of the project, and fulfillment of project objectives. The project manager is also described as the essential link between field operations and office operations in a construction company. He typically performs no craft work, but rather is a full-time manager. He attends to project budgets, project schedules, documentation and recordkeeping, payment requests, progress schedules, shop drawings, submittals and samples, change orders, and all of the other myriad administrative aspects of the project. The project manager acts as the principal liaison between the contractor and the owner and its representatives, and the architect-engineer. He also serves as the interface with various government representatives and officials who regulate the construction, such as building code officials, OSHA officials, state and federal highway and bridge inspectors, and so on. He serves as the focal point for all facets of the project and brings together the efforts of all of those people and organizations having input into the construction process. He coordinates all matters that are relevant to the project.

A project manager might perform management functions for one construction project at a time, assisting and facilitating a superintendent or foreman in managing the daily operations on that project and providing the interface between the superintendent or foreman and the company's office management. Alternately, depending on company policy and also on the size and complexity of the projects being performed, a project manager might perform these functions on a portfolio of several

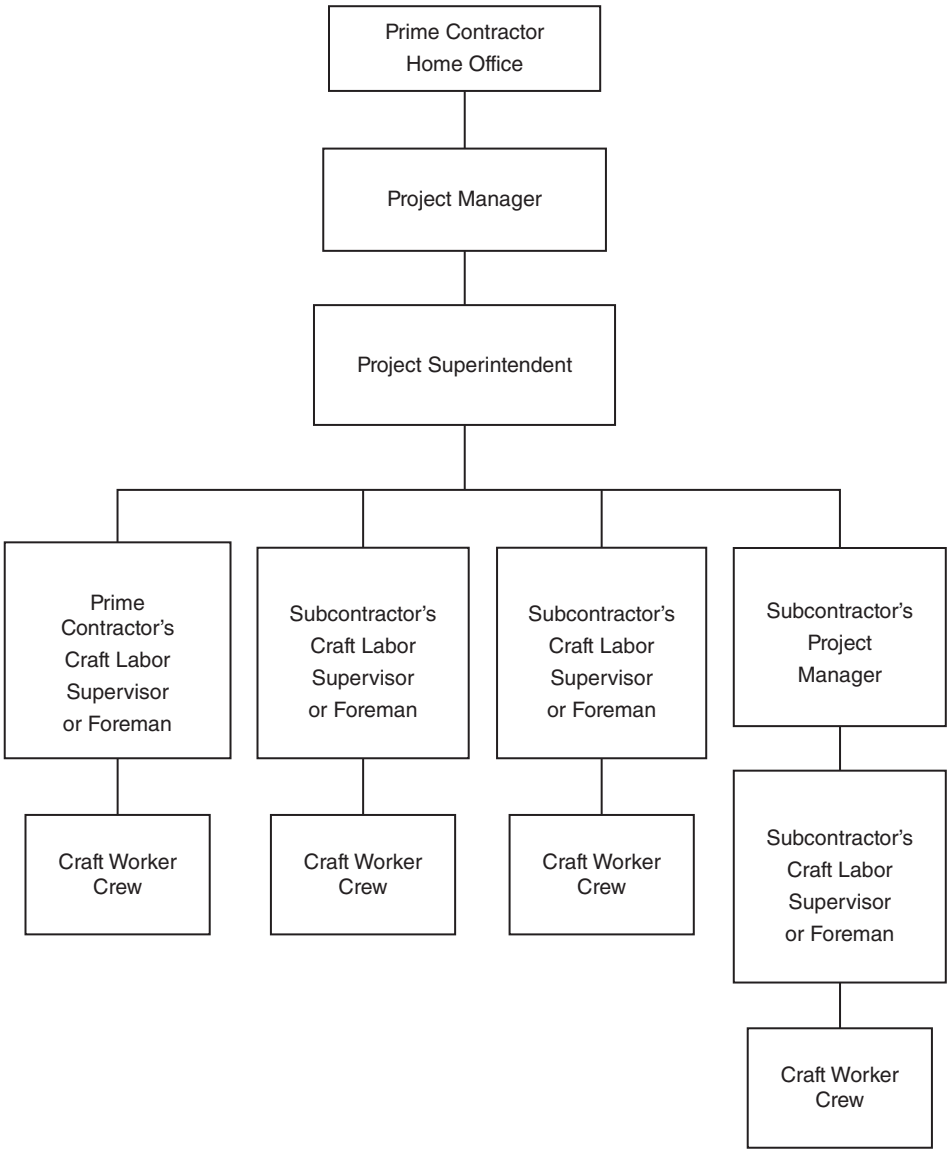



**Figure 10.1** Project Organization with Project Manager Managing One Project

construction projects at a time. Figures 10.1 and 10.2 illustrate these methods of structuring project managers' responsibilities.

On some projects, the project organization might include an assistant project manager. Additionally, there might be another person, often referred to as a project engineer, who provides assistance with some of the administrative aspects of a project manager's work. This person is not typically a registered professional engineer but a manager and administrative person who functions as an assistant to the project manager. In days past, this position was often referred to as *clerk of the works*.

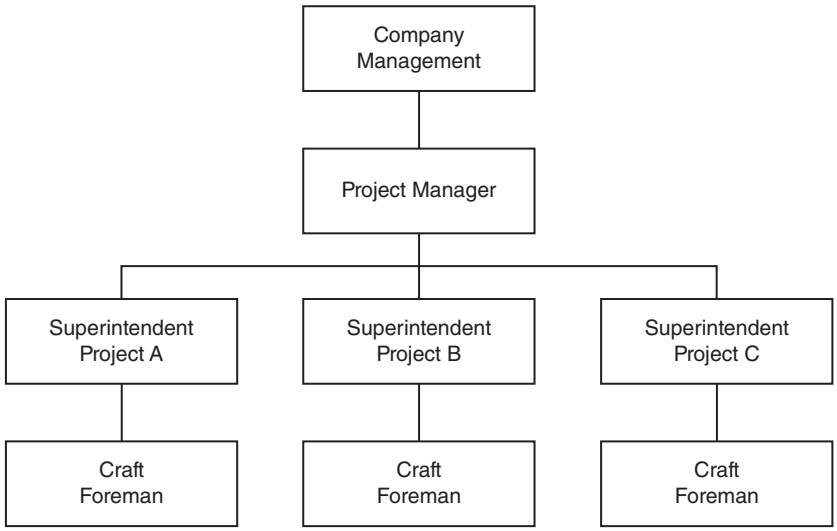



**Figure 10.2** Project Organization with Project Manager Managing Multiple Projects

The project organization methods illustrated in Figures 10.1 and 10.2 are representative of a prime contractor's organization. As previously noted, the project manager is the link between office functions and field work in the contractor's organization. The project manager facilitates and coordinates the work of project superintendents who are generally responsible for the day-to-day management of the actual construction operations on a project site, as discussed in the following section.

In a subcontractor's typical project organization, there may or may not be a superintendent in the management hierarchy. Commonly however, subcontractors utilize foremen or supervisors to manage and oversee the work of the craft workers. These supervisors report to, and receive support from, the project manager, who in these specialty contracting companies, too, is the link between field and office functions. This structure is illustrated in Figure 10.3.

In an operation as complex and as dynamic as a construction project where events progress rapidly and situations change constantly, decisions and management action must be consistent and informed, and the leadership of a single person is needed. Because he has the overall responsibility for the project, the project manager must also have broad authority with regard to managing all aspects of the project. The nature of construction is such that he must often take action quickly on his own initiative, and it is necessary that he be empowered to do so. To be effective, the project manager must have full management control of the project and must be the one voice that speaks for the project with the voice of the construction contractor. Project management is a position of leadership and provides the cohesive force that binds together the numerous and diverse elements into a team effort for project completion.

The project manager must have broad expertise and experience in the application of specialized management techniques and tools for the planning, scheduling, and cost control of construction operations. Additionally, he must be familiar with types of project delivery methods, types of construction contracts, insurance and bonding, contract provisions, subcontractor relations, and all aspects of public relations. All of these topics are further discussed in other chapters of this book.

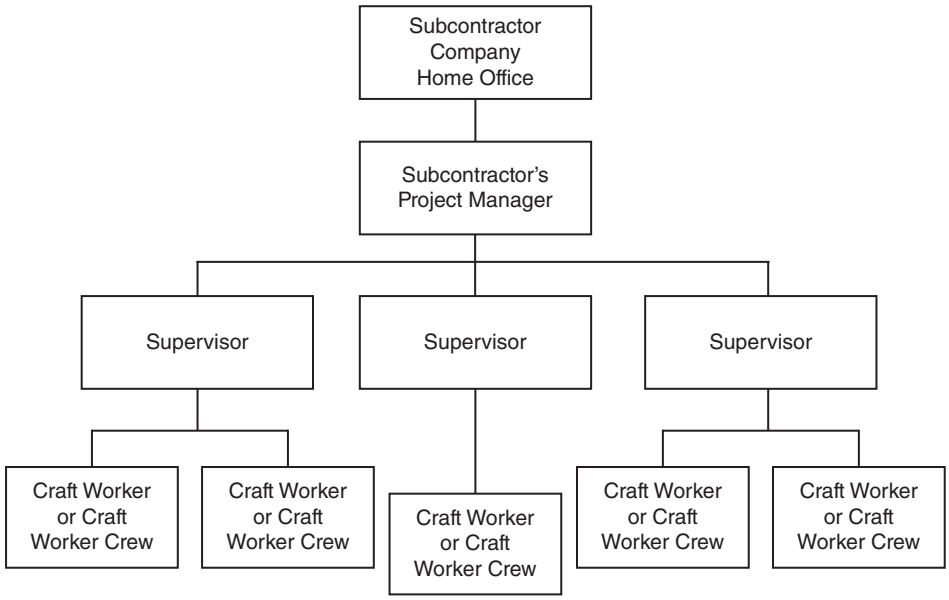



**Figure 10.3** Subcontractor's Typical Project Organization

Additionally, it is noted that in some companies the estimating and project management functions are combined. Some prime contractors and some subcontractors operate by this management method. By this logic, a person might prepare the cost estimate for a project, culminating in the submittal of a proposal. If the proposal is accepted and a construction contract is awarded, the person who prepared the estimate becomes the project manager, who performs the functions of managing and coordinating the construction of the project as described above. The rationale employed by companies that use this method is that in performing the estimating function, a person becomes closely familiar with all aspects of the contract documents requirements and the work to be performed on the project. Additionally, in the course of preparing the estimate, the person makes numerous determinations, at least in preliminary fashion, regarding work methods, equipment needed, sequences, construction schedule, and the like. When this person subsequently goes forth to manage the construction of the project, all of this knowledge of the project, and all of the thought that has already been generated, become an extremely valuable asset to effective project management.

Whether the estimating and project management functions are combined or are performed as separate functions is a matter of policy, determined by the management of the construction company. Some companies prefer to keep the estimating function separate from project management functions, while other companies have found benefit in having the same person prepare the estimate and then serve as project manager for constructing the project.

In times past, and still frequently today, project managers have been promoted to their positions from having been skilled craft worker journeymen who were then promoted to foreman, then perhaps to superintendent, and then to project manager. It is increasingly commonplace today, for project managers to have college degrees in construction, or construction engineering, or construction management, or a similar academic discipline.

## 10.4 THE PROJECT SUPERINTENDENT

The prime contractor on a project, and frequently subcontractors as well, will typically have a project superintendent as his chief management person responsible for the field operations on the construction site. Project management and field supervision are quite different responsibilities. The superintendent is the person responsible for the day-to-day management of all aspects of the field work for the construction project and on the construction site. He is typically on the site full-time every day, and has the direct responsibility of managing and coordinating all of the other people and firms who are performing work on the site.

The day-to-day direction of project operations on the construction site is handled by the project superintendent. His duties involve supervising and directing the trades, coordinating the subcontractors, working closely with the owner's or architect-engineer's field representative, checking daily production, and keeping the work progressing smoothly and on schedule. He is responsible for material receiving and storage, equipment scheduling and maintenance, project safety, job records, documentation, and reports. He is usually responsible for employee and foreman training. The superintendent is normally authorized to make small purchases directly from the field using a petty cash fund and, depending on company policy, may have authority to issue purchase orders as well.

Centralized authority is necessary for the proper conduct of a construction project, and the project manager is the central figure in that respect. Nevertheless, considerable freedom of action by the field superintendent is required in field construction work. In practice, the project authority on a construction project is typically exercised much as a partnership or as a team effort, with the project manager and the project superintendent operating as a functional team to manage the project.

Additionally, if the general contractor is self-performing some of the work on the project, the superintendent will manage and coordinate the supervisors or foreman of the general contractor's crew(s) of craft workers, as well. These relationships are illustrated in Figures 10.1, 10.2, and 10.3. In small general contracting companies, and in many subcontracting companies of all kinds, the superintendent may be designated as a "working superintendent," who spends some of his time managing and coordinating the project, and some of his time working as a skilled craft labor worker. Increasingly, however, construction companies of all kinds are recognizing that superintending a construction project is a full-time management responsibility. And as has been pointed out in other sections of this book, companies are increasingly recognizing and responding to the need to provide training and education for superintendents.

It is noted that in days past, construction workers often advanced from the position of skilled craft worker, to being a foreman or supervisor for a crew in that craft. Some of these foremen then advanced to the position of assistant superintendent or superintendent, often without the benefit of college learning. However, as construction companies and construction projects continue to increase in size and complexity, it is not uncommon today for superintendents to have formal education with associate or baccalaureate degrees in construction, construction engineering, construction management, or similar disciplines.

On large projects, the field management staff frequently includes an assistant superintendent, who may also be referred to as a field engineer or project engineer, who provides assistance to and reports to either the project manager or the project superintendent. Though not a registered professional engineer, the project engineer is assigned such responsibilities as project scheduling, progress measurement and reporting, progress billing, shop drawings, keeping of job records and reports, cost studies, testing, safety and first aid, and timekeeping and payrolls. As was noted in a previous section,

various combinations of job descriptions, and descriptive terms are used for these positions in construction companies.

## 10.5 FIELD ENGINEER

Some contractors will include on their field operations staff a person who is referred to as a field engineer. Although this person is not typically a registered professional engineer, the imprecise usage of the term *engineer* has evolved as part of the title.

This person is typically in charge of layout for the prime contractor's self-performed work, and frequently performs this function for some of the subcontractors as well. Frequently referred to as being in charge of "line and grade," the field engineer establishes benchmarks and reference lines and lays out the locations of individual members such as drilled piers and columns, as well as assemblies such as walls and ramps. Establishing and monitoring horizontal and vertical control of the structure and its component parts is the domain of the field engineer.

## 10.6 OWNER PROJECT REPRESENTATIVE

On large projects, and those where the construction is of a specialized or highly technical nature, a full-time representative of the owner is frequently included as part of the project team. This person may be referred to as the owner representative, resident project representative, resident engineer, resident architect, contracting officer, or other similar title. Although this person may be an employee of the owner or the architect-engineer, his full-time responsibility is to protect and ensure the contractual rights of the owner during the construction process.

The duties of the owner representative can be highly variable, depending on the type of contract the owner has with the architect-engineer, the form of construction contract, the type of construction, and the wishes of the owner. This person typically spends full-time on the job site, working closely with contractor personnel. Depending on the size and nature of the work, he may handle the assigned responsibilities personally or he may be in charge of a project team consisting of several persons. The duties of an owner representative will typically include such matters as inspection and quality control, checking shop drawings, maintaining job records and documentation, checking pay requests, attending project meetings, making location surveys, monitoring materials and acceptance testing, processing of change orders, measurement of work quantities, conducting or monitoring performance testing, preparing as-built drawings, status reports, and similar functions.

Usually, when the owner intends to use such a person on a project, this fact will be noted in the general or special conditions of the contract documents. These documents will also frequently include the stipulation that the contractor is required to provide suitable office space and furnishings for this person in the contractor's field office on the job site.

## 10.7 JOB SITE COMPUTERS

There is substantial, and growing, use now being made at construction project job sites of microcomputers, laptops, personal computers, tablet computers, personal digital assistants, smartphones, electronic cameras, upload and download devices, and a rapidly growing list of similar electronic devices. These computers and similar digital devices are being used for word processing, spreadsheet applications, database information systems, online document access and retrieval, and communications

systems of every kind. Digital still and video cameras are a routine component of requests for information (RFIs) and all manner of project documentation and record keeping. These machines and devices generate, transmit, and store all kinds of project information, including contract documents, project communications, project time schedules and schedule updates, labor and equipment costs, time status reports, payroll data, estimating information, materials ordering, delivery, and management information, and subcontractor and supplier information. With the increasing use of, and the continuing rapid advancement of building information modeling (BIM) technology, new project information and project management capability is becoming available, seemingly on a daily basis. These various digital machines function in a stand-alone capacity or can be integrally linked wirelessly or by hard wire to the company's computer, or to intracompany and external networks.

Field personnel and office personnel, and managers at all levels, can be and should be trained in the understanding and use of these digital devices, and should be supplied with the appropriate hardware and software to effectively facilitate their work. These digital devices can substantially increase the productivity and effectiveness of field forces and office management personnel alike, by providing the project manager and superintendent and the entire management team with accurate and current job information. In today's complex and dynamic construction environment, timely and accurate information is absolutely essential for effective management.

## 10.8 ASPECTS OF PROJECT MANAGEMENT

In general terms, project management might be described as the judicious allocation and efficient usage of resources to achieve timely completion of all the requirements of the contract documents within the established construction budget, and while fulfilling the other three project objectives as well. The resources required are skill, and expertise, as well as money, manpower, equipment, materials, and time. Considerable management effort is required if the contractor is to meet its construction project objectives. The achievement of a favorable time-cost balance by the careful scheduling and coordination of labor, equipment, and subcontractors, and the maintaining of a material supply to sustain this schedule requires dedication, hard work, and skill. The project organization, with the project management team at the forefront, must blend the quantitative techniques of scientific management together with the subjective ingredients of experienced judgment and intuition, into an effective and efficient operating procedure. Astute project management requires at least as much art as science and as much human relations as management techniques.

The details of a job management system depend greatly on the contractual arrangements with the owner. Basic to any contractor's project management system, however, is the control of project time and cost during the construction period. Before field operations begin, a detailed time schedule of all operations and a comprehensive construction budget are prepared. These constitute the accepted time and cost goals that will be used as the basis for project management and project control throughout the construction process.

After the project has been started, monitoring systems are established that measure actual costs and progress of the work at periodic intervals. The reporting system provides progress information that is measured against the programmed targets. Comparison of field costs and progress with the established project budget and project schedule quickly detects exceptions that must receive prompt management attention. Data from the system can be used to make corrected forecasts of costs and time necessary to complete the work. Chapters 11 and 12 of this text discuss the essentials of time and cost management on a construction project.

## 10.9 FIELD PRODUCTIVITY

Project management is vitally concerned with field productivity because this is the measure that determines whether or not the project will be completed within the established cost budget and time schedule. According to a Construction Industry Cost Effectiveness (CICE) study published by the Construction Industry Institute (CII), construction field productivity has declined significantly during the past several years. How to motivate workers and how to maintain the necessary level of productivity throughout the construction of the project are vital aspects of construction project management.

The CICE study disclosed that an appreciable proportion of a construction craft worker's time is completely nonproductive, and at least one half of the time wasted is caused by poor job management. Some of the factors contributing to the construction workers' poor productivity as identified in the CII study include demotivated workers, lack of material management, poorly trained supervisors, failure to utilize modern time and cost management methods, poor communications, and lack of teamwork. To overcome these negative factors, there must be a commitment by company management to establish a detailed program of action.

There are many influences that can demotivate a craftsman, but the CICE study reports that some of the most common complaints are: materials unavailable, unsafe working conditions, redoing work already completed, unavailability of tools or equipment, lack of communication, and disrespectful treatment by supervisors. All of these are factors that can be minimized or eliminated by management awareness, and by effective management action. Associated with workers being "demotivated" are absenteeism and job turnover, and both of these in turn are factors in poor productivity.

As noted in other sections of this book, some companies are making strides to provide their foremen, superintendents, and project managers with management training. There are now numerous training programs available through contractor and subcontractor professional associations, consultants, technical schools, and universities. Additionally some contracting and subcontracting companies have developed and are providing management training in-house.

Examples of management programs available for foremen, superintendents, and project managers at the time of this writing include the Associated General Contractors of America (AGC) Supervisory Training Program (STP). Additionally, the AGC has recently entered a partnership agreement with the Lean Construction Institute to provide learning in lean construction concepts and techniques. The Associated Builders and Contractors (ABC) also sponsors supervision and safety programs. The National Electrical Contractors Association has developed and is actively teaching electrical project supervision (EPS), foreman, and project management programs, as is the International Union of Painters and Allied Trades (IUPAT).

The CICE study also documented the fact that scheduled overtime can be counterproductive and inefficient. Scheduled overtime does not refer to occasional periods when more than the usual 40 hours per week are worked. Scheduled overtime refers to excess hours included as a part of the usual workweek for construction craft workers for extended periods. The CICE study found that as this form of overtime increases, both productivity and safety actually are diminished in the workplace. As the result of these studies, it is easy to see that management does well to closely examine the efficacy of scheduled overtime.

## 10.10 PROJECT ADMINISTRATION

Project administration refers to those actions that are required to achieve the established project goals. These involve duties that may be imposed by the construction contract, or that are required by good

construction and business practice. The efficient handling, control, and disposition of contractual and administrative matters in a timely fashion are of paramount importance for the effective management of a construction project.

Specifically, project administration refers to those practices and procedures that are proven methods for keeping the project progressing in the desired fashion. Whatever is required to provide the project, efficiently and in a timely manner, with the materials, labor, equipment, and services required lies within the general domain of project administration. Some of the typical procedures that project managers and superintendents utilize in effective project administration are described in the following paragraphs.

## 10.11 PROJECT MEETINGS

Following the award of the construction contract and after the principal subcontracts have been awarded, but before the beginning of actual construction, it is common practice for the general contractor to call a preconstruction meeting or series of meetings between representatives of the owner, architect-engineer, subcontractors, and the members of the prime contractor's management team. These meetings are also frequently referred to as preconstruction conferences.

These meetings serve to introduce members of the construction team to one another and to establish ground rules and procedures for the construction process. Matters of common concern such as shop drawings, project time schedule, storage and hoisting facilities, project site offices, laydown areas, temporary job services and utilities, parking areas, job site security, owner-furnished materials, site surveys, and quality control are discussed. These meetings provide the architect-engineer and the owner an opportunity to remind the contractor about insurance certificates, required permits, cost breakdowns, list of subcontractors, construction schedule, schedule of owner payments, and other actions required before the start of construction operations. Such contractual provisions as the completion date, liquidated damages, progress payments, bonus clauses, safety program, and extensions of time are reviewed and explained. This preconstruction meeting provides those attending an opportunity, on an in-person basis, to raise questions and clear up misunderstandings and hopefully, reach agreement on matters of concern.

After construction has begun, regular job site meetings, commonly referred to as project coordination meetings, are standard practice on construction projects. Such meetings are usually facilitated by the project manager with representatives of the owner, architect-engineer, material vendors, and subcontractors attending. Minutes of these meetings are kept and copies are distributed to interested parties. At such meetings job progress is discussed, with trouble spots being identified and corrective action planned. These regular meetings are very valuable in the sense that all parties concerned are kept fully informed concerning the current job status and everyone involved on the project can be continuously apprised of the importance of meeting their own obligations and commitments. Such face-to-face exchanges are invaluable for sharing information, planning, identifying potential problems, and resolving potential or actual problems or issues.

## 10.12 SCHEDULE OF OWNER PAYMENTS

A common contract provision requires the contractor to provide the owner with an estimated schedule of monthly payments that will become due during the construction period. This information is needed by the owner to facilitate his budgeting and to ensure that funds will be available as needed to make the necessary periodic payments to the contractor. Because the owner must often sell bonds or other

forms of securities to obtain funds with which to pay the contractor, it is important that the anticipated payment schedule be as accurate a forecast as the contractor can provide.

The most accurate basis for determining such payment information is the project time schedule (see Chapter 11) that the contractor has prepared for the management of time throughout the construction of the project. The contractor will also gather information from his original estimate for the project, as well as from the project budget which the contractor prepares either before field operations begin or very early in the construction period. By establishing the total costs associated with each scheduled segment of the project, and by making some reasonable assumptions concerning how construction cost varies with time (a linear relationship is often assumed), as well as by analyzing his project budget, the contractor can prepare a reasonably accurate prediction of the value of construction in place at the end of each month. By taking retainage into account, these data can be reduced to an estimated schedule of owner monthly payments. These values may have to be subsequently revised as the project progresses because of owner-initiated change orders or due to other factors that may have affected project schedule and therefore the rate of the owner's disbursement of project funds.

## 10.13 SHOP DRAWINGS

Although the working drawings and specifications prepared by the architect-engineer are adequate for estimating the project and for most general construction purposes in building the project, they nonetheless require amplification in order to prepare for the fabrication and production of many required construction products to be installed on a project. The manufacture or fabrication of some of the materials, equipment, and components required for the project often requires that the contract drawings be supplemented by detailed shop drawings that enlarge, clarify, and augment the contract design.

Shop drawings can be defined as fabrication, erection, and setting drawings; manufacturer's standard drawings or catalog cuts; performance and test data; wiring and control diagrams; schedules, as for hardware, and locksets; samples; and descriptive data pertaining to material, machinery, and methods of construction, which are prepared by a manufacturer, fabricator, or distributor for some material or product to be installed in a project, prepared as necessary to carry out the intent of the contract drawings and specifications. Such descriptive technical submittals are prepared by the producers, fabricators, or distributors of the materials or products, and are submitted to the general contractor and then to the architect-engineer for approval before the item is supplied to the project. This procedure also applies to certain materials and equipment provided by subcontractors, and in this case shop drawings are submitted to the general contractor through the subcontractor. Shop drawings are required for almost every product that is manufactured or fabricated for the project away from the building site. To illustrate, in building construction, shop drawings must be prepared for everything from structural steel and reinforcing steel to metal door frames to millwork and finish hardware. The general contractor also must sometimes prepare shop drawings for components that he will fabricate and install or for the equipment he plans to use in performing certain elements of the work.

## 10.14 APPROVAL OF THE SHOP DRAWINGS

When shop drawings are first received from a supplier, the contractor is responsible for checking them carefully against the contract drawings and specifications. He must ensure that the item complies in every way with the contract documents in terms of quality, performance, and dimension. If the

contractor discovers an error with regard to any aspect of the shop drawings as submitted, he marks the drawings accordingly, typically adds the notation "revise and resubmit," and sends them back to the originator. This iterative process continues until the contractor finds the shop drawings correct and satisfactory. When the contractor has assured himself that the shop drawings are satisfactory, he notes his approval on the drawings and then forwards them to the architect-engineer for examination and approval. The checking and certifying of these drawings is properly the responsibility of the architect-engineer since they are essentially a further development and interpretation of the design. The AIA General Conditions of the Contract for Construction in Appendix D describes the shop drawing approval process for a building construction project.

Like the contractor, when the architect-engineer receives the shop drawings he will examine them for compliance with the design intent. If he discovers an error, the designer notes his disapproval, often with the same notation, "revise and resubmit," and sends them back to the contractor. The contractor makes note for his records, and sends the drawings back to the originator. This process continues until the architect-engineer "approves" (discussed further in the next paragraph) the drawings and marks them approved, and sends them back to the contractor. The contractor makes note for his records and sends the approved shop drawings back to the person who produced the drawings. When this person receives the drawings that have been approved by the contractor and by the architect-engineer, it becomes his responsibility to furnish the item to the project in exact compliance with the approved shop drawings and in accordance with the schedule that he and the contractor will have agreed to.

It is important to note that only a qualified approval is typically given today, to shop drawings by architect-engineers. Such approval relates only to conformance with the design concept and overall compliance with the contract drawings and specifications. Approval of shop drawings can possibly place legal responsibility upon the architect-engineer if an error in the drawings is later found to be the proximate cause of damages. Possibly to minimize their potential liability, many architect-engineers no longer use the word *approved* when indicating that shop drawings have been reviewed and found satisfactory. Rather, terms such as *reviewed, no exceptions taken, accepted,* or *examined* are now sometimes used. The architect-engineer typically asserts following his review that his checking does not include verification of quantities, dimensions, fit, fabrication methods, or construction techniques.

Approval of shop drawings by the architect-engineer does not relieve the contractor of his responsibility for errors or inadequacies in the shop drawings, or for any failure to perform the requirements and the intent of the contract documents. Approval of shop drawings does not authorize any deviation from the contract unless the contractor gives specific notice of the variance and receives express permission to proceed accordingly. However, as long as there is no explicit disagreement between the shop drawings and the construction contract, approval is usually binding in the event of a subsequent dispute over design requirements. So long as the work covered conforms to approved shop drawings, the contractor is considered to have complied with its contractual obligation.

For obvious reasons, it is important that the contractor carefully check all of the project shop drawings. He cannot act merely as a "go-between" with suppliers and architect-engineers. An interesting aspect of approved shop drawings is that they are not usually considered to be contract documents, and they do not modify or extend the obligation of either party to the construction contract.

It is also important to note that the contractor must ensure that shop drawings are prepared for every component of the project for which they are required and that he knows the exact status of every required shop drawing at all times. Manufacturers, fabricators, and suppliers will not proceed with preparing their product for delivery to the project unless and until they have approved shop drawings in hand.

The procedure followed by most contractors is to carefully examine the drawings and specifications for the project and then to carefully make note of every item for which shop drawings are required. All of these items are listed on a shop drawing log or shop drawing register. Often prepared in the form of a spreadsheet, this register contains cells in which the contractor can mark the current status of each of the shop drawings throughout the approval process. When the shop drawings have been approved and sent back to the supplier or fabricator, the contractor makes note of final approval and enters the expected delivery date on the register.

## 10.15 QUALITY CONTROL

Quality control during field construction is concerned with ensuring that the work is accomplished in accordance with the requirements specified in the contract. The architect-engineer establishes the criteria for the construction in all of its components, and the quality control program is intended to check and ensure contractor compliance with those standards. A field quality control program involves inspection, testing, and documentation for the control of the quality of materials, workmanship, and methods. On a given project, the quality control program may be administered by the architect-engineer, owner, consultants, prime contractor, or construction manager.

The inspector in the quality control program has no authority to give directions, render interpretations, or change the contract requirements. The inspector is not in a position to manage the project, or to direct the work, or to relieve the contractor from any of its obligations. He cannot issue instructions to the contractor, nor can he interfere in field operations unless it is to prevent something from being done improperly. The function of the inspector is to observe the construction process and to ensure compliance with contract requirements by the contractor.

The provision of field inspection services by the architect-engineer can significantly increase his vulnerability to a wide range of potential liabilities. To illustrate, the responsibility for field inspection has led to the liability of architect-engineers for construction defects caused by the contractor's failure to follow contract requirements. Design professionals have been held responsible for contractor's construction methods and have been held liable to workers and members of the public injured by construction operations. As a result, there has been a decided trend for architect-engineers to withdraw as much as possible from any responsibility for site operations. Extensive revisions have been made to the contract language that defines their responsibilities to the owner for ensuring that the contractor is providing what is defined and required by the contract documents.

The words *supervision and inspection* have proven to be especially troublesome for architect-engineers because they have been interpreted to mean that the designer has some degree of control and thus responsibility for the contractor's day-to-day operations. By the terms of most of the usual design contracts between owner and architect-engineer today, the designer accepts only very limited responsibility for field operations. For example, the language of AIA Document B101–2007, "Standard Form of Agreement between Owner and Architect," which is included as Appendix B, provides that the designer will make periodic site visits but will not assume any responsibility for continuous or extensive onsite inspections unless provided for under a supplementary agreement. Many contracts between owners and architect-engineers today indicate that the architect-engineer will "observe" the contractor's work on the project with the intent of generally assuring the contractor's compliance with the requirements of the contract documents.

If the architect-engineer does agree to administer the project quality control program, he will usually assign a full-time employee to the project to provide administrative and observation services. Laboratory and field testing may be done by this person, or, more commonly, a commercial testing laboratory may be engaged to perform the specialized work of testing.

Many public agencies and corporate owners establish their own internal quality control programs to monitor their ongoing construction projects. Where there is a continuous construction program or where very large and complex projects are involved, the owner may establish a functional department within his overall organization which consists of a staff of trained and qualified people that develops and implements standards for quality control application in the field.

Owners sometimes hire specialized consultants to provide field quality control services. In this context, a consultant may be a technical firm such as a testing laboratory, or a specialized consulting engineer (not the project designer), or a construction management firm that provides quality assurance and quality control services. Such consultants are frequently employed on extremely complex construction, or on projects that have specialized and highly technical quality control requirements. The firms that provide these services are usually entirely independent of the architect-engineer and the contractor and are usually retained during the design process to provide advance quality assurance input and advice.

During recent years, some public and private organizations and a number of owners have required prime contractors to take a more active role in the control of project quality by requiring them to develop and manage their own quality assurance and quality control programs. Increasingly, both public and private owners are including language in their conditions of the contract requiring the contractor to develop and maintain a formal quality management policy and program, and to apply that quality assurance program to the owner's project. Such language typically requires the contractor to maintain a job monitoring and inspection system of its own and to perform such inspections that will ensure the work performed conforms to contract requirements. The contractor is required to maintain and make available adequate records of such quality control inspections.

On such projects, owner representatives monitor the contractor's quality control plan and perform spot-check inspections during the construction process. By the terms of such contracts, the contractor is usually required to provide significant and specific inspection and documentation to satisfy both himself and the owner that the work being performed fulfills the contract requirements. In the usual case, the contractor is required to report to the owner or to the architect-engineer on a daily basis, a summary of the construction progress, any problems encountered and the corrective action taken, and to certify that the completed work conforms to the requirements of the contract documents. The owner retains his right of final inspection, and also reserves the right to inspect at any other time deemed necessary to ensure strict compliance with the contract provisions.

By this same logic, today, owners are increasingly requiring contactors to submit their quality assurance and quality control policies and programs to the owner and the architect-engineer as a component of prequalification before being authorized to submit a proposal. Similarly, on projects where competitive sealed proposals are utilized or on negotiated contracts, owners require contractors to submit their formal quality control programs as an element to be evaluated in the proposal, or as a component of the negotiation.

The final aspect of quality control on a project is the final inspection, field acceptance testing, equipment certification, commissioning, and start-up of the facility. The prime contractor, appropriate subcontractors, and manufacturer's representatives are required to start up the project equipment and systems, with the owner checking all control and instrument operation. This typically includes simulation of both normal operating and emergency conditions. The facility is turned over to the owner with a complete set of job files, shop drawings, as-built drawings, maintenance and operating manuals, owner's manuals, and spare parts.

Recent years have seen what is widely described as an increasing neglect of construction quality control, to the detriment of the quality of some projects. Modern contracting methods involve so many participants on the construction team that responsibility for the end product has become fragmented

and diffused. The withdrawal of the architect-engineer from rigorous quality inspection and supervision has been previously discussed. Inspection by the contractor is frequently criticized on the basis that it is unrealistic to expect profit-oriented contractors to rigorously inspect their own work. There seems to be increasing sentiment that construction quality control should be a budgeted part of the total construction process and that this responsibility should be contracted to third-party professional firms.

## 10.16 TOTAL QUALITY MANAGEMENT

In response to the perception that construction quality has declined, many construction firms have adopted a management philosophy, and have formulated policies and procedures accordingly, seeking to assure and to publicize the delivery of a quality outcome in all of the work they do. Simultaneously, other segments of American business and industry have begun to gravitate to the principles of total quality management (TQM). First espoused by Sir Edwards Deming, and later by his protégés Juran and Crosby and others, TQM can be summarized as a management approach to long-term success through customer satisfaction. In a TQM effort, all members of an organization commit to and participate in, improving processes, products and services, and the culture in which they work.

Some of the basic tenets of TQM include:

- Top management commitment to quality.
- A company-wide dedication to continuous improvement.
- Customer focus.
- A team structure with company-wide participation.
- The use of tools and techniques to base actions on facts, data, and analysis.
- Training and education of the entire team.

Many contractors have adopted some or all of these principles and have developed written quality philosophy statements for their companies, accompanied by policies and procedures as components of a formal quality assurance and quality management program. Many of these policies are extended to their being included in the set of objectives for every project, as illustrated in the first section of this chapter.

A number of owners have begun actively seeking out such contractors, and including the quality assurance programs of contractors in their evaluations of contractors whose proposals are accepted, and with whom they enter contracts. Thus, it can be seen that a number of contractors have acquired a significant competitive advantage, along with enhanced reputations, as the result of their demonstrated commitment to the delivery of quality outcomes.

## 10.17 MATERIALS MANAGEMENT

The efficient management of materials is an essential component of the conduct and management of any construction project. Because the expense of materials and the cost of labor to install them account for more than one half the total cost of many projects, it is obvious that the supply of materials commands management attention. The process begins with the materials take-off during the estimating process and continues through requisitioning, purchasing, receiving, job site storage, and distribution to the workface.

If the owner is providing some of the materials for the project, this party is a necessary part of the management process and there must be clear communications between the owner and the prime contractor with regard to coordinating the procurement and delivery process. This rationale will likewise apply if the owner or prime contractor is supplying materials for a subcontractor.

Using computers as tools in the contractor's material procurement and management system is now common practice, especially in larger firms, and is a process that can yield substantial labor cost savings and reduce the overall costs of material procurement and handling. Computer softwares are available to track and control the flow of construction materials to work crews in the field, from quantity take-off through purchasing and allocation. Bar codes and scanners are commonly used to manage materials, both in the supply chain and after their delivery to the job site. The principal elements of the materials management system after the material purchase order has been issued are discussed in the following sections.

## 10.18 EXPEDITING

Construction is of such a nature that the timely delivery of project materials is of significant importance to maintaining the flow of the work, as well as to keeping the project on schedule. If required items are not available at the job site at the time when they are needed, the contractor can experience major difficulties because of the disruption of the construction schedule. Such delays are expensive and inconvenient, and require rescheduling, and reallocation, and relocation of craft labor manpower. In addition to the direct expense this entails, as was noted earlier in this chapter, lack of materials with which to proceed with the work is often cited by craft labor workers as a demotivating force in the workplace, and constitutes a serious productivity issue. Therefore, every effort must be made to avoid these occurrences. When purchase orders are written, delivery dates are designated that, if met, will ensure that the materials will be available when needed. These dates are established on the basis of the project progress schedule and must necessarily make allowance for the approval of shop drawings.

Unfortunately, the contractor cannot always be sure that the designation of delivery dates in the purchase orders or the securing of delivery promises from the materials suppliers will automatically ensure that the materials will arrive on schedule. A series of follow-up actions, referred to as expediting, are taken after each material order is placed, to keep the supplier constantly reminded of the importance of timely delivery. Expediting may be a job site function, or depending on the size of the project and the quantity of materials purchased, the construction firm may provide all of its construction projects with a centralized expediting service. A full-time expediter is sometimes required on large projects or when large quantities of different materials are purchased. On work where the owner is especially concerned with job completion, or where certain material deliveries are crucial, the owner will often participate along with the contractor in cooperative expediting efforts.

A necessary adjunct to the expediting function is the maintaining of a check-off system or log where the many steps in the material delivery process are recorded. Beginning with the issuance of the purchase order, a record is kept of the dates of receipt of shop drawings, their submittal to the architect-engineer, receipt of approved copies, return of the approved drawings to the vendor, and the delivery of the materials to the job site. Because shop drawings from subcontractors are submitted for approval through the general contractor, the check-off system will include materials being provided by the subcontractors. This is desirable because project delay can be caused by any late material delivery, regardless of who provides the material. This same documentation procedure is followed for other aspects of materials purchase and quality assurance, such as samples, mill certificates, concrete-mix

designs, and other submittal information required by the contract documents. General contractors sometimes find it necessary on critical material items to determine the manufacturer's production schedule, testing schedule if required, method of transportation to the site, and data concerning the carrier and shipment routing. This kind of information is especially helpful in managing the production and transportation process if strikes or other potential sources of delay are occurring or may be anticipated.

Each step in the approval, manufacture, and delivery process is recorded and the status of all materials is checked frequently on the materials supply log. At intervals, a material status report is forwarded to the project manager for his information. This system enables the project management team to keep abreast of material supply information, and also serves as an early-warning mechanism when slippages in delivery dates are occurring or seem likely to occur.

The intensity with which the delivery status of materials should be monitored depends on the nature of the materials concerned. Regularly available materials such as sand, gravel, brick, and lumber, which are typically purchased from local suppliers, usually require little follow-up. Critical made-to-order items, whose installation is on the critical path in the schedule and whose late delivery would seriously disrupt construction operations and the construction schedule, must be monitored much more closely. In such cases, the first follow-up action might very well be taken weeks or months in advance of the scheduled delivery date. This action, perhaps a letter showing order number, date of order, and delivery promise, would request specific information regarding the anticipated date of shipment. Return answers to such inquiries can be very helpful. If a delay appears forthcoming, strong and immediate action is necessary. Letters, e-mails, telephone calls, and personal visits may be required to keep the order progressing on schedule. It is also noted that the materials tracking log, the shop drawing log, and all written correspondence and records from all telephone conversations regarding materials ordering, tracking, expediting, and delivery must be maintained by the company office and/or by the project manager. If claims or other difficulties occur with regard to materials purchasing and delivery, and also for the avoidance of claims, this documentation is invaluable.

## 10.19 DELIVERIES

In addition to working and managing for the timely delivery of materials, the expediter or project manager also must plan for the receipt, unloading, and storage of the materials. In general, deliveries are made directly to the projects to minimize handling, storage, insurance, and transportation costs. However, there are often instances where it is preferable or necessary to store materials temporarily at offsite locations until they are needed on the job site. A common example occurs in the construction of buildings in crowded urban settings where laydown and storage space is extremely limited.

When notice of an impending material delivery is received, suitable receiving arrangements must be made. Advance notice of shipments is provided directly by the vendors, or through bills of lading or other shipping papers. If a shipment is due on a job site, notice is provided to the project superintendent so that the delivery process can be managed as effectively as possible. Plans must be made for unloading and handling. If a crane is needed for unloading, the lifts must be scheduled, and arrangements made for rigging. Other equipment and manpower that may be needed must be planned, along with plans and arrangements regarding job site storage. Storage location, as well as considerations such as cribbing, pallets, weatherproof covers, and the like must be planned, or arrangements made for storage in secure weatherproof containers or rooms as may be needed for the material. The specifics regarding the people who will perform these processes, who will inspect and count the delivered items

against the invoice and against the original order, who will check for damage, who will sign the delivery invoice, and so on must also be planned and arranged. If delivery is to be made to the contractor's warehouse or to a remote storage yard, similar plans and arrangements must also be made.

The scheduling of material deliveries to the job site can become critically important on some projects. For example, consider the delivery of structural steel to a building project in a downtown metropolitan area. On projects of this type, where job site storage space is extremely limited or nonexistent, deliveries must be scheduled with extra care and coordination so that the fabricated steel members arrive at the correct time in the schedule, and in the order in which they are needed, and at a rate commensurate with the advancement of the structure. Projects of this kind obviously require extremely careful scheduling of deliveries, and the close cooperation of the contractor and the steel supplier or fabricator.

An additional factor to be planned for is the routing of the delivery trucks through the city streets, often at off-hours, and arranging for the direction of traffic around the vehicles during the delivery and unloading operations. Arrangements for necessary permits, police escorts, labor, and unloading equipment must be made in advance. On such projects, many material deliveries are not made directly to the site but to temporary storage facilities owned or rented by the contractor. When such offsite storage is used, deliveries to the job site are made in accordance with short-term job needs.

Many contractors and subcontractors are now making arrangements with materials suppliers and manufacturers for their materials deliveries to be made in accord with the contractor's time schedule for the project, at the exact time when the materials are needed on the job site, and in exactly the quantities that are needed at that time. This method, often referred to as *just-in-time delivery,* has been very effective for contractors and materials dealers alike. Many suppliers favor this process because it may reduce their inventory, storage, and handling costs, and also allows for the planning of their delivery operations. For contractors, this method reduces materials handling and storage costs as well as risk, and is of tremendous benefit when job site storage space or laydown area are limited.

## 10.20 RECEIVING

Delivery of job materials is usually made directly to the job site. There are times, however, when it is either undesirable or impossible to accept shipments at the project. Construction in congested urban areas is an instance as noted above. Another example is early delivery of items that would be susceptible to damage, loss, or theft if stored on the job site for extensive periods of time. Whenever possible, such materials are stored in the contractor's yard or in a secure warehouse until they are needed.

Truck shipments may be made by common carriers or by the supplier's vehicles. In either case, the material must be checked for damage as it is being unloaded, and quantities must be checked against the freight bill or vendor's delivery invoice, as well as against the original materials order. Visible damage must always be noted on all copies of the freight invoice, as well as notation of potential concealed damage as indicated by boxes that are damaged or boxes that rattle, and so on. These notations should be witnessed by the truck driver and accompanied by his signature. The designated person who is receiving the delivery should not sign the delivery or freight invoice until he has checked all of the aspects of the delivery, as noted earlier.

When shipment is made by rail car, the contractor advises the carrier where it desires the car to be spotted as soon as the contractor has been advised of the car number. The shipment should be checked after the car is placed for unloading, and any visible damage immediately reported to the railroad claim agent. In case of damage, unloading may need to be deferred until the shipment has been

inspected and proper notations made on the bill of lading. A claim for damage or loss is submitted to the freight claim agent on the standard form of the carrier. This claim must be accompanied by the original bill of lading, the receipted original freight bill, the original or a certified copy of the vendor's invoice, and other information such as electronic photographs as appropriate, to substantiate the claim. Should damage be such that it is not visible and cannot be detected until the goods are unpacked, the contractor must make its claim at that time on the carrier's special form that is used for concealed damage.

Rail shipments of less-than-carload (LCL) quantities may be such that the contractor must pick up the material at the freight depot, or it may be delivered to the construction project site or to the contractor's yard by truck. These delivery arrangements depend on the FOB point designated by the purchase order. (The FOB designation is defined and discussed in Chapter 9.)

The party who receives a shipment on behalf of the contractor should immediately transmit the delivery invoice, freight bill, or bill of lading to the contractor's office. Information pertaining to damage or shortage, and the location of material storage should be included in notations made on the invoice by the person receiving and signing for the material.

Although most purchase orders include freight charges in their face amounts, material vendors do not always prepay freight charges. As a result, materials often arrive at the contractor's location with freight charges collect, that is, to be paid by the receiving party upon arrival of the material. The contractor usually has an account with the carrier that allows it to receive the goods without having to pay the transportation charges at the time of delivery. However, in the case of common carriers, Interstate Commerce Commission regulations require that freight charges be paid within a short time of delivery. Therefore, it is even more important that freight bills for collect shipments be transmitted immediately to the contractor's office for payment. Where the purchase order amount included freight, it is usual for the contractor to pay the freight charges and backcharge the account of the vendor, and to notify the supplier of his doing so.

## 10.21 INSPECTION OF MATERIALS

Inspection of delivered goods for quantity and quality should preferably be done concurrently with their unloading and storage. This is not always possible, however, and often would involve an objectionable delay in the unloading and release of transporting equipment. The checking of the package count as shown by the freight or delivery invoice should always be done, with any variations being indicated on the invoice before it is signed by the person receiving the delivery. However, the quantities of different items and their quality should be verified at the first opportunity after receipt. To do this, the party making the inspection obtains copies of the covering purchase order and approved shop drawings. A thorough check of the delivered items is made to verify both quantities and quality. This checking and verification can often be quite laborious, but can pay great dividends in minimizing subsequent project delays because of missing, faulty, damaged, or erroneous materials. The project inspector will frequently participate and assist in this inspection process. Inspection of material deliveries must be done with reasonable promptness so that there is time to take any corrective measures that may prove necessary and so that the correct materials in the proper quality and condition will be available at the time when they are scheduled to be installed.

After the delivered materials have been reconciled with the shop drawings and purchase orders, the inspector will normally file a receiving report with the company's procurement section. This report shows the purchase order number, date of inspection, description of the material, location of storage, quantity, remarks, and signature of the inspector. The receiving report verifying receipt of the proper

count and quality clears the order and authorizes payment to the vendor. With partial shipments, several receiving reports may be required to clear the entire order.

Inspection duties at times involve the sampling of various kinds of construction materials. Construction contracts may require the laboratory testing of certain materials as proof of quality. Thus, inspectors must be acquainted with the standard methods of sampling materials such as sand, gravel, bulk cement, asphalt, reinforcing steel, and other construction commodities. Another aspect of materials inspection is the obtaining of certifications of quality or the results of laboratory control tests or assay results from the manufacturer or producer. Submittal of the manufacturer's certification of quality may enable the contractor to avoid duplicate acceptance testing.

Commonly associated with the inspection of construction materials is the process of grouping materials together by task or by the order in which they are scheduled to be installed at the project. As the materials are checked, they are separated into groups, each of which is associated with a specific future work type or activity. This simplifies the matter of later identifying the materials needed by a given labor crew or needed in a particular location or for a particular activity. This task should be performed some time before the need arises, so that incorrect or missing items can be identified and corrective action taken while there is yet time before the material is scheduled to be installed.

## 10.22 SUBCONTRACTOR SCHEDULING

As indispensable members of the field construction team, subcontractors have a contractual obligation to pursue their work in accordance with the project schedule that is established by the prime contractor. Failure of a subcontractor to commence its operations when required and to pursue its share of the work diligently can be a serious matter for the general contractor. Consequently, the scheduling of subcontractors deserves and receives appropriate attention on the part of the general contractor. A practice followed by many contractors is to provide a project schedule to the subcontractors at the preconstruction conference or at one of the early project coordination meetings, and then to provide schedule updates as revisions are made or at the weekly coordination meetings. Most contractors will notify each subcontractor by letter and/or phone call, and/or e-mail or text message, 10 days to 2 weeks before the subcontractor is expected to move onto the project and commence operations. Subcontractors must be provided adequate time to plan their work and to make the necessary arrangements to start their operations, and subcontract agreements typically contain notice provisions in this regard. Follow-up telephone calls and/or texts or e-mails are made as needed. (See Appendices L and M.)

In the interest of good subcontractor relations, the project manager should not schedule a subcontractor to appear on the site until the job is ready and the subcontractor's work can proceed unimpeded. After the subcontractor is on the job, his progress must be monitored to ensure that his operations are keeping pace with the overall project time schedule. If the subcontractor's work falls behind, the project manager may reasonably instruct the subcontractor to take appropriate measures to accelerate its progress so as to maintain the published project schedule.

With regard to the general matter of subcontractor scheduling, the form and content of the subcontract agreement can be very important. A carefully written document with specific provisions regarding conformance with time schedule, notice requirements, material orders, and shop drawing submittals can strengthen the project manager's position in keeping all aspects of the project on schedule. In this context, a common problem is the failure of a subcontractor to order major materials in ample time to meet the construction schedule. General contractors occasionally find it

advisable to monitor their subcontractors' material purchases. This can be accomplished by including a subcontract requirement that the subcontractor submit unpriced copies of its purchase orders to the general contractor within 10 days after execution of the subcontract. In this way, the general contractor can oversee the expediting of key materials provided by subcontractors along with his own. Weekly project coordination meetings are also typically used for this purpose.

## 10.23 RECORD DRAWINGS

Record drawings are defined as drawings prepared by the construction contractor throughout the entire course of the construction of a project, whose purpose is to depict the actual manner, location, and dimensions of all work as actually performed on the project. Record drawings are also referred to as *as-built drawings,* or simply *as-builts*. A typical provision included in the conditions of the contract, requires that the prime contractor must prepare and submit to the owner a full-size set of record drawings, marked or drafted so as to depict all changes from the original drawings. Additionally, the contractor is required to submit these as-builts in a manner and format suitable to the owner and to the architect-engineer.

This set of drawings is expected to accurately depict everything which was not built as indicated on the original design drawings, perhaps as the result of change orders, or changed site conditions, or variations in alignment or location, or where the original drawings did not contain this information. Details and exact dimensions are to be provided for those work items that were not precisely located on the original contract drawings. Depth, exact location, and routing of underground piping, conduit, and utilities are additional examples.

The set of record drawings is prepared by the contractor in the field, usually by a person delegated by the project manager or superintendent to do so, and is kept continuously updated as the work progresses, to the end of the project. Usual requirements are that a satisfactory set of record drawings must be submitted to the architect-engineer and owner before the architect-engineer will issue a certificate of substantial completion that marks the completion of contract requirements, with the exception of warranty provisions.

## 10.24 DISBURSEMENT CONTROLS

To coordinate the actions of the company accounting office with events occurring on the project, it is necessary for the construction contracting company to implement a system of disbursement controls. These controls are directed toward controlling payments made to vendors and subcontractors and typically require that no such payments is to be made by the construction company home office without proper approval from the field. The basic purposes of disbursement control are twofold: first, to ensure that payment is made only for the correct price of the goods and services received to date and, second, to see that total payment does not exceed the amount established by the purchase order or subcontract.

Payments made for materials are based on the terms and conditions of the respective purchase orders. Copies of all project purchase orders are provided to the project manager for his use and information. Purchase order disbursement by the accounting office is conditioned on the receipt of a signed delivery invoice or receiving report from the job site. Suitable internal controls are established to ensure that total payments do not exceed the purchase order amount. Any change in purchase order amount, terms, or conditions is in the form of a formal written modification, with copies sent to the job site.

Disbursements to subcontractors follow a similar pattern. Because there are no delivery tickets or receiving reports for subcontractors, all subcontractor invoices and payment requests are routed for approval through the project manager, who has copies of all of the subcontract agreements. The project manager determines whether the invoice reflects actual job progress and approves the invoice or payment request or makes appropriate changes. General contractors frequently withhold the same percentage of retainage from their subcontractors that the owners retain from them. If the subcontractor bills for materials stored onsite, a common requirement is that copies of invoices be submitted to substantiate the amounts billed. Any change to a subcontract agreement is accomplished by a formal change order.

## 10.25 JOB RECORDS

To serve a variety of purposes, a documentation system is needed on every construction project that will produce a comprehensive record of events that transpired during the construction period. The extent to which this is done as well as the nature and extent of the project records that are maintained are very much functions of the provisions of the construction contract and the size, complexity, and risks inherent in the work. It is an essential responsibility of the contractor to establish what records are appropriate for a given project and to see that they are properly prepared, maintained, and filed.

The original estimating file and the contract documents are obvious and basic project records that must be maintained and kept available on the site. During the construction of the project, periodic progress reports, cost reports, the job log, incoming and outgoing correspondence, minutes of job meetings, time schedules and updates to schedules, subcontract agreements, purchase orders, field surveys, test reports, progress photographs, shop drawings, and change orders are examples of elements of project records and project documentation that are routinely maintained and filed as a permanent project record. On larger projects, additional records on manpower, equipment, operating tests, back charges, pile-driving and welding records, progress evaluation studies, and others are kept. In summary, the policies and procedures of the general contractor, as well as the experience and professional judgment of the project manager must be applied on every project in order to determine the project records to be developed, maintained, and filed as project documentation.

## 10.26 THE DAILY JOB LOG

A daily job log is prepared by the superintendent and supervisor on every construction project. The job log, or job diary as it is sometimes called, constitutes a historical record of the daily events that take place on the job site. It is considered to be the primary record, and the best record, of everything that occurred on the job site on every day of the project. The information to be included is a matter of company policy, project manager policy, and the personal judgment of the superintendent, but the log should definitely include everything relevant to the work and its performance. The date, weather conditions, changing weather conditions, number of workers on the job, subcontractors on the job, amounts of equipment, job accidents and near misses, visitors to the job, and instructions received from the owner and/or the architect-engineer, should always be noted. It is advisable to indicate the numbers of workers by craft and to list the equipment items by type. A general discussion of the daily progress, including a description of the activities where work was performed, activities completed and others started, and an assessment of the work accomplished, are important considerations. Where possible and appropriate, the quantities of work put into place can be included.

The diary should list the subcontractors who worked on the site, along with the workers and equipment provided. Note should be made of the performance of subcontractors, and how well they are conforming to the project time schedule and other project requirements. Instructions or warnings issued to subcontractors' project representatives should be noted.

Materials deliveries received must be noted, together with any shortages or damage incurred, as well as any special notes that are relevant with regard to the materials delivery. It is especially important to note when material delivery dates that were promised are not met and to record the effect of such delays on job progress and costs, and to make note of conversations or communications with suppliers in this regard.

The diary should include the names of all visitors to the site and facts that pertain. Visits by owner representatives, the architect-engineer, safety inspectors, union representatives, as well as people from government agencies should be documented and described. Visits by or notes from utilities companies should be recorded. Meetings of various groups at the job site should be recorded, including the names of people in attendance, problems or issues discussed, and conclusions reached.

Certainly any conversations with or instructions received from the architect-engineer or owner are to be recorded. This requirement holds true for conversations and instructions originated by the architect-engineer, the owner, or the contractor's representative.

An additional important component of the job log is the inclusion of onsite photographs that are taken at regular intervals, or which are taken to document some event or condition. Such a photographic record can serve a variety of purposes by providing a clear and indisputable time record of job progress. Consistent pictorial documentation of the construction process can keep the owner and the architect-engineer constantly updated on project progress and can clearly demonstrate responsibility for events such as job accidents and delays, potentially avoiding costly claims or litigation. Additionally, such a photographic record preserves the working details of a construction project long after it has been completed.

Complete diary information is occasionally necessary to substantiate payment for extra work, and is always needed for any work or event that might involve a claim. The daily diary should always include a description of job problems and what steps are being taken to correct them.

The job log is an especially important document when disputes result in arbitration or litigation. To be accepted by the courts as evidence, the job diary must meet several criteria. The entries in the log must be original entries made on the dates shown. The entries must have been made in the regular course of business and must constitute a regular business record. The entries must be original entries, made contemporaneously with the events being recorded and based on the personal knowledge of the person making them. Where the preceding criteria have been met, the courts have generally ruled that the diary itself can be entered as evidence, even if the author thereof is not available to testify.

Further to the matter of their potential use in case of claims and disputes of all kinds, and to assure the job log is as defensible as possible should the need arise, the job log should be maintained in a hardcover, bound booklet or journal. Pages should be numbered consecutively in ink, with no page numbers being skipped. Every day and its events should be reported without fail before the end of the workday, and all entries should be made on the same day as they occur. No erasures should be made. If errors or omissions are subsequently discovered, they should be included as correcting entries in that day's log entries, labeled as correcting entries, and initialed by the superintendent. Each daily job diary entry should be signed by the superintendent immediately under the last line of each day's entry.

## 10.27 CLAIMS AND DISPUTES

Construction contracts typically require the contractor to advise the owner in writing, within a prescribed period of time, concerning any event that will result in project delay and/or additional cost. The actual claim against the owner follows the notification, and includes a detailed description of the job condition underlying the claim, identification of the contract provisions or legal basis under which the claim is made, details regarding how the condition has caused the extra cost and/or delay, and a summary of the increased costs and extension of time requested. A claim usually involves both questions of entitlement, which refers to the merit of the claim, and the cost and time extension involved. Claims may originate from a wide variety of conditions. Some of the more common reasons for claims are (1) late payments, (2) changes in the work, (3) constructive changes, (4) changed conditions, (5) delay or interference, (6) acceleration, (7) errors or omissions in design, (8) suspension of the work, (9) variations in bid-item quantities, or (10) rejection of or-equal substitutions.

Almost any extra cost or time caused to the contractor by the action or inaction of the owner or the owner's agent can potentially be a valid basis for a claim against the owner. Refusal by the owner to recognize the claim does not ordinarily authorize the contractor to refuse to continue its field operations. However, the contractor should proceed with the work in dispute only after filing a written protest with the owner. It should be noted that all of the matters described in these paragraphs are set forth in detail in the contract documents.

Although provisions vary, construction contracts typically require the contractor to formally advise the owner within a specified time period when a situation arises that could lead to a claim. In the event of a dispute concerning a potential claim, the contractor usually cannot refuse to proceed with the work without committing breach of contract. Although the disputed work may be performed under protest, the contractor must continue field operations with diligence, relying on remedies stipulated in the contract to settle the questions of compensation and extension of time. The requirement that the contractor must proceed with the disputed work does not apply, however, if the change or modification involved is beyond the scope of the contract. The distinction between what is and what is not within the scope of the contract is often difficult to establish however, and should not be invoked by the contractor without consultation with legal counsel.

Contracts normally require that claims and disputes be first submitted to the owner or its representative. If the claim is denied, the resulting dispute can then be submitted to various levels of appeal, such as appeals boards, arbitration, or the courts as provided in the contract. The remedies available depend considerably on whether the dispute involves questions of fact or law. Most public owners have statutory or administrative procedures established for the settlement of contract disputes. Settlement of such disputes involving the federal government is in accordance with the Contract Disputes Act of 1978. According to this statute, if there is a dispute on a federal construction project, the contractor must first present the matter to the contracting officer and request a final decision. If this decision is not acceptable to the contractor, an appeal can then be made to the appropriate agency, board of contract appeals or the U.S. Claims Court.

In the final analysis, the successful settlement of a disputed claim depends largely on the provisions of the contract and on thorough and painstaking documentation. Preparation of a claim may be based on the routine project records compiled during the construction process. However, these records may not contain all of the detailed information needed by the contractor to substantiate a particular claim. For this reason, the contractor may be well advised to maintain a special set of records that pertain specifically to the matter in dispute where he believes there may be the potential for a claim.

The standard dictum of "put everything in writing" applies here. It is to be noted in this regard that, to be effective, documentation must be prepared during the construction process. Records created after the fact will not generally receive consideration. Project photographs, dated and identified, can be very effective when documenting for claims. It is also noted that frequently when a dispute arises and there is the potential for a claim, when the contractor presents his documentation or evidence to support his position, including photographs, the other party will frequently seek to reach a settlement rather than allowing the claim and the dispute resolution process to proceed. Thorough and complete documentation is the key.

Construction contracts frequently contain a provision that acceptance of final payment by the contractor shall be considered as a general release in full, of all unsettled claims against the owner arising out of, or in consequence of, the work. Other contracts provide for a conditional release, with the contractor being permitted to maintain other causes of action. The AIA General Conditions of the Contract for Construction in Appendix D provides that the acceptance of final payment shall constitute a waiver of all claims by the contractor except those previously made in writing and still unsettled. This can be an important point because, for one reason or another, contractors often do not or cannot file claims until after the work has been completed. Where such contract provisions appear, they are given effect and enforced by the courts.

## 10.28 CLAIMS IN THE CONSTRUCTION INDUSTRY

In the construction industry, claims by one party against another are very common, breach of contract usually being the basis of claim. However, there are many members of a construction team: architect-engineer, owner, prime contractor, subcontractors, material dealers, construction managers, and others. The actions, or lack thereof, of one party can seriously affect the rights and responsibilities of others during the construction process. Under certain circumstances, many courts have abandoned the privity requirement and allow court actions in negligence where no contract exists. This occurs where the court finds that a duty was owed to the claimant by the party sued. For example, under special circumstances, contractors and subcontractors can sue the architect-engineer and contractors can sue project managers. The party suing must be of a class whose reliance on the other party was clearly foreseeable. For example, the defendant party must have had a duty of due care; a duty to manage, supervise, or inspect the construction; a duty to review drawings and specifications and to identify design defects; or similar responsibility.

A common action by the owner is to make a notation on the check used for final payment to the effect of "By endorsement, this check is accepted in full payment of the account indicated." Ordinarily, if the contractor cashes the check, it is barred from suing to collect an additional sum. This follows from a generally recognized rule of law that when there is a dispute between debtor and creditor over the amount due, acceptance of such a check amounts to an agreement to accept it as final payment. In most states, however, if there is no reasonable basis for a debtor's denial that it owes the sum claimed, acceptance of a check for a smaller sum does not constitute a binding agreement for final payment, even if there is such a notation on the check. The contractor should consult with its attorney when such matters are at issue.

Claims by contractors against owners that they are entitled to additional compensation as a result of encountering site conditions more difficult than anticipated are very common. However, it must be kept in mind that there is a long history of court decisions to the effect that a contractor, in an express contract, does not have the right to collect additional payments from the owner just because the work is more expensive than expected. The courts have long held that the contract prevails over

the contractor's right to collect the reasonable value of the work. Much more must be proven than merely to demonstrate that the work was more troublesome than originally contemplated. The courts are reluctant to alter a construction contract simply because one party underestimated the risk.

Construction contracts sometimes include a "no-damage-for-delay" provision, which indicates that the owner will not be liable to the prime contractor or any subcontractor for monetary claims arising out of work delays. The contractor's sole remedy in such contracts is an extension of contract time. Experience with such contract clauses indicates that exceptions are rare and that they are normally valid and enforceable.

Recent years have witnessed a tremendous increase in the number of claims and disputes arising out of construction operations. The teamwork that has been traditional in the industry has degraded to a process of fault finding and defensiveness. The industry has become increasingly adversarial and costs have soared because of excessive lawsuits. Litigation, as the standard means of settling construction disputes, has reached epic proportions in the United States. Recent years have witnessed a pronounced increase in the use of onerous construction documents and contracts focused on punitive measures to enforce performance by the contractor.

The resulting swell of litigation has been expensive and counterproductive, and inhibits efforts to produce quality projects on time and within the budget. The construction industry is attempting to avoid litigation as a cost-effective way of resolving disputes. Experience shows that the process is slow, expensive, and often does not result in a fair resolution. In an effort to provide more speedy and satisfactory alternatives to the clogged judicial system, the construction industry is developing and promoting new and innovative methods of claims prevention, referred to as *partnering,* and alternative methods of dispute resolution.

## 10.29 ALTERNATIVE DISPUTE RESOLUTION (ADR)

Over the past several years, the construction industry has become excessively combative and overly concerned with disputes, dispute resolution, and litigation. The teamwork that has been traditional in the industry has degraded to a process of fault finding, defensiveness, and the courts. The industry has become excessively adversarial, in the opinion of many people, and costs are soaring because of excessive and expensive lawsuits. Unfortunately, nobody really wins in such a process, the net result being a reduction of profitability, productivity, and quality. In an era when litigation costs can literally put a contractor out of business, construction industry leaders are increasingly seeking alternative methods to prevent and settle disputes.

As an alternative to litigation, alternative dispute resolution (ADR) has become a process of curtailing and controlling the growth of construction litigation. It is a process of dispute resolution that is an alternative to the traditional judicial process. Included in ADR are arbitration, mediation, mini-trials, dispute review boards, and other means of dispute resolution that do not involve the litigation process. Each of these procedures is designed to facilitate the achievement of a private settlement or resolution of the dispute by the parties themselves with the aid of a person or process that assists the parties in reaching a solution.

## 10.30 NATIONAL CONSTRUCTION DISPUTE RESOLUTION COMMITTEE (NCDRC)

In an effort to provide a remedy for the excessive litigation which they saw arising from construction projects, leaders of the industry in 1991 established a task force whose purpose was to promote awareness and understanding, of private dispute resolution techniques, and to encourage their

use as standard practice in the industry. The National Construction Dispute Resolution Committee (NCDRC) (www.adr.org.) was formed as a committee of the American Arbitration Association. This committee represents all segments of the construction industry: public and private owners, architects, engineers, contractors, subcontractors, insurers, lenders, and others. All share a common goal, which is to actively seek ways of avoiding unnecessary disputes and litigation in construction. The NCDRC has emerged as a provider of leadership to the industry in moving toward the best utilization of ADR methods for the benefit of the construction process.

## 10.31 ARBITRATION

Customarily, when a contractual dispute arises between the contractor and the owner, the matter is first referred to the owner or its representative, who is usually the architect-engineer. However, as pointed out previously, almost all contracts provide for certain appeals from such first-level decisions. In the construction industry, arbitration is frequently the next, and simultaneously the last, step in the settlement of such controversies between the owner and the prime contractor. Arbitration is defined as the reference of a dispute to one or more impartial persons for final and binding determination, as agreed by the disputants.

Court action can impose delay, expense, and inconvenience on both the contractor and the owner. For this reason, many construction contracts provide for arbitration as the method by which disputes will be resolved. Actually, no contract clause is necessary for arbitration because a dispute can be arbitrated at any time by mutual consent of the parties. Arbitration implies a common consent by the disputants to have their differences settled and to bind themselves without appeal to the decision of the arbitrator or the arbitration board. It offers the advantages of a settlement that is prompt, informal, private, convenient, and economical, and that has been decided by experts in the field. Arbitration is not a replacement for the law but rather an adjunct to it.

Arbitration makes it possible for a construction dispute to be judged by professionals who are experienced in the construction industry. Although arbitration is an orderly proceeding governed by rules of procedure and standards of conduct, it is much more informal than a court proceeding and need not conform to the adversary rules of conduct, nor to the rules of evidence that the courts require. Finality is one of the important reasons for the use of arbitration. Court decisions sometimes take a long time to be made and then may be subject to lengthy appeals, resulting in long and costly delays in settling many cases. The award in an arbitration hearing is final and cannot be changed without both parties agreeing to reopen the case.

Arbitration clauses in contracts can, and sometimes do, limit the scope of contractual disagreements that must be referred to arbitration. However, construction contracts normally contain a broad-form arbitration provision that covers all claims, disputes, and other matters arising out of, or in relation to, the contract or the breach thereof. Hence, contract clauses that provide for arbitration are normally phrased so that the parties to the contract agree to submit to arbitration any future disputes that may arise during the course of construction operations.

However, while all arbitration statutes make agreements to arbitrate existing disputes irrevocable and enforceable, agreements to arbitrate unknown future disputes are not enforceable in all states. Where certain state arbitration statutes apply, either party can refuse to submit to arbitration even though the party may have promised to do so by the terms of a contract. However, most construction involves elements of interstate commerce, and therefore is covered by the Federal Arbitration Act, which applies to interstate commerce. This federal statute makes agreements to arbitrate future disputes binding.

Historically, arbitration was not commonly provided for in public contracts. However, recent years have seen the use of the arbitration process become an accepted means of resolving commercial disputes involving governmental units. This has been especially true in the case of states, state agencies, counties, municipal corporations, and other state political subdivisions. Legal authority for these public owners to agree to arbitration in their construction contracts comes from specific statutory authorization or is inferred from their capacity to enter into contracts.

The use of arbitration to resolve contractual disputes does not apply to the federal government, however. The Contract Disputes Act of 1978 mandates a process that must be followed to resolve contractual claims and disputes on federal projects. According to the act, the dispute is first referred by the contractor to the contracting officer. Appeals to the decision of this officer can be made to the agency boards of contract appeals or to the U.S. Claims Court. At the present writing, the federal government does not accept arbitration as a means of settling its construction disputes.

Most construction contracts that provide for arbitration stipulate that it shall be conducted under the Construction Industry Arbitration Rules, as administered by the American Arbitration Association (AAA). These rules are reproduced in full in Appendix N as the Construction Industry Arbitration Rules and Mediation Procedures. The AAA neither gives legal advice nor arbitrates disputes, but it does provide assistance in obtaining arbitrators, furnishing rules of procedure, and providing other assistance. In exchange for providing its assistance, the AAA charges a fee. Where contract bonds or insurance may be involved in the arbitration, the contractor should give its surety or insurance company advance notification. To illustrate this point, an arbitration award is not binding on a party who did not agree to submit its rights to arbitration. An insurer, for example, who has not specifically agreed to be bound by an arbitration award or to indemnify the contractor for any liability imposed by arbitration might claim to be a nonconsenting third party and thus would not be bound by the arbitration award. Some insurance policies specifically provide that the insurer will defend arbitration proceedings as well as lawsuits and will pay arbitration awards as well as court judgments. The contractor should verify this matter before signing an agreement that contains an arbitration clause.

General contractors commonly include arbitration clauses in their subcontract agreements (see Appendices L and M, subcontractor agreements). Such clauses provide that disputes between the subcontractor and general contractor that cannot be settled by mutual agreement or mediation shall be referred to arbitration or litigation. When a contract with the owner provides for arbitration, the prime contractor may generally assume that the arbitration requirement extends to the subcontractors. Experience indicates, however, that when the general contractor wishes for arbitration to be used, the inclusion of a specific arbitration provision in its subcontract agreements will help ensure the primacy of arbitration with respect to disputes between the general contractor and his subcontractors.

## 10.32 ARBITRATION PROCEDURE

Whether or not conducted strictly under the rules of the AAA, the general arbitration procedure is well established. The party wishing to initiate arbitration makes a written demand on the other side, stating the nature of the dispute, the amount involved, and the remedy sought, and requests that the matter be submitted to arbitration. If the other party agrees to arbitrate, a board of arbitration, consisting of one or three persons, is then selected. Arbitrators are selected not only for their impartiality and disinterest in the subject at arbitration but also on the basis of their experience in, and knowledge of, the construction field.

No arbitrator should have any family, business, or financial relationship, or any other form of potential conflict of interest with either party to the matter in dispute. A point to be stressed is that the

arbitrators' authority to hear and decide exists only by virtue of the agreement between the parties. The members of the board of arbitration are endowed with only such authority as these parties may confer upon them.

After the board has been selected, a hearing is conducted during which each side is free to call witnesses and to present such evidence and information as it wishes, and which the arbitrators consider admissible. Each party can be represented by counsel and is entitled to question the other party and its witnesses.

Arbitration is a less formal process than litigation in a court of law. The parties, having elected to resolve their controversy by arbitration rather than in a lawsuit, have themselves agreed not to be bound by strict rules of evidence. The principal legal requirement is that a fair and full hearing for both sides be held.

Where the matter at arbitration is very complex and involves large sums of money, a prehearing conference may be held. In such a case, an informal meeting of the parties or their attorneys is called prior to the formal hearing to exchange information, to stipulate uncontested facts, and to resolve certain collateral issues. A prehearing conference serves some of the same purposes that discovery serves for cases that go to the courts.

After the arbitration hearing has been completed, an award is made within a reasonable period of time. Usually, arbitrators will award compensation for damages suffered as a result of breach of contract. Until recently, punitive damages could not be awarded by arbitration. However, there is now a noticeable trend in both state and federal arbitration law, to permit punitive damage claims where a broadly worded arbitration agreement is involved.

A written copy of the findings and award signed by the arbitrators is sent to each of the parties. The arbitrators are not required to explain the rationale of their findings, but only to decide all of the questions that were submitted by the disputants. It is usual practice that the arbitrators stipulate how the fees and costs shall be apportioned between the parties. Once the disputants have submitted to arbitration and an award is handed down, the parties are bound to it. The decision can be submitted to the appropriate court for an order confirming the award. Once the award has been confirmed by the court, it has the same legal force as any other court judgment and can be enforced in the usual fashion as provided by the law. No appeal of the arbitrator's findings can be made. However, the amount of the award can be challenged if a party thinks the award was not within the submission; that there was bias, collusion, or prejudice on the part of the board; or a full and fair hearing was not held. Reversal of awards on such grounds is seldom requested, and is almost never found justified. Courts give every reasonable presumption in favor of award and of the arbitrators' proceedings. The burden rests on the party attacking the award to produce evidence sufficient to invalidate it.

## 10.33 MEDIATION

In recent years, another method of dealing with disputes in the construction industry has been introduced. This method is called mediation. Mediation is a less formal procedure than arbitration and provides an alternative course of action in the early stages of a dispute, which has the potential to resolve the dispute. Mediation involves a mutually agreeable and impartial third party who attempts to assist the disputing parties in reaching an agreeable settlement, while lacking any power to impose a decision. Mediation has long been associated with labor contract disputes. It is now being applied to construction contract situations in which the disputants seek outside assistance in settling their differences. Mediation is a completely voluntary process. The mediator cannot impose a settlement but can only seek to assist the parties in making a direct settlement between themselves. Mediation can be

provided for by contractual agreement or can be resorted to by mutual consent. A clause commonly included in construction contracts in recent years requires that when disputes occur, the parties will first mediate the dispute, and will escalate their action to arbitration or other method of dispute resolution when mediation has failed to resolve the dispute. This is the current language of AIA Document A201, "General Conditions of the Contract for Construction," reproduced in Appendix D.

When mediation is at issue, the mediation rules of the AAA and its Construction Industry Mediation procedures are frequently employed. In a mediation proceeding, the parties to a dispute submit to the mediator a summary of their positions, plus pertinent documentation. The mediator meets with the two sides, together and separately. The mediator tells each party about the flaws and strengths of its case, without revealing anything about the position of the other party. Subsequently, the mediator suggests a settlement to both sides that they can accept, reject, or use as the basis for negotiation.

## 10.34 MINI-TRIALS

A mini-trial is an abbreviated trial. Each party is given the opportunity to present its position using witnesses or oral presentations. The process is presided over by a so-called judge or referee who is selected by both sides to the dispute. Depending on the nature of the dispute, the individual may be an attorney or a construction professional. After both sides have made their presentations, the judge conveys his findings to the parties as he might in an actual litigation and attempts to accomplish a settlement. If no settlement is reached, the parties decide their next level of dispute resolution.

## 10.35 DISPUTE REVIEW BOARDS

Dispute review boards (DRBs) are another alternative dispute resolution method which has been used for the most part by public agencies, with some usage in private construction. After the construction contract is signed, the DRB is organized before any construction work takes place. One board member is selected by the contractor subject to approval of the owner. A second board member is chosen by the owner with acceptance by the contractor. These two board members then choose a third, who serves as chairman of the board and is subject to approval by both the owner and the contractor. Following the establishment of the board, regular site meetings are held when disputes occur. The recommendations of the board are not binding and often constitute only an intermediate step in final dispute resolution. The board is not intended to replace arbitration or litigation. However, DRB findings can provide a reliable and contemporaneous record of the facts, as well as expert opinions from a disinterested impartial panel of experts who observed the events as they occurred. DRBs typically place a strong emphasis on the avoidance of legal action.

## 10.36 NEUTRAL EVALUATION

In a dispute resolution method called neutral evaluation, each party presents its case and its documentation to a neutral third party, who is called an *evaluator*. Neutral evaluation is often used in cases of a highly technical nature, so that an expert in that field who is agreed upon by the parties can hear the case.

After hearing the case of both parties, the evaluator renders an opinion regarding the strengths and weaknesses of each party's position. In addition, the evaluator provides the parties with his opinion and arguments with regard to the manner in which he believes the case could be settled. While the evaluator's opinion is not binding, the parties often use his opinions in moving toward their resolution of the dispute.

## 10.37 SETTLEMENT CONFERENCES

Settlement conferences are recommended by many as the first attempt at resolution in any dispute. The parties sit and discuss the issues in an effort to reach agreement. The process seems to work most effectively if both parties send a written statement to the other prior to the conference, setting out the facts, as well as the provisions of the law in their opinion, and a resolution they would accept. The parties to the conference should be equal in their respective organizations, president and president, for example, and experience has shown the conferences are most effective if the disputing parties endeavor to agree on one point at a time, beginning with the simplest. If the parties reach an impasse, they are free to pursue other avenues of dispute resolution.

## 10.38 PARTNERING

Partnering can be described as the conducting of a cooperative enterprise between two or more parties dedicated to achieving a common goal for their mutual benefit with a minimum of dispute and conflict. In the construction industry, partnering involves all members of the construction team practicing the philosophy of cooperation and open communication, a spirit of trust, taking full responsibility for their actions, working toward the achievement of project goals. It works to minimize risk by setting up a cooperative atmosphere where the project takes priority. Experience with partnering indicates that an adversarial relationship between contractor and owner can be avoided with the cooperation and goodwill of all members of the building team. There are many variations to the concept of partnering, but it has proven to be a positive development that has at times resulted in a departure from the litigation and contention that has come to characterize the construction industry. Disputes still occur, but partnering has reduced resorting to the courts by a considerable amount.

Many believe that partnering is a growing practice among owners, design firms, contractors, major subcontractors, and suppliers. It is presently being applied to both public and private sector projects and focuses on achieving common objectives and creating an atmosphere that is conducive to enhancing communication between parties and minimizing disputes. Benefits include improved efficiency and cost effectiveness, improved communications, timely problem identification and resolution, improved scheduling, better subcontractor relations, increased opportunity for innovation, and improvement of products and services. The underlying hallmarks of this relationship are trust, cooperation, teamwork, shared vision, and the development and attainment of mutual objectives. In a partnering relationship, the parties seek to transform the traditional adversarial relationship between the owner and contractor into a more collaborative and productive atmosphere. It is a change of attitude rather than a formally structured contractual agreement that characterizes partnering.

## 10.39 LEAN CONSTRUCTION

Lean design and construction is a new paradigm in the design and construction professions which is coming into increasing usage. Lean construction has been defined by the Construction Industry Institute (CII) as “the continuous process of elimination of waste, meeting or exceeding all customer requirements, focusing on the entire value stream, and pursuing perfection in the execution of a constructed project” (CII Lean Principles in the Construction Project Team, PT 191).

The concept was originated by Greg Howell and Glen Ballard, who were also the founders of the Lean Construction Institute (www.leanconstruction.org). This organization is a valuable resource for additional reading and case studies regarding lean construction. Some of the fundamental principles of

lean construction are defining value from the customer's perspective; understanding the value stream of all steps in the process to create the desired end product; reducing waste; ensuring a smooth flow of value-added activities; prefabricating and modularizing building systems; utilizing collaborative pull scheduling to provide each internal and external customer what they want, when they request it; and seeking perfection by committing to continuous improvement in all aspects of the process.

Some of the commonplace lean practices applied to the construction industry are:

*Just-in-time delivery*. Delivering a material or product to the construction site in just the right quantity at just the time when it is needed.

*Last planner process*. A trademarked approach developed by the Lean Construction Institute that includes several layers of planning and full commitment to schedules by the entire project team.

*Pull planning*. A targeted, specific tool involving the definition of sequencing of events in a project, working backward form a targeted completion date.

*Percent plan complete (PPC)*. A commitment to planning reliability.

*Toyota Way*. A systematic method for providing best quality, lowest cost, and shortest lead time by eliminating waste in processes and procedures.

*Six Sigma*. A set of strategies, techniques, and tools for process improvement that use root-cause analysis to identify and solve problems.

Lean construction methods have been adopted and used by a number of owners as well as by a number of construction firms, with some very significant benefits achieved. The Lean Construction Institute continues to conduct research, and to publish papers, and to conduct lean construction seminars, and consideration of the principles and practices of lean construction is recommended for all construction contracting professionals.

## 10.40 SUMMARY AND CONCLUSIONS

Providing effective project administration and management so as to fulfill the objectives of every project it constructs is at the very heart of what the construction contracting company does. It is the reason for the existence of the enterprise. Effective project management requires a set of special skills, as well as a thorough familiarity with the construction contract, and a solid foundation in understanding of the workings of the construction company and the construction process.

## CHAPTER 10 REVIEW QUESTIONS

1. Name and define four different methods of alternative dispute resolution.
2. Define expediting in a construction company, and discuss who may perform this function in the company.
3. Explain the differences in the roles of the project manager and the project superintendent on a construction project.
4. Define shop drawings, and state the typical routing of their approvals.
5. State the key to effective management of shop drawings and the submittal and approval process, as set forth in this chapter.

6. Name three different training programs that have been written and presented by contractor professional associations for the purpose of providing learning for management people in a construction company.
7. Define the *job log,* and describe its significance.
8. Explain the typical functions of a project engineer.
9. Define *record drawings,* describe their significance, and provide a synonym for the term. Who prepares them, and when?
10. Name and define five key lean construction practices that are applicable to the construction process.
11. Explain the typical functions of a field engineer on a construction project.
12. Define the benefits and use of a contractor's quality management program.

# Chapter 11

# Project Time Management

## 11.1 INTRODUCTION

Time is an important aspect of job management. If a construction project is to proceed efficiently and is to be completed within the contract time, the work must be carefully planned and scheduled in advance. Construction projects are complex. A large job will involve literally thousands of separate operations. If these operations were to follow one another in consecutive order, job planning and scheduling would be relatively simple, but the project would not be executed efficiently and the project duration would be excessive.

Each task to be performed on the project has its own requirements. Each requires specific materials, equipment and labor, which together determine its duration. Its start depends on the completion of certain preceding operations. At the same time, many tasks are independent of one another and can be carried out simultaneously. Thus, a typical construction project involves many mutually dependent and interrelated operations that, in total combination, comprise a tangled web of individual time and sequential relationships. When individual task requirements of materials, equipment, and labor are superimposed, it becomes clear that project planning and scheduling is a very complicated and demanding management function.

## 11.2 THE CRITICAL PATH METHOD

The critical path method (CPM) is a procedure that was developed especially for the time management of construction projects. CPM involves the analysis of the sequence and time characteristics of projects by the use of networks. It is a widely used procedure for construction time control, and contractors are now frequently required by contract to apply network methods to the planning and scheduling of their fieldwork. Complete and comprehensive time management systems have been developed based on the CPM procedure. The reader is referred to books that describe these systems in detail.* This chapter confines itself to a discussion of the basics of this scheduling method.

CPM is a project management system that provides a basis for informed decision-making on projects of any size. It provides information necessary for the time scheduling of a construction project, guides the contractor in selecting the best way to shorten the project duration, and predicts future manpower, material, and equipment requirements.

The procedure starts with project planning. This phase consists of (1) identifying the elementary items of work necessary to achieve job completion, (2) establishing the order in which these work items will be done, and (3) preparing a graphical display of this planning information in the form of

*Clough, Sears, Rounds, and Segner, *Construction Project Management,* 6th ed. (New York: Wiley, 2014).

a network schedule. The procedure just described may suggest that project planning must follow a definite step-by-step order of development. In actual practice this is not the case, as the three planning steps actually proceed more or less simultaneously. However, for purposes of discussion, these three steps will be treated separately in the order mentioned.

The scheduling phase that follows planning requires an estimate of the time required to accomplish each of the work items, or activities, identified. With the use of the network, computations are then made that provide information concerning the time schedule characteristics of each work item and the total time necessary to achieve project completion. The computations associated with project scheduling are simple addition and subtraction. Manual computation is easy and logical but can become tedious and very time consuming on larger projects. In addition, one simple mistake at any point in the calculations can propagate throughout the entire network. For this reason, scheduling is best achieved with a computer, which can quickly produce the project schedule and can then modify or update it as needed during construction. For a full understanding of the method and a thorough appreciation of the data generated, however, it is necessary that the practitioner be familiar with how the calculations are made. Consequently, the following discussion of planning and scheduling is based on manual procedures.

## 11.3 GENERAL CONSIDERATIONS

Although some preliminary study of a project may take place during the estimating or negotiating process, it is usual that the detailed planning starts immediately after the contractor has been awarded the construction contract. A characteristic of CPM is that its effectiveness depends on the quality of the input information and the skill and judgment with which the generated data are used. Consequently, the development and application of a project plan and schedule should be made the responsibility of people who are experienced in, and familiar with, the type of field construction involved. Because the prime purpose of CPM is to produce a coordinated project plan, key specialty contractors should be brought into the planning process. Their input can be vital to the development of a workable construction schedule and their participation in the development process gains their buy-in to the schedule once completed. The contract establishes completion and milestone dates. A team approach led by the general contractor or construction manager, with significant participation and input from the specialty contractors is recommended for development of the project schedule in order to take advantage of the specialized knowledge of the specialty contractors and to garner their commitment to the resulting schedule.

It is usual that the network diagram be developed in rough form as the job is dissected into its basic elements and the sequential order of construction operations is established. It is often helpful to list the major segments of the project and to use them to develop a preliminary diagram either manually or with the aid of a computer. This diagram can serve as a basis for discussion and as a basic framework for the subsequent development of a fully detailed network. It is important that the plan prepared be the one the contractors actually expects to follow. This means, therefore, that those preparing the plan must have authority to make decisions concerning methods, procedures, equipment, and labor.

## 11.4 PROJECT PLANNING

Planning is the devising of a workable scheme of operations to accomplish an established objective when put into action. Besides being the most time-consuming and difficult aspect of the job time

management system, planning is also the most important. It requires an intimate knowledge of construction methods, combined with the ability to visualize discrete work elements and to establish their mutual interdependencies. If planning were to be the only job analysis made, the time would be well spent. It involves a depth and thoroughness of study that gives the construction team an invaluable understanding and appreciation of job requirements. The initial plan will likely change as the job progresses, but the planning process builds a framework within which intelligent adjustments can be made as they are required.

For purposes of planning, the project must first be broken down into elemental activities, which are the tasks or items of work to be performed in constructing the project, and which take time to perform. An activity is a single discrete, continuous work step in the total project. The extent to which the project is subdivided into activities depends on a number of practical considerations, but the following factors should be taken into account when defining activities.

- Different areas of responsibility, such as subcontracted work, which are distinct and separate from work being done by the prime contractor directly.
- Different categories of work as distinguished by craft or crew requirements.
- Different categories of work as distinguished by equipment requirements.
- Different categories of work as distinguished by materials such as concrete, lumber, or steel.
- Distinct and identifiable subdivisions of structural work such as walls, slabs, beams, and columns.
- Location of the work within the project, which necessitates different times or different crews to perform.
- Owner's breakdown for bidding or payment purposes.
- Contractor's breakdown for estimating purposes.

The activities chosen may represent relatively large segments of the project or may be limited to small steps. For example, a concrete slab may be a single activity, or it may be broken down into the erection of forms, placing of reinforcing steel, pouring of concrete, finishing, curing, and stripping of forms. If the activity breakdown is too gross, the job plan developed will not yield information in sufficient detail to be optimally useful. However, if the subdivision of the work is carried to the other extreme, the excessive detail tends to obscure the truly significant planning factors. Basically, the extent to which the work is broken down into activities is determined by the party who will be using the information. If the owner, architect-engineer, or project manager is to be the recipient, only moderate detail is needed because their usage of the data is normally limited to overall monitoring of job progress. However, if the information is being prepared for field supervisors who are concerned with day-to-day direction of the work, a considerable degree of work subdivision is required.

As the separate activities are identified and defined, the sequential relationships among them are determined. This is referred to as *job logic,* which reflects the order of construction operations. When the time sequence of activities is being determined, restraints which may also be called constraints, must be recognized and taken into consideration. Restraints are practical limitations of one sort or another that can influence or control the start of certain activities. For example, an activity that involves the placing of reinforcing steel cannot start until the steel is on the site. Hence, the start of this activity is restrained by the time required to prepare and approve the necessary shop drawings, fabricate the

steel, and deliver it to the job. In like manner, the start of an activity may depend on the availability of labor, subcontractors, equipment, completed construction drawings, owner-provided materials, and other required inputs. Failure to consider such constraints can be a serious failing in a job plan and schedule.

The restraints referred to above are physical restraints. For example, it is physically impossible to place reinforcing steel if it is not at the site. Another type of restraint is preferential. That is, the scheduler prefers to follow a certain logical path, although other paths could be followed. It is important to include all physical restraints; however, preferential restraints should be minimized or totally eliminated. The preferential restraint imposed by the initial scheduler may not reflect field conditions when that activity is performed, and it may not be the preference of the supervisor. However, if it is built into the schedule, those using the schedule later will be constrained by a preference that may not be the best at the time of installation.

Some restraints are shown as time-consuming activities. For example, the preparation of shop drawings and the fabrication and delivery of job materials are material restraints that require time to accomplish and are depicted as activities on project networks. Restraints are also shown in the form of dependencies between activities. If the same crane is required by two activities, the equipment restraint is imposed by having the start of one activity depend on the finish of the other, which releases the crane for the second activity.

## 11.5 PRECEDENCE NOTATION

As the identification of activities proceeds and their logic is established, the resulting job plan is depicted graphically in the form of a network. There are two symbolic conventions that have been used to portray network activities. One, called *precedence notation,* depicts each activity as a rectangular box, connected to other activities (boxes) with arrows. The other shows each activity as an arrow and is called "arrow notation." Both kinds of diagrams were widely used, but precedence diagrams have become prevalent due to several advantages. Precedence logic is more versatile, it is easier to revise and it does not require "dummy" activities to clarify the logic. It is more versatile because it allows representation of activities related by the start of each or the finish of each, in addition to the most common relationship relating the start of an activity to the completion of its predecessor. Because precedence notation, which is also referred to as activity on node (AON), now dominates CPM scheduling, and the computer softwares with which most project scheduling is done today, it will be used in this book.

In drawing a precedence network, each time-consuming activity is portrayed by a rectangular figure called a node. The dependencies between activities are indicated by arrows going from the predecessor activity to the successor activity. The identity of the activity and a considerable amount of other information pertaining to that activity are entered into its rectangular box. This matter will be developed further as the discussion progresses.

## 11.6 THE PRECEDENCE DIAGRAM

The preparation of a realistic precedence diagram requires time, work, and experience with the type of construction involved. The management data extracted from the network can be no better than the diagram itself. The diagram is the key to the entire time control process. When the network is first being developed, the planner must concentrate on job logic. The only consideration at this stage is to establish a complete and accurate picture of activity dependencies and interrelationships. Restraints that

can be recognized at this point should be included. The time durations of the individual activities are not of concern during the initial planning stage.

Each activity in the network must be preceded either by the start of the project or by the completion of a previous activity. Each path through the network must be continuous, with no gaps, discontinuities, or dangling activities. Consequently, all activities, except the activity or activities that terminate the project, must have at least one activity following. With the usual project network, it is not possible to have the finish of one activity overlap beyond the start of its succeeding activity. When such a condition exists in initial planning, the work must be further subdivided. It follows, therefore, that a given activity cannot start until *all* of those activities immediately preceding it have been completed.

Each activity is given a unique numerical designation, with the numbering proceeding generally from project start to finish. Usual practice is that numbering is not done until after the network has been completed. Leaving gaps in the activity numbers is desirable so that spare numbers are available for subsequent refinements and revisions. In this text, activities are generally numbered by multiples. It is standard practice, as well as being a requirement of many computer programs, that precedence diagrams start with a single opening activity and conclude with a single closing activity.

## 11.7 EXAMPLE PROBLEM 1

To illustrate how the three planning steps of activity definition, job logic creation, and network development go together, consider a simple project consisting of only a few steps, such as the construction of a heavily reinforced-concrete slab on grade. This will be called Example Problem 1. The job will be subdivided into eight activities as listed in Figure 11.1. The activity "Procure reinforcing steel" will be recognized as a job restraint. A ninth activity labeled "Start" will be added to create a single point of beginning.

The job logic or the time-sequence relationships among the activities of Example Problem 1 must now be determined. The sequence of operations will be the following. Procurement of reinforcing steel, excavation, and form building are all opening activities that can proceed independently of one another. Fine grading will follow excavation, but forms cannot be set until both the excavation and form building have been completed. The placing of reinforcing steel cannot start until fine grading, form setting, and steel procurement have all been completed. Concrete will be poured after the steel has been placed, and finishing will be the terminal operation, proceeding after the concrete pour.

As has already been mentioned, the diagram is normally drawn concurrently with the development of the job plan, and the operational sequence is not otherwise recorded or listed. There are occasions, however, when it is useful to list the job logic. A common way of expressing the necessary activity sequence is to list for each activity those following activities (successors) that can start immediately after, and only after, the given activity (the predecessor) is finished. This is a sufficient system for enumerating job logic and will be used herein. Figure 11.1 presents the previously discussed job logic of Example Problem 1. The precedence diagram describing the prescribed sequence of activities is shown in Figure 11.2.

Figure 11.2 is a complete project plan in graphical form. It shows what is to be done and in what order it will be accomplished. The diagram serves as the construction production plan and points the way on a daily basis. A precedence network of the project is an extraordinarily efficient medium for communication among all construction team members, including the owner, architect-engineer, contractor, subcontractors, and stakeholders.

| Example Problem 1: Reinforced Concrete Slab On Grade | | |
|---|---|---|
| **Activity** | **Activity Number** | **Activities Immediately Preceding** |
| Start | 10 | --------- |
| Excavate | 20 | 10 |
| Build forms | 30 | 10 |
| Procure reinforcing steel | 40 | 10 |
| Fine grade | 50 | 20 |
| Set forms | 60 | 20, 30 |
| Place reinforcing steel | 70 | 40, 50, 60 |
| Pour concrete | 80 | 70 |
| Finish concrete | 90 | 80 |
| | | |

**Figure 11.1** Example Project 1 Job Logic

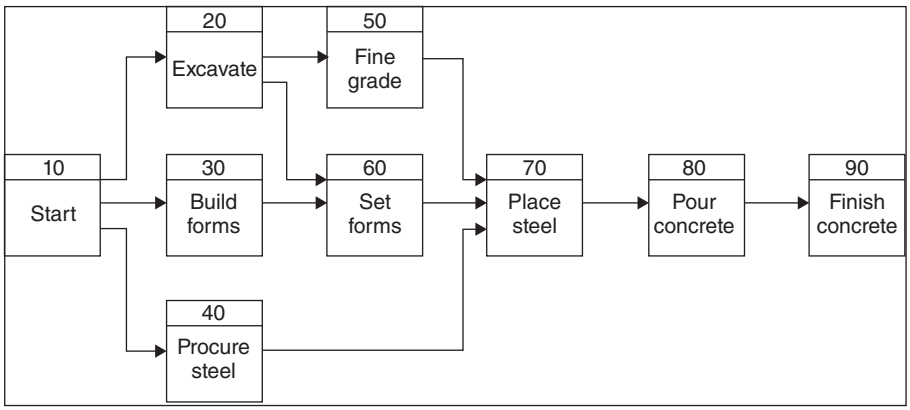



**Figure 11.2** Example Project 1 Job Logic

## 11.8 THE NETWORK FORMAT

A horizontal diagram format has become standard in the construction industry. The general flow of a network is from start to finish, from project beginning on the left to project completion on the right. The sequential relationship of one activity to another is shown by the arrows connecting the various activities. The network illustrates the manner in which the constituent activities are joined together to create a total operational pattern. In the usual precedence diagram, the length of an arrow between activities has no significance because it indicates only the dependency of one activity on another.

During initial diagram development in a manual environment, the network is sketched emphasizing activity relationships rather than the appearance or style of the diagram. The first version is apt to be a freewheeling conglomeration of sweeping curves, random direction lines, and many sequence-line crossovers. Corrections, revisions, and erasures are plentiful. The rough appearance of the first version of the diagram is of no concern; its completeness and accuracy are the objectives. The finished diagram will be put into a more tidy and understandable form at a later time.

Software is often used to replace the manual network development method described above with a computerized approach. A graphical interface allows each activity to be created on screen, represented by a rectangular node. Appropriate connections between these nodes can be made with a simple point and click process. As described above, completeness and accuracy of logic are of paramount importance. The appearance of the network can be modified later by moving activities to create a better visual effect on the computer screen or on the printed network.

The activity symbols appearing in Figure 11.2 are used only as a convenience in depicting the job logic. The use of symbols on the precedence network in lieu of writing out an abbreviated description of each activity is not recommended. For instance, "PR" might have been used for "Place reinforcing steel" or "PC" for "Pour concrete." Even mnemonic codes such as this make a diagram confusing and difficult to read, and the user must spend a considerable amount of time consulting the symbol listing to check the identity of activities. Networks are much more intelligible and useful when each activity is clearly identified on the diagram.

When a working precedence diagram is being prepared, the scale and spacing of the activities deserve attention. If the scale is too big and activities are widely spaced, the resulting network is likely to become so large that it is unmanageable. However, a small scale and overly compact makeup render the diagram difficult to read and inhibit corrections and modifications. With experience and observation of the work of others, practitioners will soon learn to adjust the scale and structure of their diagrams to the scope and complexity of the project involved. It must not be forgotten that the network is intended to be an everyday tool, used and consulted by a variety of people. Emphasis here is not on drafting elegance but on producing the most realistic and intelligible form of network possible.

Dependency lines that go backward from one activity to another should not be used. Backward, in this context, means going from right to left on the diagram, which is against the established direction of time flow. Backward sequence lines are confusing and increase the chances of unintentional logical loops being included in the network. A logical loop involves the impossible requirement that an activity be followed by an activity that has already been accomplished. Logical loops are, of course, completely illogical, but they can be inadvertently included in large and complex networks if backwardly directed sequence lines are permitted. Crossovers occur when one dependency line must cross over another to satisfy job logic. Careful layout will minimize the number of crossovers, but there are usually some that cannot be avoided. Any convenient drafting symbol can be used to indicate a crossover.

## 11.9 PROJECT SCHEDULING

In the discussion thus far, the vital concern has been with the identification of activities and their sequential constraints. Before the procedure can be carried further, attention must be given to time requirements. This represents the scheduling phase of CPM. The essential input information for project scheduling is the network diagram, which was developed in the planning phase, and a time duration estimate for each activity.

Project scheduling is accomplished by carrying out a series of simple computations that yield valuable project control information. An overall project completion time is first established. This is derived from the project duration stated in the construction contract. Times or dates within which each activity must start and finish if the established project completion date is to be met are then determined.

## 11.10 ACTIVITY DURATIONS

The first step in the scheduling process is to estimate the time necessary to carry out each activity, and is referred to as the duration of that activity. These durations are generally expressed in work days and do not include the days on which work is not performed such as holidays and weekends. Other units of time may be used, examples of which include hours, weeks, or shifts, but the workday is the most common unit of time. The only requirement is that the same unit of time be used throughout the schedule. The process of estimating activity durations will usually result in a certain amount of network refinement and activity redefinition.

Much of the value of the planning and scheduling process depends on the accuracy of the estimated activity durations. The following rules constitute the basis for this important step:

1. It is important that each activity be evaluated independently of all the others. For a given activity, assume that materials, labor, equipment, or other needs will be available when required. If there is reason to believe that this will not be so, then the use of a suitable preceding restraint may be in order.
2. For each activity, assume a normal level of labor and/or equipment. Exactly what "normal" is in this context is difficult to define and will vary depending upon such considerations as company standards and who the supervisor is. Based on experience, customary and relatively standard crew sizes and equipment spreads have emerged as being efficient and economical. In short, a normal level is intrinsic to the situation and is optimum insofar as expedient completion and minimum costs are concerned. At times, normal may be dictated by the availability of labor or equipment. If shortages are anticipated, this factor must be taken into account.
3. A normal workday or workweek is assumed. Overtime or multiple shifts are not considered unless this is standard procedure, or if it is going to be a part of a normal work period in the project plan. Around-the-clock operations are typical in many tunnel jobs, or on shutdown projects, for example, and overtime is routinely utilized on highway projects during the summer months to allow completion prior to the onset of approaching cold weather.
4. Activity durations must be estimated without regard to any predetermined contract completion date. Otherwise, there is apt to be, consciously or unconsciously, an effort made to fit the activities within the total time available. The only consideration pertinent to estimating an activity time is how much time will be required to accomplish *that* activity, and that activity only.
5. Consistent time units must be used throughout. It must be remembered, for example, that when working days are used, weekends and holidays are not included. Certain job activities such as concrete curing or plaster drying carry through nonworking days, and their times must be adjusted accordingly. Material delivery times are invariably given in terms of calendar days. A delivery time of 30 calendar days translates into approximately 21 working days.

Quantitative information is available to assist in the estimation of activity durations; for example, the estimating sheets that were compiled when the project was priced during the estimating process will yield the number of work-hours or equipment-hours for each activity. By making assumptions concerning the size of the work crew or the number of equipment units to be used, the scheduler can determine activity durations. Time estimates of good accuracy can often be made informally. Off-the-cuff time estimates made by experienced construction supervisors usually prove to be surprisingly accurate. In any event, it is important that someone experienced in, and familiar with, the type of work involved, prepare the estimate of the activity durations. Up to a point, the accuracy of duration estimates can be improved by subdividing the work into smaller units.

## 11.11 TIME CONTINGENCY

When the activity times are being estimated, it is assumed that the work will progress reasonably well. However, construction projects are complex and dynamic undertakings, and therefore some safety factor must be included in project time estimates to make allowance for possible project disruptions of many kinds. Practice varies with regard to adding contingency allowances to the estimated durations of activities. There is general agreement, however, that a contingency allowance should not be applied to individual activities to allow for unforeseen project delays caused by fires, accidents, equipment breakdowns, strikes, late material deliveries, difficult site conditions, floods, legal delays, and the myriad other disruptions to the plan that may take place. In such cases, it is generally impossible to predict in advance which activities will be affected and by how much. A suitable contingency is better included in the time required for overall project completion, a topic to be discussed in Section 11.15.

The manner in which allowances for time lost because of inclement weather are handled depends on the type of work involved. When projects such as most highway, heavy, and utility work are affected by the weather, the entire project is normally shut down. As a result, it is usual that an estimated number of days that will be lost because of weather are added to the overall project duration.

On buildings and other work that can be protected from the weather, allowances for time lost are commonly added to the durations of those activities or groups of activities susceptible to weather delay. It is relatively easy to establish average time losses for particular activity types during the season that they will be underway. After a building construction project of this type passes a certain stage, it is not often completely shut down by bad weather. Although some parts of the project may be at a standstill, others can still proceed. Consequently, a better overall job of scheduling will result if allowances for weather are included in the durations for those activities likely to be involved rather than adding a weather contingency to the entire project.

## 11.12 EXAMPLE PROBLEM 2

To illustrate the subsequent discussion, let us now consider a somewhat more involved construction project, which will be Example Problem 2. Although much simplified from an actual construction project, it will serve to illustrate the essential workings of the scheduling procedure.

The project to be discussed is a natural gas compressor station involving a prefabricated metal building, compressor foundation, standby butane fuel system, and compressor appurtenances such as piping, electrical services, and controls. Figure 11.3 presents the job logic and the estimated activity durations, and Figure 11.4 shows the completed precedence diagram.

The precedence diagram in Figure 11.4 is derived directly from the project logic worksheet in Figure 11.3 and shows the sequences and dependencies of the activities. As is noted in the legend at

| Example Problem 2: Compressor Station | | | |
|---|---|---|---|
| **Activity** | **Activity Number** | **Duration, Working Days** | **Activities Immediately Preceding** |
| Start | 10 | 0 | ------- |
| Grading | 20 | 7 | 10 |
| Granular Fill | 30 | 21 | 10 |
| Electric run-in | 40 | 42 | 10 |
| Procure metal building | 50 | 28 | 10 |
| Excavate butane | 60 | 17 | 20 |
| Compressor foundation | 70 | 8 | 20 |
| Electrical to compressor | 80 | 20 | 40 |
| Butane storage | 90 | 34 | 60 |
| Connect cooling | 100 | 11 | 30, 70 |
| Bolts and plates | 110 | 6 | 30, 70 |
| Slab and footings | 120 | 14 | 30, 70 |
| Piping station | 130 | 15 | 90, 100 |
| Set compressor | 140 | 13 | 110, 120 |
| Erect building | 150 | 29 | 50, 120 |
| Set control panel | 160 | 14 | 80, 140 |
| Wire building | 170 | 17 | 150 |
| Connect piping | 180 | 10 | 130, 160 |
| Test and clean | 190 | 4 | 170, 180 |
| Contingency | 200 | 5 | 190 |
| | | | |

**Figure 11.3** Example Project 2 Project Logic and Activity Times

the upper right of the diagram in figure 11.4, each activity box (referred to as a *node* in scheduling vocabulary), contains the name of the activity in the center of the box, the identifying number of the activity in the upper center, and the duration of the activity, in working days, in the lower center of the activity box. The other numerical values shown in each activity box in Figure 11.4 will be discussed subsequently.

## 11.13 NETWORK COMPUTATIONS

After the duration has been estimated for each activity, some simple and step-by-step computations are performed. The purpose of these calculations is to determine (1) the overall project completion time and (2) the time brackets within which each activity must be accomplished if this completion time is to be met. The network calculations involve only addition and subtraction and can be made in different ways, although the data produced are comparable in all cases. The usual procedure is to calculate what are referred to as *activity times*.

The calculation of activity times involves the determination of four limiting times for each network activity. The "early start" or "earliest start" (ES) of an activity is the earliest time the activity can possibly start, allowing for the times required to complete the preceding activities. The "early finish" or "earliest finish" (EF) of an activity is the earliest possible time by which it can be completed and is determined by adding that activity's duration to its early start time. The "late finish" or "latest finish"

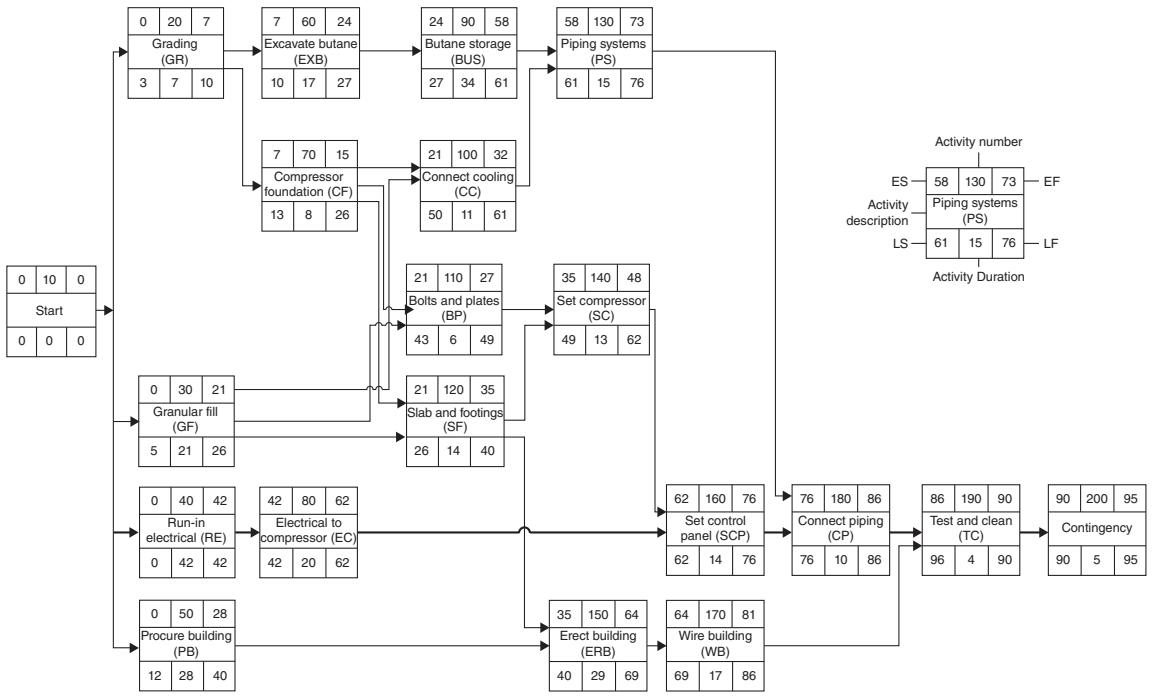



**Figure 11.4** Example Project 2 Precedence Diagram

(LF) of an activity is the very latest it can finish and allow the entire project to be completed by a designated time or date. The "late start" or "latest start" (LS) of an activity is the latest possible time it can be started if the project target completion date is to be met and is obtained by subtracting the activity's duration from its latest finish time.

Though computation of activity times can be performed manually, this is rarely done in practice. Schedule computations are best performed by computer. It is instructive to manually calculate a simple network, such as that in Example Project 2, to understand is taking place in the computer and to better understand the concepts of start and finish times for an activity, as well as activity float times that will be discussed later. When making manual computations, it is usual that activity times be expressed in terms of *expired* working days. This means that the start of the project is customarily taken to be at time zero.

## 11.14 EARLY ACTIVITY TIMES

The compressor station network shown in Figure 11.4 is used here to describe how the manual calculation of activity times is performed. This example affords an excellent basis to learn how CPM calculations are made by a computer, and it will provide a stronger intuitive understanding of the meaning of each of the activity characteristics that is calculated. The computation of the early start and early finish times is treated in this section. The determination of the late activity times will be described subsequently. Activity float times are calculated later in the chapter. The early time computations proceed from project start to project finish, from left to right in Figure 11.4, this process being referred to as the "forward pass." The basic assumption for the computation of early activity times is that every activity will start as early as possible. That is to say, each activity will start just as soon as the last of its predecessors is finished.

The ES value of each activity is determined first, with the EF time then being obtained. Reference to Figure 11.4 shows that activity 10 is the initial activity. Its earliest possible start is, therefore, zero elapsed time. As explained by the sample activity, shown in Figure 11.4, the ES of each activity is entered in the upper left corner of its activity box, or node. The value of zero is entered at the upper left of activity 10 in Figure 11.4. The EF of an activity is obtained by adding the activity duration to its ES value. Activity 10 has a duration of zero. Hence the EF of activity 10 is its ES of zero added to its duration of zero, or a value of zero. EF values are entered into the upper right of activity boxes (nodes), and Figure 11.4 shows the EF of activity 10 to be zero. Activity 10 calculations are trivial, but the use of a single opening activity is customary with precedence diagrams and is required by most computer programs.

Figure 11.4 shows that activities 20, 30, 40, and 50 can all start after activity 10 has been completed. In going forward through the network, the earliest that these four activities can start is controlled by the EF of the preceding activity. Since activity 10 has an EF equal to zero, then each of the following four activities can start as early as zero. Consequently, zero values appear in the upper left of activities 20, 30, 40, and 50. The EF value of each of these four is obtained by adding its ES of zero to its respective duration. For example, the EF value of activity 20 is zero plus 7, or a value of 7. Thus a 7 appears in the upper right of activity 20.

Continuing into the network, neither activity 60 or 70 can start until 20 has been completed. The earliest that 20 can be finished is at the end of the seventh day, so the earliest that activity 60 or 70 can be started is after the expiration of 7 working days (or at a time of 7). The ES of activities 60 and 70 are indicated to be 7 in Figure 11.4. The EF of activity 60 will be its ES value of 7 plus its duration of 17, or a value of 24. In like fashion, activity 70 will have an EF value of 15.

The start of activities 100, 110, and 120 all must await the completion of both activities 30 and 70. The earliest that activity 70 can be finished is 15, but activity 30 cannot be completed until 21. Because activities 100, 110, and 120 cannot start until both activities 30 and 70 are finished, the earliest possible start times for each of the three activities is time 21. Activities 100, 110, and 120 are examples of what is called a merge activity. This is an activity whose start depends on the completion of two or more preceding activities. The computation rule for a merge activity on the forward pass is that its earliest possible start time is equal to the latest (or largest) of the EF values of the immediately preceding activities.

The forward-pass calculations consist of only repeated applications of the few simple rules just discussed. Working methodically in step-by-step fashion, the computations in Figure 11.4 proceed from activity to activity until the end of the project, activity 190, is reached.

## 11.15 PROJECT DURATION

Reference to Figure 11.4 discloses that the early finish time for the last work activity (190) is 90 elapsed working days. For the job logic established and the activity durations estimated, it will require 90 working days to complete the work. What this says is that if a competent job of planning has been done, if activity durations have been estimated with reasonable accuracy, and if everything goes reasonably well in the field and in accordance with the plan, project completion can be anticipated in 90 working days or about $(7/5) \times 90 = 126$ calendar days.

The matter of contingency must again be considered at this point. Although allowances for lost time caused by inclement weather can be ascribed to the affected activities in some cases, as was discussed earlier in this chapter, an overall weather contingency is more appropriate in other cases (see Section 11.11). In addition, some provision must be made for general project delays caused by a variety of troubles, mischances, oversights, difficulties, and job problems. Many contractors will, at this stage of the project scheduling, plan on a time overrun of 5 to 10 percent and add this to the overall projected time requirement for the entire work. The percentage actually added must be based on a contractor's judgment and experience. In Figure 11.4, a contingency of 5 working days has been added to the diagram in the form of the final contingency activity 200. Adding an overall contingency of 5 working days gives a probable job duration of 95 working days. In the contractor's way of thinking, 95 working days represents a more realistic estimate of actual project duration than does the value of 90. If everything goes as planned, it will probably finish the job in about 90 working days. However, if the usual difficulties arise, it has allowed for a 95-working-day construction period.

Whether the contractor chooses to add in a contingency allowance or not, now is the time to compare the computed project duration with the project completion time, referred to as the project duration, as stated in the construction contract. Following along with Example Problem 2 and assuming the contingency of 5 working days will be used, the figure of $(7/5) \times 95 = 133$ calendar days plus any holidays that occur during that period of time is compared with the required completion date stipulated in the contract. If the compressor station must be completed in 120 calendar days, then the contractor will have to consider ways in which to shorten the time duration. If a construction period of 140 calendar days is permissible, the contractor will feel reasonably confident that this requirement can be met and no action to shorten the work is required. How to go about decreasing a project's duration is the subject of Section 11.20.

The probable project duration of 133 calendar days is a valuable piece of information. For the first time, the contractor has an estimate of overall project duration that can be relied on with considerable trust.

## 11.16 LATE ACTIVITY TIMES

Project calculations now "turn around" on the value of 95 working days, and a second series of calculations is performed to find the late start (LS) and the late finish (LF) times for each activity. These calculations, called the "backward pass," start at the project end and proceed backward through the network, going from right to left in Figure 11.4. The late activity times now to be computed are the latest times at which each of the activities can be started and finished with project completion still achievable in 95 working days. The supposition during the backward pass is that each activity finishes as late as possible without delaying project completion. The LF value of each activity is obtained first and is entered into the lower right portion of the activity box (node). The LS in each case is obtained by subtracting the activity duration from the LF value. The late start time is then shown at the lower left.

The backward pass through Figure 11.4 is begun by giving activity 200 an LF time of 95 as shown in the lower right of the activity box. The LS of an activity is obtained by subtracting the activity duration from its LF value. Activity 200 has a duration of 5. Hence, the LS of activity 200 is its LF of 95 minus its duration of 5, or a value of 90. This value of 90 is entered at the lower left of activity 200 in Figure 11.4.

Figure 11.4 shows that activity 190 immediately precedes activity 200. In working backward through the network, the latest that activity 190 can finish is obviously controlled by the LS of its succeeding activity 200. If activity 200 must start no later than day 90, then activity 190 must finish no later than that same time. Consequently, activity 190 has an LF time equal to the LS of the activity following (200), or a value of 90. Activity 190, with a duration of 4, has an LS value of 90 minus 4, or 86. These values are shown on activity 190 in Figure 11.4.

Figure 11.4 shows that activity 190 is preceded by two activities: 170 and 180. The LF of each of the two preceding activities is set equal to the LS of activity 190, or day 86. Subtracting the activity durations from the LF values yields the LS times. The LS times for activities 170 and 180 are, correspondingly, equal to 69 and 76.

Some explanation is needed when the backward pass reaches a burst activity, which is one that has more than one activity immediately following it. In Figure 11.4, activity 120 is the first such activity reached during the backward pass, this activity being followed immediately by activities 140 and 150. To obtain the late finish of activity 120, the late start of the immediately succeeding activities are noted. These are obtained from Figure 11.4 as 49 for activity 140 and 40 for activity 150. Keeping in mind that activity 120 must be finished before either activity 140 or 150 can begin, it is obvious that activity 120 must be finished by no later than day 40. If it is finished any later than this, the entire project will be delayed by the same amount. The rule for this and other burst activities is that the LF value for such an activity is equal to the earliest (or smallest) of the LS times of the activities following.

The backward-pass computations proceed from activity to activity until the start of the project is reached. All that is involved are repetitions of the rules just discussed.

## 11.17 TOTAL FLOAT

Examination of the activity times appearing in Figure 11.4 discloses that the early and late start times (also early and late finish times) are the same for certain activities and not for others. The significance of this is that there is time leeway in the scheduling of some activities and none at all in the scheduling of others. This leeway is a measure of the time available for a given activity above and beyond its estimated duration. This extra time is called float, two classifications of which are in general usage: total float and free float.

The total float of an activity is obtained by subtracting its ES time from its LS time. Subtracting the EF from the LF gives the same result. Once the activity times have been computed on the precedence diagram, values of total float are easily computed and may be noted on the network if desired, although this has not been done on Figure 11.4. Referring to Figure 11.4, the total float for a given activity is found as the difference between the two times at the left of the activity box or between the two at the right. The same value is obtained in either case. An activity with zero total float has no spare time and is therefore one of the operations that controls project completion time. For this reason, activities with zero total float are referred to as "critical" activities. The second of the common float types, free float, will be discussed in Section 11.19.

## 11.18 THE CRITICAL PATH

In a precedence diagram, a critical activity is quickly identified as one whose two start times at the left of the activity box are equal. Also equal are the two finish times at the right of the activity box. Inspection of the activities in Figure 11.4 discloses that there are seven activities (10, 40, 80, 160, 180, 190, and 200) that have total float values of zero. Plotting these on the figure discloses that these seven activities form a continuous path from project beginning to project end. This chain of critical activities is called the "critical path." The critical path is normally indicated on the diagram in some distinctive way such as with colors, heavy lines, or double lines. Heavy lines are used in Figure 11.4.

Inspection of the network diagram in Figure 11.4 shows that numerous paths exist between the start and finish of the diagram. These paths do not represent alternate choices through the network. Rather, each of these paths must be traversed during the actual construction process. If the time durations of the activities forming a continuous path were to be added for each of the many possible routes through the network, a number of different totals would be obtained. The largest of these totals is the critical, or minimum, time for overall project completion. Each path must be traveled, so the longest of these paths determines the length of time necessary to complete *all* of the activities in accordance with the established project logic.

If the total times for all of the network paths in Figure 11.4 were to be obtained, it would be found that the longest path is the critical path already identified using zero total floats and that its total time duration is 95 days. Consequently, it is possible to locate the critical path of any network by merely determining the longest path. However, this is not usually a practical procedure. The critical path is normally found by means of zero total float values. Although there is only one critical path in Figure 11.4, more than one such path is always a possibility in network diagrams. One path can branch out into a number of paths, or several paths can combine into one. In any event, the critical path or paths must consist of an unbroken chain of activities from start to finish of the diagram. There must be at least one such critical path, and it cannot be intermittent. A break in the path indicates an error in the computations. On the compressor station, 5 of the 18 activities (exclusive of start and contingency), or about 28 percent, are critical. This is considerably higher than for most construction networks because of the small size of the project. In larger diagrams, critical activities generally constitute 20 percent or less of the total.

Any delay in a critical activity automatically lengthens the critical path. Because the length of the critical path determines project duration, any delay in the finish date of a critical activity, for whatever reason, automatically prolongs overall project completion by the same amount. As a consequence of this, identification of the critical activities is an important aspect of job scheduling because it pinpoints those job areas that must be closely monitored at all times if the project is to be kept on schedule. This is a key element of the intrinsic value of the critical path (CPM) scheduling method.

## 11.19 FREE FLOAT

Free float is another category of spare time that is derived from the network schedule. The free float of an activity is found by subtracting its early finish time from the earliest start time of the activities directly following. To illustrate how free floats are computed, consider activity 20. Figure 11.4 shows the earliest finish time for activity 20 to be 7. The activities immediately following are 60 and 70, and the earliest start time for both is 7. The difference between the earliest finish time of activity 20 (day 7) and the earliest start time of the activities immediately following (day 7) is zero. Hence, activity 20 has a free float of zero. Another example could be activity 70. Figure 11.4 shows the earliest finish time of activity 70 to be at day 15. The activities immediately following are 100, 110, and 120, and their earliest start time is 21. Thus activity 70 has a free float of $(21 - 15) = 6$ days. As an alternate statement of procedure, the free float of an activity can be obtained by subtracting its EF (upper right) from the smallest of the ES values (upper left) of those activities immediately following. The significance of free float is discussed in Section 11.22.

## 11.20 LEAST-COST PROJECT SHORTENING

If the 95-working-day construction time is not satisfactory, the contractor must reexamine the operational plan. It may be, for example, that the construction contract for Example Problem 2 stipulates a completion time of less than 95 working days. In the absence of some analytical procedure such as CPM, there is no way in which those activities that truly control total project time can be identified. Lacking this, the usual impulse is to accelerate most, if not all, of the job operations when the construction time for a project has to be reduced or when a project is falling behind schedule. This procedure is neither necessary nor economical, because there is seldom any need to speed up any but the critical job activities. On large construction networks, only 10 to 20 percent of the activities normally prove to be critical. Consequently, most job activities contain float time: that is, more time is available for their completion than is required by their estimated durations. There is nothing to be gained by diminishing even further the durations of such noncritical activities.

Because the critical path determines the overall project duration, the only way in which the project duration can be shortened is to reduce the length of the critical path, either by revising the job logic or by shortening some of the individual critical activities, or perhaps both. The first action is to determine the possibility of performing some of the critical activities in parallel with one another rather than in series. Sometimes a localized reworking of job logic will make possible a shortening of the critical path. One caution is needed at this point: any revision of the network diagram may result in the appearance of new critical paths. Thus, when the critical path is being shortened, the network must be continuously recalculated and reexamined to ensure that all critical operations have been identified.

If the time reduction achieved by reworking the job logic is not sufficient, the durations of the critical activities themselves must be examined with the intent of decreasing some of them. This shortening of critical activities cannot be done arbitrarily. Rather, it must be ascertained that the new shortened durations are both practicable and feasible in the field.

Assume that it has become necessary to shorten the project duration of Example Problem 2 by means of reducing the durations of the critical activities. For this purpose, there are only five critical activities that are susceptible to possible shortening. Activity 10, Start, is already at zero duration, and activity 200, Contingency, must remain at 5 days. Consequently, each of the five critical activities (40, 80, 160, 180, and 190) must first be studied to ascertain whether it can be shortened and, if so, what

the additional direct cost will be. When necessary, most activities can be completed in less than the normal time. Speed-up actions do increase the direct cost of the activity, however, because they involve the additional expense of overtime work, multiple shifts, more equipment, payment of premiums for quick delivery of materials, larger but less efficient crews, and similar speed-up actions. There is a point, of course, beyond which the duration of an activity cannot be compressed further.

Suppose the contractor on the compressor station of Example Problem 2 ascertains that it can shorten activity 40 (Electric run-in) by 3 days by sending in another pole-setting truck crew. The additional expense of moving the extra truck and crew to and from the jobsite will be $2,000. Activity 80 (Electrical to compressor) can be diminished by one day if the electricians work overtime. The additional cost of premium time will amount to $400. Activity 160 (Set control panel) can be shortened by one day if the manufacturer's installation engineer does some of his work at night. This will require special lighting that will cost about $600 to install and remove. There does not seem to be any feasible way in which activity 180 (Connect piping) can be shortened significantly. Activity 190 (Test and clean) is already scheduled as a 24-hour-a-day operation and therefore cannot be shortened.

The contractor's analysis discloses, first of all, that the original critical path can be shortened by a maximum of 5 days. This means that the probable job duration can be decreased from 95 to 90 days, assuming any new critical paths created during the process can also be shortened. The project duration cannot be reduced by more than 5 days, however, because the original critical path remains a critical path during the entire shortening process.

The critical activities to be shortened will be selected on the basis of least cost. The exact activities selected will depend on the number of days the project is to be reduced. In our Example Problem 2, the time-shortening pattern and cost for each of the first 3 days of reduction are illustrated in Figure 11.5.

This now reduces the original critical path to 92 days. In doing so, a path consisting of activities 10, 20, 60, 90, 130, 180, 190, and 200, whose total length is also 92 days, now becomes a second critical path. To shorten the project further, it is now necessary to compress both critical paths simultaneously. This could be done by diminishing either activity 180 or 190 because they are common to both critical paths. However, it has already been established that neither of these can be reduced. Further project shortening, therefore, depends on reducing concurrently the two parallel branches of the critical path. Suppose shortening activity 90 is the least expensive way to shorten the new critical path, and it can be decreased by as much as 3 days at an extra cost of $300 per day. The pattern and cost for the next 2 days' reduction will be as illustrated in Figure 11.6.

| Step | Critical Activities Shortened | Amount Shortened | Project Duration (Working Days) | Total Direct Cost |
|---|---|---|---|---|
| 0 | | | 95 | |
| 1 | 40 | 3 DAYS | 92 | $2,000 |
| 2 | 80 | 1 DAY | 91 | $400 |
| 3 | 160 | 1 DAY | 90 | $600 |

**Figure 11.5** Cost Impact of Reducing Critical Activity Durations

| Step | Critical Activities Shortened | Amount Shortened | Project Duration (Working Days) | Total Direct Cost |
|---|---|---|---|---|
| 4 | 40 | 3 DAYS | 91 | $2,000 |
| | 80 | 1 DAY | 91 | $400 |
| | 90 | 1 DAY | 90 | $300 |
| TOTAL | | | | $2,700 |
| 5 | 40 | 3 DAYS | 90 | $2,000 |
| | 90 | 2 DAYS | 90 | 600 |
| | 80 | 1 DAY | 90 | $400 |
| | 160 | 1 DAY | 90 | $600 |
| TOTAL | | | | $3,600 |

**Figure 11.6** Additional Cost Impact of Reducing Critical Activity Durations

This now reduces the probable project duration to 90 working days, and this is the most that can be achieved. When there is more than one critical path (our example now has three), all critical paths must be shortened simultaneously to achieve any overall project reduction. Since the original critical path has now been decreased to an irreducible minimum, no further project shortening is possible.

This situation, when no additional shortening is possible, is called a crashed condition. If an activity cannot be further shortened, it is considered a crashed activity. If the total project schedule is unable to be shortened, the project is considered to be crashed. It is very difficult to reach a crashed condition for a project. As the project approaches the crashed condition, it becomes more and more expensive. At this point, the contractor must make a management decision concerning how much project shortening it is willing to buy. To answer this question, the consequences of running over on contract time must be weighed against the costs of shortening the project.

## 11.21 TIME-SCALED NETWORKS

The project network shown in Figure 11.4 shows activities located in the general order of their accomplishment but is not plotted to a time scale. Project diagrams can be, and frequently are, drawn to a horizontal time scale to serve a variety of useful purposes. When drawing a time-scaled diagram, two time scales can be used: one in terms of expired working days and the other as calendar dates. One scale is, of course, convertible to the other. Figure 11.7 is the time-scaled plot of Example Problem 2 plotted to a working-day scale with the calendar months also indicated. This is the same network diagram as Figure 11.4, and the two portray the same logic and convey the same scheduling information.

Figure 11.7 is obtained by plotting the ES and EF values for each activity. The horizontal distance between is equal to the estimated time duration of that activity. Although arrowheads are shown in this figure, they are not actually needed and do not appear in most time-scaled diagrams. Vertical solid lines indicate sequential dependence of one activity on another. When an activity has an early

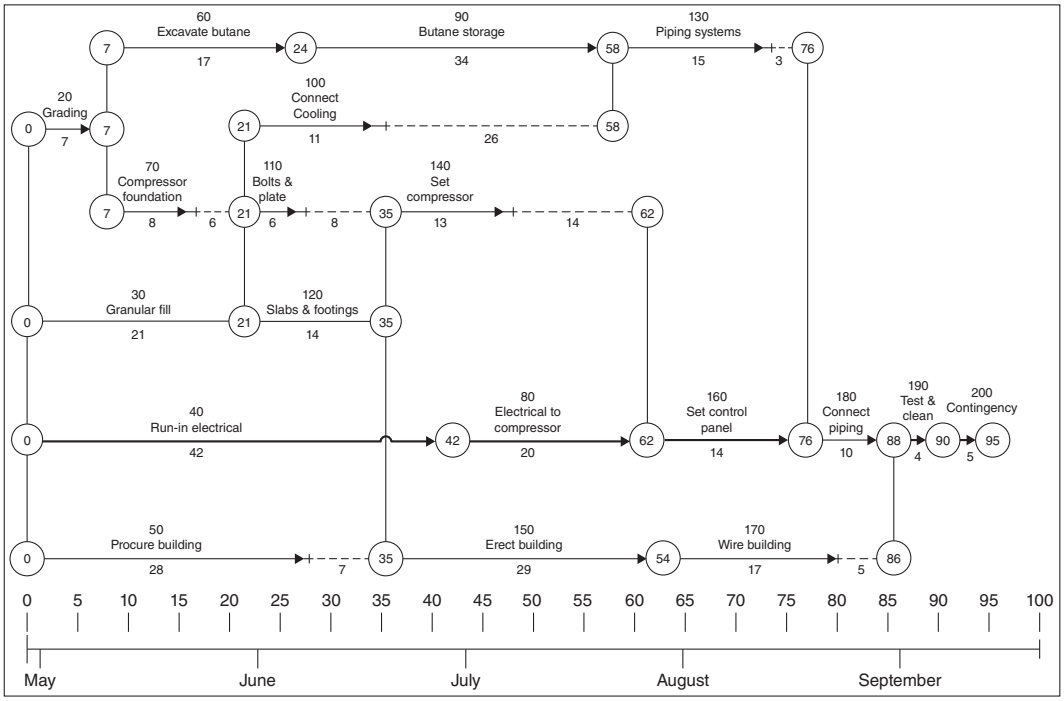



**Figure 11.7** Example Project 2 Time Scaled Network

finish time that precedes the earliest start of activities following, the time interval between the two is, by definition, the free float of the activity. Free floats are shown as horizontal dashed lines in Figure 11.7, and a time-scaled plot of this type automatically yields to scale the free float of each activity. When an activity has no free float, no dashed extension to the right of that activity appears. The horizontal dashed lines also represent total float for groups or strings of activities, a topic that is discussed in Section 11.22. The circles shown in Figure 11.7 represent the ES times of the activities that immediately follow. The numerical values in these circles are the ES times in terms of expired working days.

The time-scaled diagram has some distinct advantages over a regular network for certain applications because it provides a graphical portrayal of the time interrelationships among activities as well as their sequential order. Such a plot enables one to determine immediately which activities are scheduled to be in process at any point in time and to detect quickly where time and resource problems exist. These networks are very convenient devices for checking daily project needs of labor and equipment and for the advance detection of conflicting demands among activities for the same resource. Such a diagram is also an effective way to record and analyze the progress of the work in the field. As of any given date, progress can be plotted on each activity that is in process in accordance with its percentage of completion. The resulting plot shows at a glance which activities are on, ahead of, or behind schedule.

## 11.22 SIGNIFICANCE OF FLOATS

The float of an activity represents potential scheduling leeway. When an activity has float time, this extra time may be utilized to serve a variety of scheduling purposes. When float is available, the early start of an activity can be delayed, its duration can be extended, or a combination of both can occur. To do a proper job of scheduling noncritical activities, it is important that the practitioner understand the workings of float times.

The total float of an activity is the maximum time that its actual completion date can extend beyond its earliest finish time and not delay the entire project. It is the time leeway available for that activity if the activities preceding it are started as early as possible and the ones following it are started as late as possible. If all the total float of any one activity is utilized, a new critical path is created. Correspondingly, the free float of an activity is the maximum time by which its actual completion date can exceed its earliest finish date and not affect either overall project completion or the times of any subsequent activities. If an operation is delayed to the extent of its free float, the activities following are not affected, and they can still start at their earliest start times.

A time-scaled network illustrates and clarifies the nature of total and free float. In Figure 11.7, the critical path can be visualized as a rigid time spine extending through the diagram. The horizontal dashed lines (float) can be regarded as compressible connections between activities. Activities, singly or in groups, can move to the right (be delayed), provided the correct dependency relationships are maintained and there is flexibility (float) present.

To illustrate the nature of total float, consider the rigid subassembly in Figure 11.7 that consists of activities 20, 60, 90, and 130. Figure 11.5 shows that not only is the free float of activity 130 equal to 3 days but also the total float of each of the activities 20, 60, 90, and 130 is the same 3 days. The diagram also shows that if any one of these four activities is allowed to consume an additional 3 days, the succeeding activities are pushed along to the right and all float in that path is gone. Consequently, it becomes a second critical path. The result would be the same if 3 additional working days were to

be consumed by any combination of activities 20, 60, 90, and 130. Figure 11.7 clearly illustrates that total float is usually shared by a string or aggregation of activities, and the additional time it represents is associated with the group.

This has serious implications for any contractor on a construction project. If an earlier contractor is delayed, this delay will not delay the completion of the project if total float is available as long as all of that float is not consumed by the delay. However, another contractor later in the project might well be impacted by that lack of float that was consumed early on. As the float disappears, so does scheduling flexibility. Thus, the later contractor my lose opportunities for managing resources through the use of available float, and even more concerning, the later contractor may be put on the critical path so that even a small delay in that contractor's work will delay completion of the project. Total float is a valuable resource that should be shared wisely among all project participants.

The significance of free float is equally obvious from a study of Figure 11.7. For example, consider activity 100, which has a duration of 11 days and a free float of 26 days. Figure 11.7 shows there is a total of 37 days in which to accomplish activity 100. Within its two boundaries, activity 100 can be delayed in starting, have its duration increased, or a combination of the two without disturbing any other activity. For all practical purposes, activity 100 can be treated as an abacus bead 11 units in length that can be moved back and forth on a wire 37 units long. The free float of an activity, therefore, is extra time associated with that activity alone and which can be used or consumed without affecting the early start time of any succeeding activity. Free float in a project tends to be rare, and is very valuable to the contractor whose activity has that free float.

## 11.23 THE EARLY-START SCHEDULE

If network calculations are made by computer, the printout will generally provide activity start and finish times as calendar dates. However, if manual computations are made directly on the network, as in Figure 11.4, the numerical data obtained must be translated into calendar dates at which the activities are scheduled to start and finish. This calendar date schedule is customarily based on the early start and finish times of each activity. If modifications to the computed early times have resulted from project shortening, this can be incorporated into the schedule.

Thus far, project times have been expressed only in terms of elapsed working days. Conversion of elapsed working days into calendar dates is easily done with the aid of a calendar on which the working days are numbered consecutively, starting with number 1 on the anticipated start date and skipping all weekends, holidays, and vacation periods. It is assumed that the start date of Example Problem 2 will be the morning of Monday, April 29.

When making up a job calendar, the true meaning of elapsed days must be kept in mind. To illustrate, the early start of activity 90 in Figure 11.4 is shown to be 24. This means that this activity can start *after* the *expiration* of 24 working days, so the starting *time* of activity 90 will be the morning of calendar date numbered 25 (June 3). There is no such adjustment for early finish dates. In the case of activity 90, its early finish time from Figure 11.4 is 58, which indicates that it is finished by the end of the 58th working day. This is indicated by the calendar date numbered 58 (July 19).

Figure 11.8 is the early-start schedule for example problem 2, with the activities being listed in the order of their starting dates. Also indicated are critical activities and free float values, information that is very useful to field supervisors. Not only is this form of operational schedule useful to the contractor, but it can also satisfy the usual contract requirement of providing the owner and/or architect-engineer with a projected timetable of construction operations.

| Activity | Duration, Working Days | Free Float | Scheduled Starting Date Early Start am | Scheduled Finish Date Early Start pm |
|---|---|---|---|---|
| 20 | 7 | 0 | APRIL 29, 20__ | MAY 7, 20__ |
| 30 | 21 | 0 | APRIL 29, 20__ | JUNE 28, 20__ |
| *40 | 42 | 0 | APRIL 29, 20__ | JUNE 26, 20__ |
| 50 | 28 | 7 | APRIL 29, 20__ | JUNE 6, 20__ |
| 70 | 8 | 6 | MAY 8, 20__ | MAY 17, 20__ |
| 60 | 17 | 0 | MAY 8, 20__ | MAY 31, 20__ |
| 100 | 11 | 26 | MAY 29, 20__ | JUNE 12, 20__ |
| 120 | 14 | 0 | MAY 29, 20__ | JUNE 17, 20__ |
| 110 | 6 | 8 | MAY 29, 20__ | JUNE 5, 20__ |
| 90 | 34 | 0 | JUNE 3, 20__ | JULY 19, 20__ |
| 140 | 13 | 14 | JUNE 18, 20__ | JULY 5, 20__ |
| 150 | 29 | 0 | JUNE 18, 20__ | JULY 29, 20__ |
| *80 | 20 | 0 | JUNE 27, 20__ | JULY 25, 20__ |
| 130 | 15 | 3 | JULY 22, 20__ | AUGUST 9, 20__ |
| *160 | 14 | 0 | JULY 26, 20__ | AUGUST 14, 20__ |
| 170 | 17 | 5 | JULY 30, 20__ | AUGUST 21, 20__ |
| *180 | 10 | 0 | AUGUST 15, 20__ | AUGUST 28, 20__ |
| *190 | 4 | 0 | AUGUST 29, 20__ | SEPTEMBER 4, 20__ |
| *Critical Activities | | | | |

**Figure 11.8** Example Project 2 Early Start Schedule

## 11.24 BAR CHARTS

A conventional bar chart is simply a graphical picture of the job schedule, showing the early start and early finish times of various project segments plotted to a horizontal time scale. The unsurpassed visual clarity makes the bar chart a very valuable medium for displaying schedule information. It is immediately intelligible to people who have no knowledge of CPM or network diagrams. It affords an easy and convenient way in which to monitor job progress, check delivery of materials, schedule equipment and subcontractors, and record project advancement. Bar charts continue to be widely used on the project site to inform one and all concerning the job time schedule and progress.

It is easy to recognize that a time-scaled network is a comprehensive form of bar chart. Furthermore, bar charts can be made to show certain job information in addition to the early start and finish dates. Free float and total float can be plotted as well as the sequential interdependencies among the activities. (Bar charts of this latter type are sometimes referred to as fence bar charts.) Conventional bar charts can be quickly derived from the network diagram or project schedule. Activities may not always be the most desirable basis for preparing a bar chart. Simpler diagrams with fewer bars and showing more comprehensive segments of the work may be more suitable for some job applications. In such a case, it is an easy matter to combine strings or groups of associated activities into a single bar chart item.

## 11.25 RESOURCE SCHEDULING

If a project schedule is to be workable, it must be sustained by adequate resources as they are needed on the project. In a construction context, “resources” include materials, subcontractors, labor crews,

and equipment. The calendar date job schedule provides reasonably accurate information concerning when such resources will be required. It is now the responsibility of job management to follow through and see that they are available accordingly.

From the project schedule now established, the contractor can determine the calendar dates by which the various materials must be delivered to the jobsite. Allowing some time as a factor of safety, the purchase orders can specify reasonable delivery times. In a similar manner, a calendar schedule of subcontractor operations can be abstracted. Subcontractors can be notified well in advance of when their crews must be on the job. Advance information regarding materials and subcontracted work can be of inestimable value to the contractor's procurement people and expediters in their efforts to provide timely and adequate support to the project.

The project schedule can serve a somewhat different purpose with respect to labor crews and equipment. Not only does the contractor now know when the resources will be required on the job, but also conflicting demands for the same resource can be detected. For example, from the calendar date schedule for the job activities it is possible to determine total job labor and equipment requirements on a day-to-day basis. This information can prove to be valuable in that it can disclose hitherto unsuspected peaks and valleys in labor demand and conflicts between activities for the same equipment item. It is often possible to smooth manpower demands or remove equipment conflicts by utilizing the floats of noncritical activities.

As a simple illustration, suppose the start of activity 140 in Example Problem 2 required the use of the same heavy-duty crane already engaged on activity 90. Two such cranes on the project simultaneously would be difficult and expensive to arrange. Figure 11.5 shows that the start of activity 140 can be deferred by as much as 14 days. Rescheduling the start of activity 140 undoubtedly will remove the equipment conflict. As can be seen, a time-scaled plot of the network diagram can be valuable and convenient for the scheduling of construction equipment.

The procedure just discussed can also be applied to labor demands. The main objective here is to detect in advance where several activities may concurrently require workers of the same craft, thereby causing pronounced peaks in labor demand. Sharp fluctuations in labor needs on a project are undesirable and often impossible to arrange. The judicious rescheduling of activities by the use of float times can do much to alleviate impractical fluctuations in labor demand. In addition, it assists management in recognizing manpower needs well ahead of time where shortages of certain crafts or highly specialized labor may be a factor.

The above discussion of resource scheduling on a project can be expanded to address scheduling issues at the company level. If resource usage information is collected for all company jobs and "rolled up" into a company resource schedule, float times on individual jobs can be used to develop more efficient resource utilization for the company's valuable and limited resources. This is of particular importance to equipment-intensive sectors of the industry, such as those involved in earth moving, but it can also be valuable to other sectors. For example, an electrical contractor with a number of commercial jobs in progress and a limited number of large pipe benders and cable pullers can more efficiently schedule these critical and expensive equipment items with a comprehensive company resource schedule.

## 11.26 PROGRESS MONITORING

After the operational plan and calendar schedule have been prepared, the work can now proceed with the assurance that the entire project has been thoroughly studied and analyzed. A plan and schedule have been devised that will provide specific guidance for the conduct of the work in the field. However, it is axiomatic that no plan is ever perfect, nor can the planner possibly anticipate every

future job circumstance and contingency. Problems arise every day that could not have been foreseen. Adverse weather, material delivery delays, labor disputes, equipment breakdowns, job accidents, and other complications can and do disrupt the original plan and schedule. Therefore, after construction operations commence, there must be continual evaluation of field performance as compared with the established schedule. Considerable time and effort are expended to check and analyze the progress of the job and to take whatever corrective action may be required either to bring the work back on schedule or to modify the schedule to reflect changed job conditions.

How often field progress should be measured and evaluated depends on the degree of time control that is considered to be desirable and feasible for the particular work involved. Fast-paced projects using multiple shifts may demand daily progress reports. On the other hand, large-scale jobs such as earth dams that involve only a limited range of work classifications may use a reporting frequency of a month. However, for most jobs, progress reporting and schedule updating are normally done on a weekly basis.

## 11.27 PROGRESS ANALYSIS

The analysis of job progress is concerned primarily with determining the effect that reported job progress has on the established project completion date and any intermediate time goals (milestones) that have been identified. When a progress report is received from the field, the time status of the activities, completed and in progress, is compared with the project schedule. Of particular importance in this regard are the critical activities. If a critical activity has been started late, a setback in project completion will occur unless the delay can be made up by the time the activity is completed. If a critical activity has been finished late, the overall completion date is delayed commensurately. The analysis of job progress data establishes the current time status of the project and where the work is ahead of or behind schedule.

## 11.28 SCHEDULE UPDATING

Updating is primarily concerned with the effect that schedule deviations and changes in the job plan have on the portions of the project yet to be constructed. One of the valuable features of CPM is its ability to incorporate changes as the project goes along. No project plan is ever perfect, and deviations from the original program are inevitable. Consequently, occasional updating of the plan is necessary during the construction period. Updating involves revising the schedule of the work yet to be accomplished in order to reflect the effect of changes that have occurred as work on the project has progressed. The objective is to determine corrected information regarding activity start and finish dates, floats, and critical activities, as well as to establish a revised project completion date.

How often the project schedule should be updated depends on how often an update is needed. If the progress of the work has followed the plan closely and if the schedule has held up reasonably well, there is really no need to update the network. If there have been a number of significant deviations from the plan, then an update is in order. Attempting to make the project fit an obsolete schedule can undo much of the good realized from formalized planning and scheduling. When the accumulated changes start to render the network and its schedule ineffective, it is time to revise them.

## 11.29 FAST-TRACKING

CPM is used as a planning and scheduling device for a broad range of industrial applications in addition to field construction operations. Included among these are the planning and design of construction

projects. Many state highway departments, for instance, use CPM methods for this purpose. When the usual linear construction mode is involved, the design is accomplished and finalized before field construction starts. As such, the planning and scheduling of the design and of the construction phases are done essentially independently of one another and in sequence. However, the two are closely coordinated under a design-construct or construction management type of contract in which phased construction or fast-tracking is normally utilized. This topic was previously discussed in Chapter 1.

Fast-tracking refers to the planned coordination and overlapping of the design and construction of a project, as opposed to the traditional sequential completion of each step before the next is initiated. For the process to be truly effective, however, the best possible cooperative efforts of the architect-engineer and the contractor or construction manager are required. It is also necessary for the owner to have a well-thought-out program of requirements and to be able to make immediate design decisions. CPM is an especially useful device to achieve a truly integrated and practicable fast-track schedule. No new principles are involved, but the planning, design, and construction of the project must be merged into a single concerted course of action.

## 11.30 COMPUTERS AND TIME MANAGEMENT

Modern computer technology has made effective time management of construction projects available to contractors for a wide range of projects. At a moderate cost for both hardware and software, the contractor can acquire technology, such as laptop computers, tablets, and even smartphones that provide sufficient capability to perform all of the usual time control functions. These would include creating activity networks, making network computations, deriving calendar date schedules, showing bar charts, making update calculations, and maintaining an as-built network with the actual activity starts, finishes, and durations. This information can be shared among all project team members including project field supervisory personnel, project manages, suppliers, subcontractors, designers, and owner's representatives who can have constant access to the current time status of the work, identity of critical activities, and know the availability of free and total float.

## 11.31 DELAY CLAIMS

Delays in construction can have a serious effect on field costs and project time. Contractors sometimes find it necessary to make formal claims for delay damages and extensions of time caused by the owner, architect-engineer, another prime contractor, subcontractor, or material vendor. Claims are further discussed in Chapter 10. In situations where there is basis for a claim, the contractor must be able to establish the cause of the delay and its total impact on individual activities and on the project as a whole. Proving the direct effect of a project delay or delays can often be a very complex and difficult matter.

When attempting to ascertain the effect of a delay on the performance of the contract, a common complication is that the delay affects only certain of the individual job activities. Experience shows that the detailed planning network used for time management can be an excellent tool for analyzing delay effects because it clearly shows the time interrelationships among the various project segments. A detailed planning network affords an opportunity of demonstrating the true effects of project delays. This can help establish the compensable damages and time extensions due the contractor. Courts and other legal bodies now utilize project time networks in apportioning responsibility for job delays. To demonstrate the effect of a given delay, either on a given activity, group of activities, or the total project, a detailed comparison can be made between the as-planned and the actual as-built networks.

Such a comparison can clearly reveal extended durations, start and completion delays, and required logic changes. In this way, the effects of individual or multiple delays can be analyzed, a process that is of great assistance in establishing compensable damages and contract time extensions. The planning and scheduling network has an invaluable ability to reveal the true effect of a given delay, as can be seen by a simple example. A 7-day delay of a critical activity obviously has a commensurate impact on the overall project completion date. However, a 7-day delay of an activity with 20 days of free float would likely have no effect.

## 11.32 SUMMARY AND CONCLUSIONS

Project time management is a critically important function for the construction contractor. Construction contracts typically contain clauses that stipulate that "time is of the essence" in the completion of the requirements of the contract documents within the project duration established in the contract by the architect-engineer and the owner. Completion of the project on time is one of the five project objectives that the contractor has for every project he constructs.

Planning and scheduling methods, and the tools employed with these methods, network schedules, bar charts, time-scaled diagrams, and so on, provide the means whereby managers of construction projects can effectively manage project time. Understanding planning and scheduling principles and methods is of paramount importance for the construction contractor and the office and field management people who perform the work in completing construction projects.

## CHAPTER 11 REVIEW QUESTIONS

1. Define the critical path in a construction network schedule, and discuss its significance.
2. Define *free float* and *total float,* and discuss the significance of each.
3. Define the terms *ES, LS, EF,* and *LF*.
4. List the three steps that must be performed to develop a construction project schedule.
5. Define the terms *restraint, dependency,* and *constraint* in the context of a construction schedule.
6. Name three important values that are determined from the forward pass in the CPM scheduling method.
7. Name three important values that are determined by the backward pass in the CPM scheduling method.
8. Can a network schedule contain more than one critical path? Explain.
9. Define time-scaled networks, and discuss their value.
10. Define *bar chart,* and discuss why it is more effective for use at the superintendent, foreman, and crew leader level of management than a network schedule.

# Chapter 12

# Project Cost Management

## 12.1 INTRODUCTION

Monitoring and controlling project costs are critically important management functions on all construction projects. After construction begins, the contractor's project cost management system retrieves project costs, in accord with a system developed by the construction contracting firm for the purpose, including labor and equipment hours and production quantities, from the job site as the work progresses. This information is used in two important ways. One is to develop labor and equipment production and cost data to be stored in the company's historical information database in a form suitable for use in estimating the cost of future work.

The other application of cost and production information is to assist in keeping the construction costs of an ongoing project within the established project budget. In order that the contractor can accomplish the project objective of completing the project at or under the project budget, costs which are incurred on the project are monitored in a structured way as the project is constructed, and are compared to budgeted amounts on a regular and continuing basis. Management carefully monitors these comparisons, so that if certain activities or elements of cost exceed project budget amounts, or if they appear to be trending toward exceeding the project budget, management can take action in an effort to accomplish the objective of completing all project activities within the budget. The central elements of a contractor's project cost accounting, cost reporting, and cost control system are depicted in Figure 12.1.

Regardless of the type of contract between the owner and the contractor, or the project delivery method in use, it is important that the contractor exercise the maximum control possible over field costs throughout the construction period on every project he constructs. A functional and reliable cost accounting and cost control system plays a vital role in the proper management of a construction project, as well as in the profitable operation of a construction company.

The details regarding the structure and functioning of a cost control system will vary somewhat from one contractor to another, and will vary with project size and complexity. In any event, the justification for the expense of maintaining and operating a project cost system is the value of the management information it provides. If the information produced is not accurate and timely, or if this information is not utilized to fullest advantage by management, then the system has no real value, and its cost cannot be justified. Properly designed, implemented, and utilized however, a project cost management system is an investment in the success of projects and in the success of the company. Figure 12.2 illustrates the cyclic nature of the administration of the contractor's cost accounting, cost reporting and cost control system for use in managing construction projects, and the feedback of this information into the contractor's historical cost information database for use in estimating future projects.

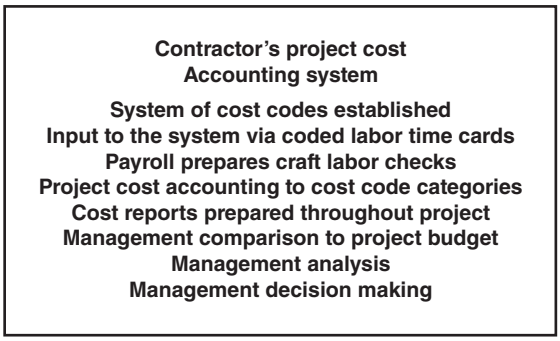



**Figure 12.1** Central Elements of a Project Cost Accounting, Reporting, and Control System

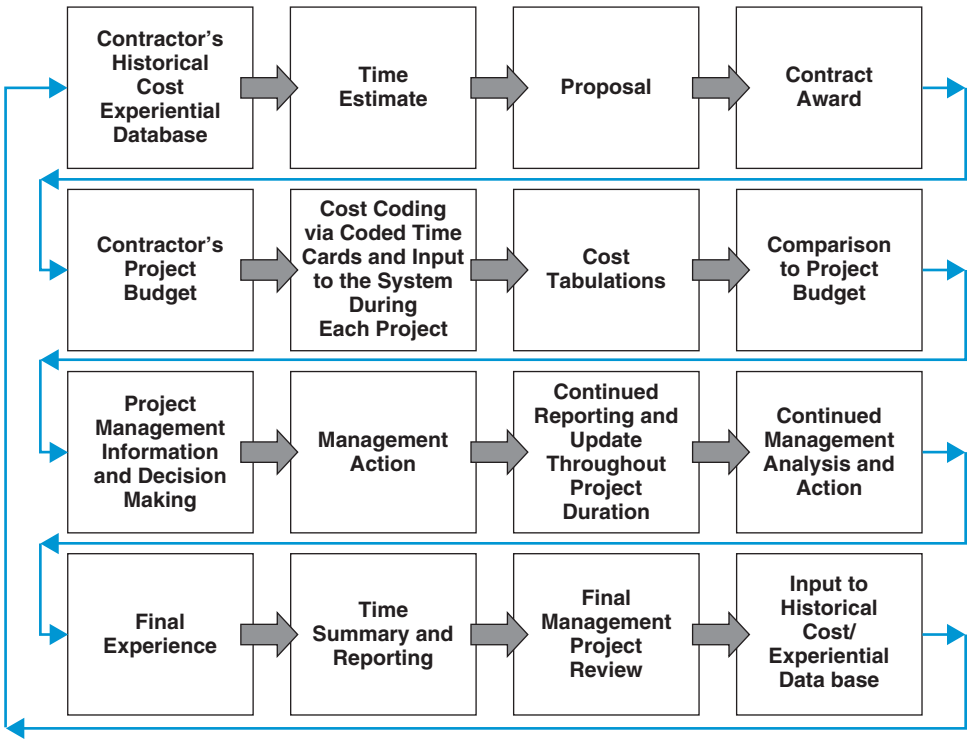



**Figure 12.2** Cycle of Project Cost Reporting, Cost Accounting, and Cost Control System

This chapter discusses the methods employed in project cost reporting and cost control and the estimating feedback process. Although the details with regard to how these actions are actually accomplished will vary somewhat from one construction firm to another, the systematic process described here can be regarded as being typical and representative of present practice within the construction industry.

## 12.2 PROJECT COST CONTROL

Project cost control is an information system structured by a construction company, which is designed to assist the project manager and other managers within the company, in controlling construction costs. It is a monitoring process that provides feedback concerning project expenses and how they compare to the established project budget.

Project cost control actually begins with the preparation of the original cost estimate for a project. For each project to be constructed, the contractor prepares a detailed estimate of construction costs that serves as the basis of the contractor's proposal in a competitive bid project, or as a target estimate if the contract is negotiated. When the contractor's proposal is accepted by the owner, a contract is formed for the amount of the proposal. After the contract is formed, a project budget is created, using the activities and costs as determined in the estimate. This project budget serves as the basis, and as the metric, for the cost control process throughout the construction of the project.

The cost control system identifies project costs as they are incurred and, in a structured manner, charges these expenses against the project work elements and activities to which they apply. The costs as they actually occur are continuously compared with the budget. Keeping within the budget and knowing when and where job expenses are exceeding the budget, or are trending toward exceeding the budget, and having this information available dependably and in timely fashion so that management can take appropriate action, are key components of profitable operation for a construction company.

The field costs on every project are obtained in considerable detail because this is the way projects are originally estimated, and also because cost overruns or potential overruns in the field can be corrected only if the exact causes can be determined. To learn that construction costs have exceeded the budget is not helpful if it is impossible to identify where the cause of the overruns is occurring, or if this information is not available in time for management to take corrective action.

Summary project cost reports are prepared at regular time intervals throughout the duration of a project. These reports are designed to provide information for the project manager in such a way as to make it possible for the project manager to determine the overall cost status of the project and also to identify those specific work activities or classifications where project costs are exceeding the budget. Management attention can be quickly focused on those activities in the project that are in need of attention.

Timely information is required on a regular basis while the work on the project is underway if effective action against cost overruns is to be taken. Determining that costs exceeded the budget only after the completion of the work on a project leaves the contractor with no possibility of taking corrective action. Therefore, cost reports are prepared, analysis performed, and actions taken on a regular recurring basis, usually weekly, throughout the duration of the construction project.

## 12.3 DATA FOR ESTIMATING

As noted in Chapter 5, when the cost of a project is being estimated, many elements of cost must be evaluated by the estimator. Labor and equipment expenses, in particular, are subject to so many variables, and are such an important component of the cost of a project, that they are best priced in light of the contractor's past experience. In essence, historical labor and equipment costs and production records are the only reliable source of information available for estimating these two critically important components of project cost. The historical cost database the company develops and maintains provides a reliable and systematic method for accumulating labor and equipment productivity and costs for use in estimating future projects. The information in this historical information database comes from coded cost reports prepared during the course of every project the company constructs.

Production rates, units of output per unit of input, are fundamental to the estimation of labor and equipment costs. Costs per unit of production, or "unit costs," are widely used for estimating labor and equipment expense because of the convenience of their application. These unit costs are determined from production rates and the hourly costs of labor and equipment, as determined from the coded cost reports which have been produced on projects which the construction company performs. Unit costs can be kept up-to-date by the contractor's periodically adjusting them so as to reflect changes in hourly rates and production efficiencies. The information compiled for company estimating purposes can therefore be expressed in terms of labor and equipment production rates, or unit costs, or both. The feedback system, as illustrated in Figure 12.2 must be designed to produce information in whatever form or forms are compatible with company needs and procedures, both for cost control and for use as historical data.

## 12.4 ACCOUNTING CODES

It is customary that an identifying code designation be assigned to each individual account in a contractor's accounting system. The coding systems used by contractors are not standardized, but rather are structured by individual construction firms as those business entities see fit to suit their particular purposes. Standard account systems have been developed by organizations such as the Associated General Contractors of America (AGC), the Associated Builders and Contractors (ABC), the National Association of Homebuilders (NAHB), the American Road and Transportation Builders Association (ARTBA), and the Construction Specifications Institute (CSI), for use by contractors.

While a number of standard systems of accounts are in existence, contractors typically use their own individual coding systems, which they have developed and have tailored to suit their particular operations. Alphabetic, decimal, and mixed alpha-numeric cost codes are used by contractors. The code used in this text is a decimal code system, and may be considered to be representative of typical construction cost accounting practice. One advantage of a decimal system is that it is expandable so as to accommodate any level of detail that may be desired.

Appendix O contains an abbreviated list of typical ledger accounts in common use by contractors. The asset accounts as included in the general ledger are identified by whole numbers from 10 through 39; general ledger liability accounts are designated by 40 through 49; net worth by 50 through 69; income accounts by 70 through 79; and expense accounts by 80 through 99.

Subaccounts are assigned a distinctive decimal number, with the first number identifying the general ledger or control account under which the subaccount exists. For example, consider the account 14.5.35. The whole number 14 indicates a property, plant and equipment account. The first decimal number, 0.5, indicates that it is associated with tractors. The last two numbers, 0.35, identify the account as a depreciation account.

In Appendix O, project expense is designated by account number 80.000. This is where every item of expense chargeable to a particular construction project is recorded. This major category of project expense is often subdivided into two major subdivisions: project work accounts and project overhead accounts. Each of these major subdivisions, in turn, has an extensive internal breakdown into detailed items of cost.

An abridged list of typical cost accounts for each of these categories is illustrated in Figure 12.3. The project cost breakdown shown is not intended to be complete or to apply to all categories of construction. The cost accounts shown in Figure 12.3 would best apply to building construction. Once they have been established by the contractor, the cost code numbers for a given cost account typically remain the same, although they are typically updated in minor fashion to accommodate

| MASTER LIST OF COST ACCOUNTS<br>SUBACCOUNTS OF GENERAL LEDGER ACCOUNT 80.000<br>PROJECT EXPENSE | | | |
|---|---|---|---|
| PROJECT WORK ACCOUNTS<br>.100 - .699 | | PROJECT OVERHEAD ACCOUNTS<br>.700 - .999 | |
| 100 | CLEARING AND GRUBBING | 700 | PROJECT ADMINISTRATION |
| 101 | DEMOLITION | .01 | PROJECT MANAGER |
| 102 | UNDERPINNING | .02 | PROJECT ENGINEER |
| 103 | EARTH EXCAVATION | 701 | CONSTRUCTION SUPERVISION |
| 104 | ROCK EXCAVATION | .01 | SUPERINTENDENT |
| 105 | BACKFILL | .02 | CARPENTER FOREMAN |
| 115 | WOOD STRUCTURAL PILES | .03 | CONCRETE FOREMAN |
| 116 | STEEL STRUCTURAL PILES | 702 | PROJECT OFFICE |
| 117 | CONCRETE STRUCTURAL PILES | .01 | MOVE-IN & MOVE-OUT |
| 121 | STEEL SHEET PILING | .02 | FURNITURE |
| 240 | CONCRETE, CAST IN PLACE | .03 | SUPPLIES |
| .01 | FOOTINGS | 703 | TIMEKEEPER AND SECURITY |
| .05 | GRADE BEAMS | .01 | TIMEKEEPER |
| .07 | SLAB ON GRADE | .02 | WATCHMAN |
| .08 | BEAMS | .03 | GUARDS |
| 0.1 | SLAB FORMS | 705 | UTILITIES AND SERVICES |
| .11 | COLUMNS | .01 | WATER |
| .12 | WALLS | .02 | GAS |
| .16 | STAIRS | .03 | ELECTRICITY |
| .2 | EXPANSION JOINT | .04 | TELEPHONE |
| .4 | SCREEDS | 710 | STORAGE FACILITIES |
| .5 | FLOAT FINISH | 711 | TEMPORARY FENCES |
| .51 | TROWEL FINISH | 712 | TEMPORARY BULKHEADS |
| .6 | RUBBING | 715 | STORAGE AREA RENTAL |
| .9 | CURING | 717 | JOB SIGN |
| 245 | PRECAST CONCRETE | 720 | DRINKING WATER |
| 260 | CONCRETE FORMS | 721 | SANITARY FACILITIES |
| .01 | FOOTINGS | 722 | FIRST-AID FACILITIES |
| .05 | GRADE BEAMS | 725 | TEMPORARY LIGHTING |
| .07 | SLAB ON GRADE | 726 | TEMPORARY STAIRS |
| .08 | BEAMS | 730 | LOAD TESTS |
| .10 | COLUMNS | 740 | SMALL TOOLS |
| .12 | WALLS | 750 | PERMITS AND FEES |
| 270 | REINFORCING STEEL | 755 | CONCRETE TESTS |
| .01 | FOOTINGS | 756 | COMPACTION TESTS |
| .12 | WALLS | 760 | PHOTOGRAPHS |
| 280 | STRUCTURAL STEEL | 761 | SURVEYS |
| 350 | MASONRY | 765 | CUTTING AND PATCHING |
| .01 | 8 INCH BLOCK | 770 | WINTER OPERATION |
| .02 | 12 INCH BLOCK | 780 | DRAYAGE |
| .06 | COMMON BRICK | 785 | PARKING |
| .20 | FACE BRICK | 790 | PROTECTION OF ADJOINING |
| .60 | GLAZED TILE | 795 | DRAWINGS |
| 400 | CARPENTRY | 796 | ENGINEERING |
| 440 | MILLWORK | 800 | WORKER TRANSPORTATION |
| 500 | MISCELLANEOUS METALS | 805 | WORKER HOUSING |
| .01 | METAL DOOR FRAMES | 810 | WORKER MEALS |
| .20 | WINDOW SASH | 880 | GENERAL CLEANUP |
| .50 | TOILET PARTITIONS | 950 | EQUIPMENT |
| 560 | FINISH HARDWARE | .01 | MOVE-IN |
| 620 | PAVING | .02 | SETUP AND RIGGING |
| 680 | ALLOWANCES | .03 | DISMANTLING |
| 685 | FENCING | .04 | MOVE-OUT |
| | | | |

**Figure 12.3** Master List of Project Cost Accounts

new technology, or new construction materials or processes, or new accounting methods. These cost code numbers are used consistently throughout the company, and do not vary from one project to another.

As noted earlier, the cost accounting and cost coding systems that are utilized by most contractors have some degree of flexibility built in, so as to accommodate new cost codes which the contractor may wish to track, as well as to accommodate changes in technology. For example, a general contracting firm may have included in the fairly recent past, a cost account code for placement and finishing

of glass fiber reinforced (GFR) concrete, and an electrical firm may have incorporated codes in the recent past, for installation and terminations in fiber optic conductors.

## 12.5 JOB COST ACCOUNTS

The point of origin for construction project cost management is a set of cost codes in the company financial accounting system, as described in the previous section. However, a basic accounting principle for construction contractors is that project costs are recorded on a periodic recurring basis for each individual construction project. Cost accounting based in these cost codes must, of necessity, be a function of each construction project, and profit or loss is evaluated for every project at the individual job level.

Summary project cost data tabulated in the usual company ledger accounting records have only very limited value for use in managing project costs during the course of the construction of a project. Although the normal company accounting system periodically reports project costs associated with labor, materials, subcontracts, job overhead, and equipment, these are summary cost data, for a number of projects the company has performed. Details concerning the exact composition of these costs, such as the expenses associated with basic work activities such as excavation, concrete, or carpentry, are not available from these summaries. In addition, this information consists of a cost tabulation only, and includes no data concerning work quantities installed. As a result, project managers cannot determine from these summaries, where costs are or were within budget, or over budget, on any project.

What is required for project cost management on each individual project is more detail concerning the composition of project costs and the work quantities accomplished. This requires the collection of additional data not provided by the company's basic financial accounting system.

The cost breakdown required for cost control and project management is achieved by maintaining a detailed set of separate cost records for each project. A separate account is established for each cost item that pertains to a given construction project. These accounts are subsidiary to the company's general ledger accounts.

In practice, each job expense is posted to the appropriate project cost account. Expenditures such as those for labor, materials, equipment, subcontracts, and project overhead are charged to the appropriate project cost accounts throughout the life of the project, and these accounts are named and numbered, as discussed previously. Accounts that are active and relevant to the project under consideration are chosen from the chart of cost accounts as discussed earlier, or the company may maintain a set of project cost accounts and cost codes which it uses for all of its projects.

The details of the job cost accounts may vary from one project to another, depending upon the type of project being constructed. The project may be divided into only a few cost accounts, or into a larger number of line items, depending upon the size of the project and the type of work involved. Because the cost system for each project is directed toward making comparisons between actual and budgeted costs, cost accounts utilized for a project will parallel the work breakdown which was used for estimating that project. Typically, the cost accounts utilized for the project cost system are identical with those that were used in the preparation of the original cost estimate. Or, said differently, the estimator produces his estimate of project costs on a project that is being bid, by the same activity set and code numbers that are in the historical cost data file. These activity names and numerical codes will, in turn, be used to prepare the project budget after the contract is formed, as well as to tabulate the costs of the work as construction on the project is performed.

It is important to note that when cost code accounts and cost code numbers are structured for the elements of cost the contractor has decided he wishes to monitor and control on the project, a

couple of practical considerations must be kept in mind. First, the activity and work item descriptions and their cost code numbers must be sufficiently detailed to provide the project management team with sufficient detailed information to be able to discern cost trends, and analyze them, and to make effective decisions based on the information. Additionally, however, it must be remembered that the project superintendent or foremen on the project will be charged with the responsibility of "coding" labor and equipment hours and costs in the field using these activity names and numbers. If the activities and cost accounts are overly detailed or complex, the all-important information that is input to the system from the field will not be accurate.

## 12.6 MONTHLY COST REPORTS

After the work on a project begins, and throughout the life of the project, information contained in the job cost accounts is periodically summarized and reported in a series of cost reports. These reports are prepared regularly on a periodic basis, and are designed to inform project management in sufficient detail and in a timely manner with regard to the cost status of the work overall, as well as the status of individual activities on the project. The information conveyed and the frequency of reporting are structured to meet the specific needs of job management. It is very important that each cost report be designed to convey its particular message in the most succinct and usable form possible. Weekly cost reports are the norm in most companies, and for most projects.

While the formats used by contractors in preparing their periodic cost reports vary somewhat, the basic information to be tabulated is consistently the same: for each activity, the budgeted cost, costs or expenditures to date, percentage complete, and variance from budget are tabulated. Sometimes additional information is provided, such as "cost to complete," or "estimated final cost," values that are calculated based on the current trend.

Figure 12.4 presents an example of a typical materials cost summary for a project and depicts the typical format utilized in cost reports. The report illustrated is a monthly materials cost report, such as might be used on a large engineered project. Typically, contractors prepare more detailed weekly cost reports, and these reports usually tabulate costs for labor, equipment, subcontractors, and for the total project. These will be discussed and illustrated in subsequent sections of this chapter.

Construction company management will make a determination with regard to which items or categories of cost will be tabulated and monitored for the projects the company performs. A company that performs large engineered projects may well tabulate costs and reports for all five of the categories of project cost noted above (materials, labor, equipment, subcontractors, and total project). A company that performs building construction work may choose to monitor only labor costs during the course of the project because these costs represent a large fraction of the total cost of the project and are the most variable and present the greatest risk for the contractor.

For each of the four cost types represented by Figure 12.4, budget values (Column 3) are taken directly from the original job cost estimate, or they may be taken from the project budget document which the contractor has prepared for the project. The project budget, which is prepared by most contractors for each project they perform, is based on the original estimate for the project.

The job cost accounts in Figure 12.4 show the tabulation of materials costs to date (column 4) for each of the materials (column 2, description) and their cost code (column 1) whose cost the contractor has chosen to monitor. The estimated cost to complete (column 5) is based on the project budget, taking into account the costs incurred to date and the percentage complete at this date, and making a calculated linear projection of the projected cost to complete. The estimated final cost (column 6) is obtained as the sum of columns 4 and 5. The variance (column 7) is column 3 subtracted from column

Monthly Cost Report

Project _____ Project No. _____
Period Ending _____ Prepared by _____

| Cost Code | Description | Budget | Cost to Date | MATERIALS: Estimated Cost to Complete | MATERIALS: Estimated Final Cost | Variance |
|---|---|---|---|---|---|---|
| 103 | Excavation | | | | | |
| 240 | Concrete | | | | | |
| 260 | Concrete forms | | | | | |
| 270 | Reinforcing steel | | | | | |
| 280 | Structural steel | | | | | |

**Figure 12.4** Monthly Materials Cost Report

6. Thus, the variance is the difference between the anticipated actual cost and the budget at this point in time. A convention must be established in the project cost accounting and reporting system as to whether a positive or a negative variance indicates a cost overrun. In this summary, a positive value for variance is the amount of the anticipated cost overrun.

Most project managers and company management people who review the periodic cost reports will direct their attention first to the "variance" column, and will be especially attentive to cost items for which a positive variance appears (where the project budget is being exceeded). Managers must then make a decision as to what best to do with regard to the items or activities indicating a positive variance. Sometimes it may be best to "stay the course" for another reporting period, so as to monitor trending. At other times, immediate management action may be indicated, in the form of changing the work plan, and/or crew mix, and/or the equipment being used, and so on. Experience has shown that it is good management practice for the project manager to discuss positive variances with the project superintendent or craft foreman, inasmuch as they are the management people closest to where the work is being performed, and often will have the best explanation as to the reasons for, and the meaning and impact of the variance.

The algebraic sum of the total variance values is the amount by which it now appears the actual total project cost will exceed or be less than the budgeted amount. For activities or materials relating to work that has not yet started, estimates of cost to complete will normally be taken as the budgeted amounts. For completed items of work, the actual final cost is used for the estimated final cost, or some contractors may add an additional column to the cost report, indicating "actual completed cost."

## 12.7 PROJECT OVERHEAD

The periodic project cost reports which are prepared for materials, labor, and subcontractor costs typically do not include a reporting of project overhead, because such expense is general in nature and usually cannot be associated with specific work items or activities. For this reason, project overhead, also referred to as project indirect cost, is normally reported separately. Figure 12.5 shows a typical form that might be used for monthly reporting of project overhead expense. Values for the various items in Figure 12.5 are obtained in much the same fashion as for the other monthly or weekly cost reports, except that the costs reported here pertain to job overhead cost accounts rather than to specific activities or work classifications on the project.

## 12.8 LABOR AND EQUIPMENT COSTS

Project costs associated with materials, subcontracts, and project overhead generally are reasonably stable, and therefore are relatively easy to predict during the estimating process. In management terms, the risk of variance between estimated costs and the actual costs that will be experienced on a project is, much of the time, relatively low for these costs. Barring estimating oversight or mistake, these costs can be determined with reasonable accuracy when the project is estimated, and, except in the case of unusual circumstances, such costs typically do not vary a great deal from their budgeted amounts.

For this reason, costs of this type are maintained as project expenses but are not usually subjected to detailed cost reporting and analysis during the course of the construction of a project. The cost

Monthly Overhead Cost Report

Project _____ Project No. _____

Period Ending _____ Prepared by _____

| Cost Code | Description | Budget | Cost to Date | Estimated Cost to Complete | Estimated Final Cost | Variance |
|---|---|---|---|---|---|---|
| 700 | Project manager | | | | | |
| 701 | Supervisors | | | | | |
| 702 | Project office | | | | | |
| 705 | Utilities | | | | | |
| 740 | Small tools | | | | | |

**Figure 12.5** Monthly Overhead Cost Report

information available from the monthly project cost reporting is normally sufficiently detailed and timely for purposes of project cost management for these categories of cost.

Labor costs and equipment costs, however, are subject to a great deal of uncertainty. These two categories of project cost can vary substantially during the construction process, and further, they can vary as the result of a number of factors, many of which are unpredictable at the time of preparing the estimate. Moreover, these two categories of cost constitute a major fraction of the cost of performing a typical construction project. It is one of the ironies of both estimating and cost management, that the two categories of cost that comprise the greatest fraction of the cost of a project are also the most difficult to estimate and control. The inherent variability, and the uncertainty, coupled with the significance of the labor and equipment costs for a project, and therefore the risk associated with these categories of costs, explains the fact that contractors' cost management systems usually concentrate on these two items of job cost.

The monthly cost reports for materials and overhead, as we have discussed them, are certainly useful for project management; however, these reports do not provide the information needed for monitoring labor and equipment costs in suitable detail or in sufficient time to be useful for project management. Accordingly, labor and equipment costs are customarily tabulated and reported at a different level of analysis and reporting. The process of determining, at regular short intervals, how much work is being put into place in relation to the costs being incurred for the labor and equipment being supplied to the project, is described in the following sections.

## 12.9 COST ACCOUNTING

In order to accumulate, report, and analyze labor and equipment cost and production information from an ongoing construction project, a contractor will establish a special system with a detailed set of cost accounts. The maintaining of these detailed project records is referred to, in the aggregate, as *project cost accounting*. This process of project cost accounting for labor and equipment is not independent of the contractor's job cost accounts as previously discussed, but rather, it is a more detailed cost accounting system which exists and functions within the framework of the contractor's overall company ledger accounts. Project cost accounting for labor and equipment involves the continuous determination of labor and equipment costs, together with determination of the work quantities produced, followed by the analysis of these data, and the presentation of the results in summary form for the information and action of project management.

Thus, it can be seen that project cost accounting for labor and equipment differs from the usual accounting practice inasmuch as the information that is gathered, recorded, and analyzed is not merely in terms of dollars and cents. This category of construction cost accounting is necessarily concerned not only with the costs themselves, but also with labor hours, equipment hours, and the amounts of production, or work accomplished. The systematic and regular checking of costs and production is a necessary component of obtaining reliable, time-average production, and cost information for the project. These labor and equipment costs are usually summarized and reported weekly, on a regular basis throughout the life of the project. This is the only way to generate sufficient information timely for management analysis and decision making, and to gather the information in sufficient detail to feed back into the historical information database for use in estimating future projects.

Additionally, this project cost accounting must strike a workable balance between too little and too much detail. A too-general system will not produce the detailed cost information necessary for meaningful management control and future estimating information. Excessive detail will result in the objectives of the cost system being obliterated by masses of data and paperwork, as well as needlessly

increasing the time lag in making the information available. It should also be noted that an excess of detail in the cost control system, and an excess of numerical values and descriptions of cost categories which are to be reported from the field, will overwhelm the superintendents and craft labor foremen who gather and report this information. This, in turn, often results in inaccurate and incomplete reporting, which defeats the purpose of the system. The company cost system must be tailored to suit the contractor's own particular mode of operation. The detail used in this book is reasonably typical of actual practice in the construction industry.

A project cost accounting system is a summary and analysis tool for field supervision as well as for project management. In the final analysis, the best cost control system a contractor can have is skilled, trained, experienced, energetic, and effective field supervision. It is important that field supervisors realize that the project cost accounting system is intended to assist them by the early detection of troublesome areas. Superintendents and craft labor foremen are vitally important members of the project management team, and they are the people who perform the "labor and equipment cost coding" that provides the primary input to the project cost accounting system. Without the complete understanding, and support, and cooperation of these key individuals, the cost accounting system cannot and will not be effective.

In a contractor's integrated system of cost accounting, cost control, and historical information gathering, as illustrated in Figure 12.2 and as shown again in Figure 12.6 below, it is necessary that the project cost account codes be broken down into the same elementary work classifications or activities, and that they be identified by the same cost code numbers, as were used in preparing the estimate for the project. As discussed in Chapter 5, the estimator identifies each work item or activity by its code of account designation when he or she sets down the results of the quantity takeoff and when craft labor is estimated. Throughout the construction process, a continuous record is kept, of the actual costs of production for these same work items. Thus, it can be seen that from the time of preparing the estimate to the time of the completion of the project, the same work breakdown and cost code numbers apply in the contractor's integrated system. For clarity, the flow chart depicting this process is illustrated in Figure 12.6.

## 12.10 LABOR AND EQUIPMENT BUDGET

For purposes of project cost accounting, a labor and equipment budget, which is often referred to as the project budget, is prepared by the contractor following the award of the contract, and prior to the beginning of field operations for the project. Each activity on the project is listed, along with its cost code, and the dollars or hours from the estimate are indicated. The budget information on this document may be expressed for each activity on the project in the form of dollars of cost, or labor man-hours, or crew hours, or equipment hours, or unit costs, or production rates. And frequently, all of this information is included in the budget.

As the work on the project is performed, costs will be coded in the field by the superintendent or labor foreman, and then will be summarized and reported on a periodic basis, and then will be compared to this project budget. Progress to date on each activity will also be determined, for each cost reporting period. This process will provide information for the project management team with regard to dollars expended to date for each activity, along with progress on the activity to date. This project budget then will serve as the metric, literally the budget, to which the actual costs incurred in the field are compared, throughout the progress of the work on the project.

For the discussions in this chapter, the convention to be used will be for the budget to be prepared in terms of the total estimated work quantity, the unit cost of labor and/or equipment, and the total

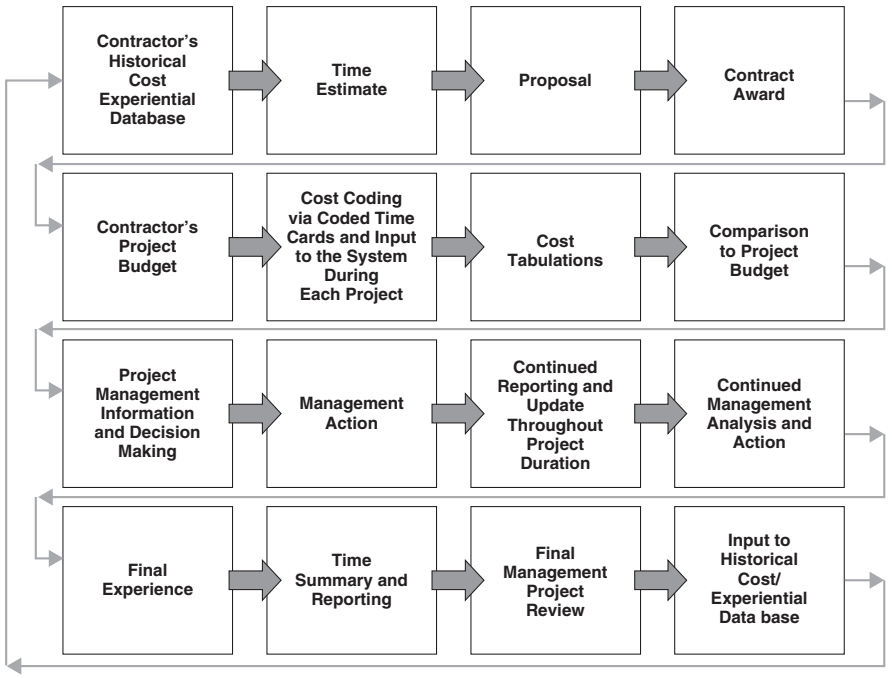



**Figure 12.6** Cycle of Project Cost Accounting, Cost Reporting, and Cost Control System

labor and/or equipment cost for each work cost code on the project to date. As was noted previously, different units may be used (unit cost, production rate, labor man-hours, crew hours, etc.) in the project budget. At some point in the analysis the metric becomes dollars, and therefore dollars are used in the discussion in this chapter to illustrate the process.

When labor costs are tabulated, management will have made a decision with regard to whether the labor cost indicated should be direct labor costs only or whether the summary should also include indirect labor cost (see Chapter 5). Contractors vary in their opinions in this regard; however, most contractors prefer that labor cost as reported in the cost reports from the field include only direct labor. What is most important in this regard, is that the budget and field costs be expressed on exactly the same basis and, that foremen, superintendents, and project managers, as well as company office personnel, are mindful of the convention being used.

In this way, valid comparisons can be made throughout the life of the project, between the estimated costs and the actual costs of construction. In this text, the project cost budget and the labor cost reports are expressed in terms of direct labor costs only, without the inclusion of indirect labor cost.

## 12.11 COST ACCOUNTING REPORTS

Summary labor and equipment cost reports must be compiled frequently enough during the course of the construction of a project, so that those activities or items of work where costs incurred are exceeding the project budget can be detected early enough, so that management has time to analyze the situation and to determine whether corrective action should be taken, and to make timely decisions regarding what form the corrective action should take. Cost reporting intervals are a function of project size, the nature of the work, the type of construction contract being utilized, and the style and preference of company management. Obviously, there must be a balance struck between the cost in dollars and time of generating such reports, and the value of the management information that is generated.

Daily cost reports may sometimes be prepared on very complex projects involving multiple shifts, or on a shutdown project, where the contractor and/or owner require accurate cost reports on an immediate basis. It is not the usual project, however, that can profit from such frequent cost reporting. Some very large projects that involve relatively uncomplicated work classifications may find intervals of a month, or perhaps a two-week reporting interval, to be satisfactory. It is generally agreed that for most construction companies and for most projects, weekly labor and equipment cost reports are best. Weekly labor and equipment cost reports are the basis for the discussion in this text.

The cutoff time for inputting to the system can be completion of work on any desired day of the week. It is commonplace practice for contractors to match their cost reporting system cutoff times to their usual payroll period cutoff day and time. In turn, the cutoff time for the contractor's schedule updates is also typically set to coincide with this same time.

In the sections that follow, we will first examine the procedures involved with project labor cost accounting and reporting. Following this will be a discussion of cost accounting and reporting methods for the equipment on a project.

## 12.12 LABOR TIME CARDS

Time cards that are prepared in the field by labor craft foremen or superintendents are the source document for both payroll purposes and for the input to the project labor cost accounting system. Time cards are used to report the hours of labor time for each worker, as well as the work categories to

**The Blank Construction Company, Inc.**
**Daily Labor Time Card**

Project Municipal Airport Terminal Building  Weather Cloudy-windy

Date August 18, 20-  Project Number 1286  Prepared by R.D. Jones

| Badge Number | Name | Craft | Time Classif | Hourly Rate | Cost Code 701.03 | 240.01 | 240.05 | 240.07 | 240.08 | 240.51 | 240.91 | | Total Hours | Gross Amount |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 316 | Jones, Richard D. | CF | RT | $ 29.75 | 4 | | 2 | | 2 | | | | 8 | $ 234.00 |
| | | | OT | | | | | | | | | | | |
| 109 | Adams, Claude | CM | RT | $ 27.75 | | | | | | 6 | 2 | | 8 | $ 222.00 |
| | | | OT | | | | | | | | | | | |
| 422 | Chavez, S.C. | CM | RT | $ 27.75 | | | | 4 | | 4 | | | 8 | $ 222.00 |
| | | | OT | | | | | | | | | | | |
| 461 | Womac, C.T. | CM | RT | $ 27.75 | | 4 | 2 | | | 2 | | | 8 | $ 222.00 |
| | | | OT | | | | | | | | | | | |
| 247 | Sears, A.M. | L | RT | $ 21.45 | | 4 | 4 | | | | | | 8 | $ 171.60 |
| | | | OT | | | | | | | | | | | |
| 356 | Johnson, Clyde | L | RT | $ 19.95 | | | | 4 | 4 | | | | 8 | $ 159.60 |
| | | | OT | | | | | | | | | | | |
| 393 | Newman, Stan | L | RT | $ 19.95 | | 4 | 4 | | | | | | 8 | $ 159.60 |
| | | | OT | | | | | | | | | | | |
| 211 | Pong, Glace | L | RT | $ 19.95 | | | | 4 | 4 | | | | 8 | $ 159.60 |
| | | | OT | | | | | | | | | | | |
| Total Labor Cost | | | | | $117.00 | $276.60 | $279.60 | $270.60 | $218.10 | $333.00 | $55.50 | | | $ 1,550.40 |

**Figure 12.7** Daily Labor Time Card

which each worker's labor hours applied. These work categories or activities have identifying names and numbers, as we have discussed, and the activity numbers are recorded on the time card along with the number of labor hours spent working on that activity on each work day, by each person. This process is referred to as *coding labor*. Figure 12.7 shows a typical daily labor time card, and Figure 12.8, a typical weekly labor time card. Which of the two is used depends on the preference and policy of company management.

Most managers agree that daily time card preparation is best, so that labor hours can be coded to the correct activities and cost codes on an immediate basis, while the recollections of the craft labor foreman or superintendent are still fresh. This ensures the most accurate tabulation of the labor hours to the correct activities or work categories.

While time card formats vary from one company to another, certain elements of content are typical. The head of each card usually provides for entry of the project name and number, date, weather conditions (for daily time cards), and the name of the person preparing the card. The body of the time card provides for the name, badge number or other identifying number for the worker, and oftentimes the name or identifying number of the craft of the worker. Each worker's labor hours are reported for each day as regular time (RT) or overtime (OT), as the case may be. Along with the labor hours listed, spaces are provided on the time card for the inclusion of the appropriate cost code for each of those hours of work. In this fashion, each craft worker's hours are "coded" for all of his or her hours of work each day throughout the life of the project.

Absolute perfection in time coding and distribution is not possible, nor expected. Nevertheless, the need for care and the best possible accuracy in labor coding cannot be overemphasized. Superintendents and craft foremen should be trained in this regard and should constantly bear in mind during their preparation of time cards that the accuracy of each person's payroll, as well as the accuracy of

**The Blank Construction Company, Inc.**
**Weekly Labor Time Card**

Name: Womac, C.T. Craft: CM Project: Municipal Airport Terminal Building

Week Ending: August 22, 20- Project Number: 1286 Prepared by: R. D. Jones

| Cost Code | Time Classif. | Hourly Rate | WORKING DAYS Monday | Tuesday | Wednesday | Thrusday | Friday | Saturday | Sunday | Total Hours | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 240.01 | RT | $ 27.75 | 4 | 8 | 8 | | | | | 20 | $ 555.00 |
| | OT | | | | | | | | | | |
| 240.05 | RT | $ 27.75 | 2 | | | | 4 | | | 6 | $ 166.50 |
| | OT | | | | | | | | | | |
| 240.07 | RT | $ 27.75 | | | | 4 | | | | 4 | $ 111.00 |
| | OT | | | | | | | | | | |
| 240.08 | RT | $ 27.75 | | | | 4 | | | | 4 | $ 111.00 |
| | OT | | | | | | | | | | |
| 240.51 | RT | $ 27.75 | 2 | | | | 4 | | | 6 | $ 166.50 |
| | OT | | | | | | | | | | |
| | RT | | | | | | | | | | |
| | OT | | | | | | | | | | |
| | RT | | | | | | | | | | |
| | OT | | | | | | | | | | |
| Total Hours | RT | | 8 | 8 | 8 | 8 | 8 | 0 | 0 | 40 | |
| | OT | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| Gross Amount | | | $222.00 | $222.00 | $222.00 | $222.00 | $222.00 | | | | $1,110.00 |
| Weather | | | Sunny | Rain | Rain | Clouds | Wind | | | | |

**Figure 12.8** Weekly Labor Time Card

cost reporting for the current project, and also the accuracy of the estimates for future projects, are all dependent on the accuracy of his or her completion of the time cards.

Figure 12.7 depicts a typical daily time card, representative of what might be in use in a construction company, for a crew of cement masons (CM), a cement mason foreman (CF), and a group of construction laborers (L). Illustrated in the figure are the features described above. It should also be noted that in Figure 12.7, some of the hours for the concrete foreman, Mr. Jones, are coded to account number 701.03, which is an overhead account, and that other hours are coded to accounts 240.05 and 240.08, which are cement mason work activity accounts. This is illustrative of the practice sometimes employed, where a foreman's time spent on supervisory duties is charged to an overhead account, while time spent working with his tools is charged to the appropriate work cost codes. Other contractors may prefer an accounting convention wherein all field supervision time is charged to project overhead.

If weekly time cards are used, a separate card for each individual worker is prepared to record the hours worked during the week. Although the arrangement of the weekly time card is different from that of the daily time card, the card presents the same information concerning each individual worker. As was discussed in a previous section, the hourly rates shown on the time cards in Figures 12.7

and 12.8 are direct labor wage rates only and do not include any indirect labor costs, such as payroll taxes, insurance, or fringe benefits. When a weekly time card is used in the contractor's system, it is preferable that the craft labor hours and cost codes information, as discussed in the next session, be entered on a daily basis. Recording the craft labor hours and the cost codes to which the hours should properly be assigned as the work progresses, will eliminate the temptation for the foreman of letting the matter go until the end of the week and then trying to enter the information from memory.

It should also be noted that increasingly, contractors are utilizing electronic time cards. Where the contractor is using computer-based payroll and cost accounting procedures, the computer can preprint all standard information on the time cards or on a daily time sheet. The person making the time report need add only the hours and cost codes. This information may be reported on a paper form, or very commonly today, may be input in the field via laptop, or PDA, or tablet computer, to a spreadsheet, or to a specialized software utilized by the contractor, and then uploaded to the accounting system.

## 12.13 TIME CARD PREPARATION

Labor cost coding, that is, the distribution of each worker's time to the proper cost accounts, normally is done by the craft labor foreman or by the superintendent because he or she is in the best position to know how each worker's time was actually spent during the course of each workday. Sometimes this information is first recorded in the foreman's pocket time book, with the nature of the work performed by the individuals of his crew often described by words rather than by cost code numbers. This information is then compiled from the pocket time form to the time card at the end of the workday. As noted earlier, this process is often performed electronically by use of PDAs or laptop computers in many companies today.

The foreman identifies the craft and position of each worker by using any of a variety of simple letter or numerical codes the contractor may have developed for this purpose. For example, in Figure 12.7, CF indicates cement mason foreman, CM means cement mason, and L indicates laborer. Sometimes, the foreman will also enter the hourly rate for each worker because it is not unusual for an individual during a week, or even during a single day, to be employed on work which is compensated at different rates of pay.

As has been discussed, the numerical codes for different activities or work categories are taken by the foreman from the contractor's master cost coding system. Ideally, this system will have a balance between generating sufficient detail for proper description of activities, and thus providing management the ability to analyze and make effective decisions, while not becoming so detailed and complicated that its use is cumbersome or unduly burdensome for the craft labor foreman.

The importance of accurate and honest reporting of craft labor hours to their proper activities and numerical cost codes simply cannot be overemphasized. On the basis of the allocation of labor (and equipment) time and costs to the various work activity account numbers, cost and production information is generated. This information is used as the basis for management decision making during the course of the performance of the project and also is stored as historical performance information in the contractor's historical cost database, where it is used in estimating future projects. If this information reported from the field is inaccurate or distorted, it may lead to ineffective decision making as the project is being constructed, and also will provide inaccurate and misleading information when it is used for estimating and cost control purposes on future projects.

Especially in cases where project costs experienced are exceeding the project budget amounts, the supervisor must avoid the temptation to code hours of labor for those activities that are over budget to other work categories where costs are under the project budget amount. Loss items must be identified as such, without any attempt at covering them up by charging time to other cost accounts.

Additionally, when reporting from the field is honest and accurate, where activities are completed for significantly less than the project budget amount, management can certainly use this information to advantage for estimating and managing future projects as well.

It should also be noted that project managers and company management can play an important role in assuring proper reporting from the field. Supervisors should be trained for the management work they are performing. This training should include emphasis on the critical importance of accurate and honest cost coding and reporting, and project managers should continue to reinforce this principle throughout the course of every project. It can be noted that one reason the supervisor is experiencing costs that exceed the budget on this project, despite his or her best efforts, may be that costs were improperly reported on a previous project or projects, leading to an inaccurate estimate for this project. When one understands the cyclical nature of the cost accounting and cost reporting system, and the use of this information for estimating future projects, it becomes clear that the entire process can be poisoned by poor cost coding and reporting from the field.

In some companies or on some projects, the time card may be completed by someone other than the craft labor foreman, such as a field superintendent, project engineer, or project manager. A project engineer, for example, can collect the foremen's time books at some convenient time each day and complete the individual time cards, adding the necessary information for payroll and cost accounting, such as employee number, and work cost codes, and hourly rates for different cost code items, and so on.

## 12.14 MEASUREMENT OF WORK QUANTITIES

For the determination of labor production rates or unit costs and their reporting to the cost report and historical information, it is necessary to obtain not only the hours and costs involved, but also the amount of each activity or work classification that has been accomplished during the reporting period. On some types of work, it may be feasible for the foreman to include with his daily time cards the work quantities accomplished for that day. It is more common practice, however, for work measurements to be made at the end of each weekly payroll period, and this method is the basis for discussion here.

The items of work measured must be identical to the standard cost code work classifications. Although labor costs are now being discussed, the weekly measurement of work quantities includes all work items performed, whether accomplished by labor, equipment, or a combination of both. Consequently, the same weekly work quantity determination can serve for both labor and equipment cost accounting.

Determinations of work quantities can be obtained in a variety of ways depending on the nature of the work and company management methods. Direct field measurement on the job, estimation of percentages completed, computation from the drawings or from the building information model, and obtaining of quantities from the estimating sheets are included in the list of methods that are commonly used.

Direct measurement in the field is a commonplace method for determining work quantities performed. The measurement may be performed in terms of total units or quantity achieved to date, or units accomplished during the week being reported. This procedure is easily applied to projects that involve relatively few cost code classifications. Many heavy, highway, and utility contracts are of this type.

There are often instances in which quantities can be obtained with reasonable accuracy by applying estimated percentages of completion to the work amount totals. Although not as accurate as direct measurement of actual quantities, this procedure can yield useful information, so long as accurate

determinations are occasionally made by actual measurement, such as for monthly pay requests by the contractor. Total work quantities of all types should also be checked against the estimating sheets on occasion, as a check on the overall accuracy of quantity reporting.

The field measurement of work quantities on projects that involve a large number of cost code classifications can become a substantial and burdensome task. Most building and industrial projects entail substantial numbers of different cost classifications. One convenient procedure in such cases is to mark off and dimension the work advancement in colored pencil on a set of project drawings that are reserved for that purpose. The extent of work put into place can be indicated at the end of each workday or each week as desired. By using different colors and by dating successive stages of progress, work quantities can be determined from the drawings or estimating sheets as of any date desired.

If the company is using a building information model for estimating, and/or for project scheduling, and/or for cost accounting and control, and/or for schedules of values and payments, the electronic model and the related softwares can facilitate the electronic determination of quantities of work installed. As these models become even more sophisticated and still more capable, it is easy to foresee that the use of the building information model, or other electronic estimating software, may well become the method of choice for determining and tabulating work quantities installed.

The field measurement of work quantities can be, and often is today, performed by the field supervisors. However, on large projects, and especially those with numerous work codes, it may be desirable that the project engineer or project manager carry out this function because of the time and effort required. Weekly reports of quantities of work performed are submitted on standard forms such as that illustrated in Figure 12.9.

The Blank Construction Company, Inc.
Weekly Quantity Report

Project Municipal Airport Terminal Building — Project No. 1286
Week Ending August 22, 20- — Prepared by R. D. Jones

| Cost Code | Work Description | Unit | Total Last Report | Total This Week | Total to Date |
|---|---|---|---|---|---|
| 240.01 | Concrete, footings | c.y. | 479 | 196 | 675 |
| 240.05 | Concrete, grade beams | c.y. | 208 | 208 | 416 |
| 240.07 | Concrete, slab | c.y. | 595 | 65 | 660 |
| 240.08 | Concrete, beams | c.y. | 0 | 60 | 60 |
| 240.51 | Concrete, trowel finish | s.f. | 50,595 | 2,865 | 53,460 |
| 240.91 | Concrete, curing, slab | s.f. | 50,595 | 2,865 | 53,460 |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

**Figure 12.9** Weekly Quantity Report

## 12.15 FORMS OF LABOR REPORTS

Weekly labor cost reports can be prepared on the basis of either man-hours of labor or labor cost, along with the amount of work produced. That is, labor production can be monitored in terms of either labor-hours per unit of work (production rates) or cost per unit of work (unit prices). Which of these is used is a function of project size, the type of work involved, and company management procedures.

Where labor hours are used as the basis for labor cost reporting and cost control, the project budget is prepared in such a way as to include labor hours per unit of work. In this regard, total labor hours are frequently used, with no attempt to subdivide labor time by craft or trade specialty. For example, the project budget may indicate so many hours of carpenter time and so many hours of ironworker time. Total labor hour project budgets of this type are usually based upon an "average" crew mix for each work category. Alternately, labor hour project budgets can be prepared by using craft-specific hours.

When labor hours are used as the basis for monitoring, during the performance of the work on the project, actual labor hours and work quantities are obtained and reported from the field. This makes possible a direct comparison of actual to budgeted production. Such an approach, of course, reflects labor productivity, but not labor cost. However, this system is simple to implement, and also avoids many of the problems associated with labor cost analysis, such as projects that require long periods of time to complete. On such projects, wage rates may be increased several times during the life of the project, rendering measurement of labor cost against the project budget a cumbersome task.

When the project cost for a very large and very long-term project is first being estimated, educated guesses are made by the estimator with regard to the potential wage rate increases during the life of the project. What this means is that labor costs on long-term projects are often estimated without exact knowledge of the wage rates that will actually apply during the entire construction process. As a result, actual labor wage rates during the work period may turn out to be different from those rates that were used in preparing the original project cost control budget. Thus, labor costs produced by the project cost system are not directly comparable to the budget. To make valid cost comparisons, it is necessary to either adjust these labor costs to a common wage-rate basis, or to form the project budget in terms of labor hours rather than labor cost.

Labor hour project budgets also are convenient and effective as a management tool for the craft foreman or superintendent in those companies that make it their practice to share project budget information with field supervisors. Many supervisors find it easy to understand how many labor hours or crew-hours have been allocated in the project budget, and then to monitor man-hours or crew-hours as they are expended during the performance of the work, so as to make their own assessment of current status relative to the project budget.

While labor hours project budgets can serve as a very effective basis for labor cost reporting and control, many companies prefer to monitor dollars of labor cost instead. These companies simply adjust their labor cost accounting when changes in craft labor rates occur. In fact, for most construction applications, labor cost analysis is more widely applied than is labor hour analysis. For this reason, the labor cost reports discussed in this chapter are based on costs.

## 12.16 WEEKLY LABOR COST REPORTS

In a company that utilizes labor dollar reporting as the basis for project budgeting and for cost reporting, cost analysis, and cost control, labor costs are typically tabulated once per week. In a typical

construction company, on the day of the week that has been designated as the reporting cutoff date, labor hours, and labor cost codes as they were entered on the time cards are summarized, and are then tabulated with the summary of work quantities produced during the same week. The results of this analysis are summarized and reported in a weekly labor cost report. While the organization and exact content of these cost reports will vary somewhat from one company to another, the basic information which these cost reports convey is almost always the same. Two different forms of labor cost reports are illustrated in Figures 12.10 and 12.11.

These labor cost reports classify and summarize all labor costs incurred on the project, through the effective date of the report. The labor costs in both of these reports are reported as direct labor

THE BLANK CONSTRUCTION COMPANY, INC.
WEEKLY LABOR COST REPORT

Project Municipal Airport Terminal Building — Project No. 1286
Week ending August 22, 20- — Prepared by W.W. Smith

| Cost Code | Work Description | Unit | Quantity | | | Direct Labor Cost | | | Unit Labor Cost | | | To Date | | Projected | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Budget | This Week | To Date | Budget | This Week | To Date | Budget | This Week | To Date | Savings | Loss | Savings | Loss |
| 240.01 | Concrete, footings | c.y. | $1,040 | $196 | $675 | $7,020 | $1,391 | $4,865 | $6.75 | $7.09 | $7.21 | | $308 | | $475 |
| 240.05 | Concrete, grade beam | c.y. | $920 | $208 | $416 | $8,694 | $1,871 | $3,779 | $9.45 | $8.99 | $9.08 | $153 | | $338 | |
| 240.07 | Concrete, slab | c.y. | $2,772 | $65 | $660 | $24,948 | $675 | $6,710 | $9.00 | $10.38 | $10.17 | | $770 | | $3,232 |
| 240.08 | Concrete, beams | c.y. | $508 | $60 | $60 | $4,800 | $572 | $572 | $9.45 | $9.53 | $9.53 | | $5 | | $39 |
| 240.51 | Concrete, trowel finish | s.f. | $128,000 | $2,865 | $53,460 | $48,000 | $1,076 | $18,716 | $0.38 | $0.38 | $0.35 | $1,332 | | $3,189 | |
| 240.91 | Concrete, curing, slab | s.f. | $180,000 | $2,865 | $53,460 | $8,100 | $129 | $1,929 | $0.05 | $0.05 | $0.036 | $477 | | $1,605 | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |

**Figure 12.10** Weekly Labor Cost Report Number 1

THE BLANK CONSTRUCTION COMPANY, INC.
WEEKLY LABOR COST REPORT

Project Municipal Airport Terminal Building — Project No. 1286
Week ending August 22, 20- — Prepared by W. W. Smith

| Cost Code (1) | Work Description (2) | Unit (3) | Total Quantity Budgeted (4) | Total Quantity to Date (5) | Percent Complete (6) | Budgeted Direct Labor (7) | Budgeted Labor to Date (8) | Actual Labor to Date (9) | Cost Difference (10) | Deviation (11) |
|---|---|---|---|---|---|---|---|---|---|---|
| 240.01 | Concrete, footings | c.y. | 1,040 | 675 | 64.9 | $7,020 | $4,556 | $4,865 | ($308) | 1.07 |
| 240.05 | Concrete, grade beams | c.y. | 920 | 416 | 45.2 | $8,694 | $3,931 | $3,779 | $153 | 0.96 |
| 240.07 | Concrete, slab | c.y. | 2,772 | 660 | 23.8 | $24,948 | $5,940 | $6,710 | ($770) | 1.13 |
| 240.08 | Concrete, beams | c.y. | 508 | 60 | 11.8 | $4,800 | $567 | $572 | ($5) | 1.01 |
| 240.51 | Concrete, trowel finish | s.f. | 128,000 | 53,460 | 41.8 | $48,000 | $20,048 | $18,716 | $1,332 | 0.93 |
| 240.91 | Concrete, curing, slab | s.f. | 180,000 | 53,460 | 29.7 | $8,100 | $2,406 | $1,929 | $477 | 0.80 |
| | | | | | | | | | | |
| | | | | | | | | | | |
| Totals to Date | | | | | | | $37,448 | $36,569 | $879 | 0.98 |

**Figure 12.11** Weekly Labor Cost Report Number 2

costs only, and do not include indirect labor costs. These reports have the objective of providing project supervisors, the project management team, and company management with detailed information concerning the current status of labor costs, and how these costs compare with those that were estimated and brought forward to the project budget. All labor cost reports, including the two labor cost report forms shown here, are intended primarily to identify those work classifications where costs are exceeding the project budget amounts and to indicate the extent of the overruns. These reports will also indicate, and the project management team should take note, where significant labor savings are occurring. This, too, is valuable information for the project management team, as well as for estimating purposes.

Figure 12.10 is a weekly cost report for concrete placement that summarizes labor costs as budgeted, for the week being reported, and a total of labor costs for this activity to date. Not all cost report forms include costs for the week being reported, but most do. These values can be of significance in indicating downward or upward trends in labor costs. The labor report form in this figure indicates work quantities, as well as labor costs for each activity or work category. Unit prices, obtained by dividing the total labor cost in each work category by the respective total quantity, enable direct comparisons to be made between the actual costs and the costs as budgeted. In Figure 12.10, the budgeted total quantity, budgeted total labor cost, and budgeted unit cost for each work type are taken directly from the project budget. The other quantities and labor costs are actual values, either for the week reported, or to date.

When the total quantity of a given activity or work item has been completed, its to-date and projected saving or loss figures are obtained merely by subtracting its actual total labor cost from its estimated total cost. When a work item has been only partially accomplished, the to-date saving or loss of that work item is obtained by multiplying the quantity in place to date by the underrun or overrun of the unit price. The projected saving or loss for each work type can be obtained in different ways. In Figure 12.10, it is determined by assuming that the unit cost to date will continue in linear fashion to the completion of that activity. Multiplying the total estimated quantity by the underrun or overrun of the unit price to date yields the projected saving or loss figure.

The projected saving and loss figures shown in Figure 12.10 afford a quick and informative summary of actual labor cost as compared to project budget labor cost on the project. The activities where labor overruns are occurring are identified, and the financial consequences if nothing changes are also indicated. Some labor cost reports also indicate the trend for each cost code, that is, whether the unit cost involved has been increasing or decreasing. This information can be helpful in assessing whether a given cost overrun is improving or worsening, and can be of assistance in evaluating the effectiveness of cost reduction or cost control efforts which have been undertaken to date.

Figure 12.11 is an alternative form of weekly labor cost report that presents the same weekly cost information for concrete placement as Figure 12.10 in somewhat different form. This figure shows actual and budgeted total labor costs to date for each cost classification. The budgeted total quantities and total labor cost for each cost code are brought forward from the project budget. The actual work quantities and labor costs to date are cumulative totals for each work classification, as obtained from the time cards and weekly quantity reports. Column 10 of Figure 12.11 shows the cost difference as column 8 minus column 9, with a positive difference indicating that the cost in the project budget exceeds the actual cost to date. Hence, in column 10, a positive number is desirable; a negative number, undesirable. The deviation is the actual cost to date (column 9) divided by the budgeted cost to date (column 8). A deviation of less than one indicates that labor costs are within the budget, whereas a deviation of more than one indicates a cost overrun.

Although column 10 in Figure 12.11 does indicate the magnitude of the labor cost variation for each cost code, it does not indicate the relative seriousness of the cost overruns. The deviation is of value in this regard because it shows the relative magnitude of labor cost variance.

It should also be noted that many labor cost reports of the kind illustrated in Figure 12.11 may also include additional columns to provide more information to management. For example, many contractors include a column that indicates "Projected Cost to Complete." This mathematical determination shows for each work classification item, the impact of the cost overrun or underrun experienced to date, on the final cost of the completion of that item, if no action is taken. This calculation assumes a linear projection, with the work assumed to continue at the current rate. This column provides an indication of the potential total savings or total additional cost of each work item.

For those work types not yet completed, the cost differences listed in column 10 in Figure 12.11 do not always check exactly with the to-date savings and loss values of Figure 12.10. These small variations are caused by the rounding off of numbers, and are not significant.

## 12.17 EQUIPMENT COST

Project cost and production accounting for equipment is important, especially on engineered construction projects where the cost of equipment frequently constitutes a significant proportion of the total project cost. On projects of this kind, the need to monitor, analyze, and control equipment costs parallels the need for the cost reporting and control of labor costs on building construction projects. The costs associated with large pieces of construction equipment are substantial and are also inherently variable, are variable with a number of different factors, and are a significant element of risk for the contractor, and are therefore deserving of a comprehensive record keeping and cost accounting and cost control system.

The objectives of equipment cost accounting are the same as those that have been discussed for labor costs. Management at all levels requires timely information for effective project cost control, and estimators need accurate data from the field for use in future estimates. It should be noted that usually only the major capital equipment items merit detailed cost study, however. Lesser equipment such as power saws, concrete vibrators, and hand-operated soil compactors are normally charged to a project on a flat rate or lump sum basis and do not require detailed cost analysis.

While labor wage rates may frequently be fixed by or related to local labor agreements, no such determination exists for equipment costs. Therefore, the contractor must establish his own equipment expense rates and the methods of their determination.

In the case of rental or leased equipment, the rental or lease rates are known or easily discernible, but the contractor must still establish the operating costs during the time he is using the equipment. In the case of contractor-owned equipment, both ownership and operating costs must be determined. As discussed in Chapter 5, ownership expenses include depreciation and investment costs. Investment expense includes the costs of interest, insurance, taxes, and storage. Operating costs are on-the-job expenses that accrue when the equipment is in use, such as fuel, oil, grease, filters, hydraulic fluids, scheduled maintenance, tire or track replacement, tire or track repairs, mechanical repairs and parts, and possibly, operating labor. As noted in another section, some contractors prefer to regard the labor associated with equipment operation as a labor expense rather than as a component of equipment cost. Others include the labor cost as a part of equipment operating cost. There are a number of cost accounting advantages in treating equipment operating labor as any other labor cost, and not accounting for it as a component of equipment operating cost. This is the basis for the discussions in this text.

When contractors are preparing estimates for new work, they must obtain the most accurate values possible for the ownership and operating costs of the various equipment units that will be required for the construction of the project. The discussion in Chapter 5, and Figure 5.6 illustrates a procedure that is widely used for estimating such costs. For convenience, this figure is reproduced as Figure 12.12. The contractor's determination of his cost per hour for the ownership and operation of equipment is often referred to as the internal rate for the company, for that piece of equipment.

For most items of production equipment, ownership, lease, or rental expense is combined with operating costs into a total cost per operating hour. When the project is under construction, it is the purpose of the project cost accounting system to determine the number of hours that each piece of equipment or equipment type is in operation on the job, and the project work accounts to which these hours apply. With the use of the hourly equipment rates as previously established for estimating purposes, equipment costs can be determined and reported periodically for each activity or work type.

**Estimate**
Hourly Ownership and Operating Cost for
DP-12 Bottom-Dump Hauler

Ownership Cost

| | | | | | | |
|---|---|---|---|---|---|---|
| 1. Depreciation | Purchase price | = | $ | 105,450 | | |
| | Freight | = | $ | 3,279 | | |
| | Delivered price | = | $ | 108,729 | | |
| | Less tires | = | $ | 17,620 | | |
| | Depreciable value | = | $ | 91,109 | | |
| | Hourly depreciation | = | $ | $\frac{91,109}{12,000}$ | = | $ 7.59 |
| 2. Interest, taxes, and storage | $\frac{\$57,997.50(0.16)}{1,200}$ | | | | = | $ 7.73 |
| | Total hourly ownership cost | | | | = | $ 15.33 |

Operating Costs

| | | |
|---|---|---|
| 3. Fuel, 4 gallons per hour @ $1.62 | = | $ 6.48 |
| 4. Oil, lubricants, filters (1/3 of fuel cost) = 1/3($6.48) | = | $ 2.16 |
| 5. Repairs, parts, and labor 35% of depeciation = 0.35($7.59) | = | $ 2.66 |
| 6. Tire replacement = $\frac{\$17,620}{3,500}$ | = | $ 5.03 |
| 7. Tire repairs (15% of tire replacement cost = 0.15(5.03) | = | $ 0.76 |
| Total hourly operating cost | = | $ 17.09 |
| Total estimated ownership and operating cost | = | $ 32.41 |

**Figure 12.12** Estimate of Equipment Ownership and Operating Cost

THE EXCELLO COMPANY, INC.
DAILY EQUIPMENT TIME CARD

Project Holloman Taxiways — Project No. 8608
Date October 16, 20- — Weather Warm-clear — Prepared by J. Brown

| Machine No. | Machine | Rate per Hour | Cast Code | | | | Total Hours | | | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | 101.05 | 103.07 | | | W | R | I | |
| 16 | Bottom dump hauler | $32.41 | 8 | | | | 7 | 1 | 0 | $259.30 |
| 12 | Bottom dump hauler | $32.41 | 8 | | | | 8 | 0 | 0 | $259.30 |
| 17 | Bottom dump hauler | $32.41 | 8 | | | | 8 | 0 | 0 | $259.30 |
| 48 | 2 c.y. shovel | $61.80 | | 8 | | | 8 | 0 | 0 | $494.40 |
| 7 | HG-11 tractor | $29.76 | 4 | 4 | | | 7 | 0 | 1 | $238.08 |
| 21 | Air compressor | $10.88 | | 8 | | | 8 | 0 | 0 | $87.00 |
| | | | | | | | | | | |
| | | | | | | | | | | |
| Total Cost | | | $896.93 | $700.44 | | | | | | $1,597.37 |

**Figure 12.13** Daily Equipment Time Card

THE EXCELLO COMPANY, INC.
WEEKLY EQUIPMENT COST REPORT

Project Holloman Taxiways — Project No. 8608
Week ending October, 18, 20- — Prepared by J. Brown

| Cost Code | Work Description | Unit | Quantity | | | Equipment Cost | | | Equipment Unit Cost | | | To Date | | Projected | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Budget | This Week | To Date | Budget | This Week | To Date | Budget | This Week | To Date | Saving | Loss | Saving | Loss |
| 101.05 | Excavation, hauling | c.y. | $127,000 | $12,000 | $113,680 | $102,870 | $9,515 | $90,383 | $0.81 | $0.78 | $0.80 | $1,698 | | $1,897 | |
| 103.07 | Excavation, common | c.y. | $127,000 | $12,000 | $113,680 | $72.390 | $8,232 | $81,846 | $0.57 | $0.67 | $0.72 | | $17,048 | | $19,046 |
| 145.11 | Base course, spreading | ion | $79,500 | $7,360 | $77,420 | $65,588 | $6,515 | $65,039 | $0.83 | $0.89 | $0.84 | | $1.167 | | $1,198 |
| 250.03 | Concerete, production | c.y. | $23,625 | $2,090 | $4,139 | $121,905 | $10,376 | $21,105 | $5.16 | $4.96 | $5.10 | $252 | | $1,440 | |
| 254.01 | Concerete, hauling | c.y. | $23,625 | $2,090 | $4,139 | $12,404 | $1,193 | $2,484 | $0.53 | $0.57 | $0.60 | | $311 | | $1,775 |
| 258.02 | Concerete, lay-down | s.y. | $90,000 | $8,360 | $16,556 | $66,150 | $5,769 | $10,923 | $0.74 | $0.69 | $0.66 | $1,246 | | $6,772 | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |

**Figure 12.14** Weekly Equipment Cost Report

When these costs are compared with work quantities produced, equipment unit costs of production are obtained. Thus, once the hourly equipment rates are determined, equipment cost accounting proceeds in very much the same fashion as labor cost accounting, and similar kinds of cost reports are produced. Figures 12.13 and 12.14 depict tabulations of equipment costs and production during the course of a project.

As a general rule, equipment expense is directly chargeable to a single project work account as illustrated above. However, there are certain occasions when this is not true, and equipment costs must be accumulated in a suspense account until such time as they can be distributed to the proper cost accounts. An example might be a central concrete mixing plant consisting of many separate equipment items on a project, which is producing concrete for several different cost accounts for the

project. Equipment expenses of this type are typically collected into a suspense account, and then are periodically distributed equitably to the appropriate work item or activity cost accounts on the basis of the quantities involved.

Another special case of equipment, insofar as cost accounting is concerned, is support equipment. Support equipment refers to an equipment item that serves many different operations on the project. Examples include cranes, hoists, air compressors, and electric generators used on a project. The allocation of time of such machines to specific work codes can be very difficult, if not impossible. Therefore, a common approach is to establish special cost codes for such equipment, often in project overhead. All equipment time is charged to its account, with no effort made to distribute the cost of that piece of equipment to the various work accounts involved.

The internal rental rates used to charge equipment time to projects the contractor performs are based on time-average ownership and operating expenses that actually vary over the service life of the equipment. To illustrate, typically investment costs will decrease and repair costs will increase for a piece of equipment as it ages. However, the use of lifetime average costs is the only reasonable way to have each project bear its proper share of the ultimate total expense associated with any particular equipment item. When equipment rental rates are assessed to a job, this is an all-inclusive charge. Correspondingly, the costs of fuel, lubrication, maintenance, repairs, and other such equipment expenses are typically not charged to the job on which they are actually incurred, but to the applicable equipment accounts.

## 12.18 EQUIPMENT TIME CARDS

Because equipment costs are expressed as a time rate of expense, time reporting is the starting point for equipment cost accounting for a project. Equipment time is kept in much the same way as labor time.

For large construction equipment, a common procedure is to have the equipment supervisor or the project supervisor prepare daily or weekly equipment time cards for each piece of equipment on the job. It should be noted that these equipment time cards are separate from and in addition to the operators' time cards as has been discussed previously. This procedure has merit because, by using different time cards, separate reportings are available for payroll and labor cost accounting purposes, and for equipment cost accounting. In addition, equipment items such as pumps and air compressors may not have full-time operators and could otherwise be overlooked. Figure 12.13 is an example of a typical daily equipment time card.

The equipment time card performs the same project cost accounting function as the labor time card. By allocating equipment times to the proper cost codes for activities or work classifications, it is possible to determine the equipment costs that are chargeable to the various work categories. Accuracy of equipment time allocation to the proper cost codes is just as important as it is for labor. This is the only way accurate and reliable information can be obtained for purposes of cost control on the current project, and for estimating future projects.

As was recommended for labor time card reporting, it is preferable that the time information for equipment be entered on a daily basis, rather than weekly. Just as with labor time, distributing the equipment time on a daily basis is much more conducive to better accuracy.

The supervisor or project superintendent usually prepares the equipment time cards. Sometimes, however, someone else, such as the project engineer or the assistant project manager, may complete the time card, and will enter the budget rates of the individual equipment items reported, and will make the cost extensions.

Additional elements of information may be generated and reflected on the time card for reach piece of equipment. As has been noted previously, company management must decide whether the value of the additional information is justified by the cost and effort of gathering and tabulating the data. Figure 12.13 records equipment time as working time (W), repair time (R), and idle time (I). Excessive equipment idle time may indicate field management problems such as too much equipment on the job, lack of operator skill, improper balance of the equipment spread, or poor field supervision. Appreciable repair time can indicate inadequate equipment maintenance, worn-out equipment, severe working conditions, or operator abuse. Substantial unproductive time can also be caused by job accidents, inclement weather, unanticipated job problems, or unfavorable site conditions.

## 12.19 EQUIPMENT COST REPORTS

Once each week, equipment costs are tabulated, along with the corresponding quantities of work produced. Work quantities are derived from the weekly quantity report as discussed in a previous section of this chapter. A weekly equipment cost report is prepared by following the same procedure described in previous sections for labor cost reporting.

An equipment cost report summarizes all equipment costs incurred on the project, through the effective date of the report. Figure 12.14 illustrates a frequently used format for such reports. As can be seen, this figure is very similar to the weekly labor cost report form shown in Figure 12.10. Alternately, management may elect to structure the weekly equipment cost report in a format similar to the weekly labor cost report illustrated in Figure 12.11.

Figure 12.14 serves to inform project management in a quick and concise manner with regard to actual equipment costs being experienced on the project, as compared to the project budget. The figure presents both work quantities produced and equipment cost, and yields actual unit costs for each work category or activity. Cost overruns (“Loss” on the report) and underruns (“Savings” on the report) can be readily identified.

The budgeted total quantity, budgeted total equipment cost, and budgeted unit cost for each work category are taken from the project budget. The other quantities and equipment costs are actual values as reported in the field, either for the week reported, or total to date. The to-date and projected “Saving” and “Loss” values represent the equipment cost experience and projections on the project through the report date of October 18.

## 12.20 OTHER EQUIPMENT CHARGES TO PROJECTS

The procedure discussed in the preceding sections is the typical method of accounting for equipment costs and for charging equipment costs to activities and work items on construction projects. There are however, some aspects of equipment costs that require special consideration.

For example, some equipment expenses are not included in the usual hourly internal equipment rates. The costs of move-in, erection, rigging, dismantling, and move-out of equipment are fixed costs that cannot be incorporated into time rates of expense. Such costs are normally charged to appropriate project overhead accounts, and are not included in the hourly or monthly equipment rates.

Additionally, for equipment that is charged to a project at an hourly rate, the matter of accounting for idle time and repair time for the equipment becomes a matter of company policy. There are a number of different procedures that may be followed, with the most common approach being to charge the project at the established internal rates for the full working day for each piece of equipment that

is on the project. Then, credit is given against this charge, for repair time and for idle time caused by weather and other uncontrollable causes. The cost accounting impact of this procedure is that the project is charged for all equipment which is on the site, whether it is used or not. This policy can materially assist in controlling underusage or hoarding of equipment.

When this process is employed, many companies have established a policy whereby when backup or standby equipment units are purposely kept on a job to handle emergencies, the project is charged only with the ownership cost for that equipment. Additionally, the cost of this backup equipment should be explained in a cost report footnote, so as to indicate the fact that this backup equipment is known and intended to be idle for most or all of its time on the job.

For feedback to the historical cost database and the estimating process, the individual activity or work category cost accounts are charged with net equipment operating hours, plus ordinary or usual idle time. This information may be skewed, however, in the case of backup equipment being kept on a project. The excessive idle time for backup equipment can be charged to a special overhead account, with an explanatory footnote. This will prevent the backup equipment from misrepresenting the actual project equipment usage costs on the project.

## 12.21 COST INFORMATION AND FIELD SUPERVISORS

Construction supervisors, foremen and superintendents, play a vital role in the management of every project, and certainly this is true for the project cost accounting and control process as well. As has been noted, it is the supervisors who provide labor and equipment cost coding information. The accuracy and honesty with which they perform this function has a profound effect on the proper reporting of project costs. This, in turn, influences management decisions and actions as the construction on the project is performed and has a direct bearing on the project cost information stored in the contractor's historical cost database and used for estimating future projects.

There is some difference of opinion expressed among owners and upper level management of construction companies with regard to whether detailed cost information or project budget information should be shared with field supervisors. The statement is sometimes made, for example, that craft foremen or superintendents may be tempted to charge labor or equipment time incurred on operations showing losses, to other cost codes on which performance has been good. It has also been said that confidential cost information may be compromised or that a superintendent or foreman may tend to relax when he or she knows that his costs are within the estimate.

However, it is well recognized that the only way a cost accounting, reporting, and control system can succeed is with the support and cooperation of the field supervisors. They try to achieve the best possible performance and expect to receive credit and perhaps a bonus or other recognition if they can complete projects at or below the estimated costs. Field costs are very much involved when companies enter into profit-sharing or incentive plans with their supervisors. Decidedly, many modern managers agree that the best management policy is to provide superintendents and craft foremen with all of the project budget information, whether in units of dollars or hours, and then to allow them to conduct their management functions in light of the actual budget information.

## 12.22 COST CONTROL

The weekly labor and equipment cost reports make it possible for company management to quickly assess the cost status of the project overall and to identify those work activities where such costs are proving to be excessive. In this way, management attention is quickly focused on those work

classifications that need it. If the project expense information is developed promptly, it may be possible to bring cost overruns back within the project budget.

In actual fact, of course, project cost control begins when the project is first estimated and priced, because this is when the values that will appear in the project budget are actually established. This truism reinforces the interrelationship between, and the cyclical nature of project cost accounting and reporting, and the historical cost information database, and the estimating process.

On a typical project, there likely will always be some work classifications whose actual costs will exceed those estimated. The project manager is primarily responsible for getting the total project built for the estimated cost. If some costs go over, the objective becomes to have them counterbalanced by savings in other areas.

Having identified where production costs are excessive during the course of the construction, project management must then decide just what to do about them, if indeed anything can be done. For certain, the hourly rates for labor and equipment are not controllable by management. The only real opportunity for cost control resides in the area of improving production rates. This element of work performance can, to a degree, be favorably influenced by skilled field supervision, astute job management, energetic resource expediting, and the improved makeup of labor crews and selection of equipment.

Any efforts to improve field production must be based on detailed knowledge of the pertinent facts. For example, it is typical for production costs to be relatively high early in the construction process, but then to diminish as the work progresses, especially on repetitive activities. This is referred to as a "learning curve" phenomenon where costs decrease as job experience and familiarity are gained. In an additional illustration, it has been observed that production costs usually tend to decrease as the project proceeds, because crew members learn how to work as a team, become familiar with the job, and determine what their foremen expect of them.

Judgment must temper management decisions made by project managers and upper level company management as based upon cost reports, especially where the cost reports indicate a cost overrun. For example, during a reporting period, especially in the early portion of an activity, costs for the activity "Install concrete formwork" may gain the attention of the project manager, inasmuch as they may be considerably in excess of the project budget amount. The overrun may in fact be due to factors such as materials not being available, the crew mix not being effective, equipment not being used effectively, or a host of other factors. Or it may simply be a matter of the superintendent and/or the carpenter foreman having made a determination that an effective approach to the work would be to fabricate a number of formwork sections at the same time, to be used sequentially as concrete is placed and gaining strength. Thus, during the current reporting period, formwork carpentry costs may be high as compared to the amount of formwork installed, while the prefabrication will ultimately lead to significant economies and savings. Judgment and communication are the key factors in effectively analyzing such situations.

If the cause of excessive costs cannot be specifically identified, then a satisfactory solution is not likely to be found. While it is impossible to generalize on this particular matter, certainly the management treatment must be gauged to the field experience as it has been reported. In the usual case, full cooperation and communication between the field supervisors and project management are absolutely essential if any real cost improvement is to be realized.

Field supervisors play an absolutely vital role in implementing corrective procedures when cost overruns are experienced. There are no precise guidelines for reducing excessive project costs; the effectiveness of corrective procedures depends largely on the ingenuity, resourcefulness, and energy of the people involved, primarily the project manager and the field superintendent or labor foremen.

## 12.23 INFORMATION FOR ESTIMATING

Effective estimating requires production rates and unit costs that are a balanced time average of good days and bad days, high production and low production on the project. For this reason, information for estimating is normally not recovered from the cost accounting system until after project completion, or at least not until all of the work type being reported has been finished. In so doing, the best possible time-average rates will be obtained. Permanent files of cost and productivity information are maintained in the historical cost database, providing the estimator with immediate access to data accumulated from prior projects.

Both production rates and unit costs are available from the project cost accounting system. To be of maximum value in the future, however, it is important that such productivity data be accompanied by a description of the project work conditions that applied while the work was being done. Knowledge of the work methods, equipment types, weather, problems, and other job circumstances will make the basic cost and productivity information much more useful to an estimator. Such written narrative then becomes a part of the total historical record of each activity or work item cost account.

## 12.24 COMPUTER APPLICATION

Computers and softwares for the purpose are widely used by construction contractors in conjunction with their project cost systems. Because cost accounting can be laborious and time consuming even for relatively small operations, the computer has advantages of economy, speed, and accuracy over manual methods. In addition, the computer provides a cost system with flexibility and depth that manual systems cannot match. This does not mean that job costs cannot be developed satisfactorily by hand. Many small contractors have completely adequate manual cost systems. Experience indicates, however, that few contractors of substantial size are able to manually generate field cost reports in time and with sufficient accuracy to serve an effective cost control purpose. In reality, almost all contractors find computer support and application of the appropriate hardware and software to be necessary for the effective operation of their project cost accounting, cost control, and historical database information system.

Electronic applications can be used to generate virtually any kind of cost report or information that project management or company management may desire. Cost reports in the same general formats as those presented in this chapter are produced by several current computer programs. The programs commonly used by contractors actually perform an integrated series of cost accounting and financial accounting functions. For example, in many companies, after the input of coded cost and production information, the computer generates payroll cheeks, keeps payroll records, maintains the equipment accounts, and performs other functions, as well as producing a variety of productivity and cost reports and project cost forecasts. The result is that the contractor can derive accurate and timely project financial information that makes it possible to more effectively control costs, manage cash flow, improve cost estimates, and increase profitability.

## 12.25 SUMMARY AND CONCLUSIONS

Project cost management is an absolutely vital function performed by the management team on construction projects. Company management must have developed and implemented an effective system of accounts, and a cost accounting, cost reporting, and cost control system for use by the home office accounting and estimating departments, as well as by the field management team.

Effective cost management is essential if construction projects are to fulfill their objective of being completed within the budget. The understanding of, and the effective operation of, the cost reporting, cost accounting, and cost control functions, and the feedback of accurate and timely information to the estimating function, is essential to the profitable operation of, and to the very survival of, the construction contracting company.

## CHAPTER 12 REVIEW QUESTIONS

1. List the elements of a contractor's project cost accounting, cost reporting, and cost control system.
2. Make a sketch of the flow chart depicting the steps in, and the cyclic nature of, a contractor's cost accounting, cost reporting, and cost control system.
3. If a superintendent or project manager sees an activity whose costs on the cost report are significantly greater than the project budget values and progress to date indicate they should be at that point in time, is taking immediate corrective action the proper management decision? Explain.
4. What are the two elements of project costs for which weekly time cards are typically prepared with coded information so that costs can be monitored closely in periodic cost reports? Explain.
5. When should craft labor time cards be coded, and who is the best person to do it?
6. How are work quantities and percentages complete obtained for the project activities, for purposes of preparing a cost report? Explain.
7. How often are cost reports usually prepared during the course of a typical construction project?
8. Discuss the advantages and disadvantages of a contractor's preparing labor cost reports in terms of dollars (unit costs), or in terms of production rates.
9. Write a short narrative containing the words you as a project manager or superintendent would use to impress upon a newly promoted foreman the necessity for, and the rationale behind, accurate and honest labor coding when time cards are prepared by the foreman.
10. State three examples of equipment charges that are not reflected in periodic cost reports for the equipment being utilized on a project. Explain.

# Chapter 13

# Labor Law

## 13.1 INTRODUCTION

The employment of skilled craft labor by a construction firm is subject to the provisions of an array of both federal and state statutes. These laws have such an important bearing on the conduct of a contracting business that the construction contractor is obliged to have at least a general grasp of their workings and implications. The purpose of this chapter is to discuss the important features of the principal federal statutes that apply to the employment of construction workers. Federal laws are discussed because of their wide applicability, and because of the fact that most state labor statutes are patterned after federal law. Emphasis is placed more on the broad implications of these laws than on the intricacies of case studies.

For purposes of discussion in this chapter, those statutes which pertain to labor-management relations are considered first. Following are the federal laws pertinent to equal employment opportunity. The last sections of this chapter discuss labor standards legislation and other related topics.

## 13.2 HISTORY OF LAW OF LABOR RELATIONS

In the early days of this nation, the right of working people to associate together, or to organize themselves for their mutual aid and protection in the workplace, was severely restricted. Labor unions were strictly curtailed and were sometimes referred to as "unlawful conspiracies."

This was the mindset in the workplace until the1930s when the first of the laws of labor relations were created, beginning with the courts. In the almost-complete absence of applicable statute law at the time, employer and union complaints were adjudicated by the courts primarily in accordance with common law. In general, the courts tended to grant employers relief from the unionizing activities of workers, while refusing to assist unions in actions against employers, on the grounds that there was no precedent for this in the common law. Court injunctions were widely used for the purpose of negating the usual union tactics of using strikes, picketing, and boycotts. At the same time, there was no comparable judicial instrument available to the unions to assist their organizing efforts in the workplace.

This state of affairs continued until the passage of the Norris-LaGuardia Act (1932). Additional legislation followed soon thereafter. However, judicial interpretations of the Sherman Antitrust Act of 1890 did provide the first elements of a statutory basis for labor-management policy. This act set forth statutory provisions against the restraint of trade. It was primarily intended to limit the growth of business cartels, and it is debatable whether it was ever intended to apply to labor unions. However, the U.S. Supreme Court ruled in 1908 that labor organizations were covered by the provisions of the act.

The Sherman Antitrust Act provided a broad new basis for the use of court injunctions against unions, and also placed in jeopardy another effective weapon of unions, the boycott. The Supreme Court ruled that a union could be sued for damages suffered by reason of a boycott, and that the union and its members were individually liable. In summary, it is widely held that the common law and the statutory law were strongly discriminatory against labor unions until the advent of the New Deal and the first adoption of new federal legislation in the early 1930s.

During the years since, Congress has passed a series of major federal labor statutes that contain positive and detailed statements of national labor policy. Under the law today, the right of workers to form or join unions and to take concerted action to improve their economic condition is guaranteed, and the exercise of that right is protected. National labor policy today is the sum of the policies and provisions contained in the major federal labor relations statutes: the Norris-LaGuardia Act (1932), the National Labor Relations Act (1935), the Labor Management Relations Act (1947), and the Labor-Management Reporting and Disclosure Act (1959). Most of these acts have been updated and amended by Congress since their initial adoption.

The sections that follow will summarize these major pieces of federal labor-management legislation, and their effects, in greater detail. The discussion of these statutes concentrates on those provisions of the law that pertain especially to the construction industry.

## 13.3 THE NORRIS-LAGUARDIA ACT

In 1932 Congress enacted the Norris-LaGuardia Act, which strictly limits the power of the federal courts to issue injunctions against union activities in labor disputes and protects the rights of workers to strike and picket peaceably. Also called the Anti-Injunction Act, this statute makes it very difficult for an employer to secure an injunction in a federal court against union activities in labor disputes. Although the act itself pertains only to federal courts, many states have enacted similar injunction-control legislation

Although it is difficult for private parties to obtain federal court injunctions against peacefully conducted labor action, injunctions are available to certain government agents under modern labor relations statutes. In this regard however, injunctions are issued against only those union activities that are in violation of the law or that imperil national health or safety. In addition, the U.S. Supreme Court has decreed that an employer can obtain a federal court injunction against a striking union that is violating a no-strike arbitration pledge in its labor contract

The Norris-LaGuardia Act also expressly prohibits agreements that are called "yellow-dog contracts," and makes them unenforceable in federal courts. Designed to discourage union membership, such employment contracts provide that a job applicant will not be hired until he or she promises not to join a union during his or her tenure of employment, and to renounce any existing membership in a union. Such contracts were very widely used by a number of industrial employers prior to the passage of the Norris-LaGuardia Act.

## 13.4 THE NATIONAL LABOR RELATIONS ACT

The National Labor Relations Act (NLRA) also known as the Wagner Act, was passed by Congress in 1935. Enacted in an atmosphere of depressed business conditions and extensive unemployment, the Wagner Act had as its central purpose the protection of union organizing activity and the fostering of collective bargaining.

By the terms of the NLRA, employers are required to bargain in good faith with the properly chosen representatives of their workers. Additionally, employers are forbidden to practice discrimination against their employees for taking part in labor activities, or to influence their workers' membership in any labor organization.

These and other unfair labor practices were defined as they pertained to employers. However, no such restrictions were applied to employees or unions in their relations with employers. Enforcement of the NLRA was vested in a National Labor Relations Board (NLRB), which was also created by the Wagner Act. Under the shelter of this legislation, union strength and membership increased enormously during the 1937–1945 period. A number of state statutes followed, which were patterned to a greater or lesser extent after the Wagner Act.

It was almost inevitable that the sudden removal of the traditional and long-standing restraints on unions would result in union excesses. Beginning in about 1938, public opinion concerning organized labor became increasingly unfavorable, following the mounting incidence of union restrictive practices, wartime strikes, and criminal activities by some labor leaders.

Congressional resentment against some of the high-handed actions on the part of some officials of organized labor resulted in the passage of the War Labor Disputes Act (Smith-Connally Act) of 1943. However, the provisions of this act proved to be largely ineffective. If nothing else, however, the act reflected the mounting popular sentiment for the enactment of positive union-control legislation. During this period, several state legislatures passed statutes that regulated and curbed union activities. By 1947, thirty-seven states had adopted some form of labor-control legislation.

## 13.5 THE LABOR MANAGEMENT RELATIONS ACT

In 1947, Congress passed the Labor Management Relations Act, which is commonly known as the Taft-Hartley Act. This was the first federal statute that imposed comprehensive controls upon the activities of organized labor. It amended the earlier National Labor Relations Act in several important respects, and added new provisions of its own. The National Labor Relations Board was reconstituted, and its authority was redefined. One section of the Taft-Hartley Act established the basic right of every worker to participate in union activities, or to refrain from doing so, subject to authorized agreements requiring membership in a union as a condition of employment. To protect such rights, a subsequent section of the Taft-Hartley Act defined unfair labor practices on the part of both employers and labor organizations. The act also established the Federal Mediation and Conciliation Service, and gave the president of the United States certain powers regarding labor disputes that were imperiling national health or safety. Additionally, the act restricted political contributions by labor organizations and business corporations.

In contradistinction to the Wagner Act, the Taft-Hartley Act was designed and intended to curtail the freedom of action of unions in several different and important ways. Although the act reiterates a national labor policy of encouraging and assisting collective bargaining, the provision is made that the public interest must prevail in the conduct of labor affairs. The provisions of the Taft-Hartley Act have had far-reaching effects on the matter of labor-management relations.

Following passage of the NLRA, experience with some of its provisions quickly revealed several imperfections and shortcomings in the law. In particular, some features of labor employment peculiar to the construction industry proved to be inadequately addressed. However, the extremely controversial nature of the act, and the considerable strength of both its supporters and its opponents rendered the likelihood of any truly significant revision of the law a very sensitive and very difficult matter.

## 13.6 THE LABOR-MANAGEMENT REPORTING AND DISCLOSURE ACT

In 1959, Congress passed the Labor-Management Reporting and Disclosure Act, also known as the Landrum-Griffin Act. This legislation established a code of conduct for unions, union officers, employers, and labor relations consultants. In addition, it guaranteed certain rights to rank-and-file union members, and imposed stringent controls on the conduct of union internal affairs.

The principal thrust of this law was to safeguard the rights of the individual union member, to ensure democratic elections in unions, to combat corruption and racketeering in unions, and to protect the public and innocent parties against unscrupulous union tactics. By the terms of the act, reports pertaining to union organization, finances, activities, and policies are required from unions, union officials and employees, as well as from employers, labor relations consultants, and union trusteeships. The act also declared that it was illegal for an employer to pay or lend money to any labor representative or labor union of his employees.

Additionally, the Landrum-Griffin Act amended the NLRA and the Taft-Hartley Act. The 1959 law enumerated additional union unfair labor practices, and remedied several inadequacies of the Taft-Hartley Act with respect to pressures that unions and their agents can legally apply to employers and their employees. So-called "hot-cargo" labor agreements, in which an employer promises not to do business with, or not to handle, use, transport, sell, or otherwise deal in the products of another person or employer, were forbidden. However, an exception was made for the construction industry; these exceptions and hot cargo clauses are further discussed in subsequent sections of this chapter.

In addition, limitations were applied to organizational picketing of employers by labor organizations. Most of the restrictions on union-security agreements in the construction industry were removed, and union hiring halls were made lawful.

## 13.7 COVERAGE OF THE NATIONAL LABOR RELATIONS ACT

The National Labor Relations Act, as amended by the Taft-Hartley Act and the Landrum-Griffin Act, continues to play a dominant role in national labor relations policy. Its stated purpose is to set forth the recognized rights of employees, employers, and labor unions in their relations with one another and with the public, and to provide mechanisms to prevent or remedy any interference by one with the legitimate rights of another. In particular, the statute protects employees in the free exercise of their right to join or not to join a union, to bargain collectively through representatives of their own choosing, and to act together with other employees for mutual aid and protection. Any violation of these rights, whether by management or by labor representatives, is declared by the NLRA to be an unfair labor practice.

The NLRA applies to employers and employees who are engaged in interstate commerce or the production of goods for such commerce. Interpretation by the courts as to what constitutes interstate commerce in the construction industry has been so broad that the jurisdiction of the act now extends to almost all construction work of any consequence. The act specifically excludes the following employers and employees from its coverage:

**Exempted Employers**

The government of the United States

States and their political subdivisions

Wholly owned government corporations

Federal reserve banks

Employers subject to the Railway Labor Act

Labor organizations (when not acting as employers)

Officers or agents of labor organizations

**Exempted Employees**

Employees of exempted employers as listed in Item 1, above

Agricultural laborers

Domestic servants

Individuals employed by their parents or spouses

Independent contractors

Supervisors

Selected portions of the NLRA, as amended, have been selected for further discussion in the following sections.

## 13.8 THE NATIONAL LABOR RELATIONS BOARD

Administration of the NLRA is the defined responsibility of the National Labor Relations Board (NLRB), which is composed of five members, and the general counsel for the board. Members of the NLRB are appointed by the president of the United States, with the consent of the Senate, for terms of five years. The general counsel for the board is appointed by the president, with consent of the Senate, for a term of four years. The NLRB has two primary functions:

1. To establish, usually by secret-ballot elections, whether groups of employees wish to be represented by designated labor organizations for collective bargaining purposes.
2. To prevent and remedy unfair labor practices.

Much of the day-to-day work of investigating and processing charges of unfair labor practices, and of handling representation proceedings has been delegated by the board to the various NLRB regional offices located in major cities throughout the nation. The board has given its regional directors final authority in election cases, subject to limited review. In unfair labor practice cases, the board acts much like an appellate court to determine if an unfair labor practice actually exists, and also to determine how such practices should be remedied.

The NLRB does not ordinarily become involved until an investigation has been conducted and recommendations have been made by an NLRB regional office. The general counsel has largely independent authority in the prosecution of unfair labor practices, and determines which cases are to be put before the board. Responsible for general supervision over the regional NLRB offices, as well as for most of the routine administrative activities of the agency, the general counsel has broad and direct authority to seek injunctions against unfair labor practices.

By statute, the NLRB exercises its powers over all enterprises whose operations affect interstate commerce. It does not act, however, on every case over which it could exercise its jurisdiction. Rather, the board restricts its attention to a caseload it can handle expeditiously, and within its budgetary limitations. The Landrum-Griffin Act authorized the NLRB to limit its cases to those whose effect on commerce is, in the opinion of the board, “substantial.”

As a guide to when it will exercise its power, the board has established minimum measures of the annual volume of business that must be involved before the NLRB will accept a case. These standards are expressed in terms of the gross dollar volume of the employer's sales and purchases that cross state lines, and these vary for different segments of industry. The Landrum-Griffin Act further provides that state and territorial courts and agencies can assume jurisdiction over labor disputes the NLRB declines to hear.

## 13.9 REPRESENTATION ELECTIONS

The NLRA requires that an employer bargain in good faith with the representative selected by a majority of its employees but does not stipulate a selection procedure for the representative. The only requirement is that the representative clearly be the choice of the majority of the workers. The representative may be an individual or a labor union but cannot be a supervisor or other representative of the employer.

For the employees to select a majority representative, it is usual for the nearest regional office of the NLRB to conduct or to oversee representation elections. However, such an election can be held only when a petition has been filed by the employees, or by an individual or a labor organization acting in behalf of the employees, or by an employer who has been confronted with a claim of representation from an individual or labor organization. In a representation election, a labor union or an individual candidate must receive a majority of the eligible votes cast. There are numerous procedural rules being applied, regarding which employees are eligible to vote. If an election is held, the NLRB, through its regional office, supervises every step in the election procedure.

In a representation election, the employees are given a choice of one or more bargaining representatives, or no representative at all. To be chosen, a labor organization must receive a majority of the valid votes cast. The NLRB has a policy whereby it will certify the choice of the majority of employees for a bargaining representative only after a secret-ballot election.

Section 7 of the Taft-Hartley Act has a free speech provision that establishes the employee's right to hear the arguments of both labor and management. The expressing or disseminating of any views, arguments, or opinions by either side does not constitute an unfair labor practice as long as it contains no threat of reprisal, or force, or promise of benefit. Within these limitations, an employer who wants to remain nonunion can state his or her opinions to the employees.

## 13.10 EMPLOYER UNFAIR LABOR PRACTICES

Under the NLRA, as amended, an employer commits an unfair labor practice if the employer:

- Interferes with, restrains, or coerces employees in the exercise of rights protected by the act, such as their right of self-organization for the purpose of collective bargaining, or other mutual assistance.
- Dominates or interferes with any labor organization in either its formation or its administration, or contributes financial or other support to the union. Thus, "company unions" that are dominated by the employer are prohibited, and employers may not lawfully assist any union financially or otherwise.
- Discriminates against an employee in order to encourage or discourage union membership. It is illegal for an employer to discharge or to demote an employee, or to single him out in any other discriminatory manner, simply because he is or is not a member of a union.

In this regard, however, it is not unlawful for employers and unions to enter into compulsory union-membership agreements that are permitted by the NLRA. This condition is subject to applicable state laws that may prohibit compulsory unionism.

- Discharges or otherwise discriminates against an employee because he has filed charges or given testimony under the act. This provision protects the employee from retaliation if he seeks assistance in enforcing his rights under the act.
- Refuses to bargain in good faith in matters regarding wages, hours, and other conditions of employment with the properly chosen representative of its employees. Matters concerning rates of pay, wages, hours, and other conditions of employment are called mandatory subjects, that is, subjects about which the employer and the union must bargain in good faith. However, the law does not require either party to agree to a proposal or to make concessions.
- Enters into a "hot-cargo agreement" with a union. Under a hot-cargo agreement, the employer promises not to do business with, or not to handle, use, transport, sell, or otherwise deal in the products of another person or employer. This unfair labor practice can be committed only by an employer and a labor organization acting together. A limited exception to this ban on hot-cargo clauses was adopted for the garment industry and the construction industry, and is discussed in subsequent sections of this chapter.

## 13.11 UNION UNFAIR LABOR PRACTICES

By the terms of the NLRA, as amended, it is an unfair labor practice for a labor organization or its agents:

1. To restrain or coerce employees in the exercise of their rights as guaranteed in Section 7 of the Taft-Hartley Act. In essence, Section 7 gives an employee the right to join a union, to assist in the promotion of a labor organization, or to refrain from such activities. This section further provides that it is not intended to impair the right of a union to prescribe its own rules concerning membership.
2. To restrain or coerce an employer in its selection of a representative for collective-bargaining purposes.
3. To cause an employer to discriminate against an employee with regard to wages, hours, or other conditions of employment for the purpose of encouraging or discouraging membership in a labor organization. This section includes employer discrimination against an employee whose membership in the union has been denied or terminated for cause other than failure to pay customary dues or initiation fees. Contracts or informal arrangements with a union under which an employer gives preferential treatment to union members are violations of this section. It is not unlawful, however, for an employer and a union to enter an agreement whereby the employer agrees to hire new employees exclusively through a union hiring hall, as long as there is no discrimination against nonunion members. Union agreements that require employees to become members of the union after they are hired are also permitted by this section.
4. To refuse to bargain in good faith with an employer about wages, hours, and other conditions of employment if the union is the representative of its employees. This section imposes on labor organizations the same duty to bargain in good faith that is imposed on employers.

**5.** To engage in, or to induce or encourage others to engage in, strike or boycott activities, or to threaten or coerce any person, if in either ease an object thereof is:

**a.** To force or require any employer or self-employed person to join any labor or employer organization, or to enter a "hot-cargo agreement" that is prohibited by the act.

**b.** To force or require any person to cease using or dealing in the products of any other producer, or to cease doing business with any other person. (This is a prohibition against "secondary boycotts," which are further discussed further in a subsequent section of this chapter.) This section of the NLRA further provides that, when not otherwise unlawful, a primary strike or primary picketing is a permissible union activity.

(It is noted that this provision permits "publicity," other than picketing, provided such action does not have the effect of inducing a work stoppage by neutral employees. Such publicity can lawfully notify the public, including the customers of a neutral employer, that a labor dispute exists concerning a primary employer's products being distributed by the neutral employer.

Additionally, this provision does not apply to picketing or other publicity for the purpose of truthfully advising the public that an employer does not have a union contract or does not employ union labor, unless it has the effect of inducing employees of persons doing business with the picketed employer not to pick up, deliver, or transport goods or not to perform services. If the purpose is purely informational, it can be continued indefinitely. If the purpose is organizational, it cannot be continued more than 30 days without a petition for an election.)

**c.** To force or require any employer to recognize or bargain with a particular labor organization as the representative of its employees that has not been certified as the representative of such employees.

**d.** To force or require any employer to assign certain work to the employees of a particular labor organization or craft, rather than to employees in another labor organization or craft, unless the employer is failing to conform with an order or certification of the NLRB. This provision is directed against jurisdictional disputes, a topic discussed in a subsequent section of this chapter.

**6.** To require of employees, covered by a valid union shop, membership fees that the NLRB finds to be excessive or discriminatory.

**7.** To cause or attempt to cause an employer to pay or agree to pay for services that are not performed or not to be performed. This section forbids practices commonly known as "feather bedding."

**8.** To picket or threaten to picket any employer to force it to recognize or bargain with a union:

**a.** When the employees of the employer are already lawfully represented by another union.

**b.** When a valid election has been held within the past 12 months.

**c.** When no petition for an NLRB election has been filed within a reasonable period of time, not to exceed 30 days from the commencement of such picketing.

The NLRB has ruled that discrimination by a labor union because of race is an unfair practice under the Taft-Hartley Act. Discrimination on the basis of race in determining eligibility for full and equal union membership, and segregation on the basis of race have also been found unlawful by

the NLRB. This has made possible the filing of unfair labor practice charges against a union because of alleged racial discrimination. A union found guilty of such practices faces cease-and-desist orders, as well as possible rescission of its right to continue as the authorized employee representative.

## 13.12 CHARGES OF UNFAIR LABOR PRACTICES

Charges of unfair labor practices can be filed with the NLRB by a contractor, or by a union, or by an individual worker. Any charges to be filed must usually be filed with the NLRB regional office that serves the area in which the case arose, and must be filed within six months from the date of the alleged unfair activity. After charges are filed, NLRB field examiners will conduct an investigation regarding the circumstances, and a formal complaint is issued if the charges are determined to be well founded and if the case cannot be settled by informal adjustment.

When a complaint is issued, a public hearing is held before a trial examiner whose findings and recommendations are served on the parties and are also sent to the NLRB in Washington, D.C. If no exceptions are filed by either party within a statutory period, the examiner's judgment takes the full effect of an order by the NLRB. If exceptions are taken, the NLRB reviews the case and makes a decision regarding next steps.

If a contractor or a union fails to comply with an order of the NLRB, the board has no statutory power of enforcement of its own, but can petition the appropriate United States Court of Appeals for a decree to enforce the order. If the court issues such a decree, failure to comply may be punishable by a fine, or by imprisonment for contempt of court. Parties aggrieved by the order may seek judicial review.

## 13.13 REMEDIES

When the NLRB finds that a contractor or a union has engaged in an unfair labor practice, it is empowered to issue a cease-and-desist order, and to take such affirmative action as deemed necessary to erase the effects of the unfair practice found to have been committed. The purpose of the board's orders is remedial, and it has broad discretion in fashioning remedies for unfair labor practices. Typical affirmative actions ordered by the NLRB include reinstatement of persons discharged, reimbursement of wages lost, or refund of dues or fees illegally collected.

The law provides that whenever a charge is filed alleging certain unfair labor practices relating to secondary boycotts, hot-cargo clauses, or organization or recognition of picketing, the preliminary investigation of the charge must be given first priority. The board or the general counsel is authorized to petition the appropriate federal district court for an injunction to stop any conduct alleged to constitute an unfair labor practice. If the preliminary investigation of a first-priority case reveals reasonable cause to believe the charge is true, the law requires that the general counsel seek such injunctive relief or temporary restraining order as seems proper under the circumstances.

In addition to filing charges of unfair labor practices when faced with illegal union activity, the contractor has access to other remedies. In case of a union's illegal use of various economic tactics such as secondary boycotts, unlawful picketing, and illegal strikes, there are corrective actions available to the contractor. A court injunction directing that the activity cease is probably the most powerful weapon for prompt resolution of the matter, and such an order usually prevents serious economic damage before it can occur. An action for damages is usually possible when it can be shown that the illegal conduct has caused harm or damage to the contractor. Discipline or discharge of the striking employees, and seeking arbitration, are additional potential remedies available to the contractor.

## 13.14 UNION-SHOP AGREEMENTS

The NLRA makes it illegal to conduct a closed shop, but does permit the establishment of a union shop. A closed shop is one that requires that a worker be a member of the appropriate union at the time he is hired. Under a union shop, a new employee need not be a union member at the time of employment, but must join within a stipulated period of time in order to retain his job. Therefore, a union security agreement (an agreement providing for compulsory union membership) cannot require that applicants for employment be members of the union to be hired, but can stipulate that all employees covered by the agreement must become members of the union within a certain period of time. This grace period cannot be less than 30 days after hiring, except in the building and construction industry, in which a shorter grace period of seven days is permissible.

Union-shop agreements often provide for the check-off of union dues, an arrangement whereby the employers deduct dues from their employees' wages and pay the withheld money to the union as union dues for the employee. The NLRB provides that such check-off is permitted only by written assignment of each employee, and such assignment is not to remain in effect for a period of more than one year or beyond the end of the current collective bargaining agreement, whichever occurs sooner. A mandatory check-off is illegal, and is defined as an unfair labor practice on the part of both the employer and the union.

The Taft-Hartley Act also provides that the individual states have the right to forbid negotiated labor agreements that require union membership as a condition of employment. In other words, any state or territory of the United States may, if it chooses, pass a law making a union-shop labor agreement illegal. This is called the "right-to-work" section of the act, and such state laws are termed *right-to-work statutes*. States that adopt such laws are often referred to as *right to work states*.

It is interesting to note that most of these state right-to-work laws go beyond the issue of compulsory unionism inherent in the union shop. Most of these states also outlaw the agency shop, an arrangement where workers, in lieu of joining a union, must pay the same initiation fees, dues, and assessments as union members, as a condition of their original or continued employment. Additionally, some of the state laws explicitly forbid unions to strike over the issue of employment of nonunion workers.

In a fundamental sense, state right-to-work laws prohibit discrimination in employment on the basis of membership or nonmembership in a labor union. It is interesting to note that in some right-to-work states, their statutes have been interpreted to protect subcontractors as well as workers. In these states, the courts have ruled that a general contractor cannot discriminate against a subcontractor on the basis of whether the subcontractor is union or nonunion.

## 13.15 PREHIRE AGREEMENTS

The NLRA allows an employer who is engaged primarily in the building and construction industry to sign a labor agreement with a union prior to the hiring of any workers or before the union can show that it represents a majority of the employees involved. Such labor contracts are called prehire or Section 8(f) agreements. Such agreements may apply only to one specific project, or to a designated geographical area.

Prehire arrangements of this kind are permitted only in the construction industry, which is considered unique because of the transience of its workers and the relatively short durations of its projects. Contractors enter such agreements primarily as a means of access to established labor rates, stable labor relations, and a ready-made source of skilled manpower in union hiring halls. By its

1987 rulings in the Deklewa case, the NLRB established the rules that now govern construction industry prehire agreements. The general workings of these rules will be further discussed in the following paragraphs.

When an employer enters into a prehire pact with a union, the status of the agreement can depend on whether there is an NLRB representation election by the bargaining unit employees during the life of the prehire arrangement. If there is such an election and the union receives majority support, the prehire agreement does not automatically convert to a conventional labor contract unless the union receives formal recognition from the contractor. At this point, the employees, a rival union, or the contractor can petition for a union decertification election at any time during the life of the 8(f) arrangement, and the prehire agreement cannot bar such an election.

If a union receives formal recognition from the contractor after establishing majority support, the union then becomes the exclusive bargaining agent for the employees and the contractor will be obligated to bargain in good faith for a new labor contract. If the union loses the election, the prehire agreement is terminated and the parties are prohibited from entering into another prehire agreement for a period of one year.

When the employer has entered into a prehire contract with a union and there is no representation election held, the contractor cannot repudiate the agreement during its tenure. The contractor is bound by the terms of the contract for all work done on any job site within the area covered by the agreement, unless the agreement is limited to a particular job site.

Under the rules of the NLRB, the parties to prehire agreements are bound by those agreements unless the workers vote to decertify or to change the union in an NLRB election. During its term, a prehire agreement is just as enforceable as a labor contract that has been negotiated with the union involved. However, when the 8(f) arrangement expires, there is no presumption that the union represents a majority of the workforce covered, and either party can end the relationship at that time. The employer must be left free from coercive union efforts to compel the negotiation or adoption of a successor agreement. By the removal of the presumption of the union's majority status when the prehire arrangement expires, neither employer nor employees are locked into a union relationship, and the contractor can walk away without bargaining if he elects to do so.

## 13.16 UNION HIRING HALLS

The NLRA provides that in the construction industry a labor agreement can require the contractor to acquire its workers only through a designated local union. Referred to as requiring the use of a "union hiring hall," such an arrangement requires the contractor to notify the union of employment opportunities available, and to give the union an opportunity to refer qualified applicants. The collective bargaining agreement may specify minimum training or experience qualifications for employment, or may provide for priority in job referrals based on length of service with the employer, or in the industry, or in the particular geographical area. However, hiring-hall agreements that give priority to employees who previously worked for employers subject to collective bargaining agreements with the union have been found to be illegal under the NLRA.

Contracts or informal arrangements with a union under which an employer gives preferential treatment to union members are illegal. It is not unlawful however, for an employer and a union to enter into an agreement whereby the employer agrees to hire new employees exclusively through a union hiring hall, so long as there is no discrimination against nonunion members in favor of union members. Both the agreement and the actual operation of the hiring hall must be nondiscriminatory.

Job referrals must be made without reference to race, color, religion, sex, national origin, or union membership. The employer must not discriminate against a nonunion employee if union membership is not available to that employee under the usual terms, or if membership is denied to that employee for reason other than nonpayment of union dues and fees. Hiring-hall provisions in labor contracts usually give the contractor the right to reject any applicant, as well as the right to obtain employees from other sources when the union is unable to supply a sufficient number of qualified people to meet the needs of the contractor.

The courts have held that a lawful hiring hall is a mandatory subject of bargaining between employers and unions, and that a union can strike and picket to press its demands for an exclusive nondiscriminatory hiring-hall referral system. Once obtained in a collective bargaining agreement, a hiring-hall arrangement is enforceable in the federal courts or before the NLRB.

Contractor responsibility for discriminatory hiring-hall practices was a troublesome issue for many years. However, the U.S. Supreme Court has ruled that contractors who are not guilty of intentional discrimination are not liable if the union-operated hiring halls they use are shown to be operated on a biased or discriminatory basis. The courts have also ruled that union hiring halls are permissible in states with right-to-work laws as long as the hiring-hall agreement expressly states that union membership is not to be considered in job referrals.

Construction hiring halls or referral systems that discriminate against minorities are certainly also illegal by the provisions of civil rights statutes, even though they may appear to be legal under the NLRA. The matter of contractor responsibility has become particularly troublesome with regard to the hiring of workers from minority groups. In this regard, the NLRB has held that hiring is a management responsibility and cannot be delegated to a union. The contractor, not the union, must be the judge of a worker's competence, and a worker's access to a construction job cannot be conditioned on his ability to pass a union examination. If a contractor hires or retains a worker the union will not accept, the union is liable for the consequences if it strikes to force that worker off the job.

## 13.17 SECONDARY BOYCOTTS

A primary boycott arises when a union that is engaged in a dispute with an employer, exhorts that firm's customers and the general public to refrain from all dealings with that employer. A secondary boycott occurs if a union has a dispute with Company A and attempts to exert pressure on that company by causing the employees of Company B to stop handling or using the products of Company A, or otherwise attempts to force Company B to stop doing business with Company A. The primary employer, in this case Company A, is the employer with whom the union has the dispute. Company B is the neutral secondary employer, hence the name secondary boycott.

Secondary boycotts have a long and turbulent legal history. Illegal in the common law, secondary boycotts were ruled to have been forbidden by the Sherman Act in a decision by the U.S. Supreme Court. This prohibition was reversed by the Norris-LaGuardia Act and the Wagner Act, which gave unions almost complete immunity from liability for damages arising from secondary boycotts. The pendulum has since returned almost to its original position, with the NLRA forbidding secondary boycotts.

Secondary boycotts in construction can take many forms, and the dividing line between a legal primary boycott and an illegal secondary boycott is sometimes hazy and difficult to establish. The wording of the law is strictly construed in determining the legality of a boycott action. A form of secondary boycott that is of extraordinary importance to the construction industry, common situs picketing, will be discussed in the following section.

## 13.18 COMMON SITUS PICKETING

A common situs is a given location such as an industrial plant or a construction project at which several different employers are simultaneously engaged in their individual business activities. A dispute between one of these employers and a union is likely to involve the other employers who may very well be neutral, especially if picketing is involved. Decisions of the NLRB and of the courts have evolved some rules for establishing whether such common situs picketing constitutes an illegal secondary boycott action.

In an attempt to give effect to both the union's right to picket the primary employer and the right of the secondary employer to be free from disputes that are not its own, the NLRB established in 1950 the Moore Dry Dock tests, which determine when a union may picket a common site without committing an illegal secondary boycott.

These rules are summarized as follows:

1. The picketing must be limited to times when the employees of the primary employer are working on the premises.
2. The picketing must be limited to times when the primary employer is carrying on its normal business there.
3. The picket signs must clearly indicate the identity of the primary employer with whom the union is having the dispute.
4. The picketing must be carried on reasonably close to where the employees of the primary employer are working.

Common situs picketing occurs frequently in the construction industry, often as the result of a union contractor awarding work to a nonunion subcontractor. The resulting picketing causes the employees of the union contractors on the project to refuse to cross the picket line.

In 1951 the U.S. Supreme Court decided the Denver Building and Construction Trades Council case. This dispute involved a general contractor whose employees were union members and a nonunion subcontractor. The project was picketed and shut down by the construction unions, which demanded that the subcontractor be discharged. The U.S. Supreme Court found that the unions were guilty of an illegal secondary boycott because the object of the picketing was to force the general contractor (secondary employer) to quit doing business with the nonunion subcontractor (primary employer).

Following the Denver Building Trades case, the "separate gate" doctrine was developed. On multi-employer construction sites, one gate is reserved and marked for the primary contractor involved in the labor dispute and another gate is designated for the neutral contractors who are not involved. On the basis of the Moore Dry Dock standards traditionally applied to common situs picketing and the Denver Building Trades case, the NLRB and the courts now hold that picketing of the gate reserved for the contractor directly involved in the dispute is permissible, but that the unions cannot picket separate gates which are used by employees of the neutral secondary contractors if the effect is to keep them off the project. In essence, this decision says that construction contractors at the site are separate and distinct employers, and union picketing must be limited to the primary contractor involved in the dispute.

However, other courts have ruled that common situs picketing is permissible under certain circumstances. The court has decreed that a union can engage in common situs picketing when the gate reserved for the open-shop employer is so located that the union cannot communicate its picketing message to the public. Recent years have seen a sustained attempt by organized labor to prevail upon Congress to amend the NLRA to permit unrestricted picketing of construction sites.

The U.S. Supreme Court, in the General Electric case (1961), decided that the matter of situs picketing is different, however, when construction work is being done at an industrial plant by a construction contractor. The Court ruled that picketing by plant strikers of gates reserved exclusively for contractor personnel can be banned only if there is a separate, marked gate set apart for the contractor, if the work being done by the contractor is unrelated to the normal operations of the industrial company, and if the work is of a kind that will not curtail normal plant operations. The courts have ruled that the General Electric decision does not apply to a prime contractor and subcontractors at the usual construction site.

## 13.19 SUBCONTRACTOR AGREEMENTS

The Landrum-Griffin Act made it an unfair labor practice for an employer and a union to enter into an agreement whereby the employer agrees to refrain from handling the products of another employer or to cease doing business with any other person. As has already been pointed out, such a contract provision is called a "hot-cargo clause." However, the construction industry was exempted from this ban under certain circumstances.

Under the construction industry proviso to Section 8(e) of the National Labor Relations Act, contractors can agree to restrictions on subcontracting or can agree not to handle certain products as long as the restrictions relate to the contracting or subcontracting of work to be done at the site. This construction industry exemption has led to the widespread use of two forms of "hot-cargo clauses" in construction labor contracts. One of these is the subcontractor agreement, a subject to be discussed in this section. The other is the prefabrication clause, which is discussed in the following section.

Subcontractor agreements in this sense are agreements that require the general contractor to award work only to those subcontractors who are signatory to a specific union labor contract, or who are under agreement with the appropriate union. Such agreements do not extend to supplies or other products produced or manufactured elsewhere and delivered to the construction site.

The NLRB and the courts have ruled that construction unions may strike to obtain subcontractor clauses in their labor contracts if no secondary boycott is involved. To illustrate, picketing to induce a general contractor to accept a subcontractor clause is legal, but picketing is illegal as a secondary boycott if it is designed to force a neutral general contractor to stop doing business with an existing and identified nonunion subcontractor. The courts have held that unions cannot enforce subcontractor clauses by threats, coercion, strikes, or picketing, but that violations of such labor contract provisions can be submitted to arbitration, or that a civil action can be taken under Section 301 of the Taft-Hartley Act.

Additionally, self-enforcing clauses have been ruled illegal and unenforceable. These are clauses in which the contracting firm agrees that if it violates the terms of the subcontract agreement, the union can take action against the contractor such as picketing, refusing to provide workers, or canceling the labor contract between them.

For many years there has been considerable uncertainty as to just what constitutes a legal subcontracting clause. As a result of U.S. Supreme Court decisions in the Connell case (1975) and the Woelke & Romero case (1982), the following guidelines have emerged with respect to subcontractor clauses not being in violation of federal labor or antitrust statutes:

1. The agreement with a union containing restrictions on subcontracting must pertain only to work performed at a construction site. There is no requirement, however, that the pact be limited to the subcontracting of work to be performed at a particular project.

2. The workers represented by the union that makes the agreement restricting the contractor's right to subcontract must have an employer-employee relationship with that contractor.
3. The subcontracting restrictions must be provided for in a collective bargaining agreement.

## 13.20 PREFABRICATION CLAUSES

The prefabrication clause is the second form of "hot-cargo" provision ruled to be permissible under the construction industry exemption provision of the NLRA. In accordance with a U.S. Supreme Court decision concerning the installation of precut doors in Philadelphia, construction unions may legally obtain labor agreements to bar the use of prefabricated products in construction in order to preserve their customary onsite work. In addition, the ruling provided that unions can enforce such clauses by strikes and picketing.

These provisions ban the use of prefabricated construction products manufactured off the construction site, and products that eliminate work normally done on the project itself. Examples of these construction products are precut and prefitted wooden doors, precut pipe insulation, prefabricated trusses, prepackaged boilers, and many others. Such product boycotts have been construed to fall within the construction industry exemption from the ban on "hot-cargo clauses," and can be legal provisions included in a labor agreement if the prefabricated products is found to replace work customarily and traditionally performed on the site by union members.

The NLRB typically applies the "right-of-control test" as one factor in determining the legality of prefabrication clauses. Under this test, if a prefabricated product is specified by the architect-engineer and/or owner, then the contractor is required by the terms of the construction contract to provide the materials as specified and has no control over product selection. In such a case, the union cannot refuse to handle and install the product, whether or not a prefabrication clause exists. However, if the construction contract provisions do not specify the use of a prefabricated product, but the contractor, on its own volition, decides to use such materials, then the union is entitled to enforce the clause, and to strike and picket the offending contractor to block the use of the prefabricated materials. Application of the right-to-control test to determine when a prefabrication dispute becomes an illegal secondary boycott has been upheld by the U.S. Supreme Court.

## 13.21 JURISDICTIONAL DISPUTES

A jurisdictional dispute can arise when more than one union claims jurisdiction over a given item of work on a construction job site. The dispute is actually between the unions, and the prime contractor or subcontractor who are responsible for the performance of the work in accord with the provisions of their prime contracts and their subcontract agreements are caught in the middle. The unionized segment of the construction industry frequently has disputes of this kind because each of the many craft unions regards its type of work as a proprietary right, and jealously guards against any encroachment of its traditional jurisdiction by other unions.

Craft jurisdiction is of great economic and personal importance to the unionized worker and has been a continual source of contention among construction unions. The issue is compounded by the fact that lines of demarcation between the various jurisdictions are sometimes indistinct, and the development of new products and methods is often accompanied by jurisdictional clashes between different unions whose members claim exclusive right to the work assignment.

With the thought in mind that jurisdictional conflicts are an ever-present possibility on union projects, construction contractors and their project managers and superintendents can avail themselves

of some basic and commonsense precautions in order to preclude such disputes before they occur. One such action is to hold a meeting of the craft foremen and union stewards and business agents before work starts in the field. At this meeting, items of work and activities to be performed are discussed, and work assignments are made by the prime contractor. This allows potential disputes to surface early, and gives the conflicting unions time to resolve their differences. However, if agreement between the unions is not forthcoming, the contractor typically makes the final assignment and moves on.

The craft stewards can informally settle many jurisdictional differences that arise during the construction period. Despite these types of preemptive actions however, jurisdictional disputes do occur, and when they do the contractor is confronted with the inevitable need to get the matter resolved as quickly as possible.

When disputed work is at issue, the contractor has the authority and responsibility to assign the work to the workers of one of the unions involved. Although strikes, picketing, and other coercive action by a union to gain a work assignment is defined as an unfair labor practice, and most labor contracts contain provisions prohibiting such union actions, the union which is not receiving the assignment may well resort to mechanisms such as slowdowns, walkoffs, or other disruptive action. And the contractor finds that he now has a jurisdictional dispute on his hands.

If informal efforts to avert a jurisdictional dispute are to no avail, the contractor who is responsible for the management of the work must now make an assignment to one of the disputing unions. Although contractor decision criteria tend to vary, time efficiency and economy of operation are normally important aspects of the choice. If the jurisdictional dispute persists, the contractor may determine the need to take the matter to the National Labor Relations Board as discussed in the following section, or he may utilize a voluntary plan negotiated with the union representatives for the resolution of such matters.

## 13.22 NLRB JURISDICTIONAL SETTLEMENT

The provisions of the Taft-Hartley Act provide that the NLRB will hear and determine a jurisdictional dispute if the parties to the dispute have not agreed to a voluntary procedure. After a contractor has made the work assignment and the offended union begins or threatens picketing or other coercive action, the contractor can initiate a proceeding with the NLRB.

To do this, the contractor must file an unfair labor practice charge with the regional NLRB office. The regional office conducts a hearing on the matter, makes a determination, and notifies the parties, and the results are sent to the NLRB headquarters in Washington, D.C.

In the event one of the unions refuses to comply with this ruling, the board can petition the appropriate U.S. Circuit Court of Appeals to enforce its order. The NLRB can obtain an injunction to halt any project picketing, or strikes, or other union activity associated with the dispute.

Many contractors utilize the NLRB to resolve their jurisdictional disputes. Work awards made by the NLRB are limited in scope to the disputes from which they arise. The Taft-Hartley Act provides private parties who have been damaged by a jurisdictional strike, or picketing, or other union action the right to sue the union or unions involved. The NLRB has consistently given priority to contractor decisions regarding jurisdictional disputes that can be shown to be based in achieving economy and efficiency of the contractor's operation when making work awards. When the contractor's assignment can be shown to be based on these considerations, NLRB awards uphold the contractor's original assignment in more than 90 percent of the cases.

In the Texas Tile case (1971), the U.S. Supreme Court held that the contractor is a party to a jurisdictional dispute as well as the rival unions. The effect of this ruling is that any private arrangement between unions providing for the settlement of their jurisdictional differences must include the employer if the employer is to be bound by it. Otherwise, such an agreement between the unions does not prevent a contractor from referring the matter to the NLRB, and will not bar the NLRB from hearing the dispute and making an assignment regarding the contested work.

## 13.23 VOLUNTARY JURISDICTIONAL SETTLEMENT PLANS

The Taft-Hartley Act does not require the NLRB to rule on jurisdictional matters when the disputants have agreed to voluntary methods of settlement. Accordingly, the construction industry has established a number of voluntary plans, one of which is national in scope, and many others that are local in their coverage.

The Plan for the Settlement of Jurisdictional Disputes in the Construction Industry is a national procedure for the resolution of disputes. This joint labor-management mechanism was established in 1984 by the AFL-CIO Building and Construction Trades Department and six contractor associations; the plan was amended in 2011.

Under this plan, there is a Joint Administrative Committee (JAC) that oversees administration of the plan through an Administrator appointed by the JAC. This committee also produces a list of arbitrators from which one is selected to decide a certain jurisdictional dispute.

When the disputing unions wish to utilize this plan for the resolution of a jurisdictional dispute, they first sign a "stipulation," which in effect says that each agrees to this procedure, and that each agrees to be bound by the findings. In accord with the elements of the plan, the administrator sees to the appointment of an arbitrator who will hear the cases of the two disputants. The arbitrator will then schedule a hearing, and subsequently will make a ruling in accord with the procedural elements set forth in the plan. The criteria to be used by the arbitrator in reaching a decision are prescribed in the settlement plan. Included in these criteria is a requirement that the arbitrator must first determine whether there has been a previous decision or national agreement between the unions concerning the matter at issue. Rulings of arbitrators under the plan are enforceable in federal court. While it has been used in a number of cases, this national plan has not received widespread acceptance from contractor ranks.

In addition to this national plan, there are many local areas that have set up mechanisms for the voluntary local settlement of jurisdictional disputes. Several large metropolitan areas maintain their own boards for settling jurisdictional strikes. A large proportion of the jurisdictional disputes in the construction industry are settled in this manner at the local level.

## 13.24 PAYMENTS TO EMPLOYEE REPRESENTATIVES

Other provisions of the Taft-Hartley Act prohibit any employer or association of employers from paying, lending, or delivering money or other things of value to its employees or their representatives, if the purpose of the payment is to influence the right of employees to organize and bargain collectively. This includes labor unions or officers thereof and any employee or group of employees. Specifically permitted within the act however, are various fringe benefits such as health, welfare, pension, vacation, holiday, and annuity payments, as well as apprenticeship plans and prepaid legal services for

which employer contributions are permissible and over which unions are given some control. Such contributions must be paid to a trust fund, and the trustees must consist of an equal number of labor and management representatives.

## 13.25 POLITICAL CONTRIBUTIONS

The Taft-Hartley Act makes it unlawful for certain organizations, including business corporations, labor organizations, and trade associations, to make a contribution or expenditure in connection with the election of federal officials. A labor organization is defined to be any organization in which employees participate and which exists for the purpose of dealing with employers concerning grievances, labor disputes, wages, rates of pay, hours of employment, or conditions of work. The obvious intent is to refer to labor unions.

Despite these restrictions however, business corporations, labor unions, and trade associations are very active on the American political scene through the medium of sponsoring political action committees (PACs). Under federal campaign laws and Federal Election Commission regulations, corporations, labor unions, and trade associations are permitted to establish PACs at the national, state, and local levels. Within limitations established by law, these organizations are authorized to solicit and receive personal contributions from individuals and then to disburse these funds to selected candidates for political office.

PACs established by corporate businesses and trade associations use contributed funds to help elect candidates who are philosophically in tune with management viewpoints. At the same time, PACs associated with labor unions contribute large sums toward the election of candidates who support the causes of organized labor. PACs now account for a large percentage of the campaign funds raised by those who seek election to public office.

In addition, labor unions maintain local "education" funds through the AFL-CIO Committee on Political Education (COPE). This committee is allowable under federal law that allows labor unions to spend unlimited amounts of their own monies on communications to members and their families on any subject. These funds support get-out-the-vote efforts through the publication and distribution of union newsletters that make specific candidate endorsements. They also finance meet-the-candidates sessions where union-endorsed candidates may speak and solicit funds, and ask for volunteer labor for their campaign. While the campaign laws allow business corporations to conduct similar education activities with their management employees and stockholders, this is a not commonly done.

## 13.26 THE CIVIL RIGHTS ACT OF 1964

In passing the Civil Rights Act of 1964, Congress confirmed and established certain basic individual rights pertaining to voting; access to public accommodations, public facilities, and public education; participation in federally assisted programs; and opportunities for employment. Title VII of this act, Equal Employment Opportunity, prohibits discrimination in employment or in union membership. It is an unlawful practice for an employer to refuse to hire or to discharge any individual or otherwise discriminate against him or her regarding conditions of employment because of race, color, religion, sex, or national origin. It is also illegal for an employer to limit, segregate, or classify employees in any way that would deprive the individual of employment opportunity or adversely affect his or her status as an employee because of race, color, religion, sex, or national origin.

Administration and enforcement of the Civil Rights Act is the responsibility of the Equal Employment Opportunity Commission (EEOC), which was created for this purpose when the Civil

Rights Act was adopted. The responsibility of the EEOC is to assure that consideration for hiring and promotion is based on ability and qualifications, without discrimination. Title VII prohibits discriminatory practices on the part of employers, employment agencies, labor organizations, and apprenticeship or training programs.

The Civil Rights Act applies to interstate commerce and covers both employers and labor organizations. The law requires that employers, labor unions, employment agencies, and joint labor-management apprenticeship committees keep such records and submit such reports as the EEOC may require. Special rules apply in states that have their own enforceable fair employment practice laws.

The Equal Employment Opportunity Act of 1972 amended the Civil Rights Act of 1964 in several important respects, and expanded its coverage substantially. This legislation authorized the EEOC for the first time to go directly to court for temporary restraining orders and for permanent injunctions against unlawful discrimination. Additionally, the EEOC is provided other remedies such as requiring reinstatement or hiring, with back pay and appropriate affirmative action directives.

The Civil Rights Act of 1964 now covers joint labor-management committees for apprenticeship and other training programs. The coverage of the act was expanded to include employers of 15 or more employees and unions that operate hiring halls or referral systems or that have 15 or more members. Also created was the position of general counsel for the EEOC with the intent for this general counsel to act along much the same lines as defined for the general counsel in the NLRB. The general counsel of the EEOC has authority to bring civil court actions against patterns and practices of employment discrimination in interstate commerce.

## 13.27 EXECUTIVE ORDER 11246

Issued in 1965, Executive Order 11246 applies to contracts and subcontracts exceeding $10,000 on federal and federally assisted construction projects. By the terms of this order, contractors are prohibited from discriminating against any employee or applicant for employment because of race, color, religion, or national origin. Further, the contractor must take positive action to ensure that applicants are employed, and that employees are treated during employment, without discrimination. Additionally, affirmative action must be taken by contractors on projects covered by the executive order, to increase the level of minority representation in their workforces. Actions pertaining to employment, promotion, transfer, recruitment, layoff, rates of pay, training, and apprenticeship must not be discriminatory. Executive Order 11375 (1968), which is an extension of Executive Order 11246, applies to federal and federal-aid contracts, and prohibits discrimination against any employee because of sex.

Executive Order 11246, is administered by the Office of Federal Contract Compliance Programs (OFCCP), a division of the U.S. Department of Labor. The language of the order states that each federal contracting agency shall be primarily responsible for obtaining compliance with the provisions of the order. In addition, each administering agency is made responsible for compliance by the recipients of federal financial assistance.

Federal agencies have compliance officers whose duties are to ensure adherence to the objectives of the order, including compliance reviews. A compliance review is a procedure used to check an ongoing contract. In such a review, the contractor is required to provide information to show that it is complying with the nondiscriminatory requirements of its contract, including meeting affirmative action requirements.

In the event of a finding of noncompliance with OFCCP rules, the federal contract may be canceled or suspended, and the contractor can be declared ineligible for further government or federally

assisted construction contracts. Additionally, the OFCCP has the authority to withhold progress payments from contractors who are found to be in violation of Executive Order 11246. This authority stems from the government's right to suspend payment when a contractor fails to comply with any requirement of the contract. Compliance reports from contractors are required, and the general contractor must include suitable provisions concerning compliance with the order in its subcontracts and purchase orders.

## 13.28 THE AGE DISCRIMINATION IN EMPLOYMENT ACT

The Age Discrimination in Employment Act of 1967 prohibits arbitrary age discrimination in employment. This act protects individuals 40 years of age or older from age discrimination by employers of 20 or more persons in an industry affecting interstate commerce. Employment agencies, labor organizations, and most employees of federal, state, and local governments are also covered by the act.

By the terms of the act, it is against the law for an employer to:

1. Fail or refuse to hire, to discharge, or to otherwise discriminate against any individual as to conditions of employment because of age.
2. Limit, segregate, or classify its employees so as to deprive any individual of employment opportunities or to adversely affect his status as an employee because of age.
3. Reduce the wage rate of any employee in order to comply with the act.

The prohibitions against discrimination because of age do not apply when age can be shown to be a bona fide occupational qualification, when differentiation is based on reasonable factors other than age, when the differentiation is caused by the terms of a bona fide seniority system or employee benefit plan, or when the discharge or discipline of the individual is for good cause.

Employers must post an approved notice of the Age Discrimination in Employment Act in a prominent place where employees can see it, and must maintain records with regard to their compliance with the act as required. The act is enforced by the EEOC, which can conduct investigations, issue procedural rules, and enforce its provisions through the courts.

## 13.29 THE DAVIS-BACON ACT

The Davis-Bacon Act (1931), as subsequently amended, is a federal law that determines the wage rates, including fringe benefits, that must be paid to workers on all federal construction projects, as well as on a host of federally assisted projects. The Davis-Bacon Act is administered by the U.S. Department of Labor.

The law applies to contracts in excess of $2,000 and states that the wages of workers shall not be less than the wage rates specified in the schedule of prevailing wages as determined by the Secretary of Labor for comparable work on similar projects in the vicinity in which the work is to be performed. Further, the act requires that the contractor must pay overtime at the rate of time and one-half for all work performed by an employee in excess of 40 hours per week. General contractors and subcontractors are required to make payment at least once a week to all workers employed directly on the site of the work, at wage rates no lower than those prescribed. Additionally, contractors and subcontractors whose projects are covered by the act must keep certain records, and must file periodic reports, and must comply with various regulations with respect to the use of apprentices.

The act also stipulates that the prime contractor is responsible for its subcontractors' compliance with prevailing wage requirements. This means that the general contractor assumes the duty

of checking to ascertain that the required Davis-Bacon compensation is being paid by his subcontractors. The act requires that all workers must be paid in full each week, with the exception of such payroll deductions as are permitted by the Copeland Act. The purpose of the law is to protect the local wage rates and the local economies of each community, and presumably to put union and nonunion contractors on a more nearly equal competitive footing in the bidding of federal and federally assisted projects.

For purposes of defining the coverage of prevailing wages prescribed for a given project, the work site is defined as being limited to the physical place or places where the construction called for will remain, and to other adjacent or nearby property used by the contractor or subcontractors that can reasonably be included in the "site" because of proximity. This means that fabrication plants, batch plants, borrow pits, tool yards, and the like are considered to be a part of the work site, provided they are dedicated exclusively or nearly so to performance of the contract, and are so located in relation to the actual construction location that it would be reasonable to include them. Exempt from the work site definition, and therefore from Davis-Bacon wage rates, are contractors' permanent offices, branch plants, or fabrication plants whose locations and continuance are governed by the contractor's or subcontractor's general business operations.

Violation of Davis-Bacon requirements constitutes a breach of contract, and exposes the contractor and subcontractors to government compliance action. The prevailing legal opinion is that workers cannot sue employers who fail to pay prevailing wages required under the Davis-Bacon act. Only the federal government can enforce the law. Restitution is secured for workers found to have been underpaid, and penalties are assessed for violations of the overtime requirements. Additionally, violators can be denied the right to bid on other federal or federal-aid projects.

The act does not provide for judicial review of Labor Department wage rate determinations, but a Wage Appeals Board that operates under delegated authority from the Secretary of Labor has been established to hear appeals from findings or decisions of the Davis-Bacon Division. Federal contracting agencies have primary responsibility for Davis-Bacon enforcement, because obligations under the act become a part of the construction contract. Most of the states and many cities also have some type of prevailing wage requirement covering state and locally funded construction work.

## 13.30 DAVIS-BACON ADMINISTRATION

Recent years have seen the Davis-Bacon Act come under criticism from a number of different quarters. The General Accounting Office of the federal government has recommended that the act be repealed, and demands for its reform have been voiced by many responsible parties, including committees of the U.S. Congress. Much of the criticism has been directed at the administration of the act and the procedures that have been followed in determining prevailing wages. There have been numerous allegations that prevailing wages as determined were often too high, thus resulting in excessive construction costs for the government. In many instances, prevailing wage rates have simply been equated to local union pay scales. It has been stated that the Davis-Bacon Act eliminates competition between union and nonunion contractors, and imposes costly and burdensome reporting requirements on contractors.

The act is now being applied to more and more construction projects as a result of the Department of Labor rendering more expansive interpretations of "site of the work" and "expenditure of federal funds." However, in 1984 the following additional regulations were put into effect:

1. A prevailing wage is determined as a weighted average when a single wage rate does not apply to a majority of workers in a given area.

2. Wage data from prior Davis-Bacon projects are excluded from wage surveys when setting prevailing wages for building and residential construction work. (This rule does not apply to heavy and highway projects where there is little nonfederal construction.)
3. Urban wage data cannot be used in the determination of rural prevailing wages, and vice versa.

The Davis-Bacon Act requires that workers on covered projects receive at least the hourly wages and fringe benefits prevailing in the project locality. Payment by the contractor must equal or exceed this total hourly sum. However, the law does not limit the portion of the total amount that can be paid to the worker in the form of fringe benefits. Contractors could conceivably abuse this by reducing a worker's cash wages and paying more of the required compensation into fringe benefit trust funds, thus reducing the employer payments for Social Security, workers' compensation insurance, and unemployment tax. To guard against this possibility, the Internal Revenue Service and Department of Labor now limit the contractor's contribution for fringe benefits to 25 percent of an employee's annual compensation.

The craft classification of "helpers" is now allowed on Davis-Bacon projects located in those areas where the use of such a labor classification is a prevailing practice. Helpers are defined as semiskilled workers who perform their job duties under the direction of, and provide assistance to, a journeyman tradesman. A maximum ratio of two helpers for every three journeymen in a given craft is normally permitted, although variances allowing a larger ratio can be granted under certain circumstances.

Another recent action regarding Davis-Bacon is based on the Freedom of Information Act. The courts have ruled that a contractor on a Davis-Bacon project must, on request, provide unions with copies of its certified payroll reports showing the workers' names, job classifications, pay scales, and fringe benefits. In this way, the unions can check on the contractor's compliance with the prevailing wage law.

## 13.31 THE COPELAND ACT

As passed in 1934, and since amended, the Copeland Act makes it a punishable offense for an employer to deprive anyone employed on federal construction work, or work financed in whole or in part by federal funds, of any portion of the compensation to which the employee is entitled. Other than deductions provided by law, the employer may not induce "kickbacks" from its employees by force, intimidation, threat of dismissal, or any other means whatsoever. This portion of the Copeland Act is commonly known as the Anti-Kickback Law. A violation may be punished by fine, imprisonment, or both.

Regulations issued by the secretary of labor allow a contractor or subcontractor to make additional deductions from wages, provided the prior approval of the Department of Labor is obtained, by showing that the proposed deductions are proper. For example, union dues may be deducted by the employer if such holdback is consented to by the employee and is provided for in a collective bargaining agreement.

The law stipulates that payroll records shall be maintained and reports submitted by contractors as the Department of Labor may require. The Copeland Act covers all construction projects on which Davis-Bacon prevailing wages apply. The contracting agency is responsible for enforcing compliance with the act.

## 13.32 THE FAIR LABOR STANDARDS ACT

First enacted by Congress in 1939 and since amended several times, the Fair Labor Standards Act, also known as the Wage and Hour Law, contains provisions relating to minimum wages, maximum hours, overtime pay, equal pay, and child-labor standards. Workers whose employment is related to interstate commerce or consists of producing goods for interstate commerce are covered by the act, without regard to the dollar volume of business conducted by the employer.

The Fair Labor Standards Act provides for a minimum wage for all employees covered. This minimum wage has been steadily increased over the years. The act also requires payment of an overtime rate of one and one-half times the regular hourly rate of pay for all hours worked by craft workers in excess of 40 hours in any workweek. However, the act does not require payment of overtime for more than 8 hours of work per day, nor is there a limit set on the number of hours that may be worked in any one day, or during any one week. The law does not require premium pay for Saturday, Sunday, or holiday work, or vacation or severance pay.

An employer who violates the wage and hour requirements of the Fair Labor Standards Act is liable to its employees for double the unpaid minimum wages or overtime compensation, plus associated court costs and attorney's fees. Willful violation of the law is made a criminal act, and the errant employer can be prosecuted. Several classes of employees are exempted from coverage under the act, such as bona fide executive, administrative, management, and professional employees who meet certain tests established for exemption.

The Fair Labor Standards Act, as amended by the Equal Pay Act of 1963, provides that an employer must not discriminate on the basis of sex by paying employees of one sex wages at rates lower than it pays employees of the other sex for doing equal work on jobs requiring comparable skill, effort, and responsibility, and performed under similar working conditions. Pay differentials can be justified by a seniority system, merit system, piecework pay system, or other system based on factors other than the sex of the employee.

The basic minimum age for employment covered by the Fair Labor Standards Act is 16 years of age, except for occupations declared to be hazardous by the Secretary of Labor. For these jobs an 18-year minimum age applies. Construction work itself is not designated as hazardous work, but specified work assignments such as truck driving, demolition, roofing, and power tool operation are so designated.

## 13.33 THE CONTRACT WORK HOURS AND SAFETY STANDARDS ACT

In 1962, Congress passed the Contract Work Hours and Safety Standards Act, also known as the Work Hours Act of 1962. This act, as subsequently amended, applies to federal construction projects as well as to projects financed in whole or in part by the federal government. The primary thrust of this law is a requirement that every worker shall be paid at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of 8 hours per day or 40 hours per week. In the event of violation, the contractor or subcontractor responsible is liable for unpaid wages to the employees affected, and for liquidated damages to the federal government. Willful violation of the Work Hours Act is punishable by fine, imprisonment, or both. The enforcement of the law and the withholding of funds from the contractor to secure compliance with the act are made the responsibility of the government agency for which the work is being done.

An earlier congressional enactment related to overtime pay was the Walsh-Healey Public Contracts Act (1936), which requires contractors performing federal or federally assisted work to pay overtime wages after 8 working hours per day. Amendments made in 1986 to the Walsh-Healey Public Contracts Act and the Contract Work Hours and Safety Standards Act eliminated the requirement that contractors pay workers overtime when their workers work more than eight hours per day. Contractors on federally funded construction can now work flexible hours up to 40 per week before they must pay overtime rates. For example, a contractor can schedule 4 days of 10-hour shifts in one week without being required to pay overtime wages. Contractors have long supported such a change, maintaining that it would clear the way for more flexible schedules, resulting in savings of time and cost to the federal government. This change does not affect any obligation to pay overtime after 8 hours per day contained in state laws, local laws, collective bargaining agreements, or employment contracts.

## 13.34 THE HOBBS ACT

Also known as the Anti-Racketeering Act, the Hobbs Act, enacted in 1946, makes it a felony to obstruct, delay, or affect interstate commerce by robbery or extortion. To attempt or conspire to do so is also made a felony. Robbery is defined as the unlawful taking or obtaining of personal property from a person against that person's will by means of actual or threatened force or violence. Extortion is defined as the obtaining of property from another, with that person's consent, but with the consent induced by the wrongful use of actual or threatened force, violence, or fear. The underlying motive behind the act was to put an end to the use of threats, force, or violence by union officials to obtain payment from employers under the guise of recompense for services rendered. Prosecution of violators is placed in the hands of the U.S. Department of Justice.

Extortion by unions and union officials has been practiced in many guises against contractors, with payments being demanded as a condition of avoiding "labor trouble." These payments have been concealed behind many subterfuges such as "gifts," "commissions," "equipment rentals," and "services."

The courts have held that, under the Hobbs Act, extortion extends to attempts by a union or union officials to obtain money from an employer in the form of wages for imposed, unwanted, and superfluous services. Violence or threats of violence need not be involved if such attempts involve fear of economic loss, injury to employees, or damage to equipment. However, by its 1973 decision in the Enmons case, the U.S. Supreme Court held that the Hobbs Act does not extend to extortion connected with legitimate labor disputes such as acts of violence committed on a picket line set up to obtain economic bargaining demands. However, it is possible to prosecute a union for its extortionary demands for superfluous and unnecessary employees. Such demands are not a legitimate labor objective under the law.

## 13.35 IMMIGRATION REFORM AND CONTROL ACT

The Immigration Reform and Control Act of 1986 contains civil and criminal penalties for employers who knowingly hire aliens who are not authorized to work in the United States. The law requires every employer to establish both the identity and eligibility for employment of each person hired. This act requires all employers to verify the employment status and keep records on each new employee. Under the law, employers are subject to sanction if they knowingly hire unauthorized aliens or if they discriminate against prospective employees on the basis of national origin or citizenship status.

One of the principal goals of this act was to stem the flood of illegal aliens into the United States by making it difficult for them to find work. It is to be noted that the construction industry has been among the top employers of illegal aliens nationally. The act requires employers to verify the status of all their new hires and to examine certain documents to ensure identity and work authorization. The law forbids employers from hiring any aliens known to be unauthorized to work in the United States, or to continue to employ any of these aliens. Employers face stiff fines for not requiring proper documentation and knowingly hiring an illegal alien. Federal agents can seek criminal penalties for a pattern or practice of violating the provisions of this act.

Under the provisions of the act, employers must check that employees hired have documents which establish both identity and employment authorization. Documents such as a driver's license, certificate of naturalization, Social Security card, U.S. military card, certificate of citizenship, passport, birth certificate, or alien registration card must be provided by the prospective employee. The employer is required to have each newly hired employee complete a sworn statement on Immigration and Naturalization Service (INS) Form 1–9, which attests that the person is either a citizen of the United States or is authorized to work in the United States. The employer provides a sworn statement on the same Form 1–9 that the employer has examined the documents provided showing both the individual's identity and employment authorization. The specific documents examined must be listed, including their identification numbers and expiration dates. Form 1–9 must be retained by the employers for three years after date of hire or one year after employment is terminated, whichever is later.

The INS has ruled that contractors do not need to complete verification forms for temporary workers each time they are rehired. Employers must prepare the forms only once a year for such employees. Employers may, but are not required to, retain copies of the documents used to complete the verification procedures. Contractors may, under certain circumstances, rely on unions, central clearinghouses, or state employment agencies to complete the verification process.

It should be noted that at the time of this writing, there is a great deal of attention being focused, at both the national and state levels, on the matter of immigration control and immigration policy. It is to be expected that additional legislation will soon be forthcoming having to do with this matter.

## 13.36 THE NATIONAL APPRENTICESHIP ACT

In 1937, Congress passed the National Apprenticeship Act, authorizing the establishment of the Bureau of Apprenticeship and Training (BAT) of the U.S. Department of Labor. The bureau has the responsibility to encourage the establishment of apprenticeship programs and to help improve existing programs but does not itself conduct such programs. One of its prime objectives, however, is to promote the development of such programs.

Since its establishment, the bureau has provided technical assistance in developing and improving apprenticeship and other industrial training programs, and has set up minimum standards for the registration of local apprenticeship programs. The bureau works closely with state apprenticeship agencies, as well as with trade and industrial education institutions, and with management and labor. Through its field staff the bureau cooperates with local employers and unions in developing apprenticeship programs to meet specific needs.

To implement apprentice training on a local level, many states have passed laws that provide for the establishment of state apprenticeship councils. These state agencies function cooperatively with the Bureau of Apprenticeship and Training and are comprised of labor, management, and public representatives, often with the addition of members from the state labor departments, and others.

Using the standards recommended by the Bureau of Apprenticeship and Training as a guide, these councils have established detailed standards and procedures that apprenticeship and training programs in the state are expected to follow. A state council that wishes to do so can become a part of the national apprenticeship program by securing recognition of its standards and procedures by the Bureau of Apprenticeship and Training.

## 13.37 THE DRUG-FREE WORKPLACE ACT

In 1988, the Drug-Free Workplace Act was passed, which requires federal government contractors and employers who receive federal contracts and grants to maintain a drug-free workplace. Construction contractors performing federal work of $25,000 or more are required by law to take various steps to discourage drug use by their employees. Specifically, the act requires the contractor to:

1. Publish and distribute to each employee a statement prohibiting drugs in the workplace and specifying punitive actions.
2. Establish a drug awareness program.
3. Notify the contracting agency of a workplace drug conviction.
4. Discipline any employee convicted of a criminal drug offense in the workplace, or require the employee to participate in an approved drug abuse treatment program.
5. Make a good-faith effort to maintain a drug-free workplace.

Contracting agencies can suspend or terminate contracts and can bar contractors from federal work for up to five years if they make a false certification, fail to carry out the requirements of the act, or have such a number of employees convicted of drug offenses as to indicate that the contractor failed to make a good faith effort to provide a drug-free workplace.

At the present time, drug testing has become a common employment requirement on both union and open shop construction projects. Many unions have now entered into labor contracts that require prehire drug testing as a part of contractors' anti-drug programs. Many open shop firms now reserve the right to spot-check individual employees on their job sites. Employees of subcontractors are also subject to such examination. Both union and contractor testing policies call for the firing of employees who test positive.

## 13.38 FAMILY AND MEDICAL LEAVE ACT

In 1993, Congress adopted the Family and Medical Leave Act (FMLA), which provides that an eligible employee, whether male or female, is entitled to up to 12 weeks of unpaid medical leave during any 12-month period:

1. Due to the birth or adoption of the employee's son or daughter.
2. To care for the employee's spouse, son, or daughter, or parent having a serious health condition.
3. Because of a serious health condition that makes the employee unable to perform the functions of the employee's position.

The secretary of labor has issued regulations to carry out the intent of Congress in the FMLA. Under FMLA and Labor Department regulations, when an employee requests leave due to the birth

or adoption of a child, the employer may require that the employee use all accrued paid personal, vacation, and family leave, but not sick leave toward the leave provided for in the act. In the event of an employee's serious health condition or that of a family member, the employer may require verification of the condition. Additionally, the employer may require that the employee use any available paid vacation time, and personal, medical, or sick leave toward any part of the twelve weeks of leave provided by the act.

Additionally, an employer cannot utilize FMLA leave time in an adverse manner in any decision regarding hiring, promotion, or discipline, nor may this leave time be taken into consideration with regard to matters such as bonuses for a good record of safety in the workplace or for perfect attendance at work. Upon return from FMLA leave, the employee is entitled to be restored to the same or equivalent position in the company, with equivalent pay and benefits.

The act applies to employees of companies that have 50 or more employees. To be eligible for FMLA leave, an employee must have been employed for at least 12 months and must have worked for at least 1,250 hours during that 12-month period.

## 13.39 AMERICANS WITH DISABILITIES ACT (ADA)

Enacted in 1990, the Americans with Disabilities Act (ADA) was the first federal statute to extend civil rights protections to the disabled. This act extends extensive legal protections and remedies to persons with disabilities, or to persons who are defined as being disabled. The stated purpose of this act is:

> to provide a national mandate to end discrimination against disabled individuals and to bring them into the economic and social mainstream of life, to provide enforceable standards addressing discrimination against disabled individuals, and to ensure that the federal government play a central role in enforcing the standards on behalf of disabled individuals.

The ADA prohibits discrimination based on a disability in both the private and public sectors, in areas of employment, public accommodations, public service, transportation, and telecommunications. The act sets forth prohibitions against discrimination on the basis of disability by employers, employment agencies, labor organizations, or joint labor-management committees with respect to hiring and all terms, conditions, and privileges of employment.

The act defines an individual who is disabled as:

1. Having a physical or mental impairment that substantially limits one or more of the major life activities of such individual.
2. Having a record of such an impairment.
3. Being regarded as having such an impairment.

Under the provisions of the ADA, employers may not discriminate against any qualified individual with a disability in any aspect of hiring or employment. Only disabled individuals who are otherwise "qualified" can be protected against employment discrimination. A "qualified individual" is a person with a disability who, with or without reasonable accommodation, can perform the essential functions of the job. The phrase "essential functions" means job tasks that are basic and fundamental and not marginal.

An additional requirement in the ADA, is the provision of "reasonable accommodation" for persons defined as disabled. This matter is subject to varying interpretations, and the courts and federal agencies are continuing to define, on an ongoing basis, what is, and what is not, reasonable accommodation.

In addition to the general provisions in the ADA prohibiting employment discrimination, this law also contains a number of additional specific prohibitions. Some of these are: limiting, segregating, or classifying a job applicant or employee in a manner that adversely affects his opportunities or status; using standards, criteria, or methods of administration in a manner that results in or perpetuates discrimination; imposing or applying tests and other selection criteria that screen out disabled individuals, unless the test or selection criteria is job-related or consistent with business necessity; and denying employment opportunities because a qualified individual with a disability needs reasonable accommodation.

## 13.40 ERISA

The Employee Retirement Income Security Act (ERISA) is a federal statute adopted in 1974. The purpose of the act is to "set minimum standards for most voluntarily established pension and private health plans in private industry, so as to provide protection for individuals in these plans."

ERISA requires such plans to provide participants with plan information, including important information about plan features and funding; provides fiduciary responsibilities for those who manage and control plan assets; requires plans to establish a grievance and appeals process for participants who get benefits from the plans; and gives participants the right to sue for benefits and breach of fiduciary duty.

There have been a number of amendments to ERISA, expanding the protections available to health benefit plan participants and beneficiaries. One important amendment, the Consolidated Omnibus Budget Reconciliation Act (COBRA), provides some workers and their families with the right to continue their health coverage for a limited time after certain events, such as the loss of a job. Another amendment to ERISA is the Health Insurance Portability and Accountability Act (HIPAA), which provides important new protections for working Americans and their families who have preexisting medical conditions or might otherwise suffer discrimination in health coverage based on factors that relate to an individual's health. Other important amendments include the Newborns' and Mothers' Health Protection Act, the Mental Health Parity Act, and the Women's Health and Cancer Rights Act.

In general, ERISA does not cover group health plans established or maintained by governmental entities, churches for their employees, or plans which are maintained solely to comply with applicable workers compensation, unemployment, or disability laws. ERISA also does not cover plans maintained outside the United States primarily for the benefit of nonresident aliens or unfunded excess benefit plans.

(Department of Labor Website, www.dol.gov/dol/topic/health-plans/erisa.htm)

## 13.41 SUMMARY AND CONCLUSIONS

National and local labor statutes, as well as the interpretations and policies which have been formulated on the basis of these statutes, regulate in numerous ways the interactions between management and labor, both within construction companies and on construction projects. Understanding and complying with all of the applicable laws and policies is both a matter of obvious significance, as well as a matter of critical importance, for the construction contractor.

## CHAPTER 13 REVIEW QUESTIONS

1. Define *hot cargo agreement*.
2. Define *secondary boycott*.
3. Provide a synonym for the National Labor Relations Act, and state two of its key provisions.
4. Define ERISA and discuss the basics of its provisions as they relate to construction workers.
5. Define *common situs picketing*. Include discussion of the "secondgate" policy.
6. Define and contrast the meaning of the terms union shop and closed shop.
7. Define *jurisdictional dispute*. Define two methods by which they may be resolved, as discussed in this chapter.
8. Define *ADA,* and discuss its impact on the construction industry in terms of a contractor's hiring and employment practices.
9. State the key provisions of Executive Order 11246.
10. State the key provisions of the Davis-Bacon Act.
11. Describe the conditions under which a contractor can deduct union dues from an employee's paycheck, and state the name of the legislation that made this a legal practice.
12. State the key provisions of the Fair Labor Standards Act.
13. State the key provisions of the National Apprenticeship Act.
14. State the key provisions of the Contract Work Hours and Safety Standards Act, and contrast these provisions with those of the Fair Labor Standards Act.
15. Describe the key provisions of the Immigration Reform and Control Act.

# Chapter 14

# Labor Relations

## 14.1 THE CONSTRUCTION WORKER

All construction projects have a limited duration. When a project is completed, the craft workers move on to another project, or are laid off until more work becomes available. The average construction worker often has no fixed relationship with any one contractor, and his tenure of employment with a given employer is normally indefinite and temporal. He is tightly bound to his occupation and typically is only loosely associated with any given construction company. He may work for several different employers over a period of time, and is known more as a carpenter or cement mason than as the employee of any particular firm.

Although these generalities are not true in every general contracting concern, and are much less true for workers in the specialty trades, such as electricians and plumbers, than they are for carpenters, ironworkers, and others in the basic trades, they still typify a great deal of the employment in the construction industry. The construction worker is in the unusual position of being a skilled craftsman with no permanent place of employment. This circumstance is a manifestation of the fact that the projects of a typical construction company are of relatively short-term duration, and are variable as to location, along with the fact that different projects require different combinations of trade skills at different times in the work. All contractors experience fluctuating requirements for manpower as new projects are started and as existing jobs are completed. The economics of a contractor's business operation dictate that most of a contractor's work force be drawn from a local pool of skilled manpower, as company needs and the needs of projects dictate.

Although the popular conception of a construction worker is that of a "migratory worker," the geographical mobility of such people is variable with the craft and the individual circumstances of employment. Crews on large industrial construction projects and on highways, pipelines, bridges, transmission lines, tunnels, and other engineering construction are necessarily mobile. Tradesmen such as millwrights, boilermakers, pipe fitters, pile drivers, and structural ironworkers often follow their specialties over wide geographical areas, moving from one project to another. Craft workers in building construction are much more likely to find continuous or relatively continuous employment within a given locality. A number of considerations such as home ownership, family ties, schools, pensions, and other factors cause many construction workers to be reluctant to move their places of residence. This, among other reasons, leads to a certain amount of movement into and out of the construction industry itself. Many tradesmen find jobs elsewhere in the economy when local job opportunities are limited in construction for their particular craft skills.

In the construction industry, some more or less standard terms are applied to construction workers, and are used to designate the skill level of the individual worker. The term *journeyman* (sometimes *craftsman,* and the archaic term *mechanic*) is used to designate a skilled worker who is fully qualified

in a given craft or trade. An *apprentice* is a person who is enrolled in a craft apprenticeship program certified by the Bureau of Apprenticeship and Training. *Helper, trainee, preapprentice,* and *subjourneyman* all refer to unskilled and semiskilled craft workers who are below the skill level of journeymen and are not classified as laborers or apprentices.

## 14.2 EMPLOYMENT IN THE CONSTRUCTION INDUSTRY

The construction industry, as this nation's largest single economic effort, provides about 6 percent of the total national civil employment. At the present time, employment in this vital industry totals approximately 6 million workers. Construction employees are, and historically have been, predominantly male. However, women are increasingly finding employment and career opportunities as craft workers and as management workers in construction. Construction relies more upon younger workers than do other industries with a quarter of all persons employed in this industry being younger than 30 years of age. This circumstance, however, results in a higher attrition rate among new entrants.

Recent years have seen a reduced inflow of new workers into the construction industry. With an estimated need for more than 200,000 new tradesmen per year, the construction industry is exerting every effort to attract additional workers by improving the industry image, actively recruiting young workers, improving retention, establishing better training programs, and providing more on-the-job experience. Statistics show that the construction workforce is aging, and at the present time there are not as many new entrants joining the industry as there are construction workers retiring.

## 14.3 EMPLOYEE BENEFITS

Construction workers earn good wages and salaries. In addition, construction contractors now typically provide their employees with an array of pay augmentations, which are known collectively as fringe benefits. Employee benefits can be defined as programs, other than direct wages, that compensate employees in some way. The nature of these benefits varies somewhat between union shop and open shop contractors in terms of their details of operation and administration, but their provision is now a common feature throughout the construction industry. Some of these benefits are mandated by law such as Social Security, Medicare, and workers' compensation. Benefits provided voluntarily by employers include such fringe benefits as pension plans, profit sharing, health and welfare funds, sick leave, life insurance, paid vacations, paid holidays, employee education, legal aid funds, annuities, bonuses, supplemental unemployment payment plans, apprenticeship programs, employee stock ownership plans (ESOPs), employee-sponsored 401(k) retirement savings programs, and other types of benefits. Such benefits are made available to construction workers through private company plans and/or those of contractor professional associations, unions, and public organizations.

The motivation for such generous employer-provided benefits is quite obvious. These programs are designed to meet contractors' needs for skilled craft labor and to serve the purpose of attracting and retaining skilled and productive tradesmen, improving employee morale, and providing a high level of job satisfaction. To receive the full advantage from such programs, contractors exert every effort to communicate information concerning the nature and value of such benefits to their employees.

## 14.4 THE UNION CONTRACTOR

In the conduct of their labor relations, some contractors work under union contracts with their employees, while others operate as open shop or merit shop concerns. The construction unions will be considered first, followed by a discussion of open shop or merit shop employment.

A union contractor is one who has signed a collective bargaining agreement with a group of workers who have elected to organize in a union. Such a contractor's labor relations are determined for the most part by the provisions of the labor contract negotiated between the contractor and the organized workers. This contract is referred to as the collective bargaining agreement (CBA). Although the contractor may or may not have been directly involved with the negotiation of the CBA inasmuch as some contractors have elected to have their trade associations or professional organizations negotiate their labor contracts in their behalf, he is bound by the terms of the contract when he signs the labor agreement.

The workers of such employers are required to belong to, or to join, the appropriate union and often must be hired through the local union hiring hall. Thus, the union contractor has the decided advantage of having access to a constant pool of skilled labor, with all of these tradesmen being qualified for the work of their trade by virtue of having fulfilled union entrance requirements and apprenticeship training requirements. These workers typically have a strong sense of identity with their union and often refer to themselves as "brothers" (both men and women) in the union. Many of the unions of skilled construction craft workers have the term *brotherhood* in their names. The matter of compensation and working conditions for these skilled workers in terms of wages, hours, fringe benefits, and other conditions of employment are largely determined by the language of the labor contract between the contractor and the union and are not established directly by the contractor or his company.

As a general rule, relations between the contractor and its unionized employees are casual and impersonal. The tradesman is referred to a project by his union, following a request for skilled labor placed by the contractor with the union, and his job performance is largely judged by his foreman, who is also a union member. There is little direct contact between the construction worker and the contractor-employer. Personal relations are almost nonexistent because rates of pay, holidays, overtime, and other conditions of employment are not negotiated with the employee directly, but rather with his union, and are determined by the labor contract which has been negotiated.

When he reports to a project from the union hall, the tradesman is assumed to know his trade and is expected to be able to capably perform any task that is assignable to his craft. He receives the same rate of pay as his fellow craftsmen, regardless of their age, relative skills, and abilities to produce. By and large, the craftsman's first loyalties are to his union, whose well-being he closely associates with his own. He is typically not particularly "company-minded" toward his employer because he has no fixed relationship with any given contracting firm.

As a result of these circumstances pertaining to the employment of unionized tradesmen, a contractor's labor relations are conducted almost entirely with the craft union locals whose members the contractor employs, rather than with the workers themselves. Labor relations for a union-shop contractor consist primarily therefore, not of interpersonal relationships but of labor contract negotiation and administration.

## 14.5 THE ROLE OF THE UNIONS

Despite the fact that many people have conflicting personal opinions with regard to unions, there is no denying the fact that unions make an important contribution to the operation of the construction industry. The unions have a stabilizing influence on an area of the construction contracting business that is basically unstable, the matter of availability of qualified skilled labor when it is needed.

From the point of view of the contractor because there are unions and because there are negotiated labor contracts, fixed wage rates are established and much of the uncertainty is removed, which

is associated with the availability and employment of labor at the time it is needed for a construction project. The unions provide a pool of skilled and experienced workers from which the contractor can draw as its needs indicate.

Belonging to a union can offer many advantages to the working craft person. A prime consideration is the leading role organized labor has taken in raising wages, and enhancing working conditions, and establishing some degree of job security for its members. Unions exist and can achieve these benefits for their members because although the bargaining power of the individual worker is weak, that of an organization of workers can be very strong. The workers are secure in the belief that their union will provide them with good wages and benefits, and will secure good working conditions for them, and will protect them from unfair treatment, and will in general exert every effort to improve their situation. They enjoy a sense of belonging to a group that has the common purpose of mutual assistance and benefit, and through their elected union representatives they have a voice in the determination of their wages and working conditions.

It is true that some union members belong, not of their own volition, but as a matter of necessity to keep their jobs, in closed shop areas, for example. However, it is generally agreed that most union members are not unwilling captives of organized labor, but rather belong to their union because it is their desire to do so. Of course, it can also be agreed that not all union members are enthusiastic unionist advocates. Many union workers do not actively participate in union affairs nor even attend local union meetings regularly. However, the point remains that most union craft workers in construction identify very strongly with their union and have a strong sense of union patriotism.

## 14.6 UNION HISTORY

Trade unions originated at least 150 years ago and exist not only in the United States but in many other nations as well. Many unions have the word *international* in their title. However, organized labor has become a stable element in the American workforce only within the past 85 years or so. In 1886, the first enduring union association in this country was founded after a long era of repeated failures. The American Federation of Labor (AFL) was organized in that year with Samuel Gompers as its first president. Since the time of its inception, the AFL has traditionally been identified with the skilled craft worker. The AFL is a confederation of many sovereign national unions, each of which remains free to manage its own internal affairs. The construction trade unions were charter members of the AFL.

At the time the AFL was founded, semiskilled and unskilled factory workers were largely unorganized. The Knights of Labor, an organization of diverse membership, had made some progress in the matter of organizing labor in the workforce, but was waning rapidly. Although the AFL existed, its views were not in accord with organizing the industrial workers. In 1905, the Industrial Workers of the World (IWW) was organized to fill the void left by the AFL's unwillingness to meet the needs of these workers. The IWW advocated the elimination of capitalism, engaged frequently in violent strikes, and declined rapidly in the post-World War I era. Once again no central organizing force existed to advance the cause of the mass-production worker, although at the time several independent industrial unions were leading somewhat precarious existences.

Enactment of the Norris-LaGuardia and Wagner Acts in the 1930s (see Chapter 13) encouraged and assisted union activity. The AFL began to extend a lukewarm welcome to some industrial unions, but relegated them to a second-class position known as "federal locals." This attitude enjoyed no great success because the AFL craft unions, apprehensive that they would be obliterated in a huge mass of

industrial production workers, pressed demands on the federal locals for jurisdiction over members who were engaged in craft occupations.

In 1935, the disgruntled leaders of eight industrial unions that were associated with the AFL formed the Committee for Industrial Organization with the stated purpose of organizing the mass-production industries. This committee was organized within the AFL and sought to induce the AFL to assume a dual personality, representing both craft workers and industrial workers. This was nothing short of treason in the eyes of the AFL hierarchy, and the committee was summarily ordered to disband or be expelled from the federation. In 1936, the AFL executive council suspended the Committee for Industrial Organization. In 1938, after two fruitless years of attempts at reunification, the committee became the Congress of Industrial Organizations (CIO), an association of autonomous industrial unions, with John L. Lewis of the United Mine Workers as its first president.

In the following years, the AFL and the CIO engaged in a bitter struggle for the leadership of American organized labor, and both sides came to recognize the need for reconciliation. However, personal animosities and conflicts of interest proved difficult to resolve, and the merger was delayed for many years. Not until 1955 were the two groups able to reconcile their differences sufficiently to negotiate a reunification. The new federation of labor unions became the AFL-CIO.

## 14.7 CONSTRUCTION UNIONS

The vast majority of unionized construction tradesmen belong to one of the AFL-CIO construction trade unions or the International Brotherhood of Teamsters. The Teamsters is a very large AFL-CIO union that includes construction truck drivers as a part of its total membership.

However, significant numbers of construction workers are represented by unions other than those in the AFL-CIO. For example, there are a number of small independent unions that represent limited numbers of construction workers in a few localities. *Independent,* in this context, means the unions involved are not affiliated with the AFL-CIO. Most of these unions are organized along industrial lines without trade jurisdictions.

In addition, one of the largest union competitors to the AFL-CIO craft unions is the Construction Industry Conference of the United Steelworkers of America. This conference represents construction workers in many localities across the United States and Canada and is especially strong in the Appalachian coal areas. Most of the contractors who have labor contracts with locals of this conference are engaged in heavy and highway construction, or are specialty contractors. This conference does not divide its members into separate crafts or jurisdictions, and contractors can shift their workers from one occupational classification to another, so long as the workers are able to perform the work and are paid the wages which have been established for that classification through collective bargaining. Chapters of the locals forbid strikes without approval of the international union, members can transfer freely from one local to another, and union membership is open to anyone the contractor hires. Labor contracts with these locals specifically give contractors control over management of the work, assignment of the workers, source of the construction materials, and use of tools. Grievance machinery that can terminate in binding arbitration is written into all labor contracts.

In terms of total numbers, the AFL-CIO craft unions represent a very large majority of the organized construction workers. For this reason the discussion in the following sections pertains principally to those unions.

## 14.8 THE LOCAL UNION

The basic unit of a construction craft labor union is the "local,'" with each local exercising jurisdiction over an assigned geographical area such as a borough, city, county, or state. The local serves as a

headquarters for, and is responsible for, all union activities of that craft within its boundaries. The geographical area assigned to a given local can vary widely from one craft to another. For example, there may be an appreciable number of carpenters' locals within a given state but only a few locals of the plumbers' union.

The legislative body of local unions is the membership. Elected officers of the local have only the responsibility for carrying out union rules as ratified by majority vote of the members. Correspondingly, all matters of union policy, labor contract terms, decisions to strike, and other basic union issues must be approved by the voting membership.

Each local union elects its own officers, and these usually consist of a president, vice president, secretary-treasurer, and sergeant at arms. These officers may or may not be salaried, depending on the bylaws of the local. A typical arrangement is that the officers are paid only for the time that they actually spend on union business. An executive board or some equivalent body may also be established within a local, which is concerned primarily with the admission of new members, matters of discipline, financial matters, and contract negotiation. The day-to-day affairs of the local are managed by a paid business agent who is elected from the membership. The local is represented on each construction project by a job steward, who is expected to see that union rules are observed, and to report any violations or grievances to the business agent. The steward for each project is usually appointed by the local.

The locals of the same international union are commonly grouped together on a district, state, county, or city basis. For example, carpenters' locals within designated regions may band together to form district councils of carpenters, which serve to coordinate the activities of all member locals into a unified approach to common problems. Locals of the different construction unions unite on a regional basis to form building and construction trades councils. These councils consist of delegates from each member local and serve as agencies for regional cooperation. An important function of these councils is to present a united front to employers during periods of collective bargaining.

Over a period of years, the National Labor Relations Board (NLRB) and the courts have issued a series of landmark decisions concerning individual worker rights under the National Labor Relations Act (NLRA). These rulings pertain to the worker's association with a local union, and the mutual rights of each party. Certain of the most important of these findings are discussed in the next paragraph.

It has been held that a union member can be obliged to pay his local union only the prevailing dues and fees, and need not become a full member. Unions are prevented from requiring such a "dues paying only" member or "limited member" to take the union oath, or to accept full membership, or to attend union meetings. Unions may not fine full members who convert to limited status and work open shop or who return to work during a strike. After a union member resigns full membership, he can cross a picket line and return to work with no risk of union retaliation. Unions cannot impose fines to restrict a member's right to resign, even during a strike. A union cannot discipline a limited member who becomes a supervisor for an open-shop contractor.

## 14.9 LOCAL UNION AUTONOMY

The local is chartered by its international union and is subject to the constitution and bylaws of the parent organization. Beyond these provisions however, the decentralized nature of construction requires that locals possess a high degree of independence and freedom of action. Construction locals typically have the authority to negotiate their own labor agreements, and to call strikes, without the formal approval of their international unions. There are exceptions to this generality however, and the parent unions can restrain their locals from reckless actions regarding work stoppages and strikes. Locals cannot, for example, defy their international union with impunity, and strike at will. Locals do have

considerable autonomy, but parental authority can be lawfully applied when the occasion demands. Each local has its own set of bylaws that governs the election of local officers, the ratification of labor contracts, conduct of meetings, payment of dues, admission and expulsion of members, and other union business.

## 14.10 UNION WORK RULES

Most local unions promulgate work rules that pertain to the employment of the locals' members, and negotiate for their inclusion in collective bargaining agreements with employers. These rules vary considerably from one craft to another, and also vary with geographical area. Some of the work rules represent concessions gained from employers in past collective bargaining, and pertain to a wide range of issues such as work hours per day, jurisdiction of work, multiple shifts, overtime and holidays, apprentices, prohibition of piecework, paydays, reporting time, foremen, crew size, crew mix, safety provisions and devices, tools, job stewards, and a variety of others. Contractors and others have often been critical of certain aspects of union work rules as being restrictive labor practices that unduly increase costs of production, prolong construction time unnecessarily, and interfere with the contractor's management prerogatives. Unions defend their work rules on the grounds that they make the employment of their members more secure, defend against the loss or subversion of hard-won gains, protect the members from unfair or arbitrary treatment by the employer, and ensure the safe employment conditions to which their members are entitled.

It can be said without doubt, that many work rules do function to preserve legitimate union rights and prerogatives. Unfortunately, many locals have shown little restraint in their imposition and enforcement of work rules. Examples include union insistence on the use of unnecessary workers on the job, prohibitions on the use of labor-saving methods and tools, inflexible application of overtime requirements, and other restrictive practices which have substantially lowered productivity and have commensurately increased construction costs in many sections of the country, especially the large metropolitan areas. Overlong coffee and lunch breaks, requirements that skilled workers perform unskilled jobs, strict and inflexible trade jurisdictions, flagrant featherbedding, excessive nonproductive time, limitations on the daily production of a tradesman, and the requiring of unnecessary work or the duplication of work already done, are additional examples of work rules that adversely affect both productivity and labor costs.

The work-rule environment has changed significantly in recent years, however. High construction labor costs are resulting in changes to faster and more economical ways to build. The shift to materials and processes such as drywall to replace plaster, precast concrete in place of cast in place concrete, and prefabricated steel buildings in place of structures where each structural steel member is fabricated and erected individually illustrates this point. In addition, the increase in the number of open-shop and merit-shop contractor operations across all parts of the country has resulted in a noticeable easing or elimination of restrictive work rules by many construction union locals.

## 14.11 THE BUSINESS AGENT

The local union elects a business agent, sometimes called a business manager, who conducts its internal business affairs and serves as the representative of the local union to outside agencies, including employers. He is paid for his services at the top rate for his craft. The business agent is the key person in

a building trades local. As the full-time spokesman for the local, he has the primary responsibility for "policing the trade" within the assigned geographical area of the local. He refers union craft worker members to jobs, has considerable authority in determining who joins the union, and is clearly a powerful person insofar as both local contractors and union members are concerned.

Large locals may often have more than one full-time business agent; small locals may have one of their number act as a part-time business agent. The business agent is the contractor's only direct contact with a local union. The agent helps negotiate collective bargaining agreements, enforces the agreements after they are finalized, reconciles grievances, protects the union's work jurisdiction, and serves as a general intermediary for the local members and their contractor employers. The agent directs strikes and other concerted activities that are undertaken by the local. To the construction contractor, the business agent is the local union.

The business agent has substantial authority to make decisions for the local and bears almost the entire responsibility for the management of its affairs. Obviously, such freedom of action is a necessary condition in the construction industry, where jobs are scattered over a geographical area and can be of short duration. To be effective, the business agent must be empowered to act quickly and without having to await approval of a higher body. In a complex and shifting environment, he seeks to protect the interests of the local union and its members. Even though he can act freely however, he must remain responsive to the members of his local because he is elected by them, and his job depends on how well he meets the needs of his constituency.

The business agent is, in many respects, the middleman of the industry who strives to reconcile the conflicting demands of the employers on the one side, and the union rank and file on the other. Contractors look to the business agent to find qualified people for their projects and to assist with recalcitrant or troublesome workers. Members of the local depend on him for such services as finding jobs for them, and settling disputes with employers. He must manage his local's office, maintain the necessary records, and supervise the finances. He must also visit the jobsites and check on employer compliance with union work rules and contract provisions.

## 14.12 COLLECTIVE BARGAINING

Labor contracts between construction contractors and labor unions are obtained by a process of collective bargaining, and constitute the essential basis for labor-management relations in the unionized segment of the construction industry. These contracts, called collective bargaining agreements, are negotiated between the two parties, and establish wages, hours, and other essential conditions of employment within the geographical jurisdictions of the participating local unions, for the duration of the agreement. These agreements pertain only to the craft or crafts involved, whom the union represents. As existing labor agreements near expiration, negotiations are conducted to arrive at new, mutually acceptable contracts.

The NLRA and the NLRB require management and labor to bargain in good faith with one another in negotiating these collective bargaining agreements. Failure to do so by either party constitutes an unfair labor practice. The law does not require that concessions be made, or even that the two sides come to an agreement.

The law does not actually define what is meant by good-faith bargaining, although decisions of the NLRB and the courts have identified good-faith bargaining as a duty to approach negotiations with an open mind and a real intention of reaching an agreement. Lack of good faith on the part of the employer may be indicated by ignoring a bargaining request, conducting antiunion activities, failing to appoint a bargaining representative with power to reach an agreement, delaying and evasive

tactics, attempting to deal directly with employees rather than with the union representatives during negotiations, refusing to consider each and every proposal, failing to respond with counterproposals, and refusing to sign an agreement.

## 14.13 PATTERNS OF BARGAINING

For many years, multiemployer collective bargaining was the standard method by which labor agreements were reached between contractors and the unions. In multiemployer bargaining, contractor groups or associations bargained with a union or unions on behalf of their members. The usual procedure was that the individual contractor authorized the association to bargain in its behalf by appointing the association as its bargaining agent and agreed to then be bound by the terms of the resulting labor contract. Such a negotiating procedure provided strength in numbers, and often improved the bargaining power of the individual construction firm. Additionally, this collective action prevented the unions from whipsawing one contractor against another. Local associations of general contractors typically negotiated with the locals of the basic trades such as carpenters, cement masons, laborers, operating engineers, construction teamsters, and ironworkers. The resulting labor contracts were often referred to as master labor agreements because they were multiemployer and multicraft in coverage.

The specialty contractor groups often negotiated with the union locals whose members they employed. For example, a city or regional association of painting contractors would negotiate with the appropriate local or locals of the International Brotherhood of Painters and Allied Trades. In a similar manner, locals of plumbers, plasterers, roofers, electricians, and the other specialty trades would bargain with organizations of their specialty contractor counterparts.

However, recent years have seen a trend toward individual contractors negotiating their own labor contracts. Although multiemployer bargaining is still very prevalent in the construction industry, collective action is frequently being replaced, especially in some geographical areas, by a more flexible free market concept of labor negotiations wherein individual contractors decide to negotiate with the craft labor unions one on one. A number of reasons have been cited for this trend. New construction management styles, new project delivery methods, periodic economic recessions, and the rapid growth of the open shop are believed by many to have triggered much of the change.

In addition, diverse groups of contractors, facing different economic problems, and having different viewpoints and different labor needs, being on the same side of the bargaining table have made multiemployer bargaining very difficult in some areas. Selective strikes by unions committed to multiemployer bargaining, and the use of interim, project, and national labor agreements have diminished contractor faith in and commitment to collective action.

Some work preservation clauses in labor contracts that contractors find unacceptable, have left many contractors even more reluctant to participate in multiemployer bargaining. Many contractors now consider multiemployer and multicraft bargaining to be unresponsive to market changes and modern industry conditions and perceive individual negotiations to be advantageous for them. Additionally, some contractors are reluctant to give power of attorney to trade organizations to bargain for them because they may wish to preserve their right to employ a nonunion workforce, or to perform work with nonunion craft workers in some areas.

A number of multiemployer bargaining units have been disbanded in recent years. In other cases, contractors authorize professional or trade association officers to negotiate agreements with the trades, but without the power to bind member contractors to them. Contractors are therefore left free to sign the resulting agreements or not, as they see fit. In many geographical areas, there is no association bargaining with some crafts.

In bargaining with the individual union locals, contractors can now attempt to confine the terms of a labor agreement to a specific marketplace. In bargaining one-on-one with the craft unions, construction firms find that they have the flexibility of avoiding a strike or accepting a strike, in order to gain concessions or to keep the work progressing at any price. This can sometimes be a matter of necessity for certain union contractors who are struggling to keep their share of the market. Negotiating one-on-one with the unions allows a firm to seek the best collective bargaining agreement it can negotiate from the trades, or to move to employing nonunion craft workers if the terms are not acceptable.

As can be seen, the overall present condition of collective bargaining in the construction industry is in a state of change. It remains to be seen what the results of some of the current trends and practices will be.

## 14.14 WITHDRAWAL FROM BARGAINING UNIT

When a contractor withdraws from a multiemployer bargaining unit to engage in his own bargaining, he must take certain steps to avoid being obligated by future contracts negotiated by the bargaining unit and to avoid being penalized for withdrawing. In order to be excused from a bargaining agreement negotiated by the union and the multiemployer unit, the contractor must give written notice to the union and to the bargaining unit prior to the date set by the existing labor agreement for modification, or the agreed-upon date for the beginning of negotiations for a new agreement. The contractor's notice must indicate an unequivocal intent to withdraw from the multiemployer bargaining unit. Such notice should also be given to the Federal Mediation and Conciliation Service, which is further discussed in subsequent sections of this chapter.

An employer may withdraw from a multiemployer bargaining unit unilaterally by giving proper notice prior to the onset of negotiations, as described in the preceding paragraph, with emphasis on the fact that the contractor must provide clear notice of his intent to do so, prior to the onset of bargaining between the multiemployer unit and the union. Once bargaining commences, the right to withdraw is very limited. However, if the union concurs, the employer can withdraw at any time.

Even with timely notice, there is normally a continuing obligation for the contractor to bargain with the union, now doing so individually rather than as part of the multiemployer unit. The only way this requirement can be avoided, is for the contractor to demonstrate that the union no longer represents a majority of the employees concerned. If the contractor elects to withdraw from the multiemployer bargaining unit, he may retain a withdrawal liability to any multiemployer pension plan, under the provisions of the Employee Retirement Income Security Act (see Chapter 13).

## 14.15 THE BARGAINING PROCESS

By terms of the NLRA, both management and labor can be represented by anyone of their own choosing at collective bargaining sessions. Individual construction firms are normally represented by company officers, perhaps supported by outside parties who possess expertise in construction labor law and labor relations.

Bargaining by a trade association is usually conducted by a committee of contractor members, legal or labor relations counsel, and association staff. The unions appoint the members of their negotiating team, usually officers of the locals, district councils, or building trades councils if multicraft bargaining is involved. Representatives of the international unions frequently assist the local unions and participate in the negotiations as well.

Almost invariably, the labor side opens the negotiations by demanding more than it actually expects to obtain. The resulting negotiating sessions usually follow a complex strategy of offer and counteroffer on the part of both sides. Experience and skill are required, to recognize the moment in the negotiations at which the best provisions can be agreed to. As a general rule, the union negotiators in these sessions do not have the final authority to consummate binding agreements, but must obtain ratification of the proposed collective bargaining agreement by the union membership following their bargaining sessions with management. It is not unusual for the union members to refuse to ratify the proposed settlement, sending the negotiators back to the bargaining table. In the event of an impasse in bargaining which cannot be overcome, there are various settlement plans in use about the country that assist contractors and unions toward reaching mutually satisfactory agreements without the necessity of resorting to strikes or lockouts.

It is absolutely essential that management realize when it enters these negotiating sessions, that it must be thoroughly prepared in every respect, and that it must negotiate with the assistance of expert and experienced labor law counsel. It must be remembered that the primary purpose of unions is to establish favorable working conditions for their members. The periodic negotiations with employers are the focal point for union activity and are not taken lightly by union representatives. By the same token, these negotiations are a serious matter for management also, and unsophisticated bargaining by poorly prepared management representatives can only lead to the contractors being outmaneuvered and outpointed by their union adversaries, who spend a great deal of their time in constant association regarding labor-management matters. The highly specialized art of labor negotiation has led to the increasing practice of hiring professional assistance for this purpose. Most large contractors and many of the contractor associations now retain labor relations specialists on their staffs.

## 14.16 LABOR AGREEMENTS

Once a settlement is reached between a contractor and a labor union, a written instrument is prepared that contains the essentials of the agreement and is signed by the parties. This instrument is referred to as the collective bargaining agreement (CBA), or as the labor agreement or the labor contract, and is binding on both management and union labor in that jurisdiction. The life of a typical labor agreement may run from a short-term interim arrangement to a multiyear contract, as determined in the negotiations.

An interim agreement is used when an existing labor contract with a multiemployer unit has expired, and there is a bargaining impasse, and a new agreement has not yet been reached. Because the building trades union members will not usually work without a contract, an individual contractor may enter into an interim agreement with the labor union that will keep its projects staffed with craft labor, and allow construction progress to continue, until a new contractual arrangement is reached. Such an interim contract normally provides that the contractor will pay any final settlement retroactively, or will pay an interim wage negotiated with the union.

During recent years, the majority of labor contracts in the construction industry have been one-year settlements, although two-year and three-year agreements have also been negotiated. The longer-term contracts often provide for periodic pay adjustments or contain wage reopener or wage adjustment clauses.

Bargaining agreements in the construction industry contain many provisions and cover a very wide range of provisions. Such contracts stipulate wages, hours, fringe benefits, overtime, and a wide variety of working conditions. Most agreements are negotiated to cover a particular category of construction. For example, separate agreements are negotiated for the same geographic area between the

same unions and different contractors or contractor groups to cover building, heavy, highway, and residential construction. Most agreements provide for the settlement of jurisdictional disputes, a job referral system, apprenticeship, and grievance procedures. A large proportion of construction labor agreements contain no-strike and no-lockout pledges. Many of the no-strike clauses are conditional, however, permitting strikes under certain conditions such as after the grievance procedure has been exhausted, or when the employer is in noncompliance with the provisions of the agreement.

The legislation that pertains to the provisions discussed in this section is the NLRA. The provisions that set forth the requirements for an employer who wishes to terminate or modify an existing labor contract are in Section 8(d) of the NLRA, which provides that the party desiring to terminate or modify an existing labor contract covering employees in an industry affecting interstate commerce must do the following:

1. Serve written notice on the other party of the termination or modification 60 days before the termination date or date of modification.
2. Offer to negotiate a new or modified contract.
3. Notify the Federal Mediation and Conciliation Service and any similar state agency that a dispute exists, if no agreement has been reached 30 days after the notice was served.
4. Continue to live by the existing contract terms without resort to slowdowns, strike, or lockout until expiration of the 60-day notice period or until expiration of the contract, whichever is later.

Any employee who engages in a strike within the 60-day period loses his status as an employee of the struck employer and is no longer protected by the NLRA. This means, for example, that employees who engage in strikes during this period are not entitled to reinstatement.

## 14.17 GEOGRAPHICAL COVERAGE OF AGREEMENTS

In terms of geographic coverage, labor contracts in the construction industry cover the spectrum, from some agreements that are national in their coverage to others that pertain to a single construction project. However, most of these agreements are local in their coverage, with their application ranging from cities to entire states.

## 14.18 PROJECT AGREEMENTS

Union labor agreements called project agreements have become more commonplace in recent years. A project agreement is a labor contract that normally applies only to a specific construction project, usually a large job. However, in some cases such labor contracts may apply to a series of projects in a given geographical area, or even to projects of a specific industry.

These labor agreements commonly contain special conditions that pertain to a single project, which are different from those in the collective bargaining agreement for the geographic area. Such agreements have the goal of constructing projects efficiently, on time, and with reasonable and predictable labor costs. Such contracts frequently require that all subcontractors be union, and include applicable local wage rates and fringe benefits, but attempt to reduce labor costs and ensure uninterrupted work by sometimes including special terms that are more favorable to the contractor than the existing local labor agreements. To illustrate, project agreements often prohibit strikes, lockouts, and slowdowns. They can contain grievance procedures, ban jurisdictional disputes, reduce or eliminate

coffee breaks, reduce overtime, provide for employment of trainees, and eliminate travel time and standby crews. They often allow the project to continue work through local collective bargaining strikes under interim agreements.

Although some local contractors who are signatories to the local agreement may object to project agreements that provide special terms and special treatment to others that they do not receive, project agreements are still widely used. The growth of open shop has spurred the usage of project agreements because they can help to improve the competitive position of unionized firms. The unions have even sometimes entered into project labor contracts with otherwise nonunion contractors to capture work for union members that would otherwise be performed by nonunion craft workers.

## 14.19 NATIONAL AGREEMENTS

The term *national agreement* has come to refer to a nationally applicable labor contract that is negotiated between the AFL-CIO international building trades unions, and certain individual contractors and contractor associations. A national agreement provides for the employment of the members of a given union anywhere within the United States, and often in Canada. Employers who sign national agreements are mainly large industrial contractors who perform work in widely scattered locations. Rather than attempt to become parties to the myriad of local labor contracts in effect in different locations about the country where they may be performing work, these contractors and the union use the national agreement as a convenient method of handling their labor relations.

The usual national agreement does not include any of the terms and provisions of local labor contracts but does provide that all workers must be obtained through local union hiring halls. Usually, contractors can hire their field supervisors directly. Typically, these agreements contain explicit work rules, often including provisions that specifically ban slowdowns, standby crews, and featherbedding practices. A grievance procedure, as well as provision for flexible eight-hour workdays, are often included.

National agreements often contain a no-strike, no-lockout clause, although an exception to this provision allows for support of local collective bargaining. These pacts also usually eliminate coffee breaks and other nonworking time, travel and subsistence pay, and overtime except under unusual circumstances. The agreement establishes a joint administrative committee that adapts the agreement to suit the conditions of a specific project. The committee establishes wage rates, alteration of workweek, and numbers of preapprentices and helpers to be allowed, and other matters to more closely tailor the scope of the national agreement to the conditions of a particular project or location.

## 14.20 THE FEDERAL MEDIATION AND CONCILIATION SERVICE

Established by the Taft-Hartley Act in 1947, the Federal Mediation and Conciliation Service is an independent agency of the federal government that is charged with the responsibility of assisting employers in interstate commerce and labor organizations in promoting labor peace. As discussed in a previous section of this chapter, employers or unions who wish to modify or terminate existing collective bargaining agreements must serve notice on the other party 60 days before the effective date of these changes. Should the matter not be resolved within 30 days, notice to the Federal Mediation and Conciliation Service is required, as well as to any similar state agency having jurisdiction. The service is also notified when negotiations threaten to lead to a dispute.

Absolute neutrality in labor disputes is a guiding principle of the service. For the parties to a labor negotiation, agreeing to submit to mediation by the Federal Mediation and Conciliation Service

is generally a voluntary process, although there are a few exceptions. The parties to a dispute are encouraged to settle their differences by themselves, but either side may request a mediator's assistance at no charge. The aim of the service is to reconcile conflicting views without intervention or dictation into the affairs of either party. Mediators cannot compel either side in a labor dispute to do anything, but they do bring their experience and dispassionate advice to the bargaining table in order to help the disputing parties reach a mutually acceptable area of agreement. Thus, the Federal Mediation and Conciliation Service functions to keep the parties bargaining, offers helpful suggestions, and otherwise assists in the ultimate achievement of collective bargaining agreements. In no way altered, however, is the fact that the resulting agreement is both the product and the responsibility of the signatories.

The service employs a staff of mediators who are located in regional offices throughout the country and who are recruited from both management and labor. Through the years the Federal Mediation and Conciliation Service has established a reputation for impartiality and devotion to duty while occupying a sometimes difficult role. As a general rule, the service concentrates its energies on the resolution of disputes that have an appreciable impact on interstate commerce. In a dispute that threatens to cause a substantial interruption to commerce, the Federal Mediation and Conciliation Service may enter the dispute either on its own motion or on the request of one or more of the parties to the dispute. In disputes that imperil the national health or safety, the service must by law intervene. Should the parties agree to arbitrate their differences the service will furnish them with a list of qualified arbitrators.

## 14.21 EMPLOYER LOCKOUTS

A lockout occurs when an employer or, more commonly, an association of employers close their establishments against employees during negotiations, and cease operations until a settlement has been reached. A strike is the withholding of workers from the contractor until a settlement is reached. A lockout is an employer device to withhold employment from its workers until an agreement is achieved. Employer lockouts have sometimes been referred to as strikes in reverse.

Labor's right to strike or to engage in concerted activity for bargaining purposes is protected by law. The law does not, however, directly provide employers the parallel right to engage in a lockout. Federal labor law does not expressly permit or forbid lockouts, and such lockouts are legal under certain circumstances that are not spelled out in the law. The NLRA gives workers the right to bargain collectively and makes it an unfair labor practice for employers to interfere with that right. Hence, it is up to the NLRB and the courts to decide whether a particular lockout constitutes "interference." The guideposts to legality are vague, and contractors who engage in protective lockouts assume the risk of having to prove that the circumstances justified their actions. Competent legal counsel is highly desirable for contractors who contemplate such an action.

Over the years, some guidelines have emerged that are generally useful in judging the legality of a lockout action. Based on precedent, the following can be said to be circumstances that could justify a lockout:

1. Unusual economic circumstances exist such that a strike would cause substantial loss to the contractor.
2. Circumstances where a strike would pose a serious threat to the public health and welfare.
3. A lockout by members of an employer association is necessary to prevent "whipsawing" by the union.

4. A union is engaging in selective strikes against individual members of an employers' association.

In addition, the U.S. Supreme Court has held that the lockout is a valid counterweapon after an impasse has been reached in a bargaining dispute, even if the employer is not anticipating an immediate strike. The lockout cannot be used in situations in which there is antiunion intent, but is lawful for use only in support of a legitimate bargaining position as an economic tool to counter a union's strike weapon. The NLRB has held that multitrade contractor groups acting in concert does not render a lockout illegal, so long as the interests of the employers involved are sufficiently interwoven to justify their taking concerted action in their common interest. The NLRB has also ruled that it is legal for an employer to hire temporary workers during a lockout of its regular employees. This decision says that a contractor does not violate current labor law by hiring temporary replacements during a lockout in order to keep construction operations progressing.

## 14.22 WAGES AND HOURS

Details associated with craft labor wages and hours are generally the pivotal bargaining issues in the negotiations for a collective bargaining agreement. The negotiations on other issues typically are very much secondary in nature. Actually, wages and hours are broad subjects, covering such considerations as hourly wage rates, fringe benefits, overtime rates, show-up time, designation of premium time, additional compensation for working at heights, travel time, subsistence allowances, apprentice wage rates, and cost-of-living wage escalators.

It is usual practice for overtime rates to be required for all hours worked in excess of 8 hours per day, 40 hours per week, and for work done on Saturdays, Sundays, or holidays. Overtime rates are normally one and one-half times the regular rate of pay, although "double time" pay may be stipulated in some agreements. Many union contracts now allow four 10-hour workdays without payment of overtime.

Travel time and subsistence are often included, and usually pertain to projects located in remote areas. Most bargaining agreements establish a mechanism for determining the status of a given project. If a job is found to have a remote classification, special rules apply regarding contractor-furnished transportation, field camp facilities, payment of subsistence, and travel reimbursement.

During periods of inflation, cost-of-living adjustment often referred to as "COLA clauses" are commonly included in construction labor contracts. In an attempt to protect the purchasing power of their members during such times, the unions often negotiate contracts that automatically adjust wage rates for inflation or for increases in the cost of living. The most commonly used measure of the rate of inflation is the Consumer Price Index (CPI), which is published every month by the Bureau of Labor Statistics for selected cities, and for the country as a whole. Changes in the CPI, expressed in either index points or percentages, are the typical basis for calculating periodic wage changes in collective bargaining agreements.

The rapid growth of open-shop work has served generally to abate the historic steady increase in negotiated union wage rates in recent years. In many cases, the wage rates of organized construction workers have been reduced or held steady with no increase. Where increases have been negotiated, the changes have generally been relatively small. Of course, general economic trends and the volume of construction work being performed are also moderating factors that affect the ability of organized labor to seek wage rate increases for craft workers.

## 14.23 ADMINISTRATION OF THE LABOR CONTRACT

The signing of the negotiated collective bargaining agreement does not close the matter of contractor-union relationships. Rather, the status of the agreement merely changes from that of negotiating for the terms of the labor contract, to one of interpretation and administration of the agreement. A carefully considered and clearly worded contract will do much to minimize subsequent misunderstandings regarding the contract.

Labor agreements in the construction industry typically contain procedures for the settlement of disputes that may arise during the life of the labor contract. When a dispute occurs that cannot be resolved by a conference of the steward, business agent, superintendent, and any other party directly involved, the grievance procedure that has been set forth in the agreement is followed. This procedure often provides for meetings between successively higher echelons of contractor and union officials, and typical provisions are that during this time no work stoppage is to occur. Should the grievance procedure not resolve the dispute, arbitration of the matter may or may not be provided for in the labor agreement. Historically, unions have resisted the concept of binding arbitration, preferring to remain free to select their own course of action to suit the situation. Nevertheless, many construction labor contracts now provide for the arbitration of contract disputes with no option to resort to strikes or lockouts.

It is worthwhile to note that an agreement to arbitrate can be enforced against either contractors or unions by a federal court injunction. The law on this matter with respect to management has been long established. In 1970, the U.S. Supreme Court reversed an earlier ruling that the Norris-LaGuardia Act barred federal court injunctions against labor unions and ruled that injunctions could be issued on complaint of employers to enforce no-strike agreements to arbitrate.

When a labor contract is signed, the contractor is obligated to comply with the terms of the agreement, and he must be insistent that the unions do the same. Because administration of labor contracts is an everyday requirement for the union contractor, a carefully selected individual is usually designated within the contractor's organization whose responsibility it is, to handle the labor relations for the firm. When a specific person is assigned to this duty, even if this duty is one of several responsibilities, he or she can become versed in the complexities of labor law and the provisions of the local labor agreements. This person becomes, in fact, the labor relations specialist for the company. In this way the labor policy of the company can be consistent and informed.

## 14.24 DAMAGE SUITS

Section 301 of the Taft-Hartley Act provides that suits for violation of labor contracts between an employer and a labor union representing employees in an industry affecting interstate commerce can be brought in the federal district court having jurisdiction. The law provides that any employer or labor organization subject to the Taft-Hartley Act is bound by the actions of its agents, and that a labor organization may sue or be sued as an entity and on behalf of the employees whom it represents. Any monetary judgment so obtained against a union is enforceable only against the organization as an entity, and not against any individual member of the union. The U.S. Supreme Court has ruled that an employer can sue a union for damages resulting from violation of a no-strike arbitration agreement, but may not sue union officials or members individually.

Damage suits for losses suffered as a result of unlawful strikes, picketing, or other union actions may also be brought into federal courts under the provisions of the Taft-Hartley Act. Section 303 of

this act establishes the right of an employer who is injured in his business or property by a secondary boycott, hot-cargo agreement, jurisdictional dispute, or other unfair labor practice, to sue the responsible union or unions for damages. Additionally, any injured party, not just the employer against whom a strike or boycott is called, is entitled to bring suit for damages which are sustained through unlawful union action.

## 14.25 PREJOB CONFERENCES

When employment conditions pertaining to a given union project are out of the ordinary (that is, the conditions are not clearly provided for in the local agreement), it is common practice for a prejob conference to be held between the contractor and the union or unions involved. This meeting may be held before bidding, so as to establish standard conditions for the bidding contractors, or may be held prior to the start of field operations. In either case, the underlying motive is to achieve a meeting of the minds between the employer and the unions regarding specific job conditions of employment.

For example, consider a job that is to be located in a remote area. The contractor wishes to provide the necessary labor in the most economical manner possible, and the unions require that fair standards be maintained. If the project is near a town of any size, the contractor may decide to quarter its workers there and furnish transportation back and forth to the site. If this solution is not feasible, temporary barracks or trailers may be provided for the craft workers at the project location. The contractor and the unions must arrive at a mutually acceptable understanding with regard to quarters, subsistence pay, and transportation. In addition, the locals having jurisdiction must be queried in order to determine whether they have sufficient workers available to staff the remote project with craft workers. If not, arrangements must be made to bring in workers from the outside, on the part of either the local union or the contractor.

There has sometimes been some degree of contractor resistance to the use of the prejob-conference concept, based on the belief that such meetings can encourage the unions to make exorbitant demands because of an unusual situation. However, it has often been found that unions may be much more reasonable when approached at this stage than they may be at a later date, when they become aware of the unusual conditions and come to believe that the contractor is not maintaining fair standards for the craft workers. Obtaining advance union acceptance of the contractor's proposed procedures can generally be said to make it much easier for the contractor to devote its energies to getting the project completed, rather than having to combat active union resistance and interference because the union is working to mitigate what it believes to be an encroachment upon the fair treatment of workers.

## 14.26 THE MERIT-SHOP CONTRACTOR

A merit-shop contractor, also referred to as an open-shop contractor, is one who is not a signatory to a labor agreement with a construction union or unions, and who hires its craft workers from the open labor market. This type of employer hires its employees and contracts with subcontractors without regard to their union or nonunion status. A merit-shop contractor recruits, hires, trains, promotes, disciplines, and discharges its employees in accordance with its own company policies and procedures. It is up to the employer to establish its own pay rates and fringe benefit plan. Additionally, the merit-shop contractor establishes its own company policies with regard to working conditions and work rules for craft labor.

Because the merit-shop contractor has no ready-made source of construction labor, it must make an extra effort to obtain, train, and retain its field forces. This requires a company labor relations policy

that helps the new employee get to know and understand the company and to engender a feeling of personal involvement and belonging. Because the contractor is free from union trade jurisdictions, open-shop firms have created new occupations combining different construction types, and helpers are widely used for routine and unskilled work.

Although merit-shop pay rates are, on the average, somewhat lower than union scale, continuity of employment and the fact that union dues are not required, provides the nonunion craft worker with an annual income that is frequently much the same as, or sometimes better than, that of his union counterpart. Open-shop contractors may employ union and nonunion workers alike. They oppose union make-work rules and strict trade jurisdictions, and maintain that every contractor should have the right to deal with any other contractor or business firm, union or nonunion, as it may choose. The open-shop concept defends the right of the contractor to manage its projects and to establish and maintain workplace practices for its craft labor.

For example, merit-shop contractors decide for themselves what the size and composition of work crews will be, and they make the determination regarding the jobs or tasks to which a worker can be assigned. They are free to use prefabricated materials as they choose, and are not subject to jurisdictional disputes, featherbedding practices, forced overtime, or work slowdowns. They pay workers according to the ability and performance of the craft workers. Workweeks of four 10-hour days without payment of overtime are common on projects constructed by open-shop contractors.

Merit-shop contractors have complete freedom with regard to the manner in which they deploy field personnel. Unhampered by union rules, they can assign workers according to the needs they have determined, and can utilize labor efficiently. When the level of company employment is down, skilled personnel can be assigned to lower task levels, thus keeping key workers employed by the firm until the work volume again increases. Open-shop contractors can pay a broad range of wages to journeymen and helpers of different levels of skill and experience, while the union employer is bound to pay all workers of a given trade classification the same wage.

## 14.27 SOURCES OF OPEN-SHOP LABOR

A common problem faced by open-shop contractors is obtaining adequate numbers of skilled workers. Of necessity, the open-shop firm must recruit its work force through more informal channels than does its unionized counterpart. Through the medium of hiring halls, the construction unions act as brokerage agents to provide unionized contractors with the needed skilled labor on a consistent and dependable basis. Moreover, union apprenticeship programs assure that when a journeyman is dispatched from the union hiring hall, he or she has the requisite skills of the craft. Nonunion companies do not have such a centralized recruitment mechanism available to them.

Open-shop contractors now use a variety of procedures to assist them in obtaining their craft labor. Open-shop apprenticeship and training programs on a company-wide, and regional, and national basis, are now producing substantial numbers of skilled tradesmen. Open-shop firms often maintain a network of informal worker contacts, mostly through their project superintendents and crew foremen. Many such firms cooperate with one another by lending and trading workers and information about workers among themselves as their individual needs dictate.

## 14.28 APPRENTICESHIP PROGRAMS

Traditionally, apprenticeship programs in the construction industry have been a joint effort between individual union-shop contractors or local chapters of contractor associations and the AFL-CIO building trades unions. A National Joint Apprenticeship Committee for each craft is responsible for developing suggested national training standards for that craft. The actual employment and training of

apprentices is essentially a local matter supervised by local joint apprenticeship committees that are comprised of both contractor and labor union representatives. Most union labor agreements contain provisions for apprenticeship training. These programs are typically funded by a "cents per man-hour worked" payroll fee that is paid by the signatory contractors into an apprenticeship fund.

In 1971, however, the Bureau of Apprenticeship and Training approved national apprenticeship standards for the employees of open-shop contractors. This was the first time unilateral apprenticeship programs were approved on a national basis and placed under the direct supervision of employers only. Consequently, independent programs can be registered when the sponsors decline to participate in existing local joint training programs of the union.

For local programs to be approved by and registered with a state apprenticeship council or with the Bureau of Apprenticeship and Training, the operating standards adopted by the local body must meet certain criteria. In general, a construction trade requires two to four years of on-the-job training and a minimum of 144 hours a year of related classroom instruction. Apprentices can be indentured to an individual contractor or to a multiemployer organization. Many apprenticeship programs, both union and open-shop, are sponsored by contractor organizations such as the Associated General Contractors of America, Associated Builders and Contractors, National Association of Home Builders, and many other national employer organizations. It is important to note that apprenticeship wage rates on Davis-Bacon projects can be paid only to workers who are participating in a certified training program.

Federal regulations designed to increase minority-group participation in apprenticeship programs by requiring unions and contractors to go beyond passive nondiscrimination have been in effect for some years. These regulations require that apprenticeship programs accept sufficient numbers of minority-group apprentices to make the racial composition of the local labor force reflect the racial mix of the community. In addition, special apprenticeship programs are in operation to accelerate the entry of women into the building trades. Unions and/or contractors operating apprenticeship programs must have a positive affirmative action plan covering all phases of the program including recruitment, admission, and selection of minorities, and underrepresented groups, and women. Compliance reviews are made, and noncompliance can lead to deregistration of the apprenticeship program or prosecution under the provisions of the Civil Rights Act.

The Bureau of Apprenticeship and Training has approved the "Model for Unilateral Trainee Program Standards" as prepared by the Associated General Contractors of America and the "Wheels of Learning" training materials of the Associated Builders and Contractors for use in unilateral (no union participation) apprenticeship programs. These modular materials allow competency-based rather than time-based training. The use of these programs allows apprentices to complete each phase of their training by demonstrating their competence and abilities rather than spending a prescribed number of hours in the program. The competency-based format can appreciably reduce the length of the traditional apprenticeship period. However, competency-based training must be approved by the local Bureau of Apprenticeship and Training office, or by the state apprenticeship council if there is one. It is also important to note that job safety is now integrated into all apprenticeship and training programs.

In some union-conducted apprenticeship programs, the unions have their apprentices sign a promissory note for each year of training, a debt that can be repaid by working for union contracting firms. To make it more difficult for nonunion contractors to hire skilled union workers, the union may charge apprentices for the cost of their training if they work for an open-shop firm within a stated period of time following the completion of their apprenticeship program.

## 14.29 NONAPPRENTICESHIP TRAINING PROGRAMS

There are a variety of programs that are designed to train construction industry workers, which do not follow formal apprenticeship procedures. There are publicly funded plans at both the federal and local level designed primarily to train minority youths, women, and unemployed workers, veterans, underrepresented groups, etc. These programs concentrate on hands-on, preapprenticeship preparation and the upgrading of existing skills. In addition, many vocational-technical schools provide construction-related instruction.

Privately supported and conducted training programs are largely concentrated in the open-shop segment of the construction industry. Classroom instruction, on-the-job training, and a variety of other teaching media are utilized by different training programs.

Additionally, some contractors conduct their own in-house training programs. These include all types of training in curricula of varying styles and scope of coverage. Many of these contractor efforts involve intensive specialized instruction to develop craftsmen who are highly skilled in a particular type of work. Large open-shop contractors often make a heavy investment in their manpower training. This involves diverse forms of training geared to the needs of specific job requirements.

Many local chapters of the Associated Builders and Contractors and the Associated General Contractors of America have programs that train people as helpers. These are on-the-job procedures that prepare workers to fill jobs in support of skilled craftsmen. Chapters of several contractor associations sponsor programs that offer specific task and cross-craft instruction.

## 14.30 SUPERVISORY TRAINING

In addition to providing craft worker training, many contractors, as well as a number of contractor and subcontractor professional associations, are now offering training in the supervision and management of construction projects. Founded on the principle that supervision and management require the development of skills and abilities which are different from the technical skills of craft workers, and based in the notion that effective management of craft labor on construction projects is critical to the success of projects and the profitability of contractors, these programs utilize a variety of methods to make construction workers aware of, and proficient in, the workings of supervision and project management. These programs are discussed more fully in Chapter 9. It should also be noted that some construction craft unions, recognizing that their journeymen often advance very rapidly into supervisory roles or foreman roles today, are also participating in some of these programs, and/or are offering such programs as a component of apprenticeship training.

## 14.31 PRESENT CONSTRUCTION INDUSTRY STATUS

During the past 20 years or so, the construction industry has seen a profound shift in some locations, away from union shop operations and toward open-shop contracting. Despite opposition from the labor unions, an increasing proportion of construction work today is being performed by open-shop or merit-shop contractors. A variety of statistics published by the Bureau of Labor Statistics, which is a division of the Department of Labor, can be consulted for documentation of these facts (http://www.bls.gov/).

One of the reasons for this unprecedented transition has been the loss by unions and union contractors, of much of their traditional competitive advantage. A marked decline in worker productivity,

coupled with high wage rates, expensive fringe benefits, restrictive rules on apprentices and helpers, inefficient work rules, and jurisdictional disputes that are contained in many collective bargaining agreements today, have left many union firms no longer competitive, and have contributed to the shift to open-shop. Some contractors believe that overly rigid labor agreements have made it difficult or impossible for union contractors to exercise sufficient effective management control over their craft workers and their field operations.

A swelling of the ranks of nonunion construction firms and workers, along with disenchantment on the part of some construction craftsmen with the unions, have contributed to the rapid growth of open shop contracting. Some union construction craft workers have sought employment with nonunion firms. This phenomenon has also been enhanced by the fact that some owners are seeking out nonunion construction firms to perform the work on their projects because they believe this may result in lower cost and fewer job delays.

It should be noted with regard to the general trend toward increased open-shop contracting, that there are appreciable differences among states, regions, and local labor markets with respect to this shift. There are still many areas, especially those large cities that have long been the citadels of construction union power, where open-shop penetration has been limited or nonexistent. In addition, the Davis-Bacon Act and many state prevailing wage laws have operated to offset the open shop's cost advantages on public works. For many years, Davis-Bacon administrative procedures often required that open-shop contractors pay the equivalent of union wages. Also, Davis-Bacon generally uses union craft designations and excludes from its wage categories the helper, trainee, and preapprentice labor classifications that open-shop contractors utilize so effectively. Such prevailing wage laws have effectively forced open-shop operators to adopt some of the more costly practices of their union competitors on public projects. Hence, to date, open-shop work has not made a strong entry into the public sector. However, recent modifications in state laws and new Davis-Bacon regulations may portend change in this situation.

During the past several years, the Associated Builders and Contractors (ABC), an organization founded on the principles of merit-shop construction, has become a large, and active, and effective national organization, advocating open-shop construction contracting. This organization now has chapters in all parts of the country and provides its members with a variety of valuable services. Furthermore, more than 50 percent of the members of the traditionally union-oriented Associated General Contractors of America (AGC) now operate as open shop or dual shop contractors. The AGC now offers its members a full line of open-shop services.

## 14.32 DUAL-SHOP OPERATION

A number of construction contractors operating under union labor agreements have found that their labor costs have made them noncompetitive for work in certain categories, or in some geographical areas. To solve this problem without changing to an open-shop operation, some construction firms have chosen to form and operate a second company that is open shop. The original union-shop firm continues to function in those areas where unions are strongly entrenched, and the nonunion firm does business where open-shop work has become established. The NLRB has approved such "dual-shop," or "double-breasted," operations when certain conditions are met.

It is of great importance to a contractor establishing a dual shop to avail himself of expert labor law counsel in order to assure that the open-shop operation is properly established, and that the two companies are sufficiently separate in management and operation so as to qualify for separate employer status as defined under federal labor law. If the two firms are found to actually be a single

employer, or if the nonunion firm is found to be the "alter ego" of the union company, the open-shop company can be held liable retroactively for underpaid wages and delinquent fringe benefit payments under the original company's collective bargaining agreement. Additionally, the employees of the open-shop firm could then be placed under the jurisdiction of the original company's labor contract, with very costly consequences. In addition, a breach-of-contract suit or unfair labor practice charge could be filed by the union.

The principal factors that the NLRB considers in deciding whether sufficient separation exists between the two businesses include:

1. Interrelationship of operations.
2. Centralized control of labor relations.
3. Common management.
4. Common ownership or financial control.

The factors most emphasized by the NLRB in its analysis of the company are operational integration and control of labor relations. The main criterion for a double-breasted operation is that there must in fact be two separate and independent business entities, each of whose labor policies are conducted without interference from the other. This requires that the two companies be independent in their day-to-day operations and also in their labor relations policies. The usual procedure employed by companies has been to establish separate corporations (not wholly owned subsidiaries or divisions) with each having separate management, field supervision, work forces, equipment, and financing.

The NLRB, with court approval, has held that common ownership does not, in itself, dictate an illegal status of dual operations when there is no common control of labor policies. The general rule is that two commonly owned corporations in a double-breasted operation are considered to be two separate entities under the National Labor Relations Act if there is no direct control from one company over the other with regard to day-to-day operations or labor relations. The principal consideration is that independence of labor policy makes the two act as different employers and, as such, employees of each constitute a separate bargaining unit. When each company is a separate and independent entity, each is entitled to the same protection against secondary boycotts and to the same protection from one another's labor controversies. Competent legal advice is certainly a necessity for any contractor contemplating double-breasted operation, or considering changing from union to nonunion status.

The dual-shop concept is, understandably, opposed by the construction unions. As a part of their continuing efforts to inhibit the growth of dual shops, some labor unions have sent questionnaires on this subject to their signatory contractors. The purpose of such questionnaires is to determine the extent to which a union firm may be operating, managing, or controlling a nonunion company arm. The U.S. Supreme Court ruled in 1983 that such a union request for information from a union contractor concerning the existence or the workings of a dual-shop arrangement cannot be refused. To do so is regarded to be an unfair labor practice and a failure to bargain in good faith.

In a move designed to keep the nonunion part of a dual-shop company from being able to compete effectively, many local unions negotiate "work preservation clauses" into their labor contracts. These clauses extend the terms of a labor agreement to any business entity with which a signatory contractor may have direct or indirect management, control, or majority ownership. Such a clause requires the nonunion arm of a dual shop to conform to all of the terms of the labor contract pertaining to the union half. Thus, the work preservation clause requires that both companies are bound to the same union wage agreement for all work done within its geographical jurisdiction.

## 14.33 UNION REACTION TO OPEN SHOP

The construction unions have not taken the trend to nonunion employment lying down. In an effort to halt the open-shop tide and to regain lost ground, the building trades unions have taken a number of countermeasures.

Some of the steps taken have been purely defensive, concentrating on restrictive strategies to lock in the union market. As noted in the previous section, a vigorous effort to restrict or eliminate the dual shop has been under way for some time. Broad restrictions of many kinds on the subcontracting of work to nonunion firms are being included in negotiations for labor contracts. Strong political pressure is being exerted to prevent further revision or repeal of the Davis-Bacon Act. The unions display opposition to any change being made to existing apprenticeship procedures or program classifications, and support fully withdrawal liability for contractors who withdraw from multiemployer pension plans, which can make it difficult for a union contractor to change to open-shop status. At times, union pension, health, and welfare funds have been used to finance projects, where the construction of the project has been restricted to union contractors.

The unions have also frequently reflected a much more moderate attitude regarding collective bargaining and have at times made sincere attempts to improve the cost-effectiveness and the competitive position of unionized construction contractors. Recent years have seen some important changes in labor contract provisions. Wage reductions have been made at times, and wage freezes have become fairly commonplace. Where wage increases have been negotiated, they have often been much more moderate than in past years. Fringe benefits have been subjected to the same treatment. Wage rates for overtime have been reduced from double time to time and a half for Saturdays as well as weekdays. Shift-work clauses now allow some crafts to work in shifts at round-the-clock sites at straight time pay. The requirement for standby crews has been eliminated in many cases. Limitations have been placed on travel and subsistence pay, show-up pay, nonworking foremen, minimum crew sizes, and rules regarding crew composition.

Many labor contracts now include strict no-strike–no-lockout provisions. Many unions have dropped the all-union or all-nonunion job concept in favor of accepting a mix of union and nonunion contractors and subcontractors on a given jobsite. Some unions now allow the use of more apprentices on jobs as well as subjourneymen and preapprentices or helpers. Many restrictive work rules and jurisdictional conflicts have been eliminated and steps have been taken to provide more jobsite flexibility to the contractor. A concerted effort is being made to avoid job delays, strikes, picketing, and work stoppages on union projects.

A conscious joint effort is being made in many cases, by union labor and management to reduce or eliminate the adversarial relationship between unions and employers. Joint committees conduct regular meetings seeking to resolve common concerns. A real effort is being made to open lines of communications and improve common understanding. Joint public relations programs, designed to improve the public perception of unionized construction and to apprise users as well as the public of the advantages of union-built jobs, are under way.

## 14.34 SUMMARY AND CONCLUSIONS

The heart and soul of a construction project, and of the operations of a construction contracting company as well, are the skilled working people, the craft workers who actually perform the work of construction. Small wonder then, that the content of this chapter has addressed itself to ways and means by which construction contractors go about the matter of effectively providing for and

managing their most important, and most complex, and most valuable resource, the skilled and talented craft workers who perform construction work.

## CHAPTER 14 REVIEW QUESTIONS

1. Define *dual shop operation* and state a synonym by which it is known. Is a dual shop operation legal? Explain.
2. Define the following and discuss their roles: union steward, union business agent.
3. Define *open-shop contractor*.
4. Define *merit-shop construction contracting,* and name the contractor trade association that promotes this practice.
5. Define national agreements and project agreements, and discuss their use.
6. Discuss the role of the Bureau of Apprenticeship and Training in assisting with training of construction craft labor.
7. Is it possible for a contractor to withdraw from a multiemployer bargaining unit? Explain.
8. Discuss the origin, evolution, and current role of the AFL-CIO.
9. Define, and explain the role of, the CBA.
10. What are the most prevalent issues to be negotiated in a collective bargaining agreement?

# Chapter 15

# Project Safety

## 15.1 INTRODUCTION

Construction contractors today are, for the most part, mindful in every way of their duty morally and legally, to provide for the safety and health of their employees. Because construction sites are fraught with hazards of all kinds, it is imperative for management and craft people alike, to be mindful of safety at all times. Safety consciousness, policies, practices, and mind-sets cannot be reinforced too often, nor too emphatically.

Virtually all construction companies are required to comply with laws regarding safety in the workplace, and all companies have adopted safety policies, and training, and behavior-based programs. It is not the intent of this chapter to provide a comprehensive summary of all aspects of safety requirements and policies and procedures for all construction contracting companies. Rather, some of the key features of the laws regarding safety will be recounted here. Additionally, some of the important aspects of safety policies and procedures for construction companies, and some of the key elements of safety planning and safety practice important in the management of construction projects will be addressed here.

## 15.2 THE COST OF CONSTRUCTION ACCIDENTS

Construction, by its very nature, is permeated with hazards and risk of all kinds, and the construction industry has historically experienced very high rates of deaths and disabling injuries. Tragically, still today, a number of construction workers are injured and some die each year in the United States as the result of work-related injuries on construction sites. The toll from construction accidents ranks the construction industry very high every year with regard to both the incidence rate and severity of accidents as compared to other industries. The fatality rate of construction workers is among the highest of all American industries. The cost of these accidents in the construction industry is high, in terms of both dollar cost and human suffering. Job accidents impose on this industry a tremendous burden of needless and avoidable expense, as well as a terrible toll, physical and emotional, on all of those who are directly impacted.

But the consequences of construction accidents are not expressible in terms of dollars alone. Money loses much of its significance when bodily injury and death are involved. Nevertheless, the financial consequences of accidents are an important matter to the construction industry and for the individual contractor.

The construction industry bears a burden of approximately $2 billion per year in direct cost resulting from largely avoidable job accidents resulting in injury and death. Direct costs of accidents are those attributable to emergency medical services, emergency room and hospital and medical care,

subsistence payments, rehabilitation, and other benefits that are provided by worker's compensation insurance.

In addition, construction accidents also involve an additional component of substantial costs that are either not insurable or that are not provided for by the usual construction insurance coverage. These are described as the "hidden costs" or "indirect costs" of accidents. These costs are enormous, and by various estimates range from four to as much as twenty times greater than the direct costs. Examples of uninsured indirect costs are first aid expenses, disruption of job site activities, time spent by management workers and craft workers in looking after the injured, damage or destruction of materials, cleanup and repair costs, idle machine time, unproductive labor time, lowered employee morale, spoiled work, equipment damage, schedule disruptions, loss of trained manpower, work slowdowns, wages paid to injured workers, adverse publicity, administrative and legal expenses, and other expensive side effects.

Another common source of cost to the contractor stemming from job accidents is third-party lawsuits by injured workers of another employer. For example, the injured employee of a subcontractor often sues the project owner, the general contractor, or another subcontractor because worker's compensation laws do not normally allow an injured worker to sue his direct employer (see Chapter 8).

## 15.3 SAFETY LEGISLATION

The advent of the industrial revolution in the United States was marked by a simultaneous proliferation of unsafe working conditions in a number of industries, including the construction industry. Although employers had certain common-law duties toward their employees, such as to provide a safe place to work, the safeguards to health and safety that are taken for granted today were not customary at that time. As a matter of fact, there was no general acceptance of the notion that employers should be concerned with the welfare and safety of employees while they were on the job. Certainly, no concerted effort was made to render working conditions less hazardous. It was believed by management that most work accidents were caused by the carelessness of the employees themselves and that it was the worker's responsibility to avoid accidents. However, the grim loss of life, limb, and livelihood aroused the public conscience, and the latter half of the nineteenth century witnessed a gradual change in the general attitude toward work safety.

The primary responsibility for statutory job safety requirements in the United States has traditionally rested with the state governments. In 1867, Massachusetts took the first legal step toward remedying the dangerous working conditions that were characteristic of the time. During the following years, many other states enacted laws pertaining to working conditions for workers in factories, in mines, operating machinery, inspecting and operating steam boilers and elevators, and those engaged in fire protection. All states have now enacted some form of legislation that provides general rule-making authority to designated state agencies in the areas of occupational health and safety.

## 15.4 STATE SAFETY CODES

Details of safety codes vary considerably from one state to another, but there is a trend toward greater uniformity in the provisions of the regulations through adoption of the standards developed by such bodies as the American National Standards Institute. Although some states have established comprehensive safety standards applicable to all types of employment, the tendency has been to develop special codes for particular industries, operations, or hazards.

Some specific hazards are regulated in a large majority of the states. Codes now relate to construction, as well as to cranes and derricks, elevators, boilers, mechanical systems, power transmission towers, fire protection, floors and stairways, illumination, sanitation, ventilation, electrical hazards, explosives, ladders, spray painting, welding, and other areas of potential danger. All states require the provision of first aid and protective equipment in places of employment. State safety codes make the employer and its supervisory personnel responsible for compliance with the code, and for suitable safety instruction to the worker. In turn, the employee is required to make use of safeguards provided for his protection and to conduct his work in conformance with the established safety rules.

Each state industrial commission or labor department has jurisdiction over every type of employment and place of employment within its state, and is authorized to enforce and administer established codes and rules pertaining to the safety and protection of workers. The commission is vested with full power and authority to establish and enforce necessary and reasonable rules and regulations for the purpose of implementing the state law. In general, whenever the commission finds that any type of employment or place of employment is not safe, or that employees are not being adequately protected, it is empowered to order the employer to rectify the situation and to furnish safety devices and other safeguards reasonably required. Violation of a state safety code is punishable by fines and/or imprisonment as provided by the applicable statute. As discussed in the next section, a number of federal statutes have now been adopted which are supplementary to or are preemptive over state law in matters of health and safety in certain employments, unless the state has adopted health and safety requirements that meet or exceed federal standards.

## 15.5 FEDERAL HEALTH AND SAFETY ACTS

Two federal laws have been enacted that impose safety standards on the construction industry. These are the Construction Safety Act of 1969 and the Occupational Safety and Health Act (OSHA) of 1970. The Construction Safety Act of 1969 was written to apply to construction projects financed in whole or in part by federal funds. It prohibits contractors from requiring tradesmen to work under conditions that are unsanitary, hazardous, or dangerous, as determined under standards issued by the secretary of labor. Before the provisions of this act could be effectively implemented, however, the federal government adopted OSHA in 1970. This legislation applies to employers in interstate commerce, including those in construction. The safety regulations that were promulgated for the Construction Safety Act were included within the construction regulations for OSHA. The OSHA provisions pertain to virtually all construction in the United States, both public and private. Some of the important provisions and details of this legislation are further discussed in the following sections.

## 15.6 THE OCCUPATIONAL SAFETY AND HEALTH ACT (OSHA)

Under OSHA, employers are responsible for providing a safe and healthful workplace. OSHA's mission is to assure safe and healthful workplaces by setting and enforcing standards, and by providing training, outreach, education, and assistance. Employers must comply with all applicable OSHA standards. Employers must also comply with the General Duty Clause of OSHA, which requires employers to keep their workplace free of serious recognized hazards.

OSHA established the first nationwide program for job safety and health by directing the secretary of labor to establish safety and health standards for all industry. Every employer in interstate

commerce has a twofold obligation to provide employment and a place of employment that is free of recognized health and safety hazards, and to comply with OSHA standards. OSHA also authorized the formation of the Occupational Safety and Health Administration, also referred to as OSHA, to administer and enforce the act.

OSHA has established the Office of Construction Services which publishes protocols and standards intended to respond more quickly and more effectively to the unique hazards and unusual situations in construction. The specialized staff of this office stays abreast of new construction methods, processes, and operations, and bring the expertise of this office into the standard-setting and compliance activities of OSHA. This affords OSHA a higher concentration on construction problems, and enhances protection for those in the industry. OSHA regulations and references for the construction industry are published as the "Construction Safety and Health Regulations" in the Federal Register, and are published as "29 CFR Part 1926 Safety and Health Regulations for Construction." Copies of this document are available from OSHA offices, as well as from book vendors, and construction contractor professional associations.

In addition to providing a safe workplace and complying with all of the safety standards and provisions of the law, OSHA also requires employers to keep and preserve stipulated records of recordable occupational injuries and illnesses. Any fatality or any accident that hospitalizes three or more employees must be reported to OSHA within 8 hours. OSHA records provide management with valuable information concerning the efficacy of the company safety program. For example, OSHA requires that contractors who have more than 10 employees complete and maintain "The Log of Work-Related Injuries and Illnesses" (Form 300). This document is used to classify work-related injuries and illnesses and to note the extent and severity of each case. This log must be maintained at each of the contractor's offices, and construction sites. The contractor is required to inform all employees that the log exists, and to make it available for their examination and review.

Contractors are required to report on Form 300, work-related injuries and illnesses that result in:

- Death
- Loss of consciousness
- Days away from work
- Restricted work activity or job transfer
- Medical treatment beyond first aid

Additionally, the contractor is required to record work-related injuries and illnesses that are defined in the Act as significant, that is, diagnosed by a physician or other licensed health care professional, as well as:

- Any work-related case involving cancer, chronic irreversible disease, a fractured or cracked bone, or a punctured eardrum.
- Any needle stick injury or cut from an object that is contaminated with another person's blood or other potentially infectious material.
- Any case requiring an employee to be medically removed under the requirements of an OSHA health standard.
- A tuberculosis infection as evidenced by a positive skin test or diagnosed by a licensed physician or other licensed health care professional after exposure to a known case of active tuberculosis.

- An employee's hearing test (audiogram) reveals that the employee has experienced a standard threshold shift (STS) in hearing in one or both ears (averaged at 2,000, 3,000, and 4,000 Hz) and the employee's total hearing level is 25 decibels (dB) or more above audiometric zero (also averaged at 2,000, 3,000, and 4,000 Hz) in the same ear(s) as the STS.

An injury or illness is considered to be work related if an event or an exposure in the work environment caused or contributed to the condition or aggravated a pre-existing condition.

When an incident occurs, the contractor uses Form 300 to record specific details about what happened and how it happened, and keeps all of these forms at each office and job site location. A separate form, Form 300A, "The Summary," is prepared once each year to recapitulate the information in the contractor's Form 300s. At the end of the year the summary must be posted in a visible location so that all employees are aware of the injuries and illnesses that are occurring in their workplace. This summary must be posted by February 1 of the year following the year covered by the form, and must remain posted until April 30 of that year. The log and summary must be kept on record for five years following the year to which they pertain.

OSHA established the position of Assistant Secretary for Occupational Safety and Health to take charge of standards and enforcement. Also established was a National Advisory Committee on Occupational Safety and Health to assist with the devising and establishing of standards. An independent Occupational Safety and Health Review Commission, appointed by the president with the advice and consent of the Senate, was created to enforce the standards and to hear appeals. The commission is assisted by an organization of trial examiners and supporting staff similar to the system used by the National Labor Relations Board (NLRB). The commission's findings can be appealed to the courts.

## 15.7 SITE INSPECTIONS BY OSHA

Under OSHA as originally enacted, compliance officers were authorized to conduct unannounced site inspections to see whether employers were complying with safety standards. In the event of such a surprise visit, employers were required to admit the inspectors to their places of business. This was changed in 1978 by a U.S. Supreme Court decision to the effect that such visits are unconstitutional because they violate the prohibition against unreasonable search. Following this ruling, inspections are still made, but admission of the OSHA inspector must be voluntary with the employer, or the compliance officer must first obtain a search warrant. However, warrants are available as long as the inspection is conducted as part of OSHA's general administrative plan for enforcement of the act. Almost one half of all OSHA site visits are on construction projects.

An employer representative and an employee representative have the right to accompany the compliance officer during his rounds of the premises. When a violation exists, a citation is issued by the OSHA area director describing the nature of the violation, the amount of any civil penalty imposed, and setting a reasonable time in which to correct the situation. The employer is required to post at the work site, records of citations and notices of employees' rights. The employer has 15 working days in which to contest a citation. The employer has the option to request an informal hearing with the area director prior to contesting the citation. If a citation is formally contested, the review commission in the regional office holds a formal hearing. Enforcement of the commission's orders or review of its decision is submitted to the area director. Then, if the contractor is not satisfied, he can file with the appropriate U.S. Court of Appeals. If a citation is not contested, it becomes final.

Employees or their representatives can demand inspections of their employers' premises by making complaints directly to the Labor Department in writing. If it is determined that there are reasonable grounds to believe a violation or danger exists, a special inspection is made as soon as possible.

Also, during the course of an inspection, any employee or employee representative can notify the compliance officer of any violations that may exist. The act provides that employees may not be discharged or discriminated against in any way for filing safety and health complaints or otherwise exercising their rights under the act. In 1980, the U.S. Supreme Court ruled that employees have the right to refuse to perform tasks they reasonably believe could result in serious injury or death and cannot be discharged, provided the worker attempted and failed to have the hazard corrected. These provisions of the act are commonly referred to as "whistle-blower" provisions.

If imminent danger to safety or health is noted, the compliance officer is required to promptly notify the employer, the employees, and the secretary of labor. If the imminent danger is not eliminated, the secretary of labor is required to seek a temporary injunction in a federal district court to shut down that part of the operation where danger exists.

## 15.8 PENALTIES UNDER OSHA

OSHA provides for mandatory civil penalties against employers of fines for each serious violation, and for optional penalties of up to $7,000 for each nonserious violation. Penalties of up to $7,000 per day may be imposed for failure to correct violations within the proposed time period. Any employer who willfully or repeatedly violates the act may be assessed penalties of up to $70,000 for each such violation.

Criminal penalties are also provided for in the OSHA legislation. Any willful violation resulting in the death of an employee is punishable, upon conviction, by a fine of not more than $10,000, or by imprisonment of not more than six months, or by both. Conviction of an employer after a first conviction doubles these maximum penalties. The law requires workers to observe applicable health and safety rules, but provides no penalties for their failure to comply. Employers are liable under OSHA for all acts of employees except when the employer did not and could not, with the exercise of reasonable diligence, know of the presence of the violation. Thus, it is the contractor's responsibility to ensure workers' compliance with the OSHA legislation.

It is worthy of note that if a construction manager is controlling or directing the work on a project, he can be held liable for OSHA violations. This is true even when the CM performs no actual work, has no direct contracts with trade contractors, and the actual violation was caused by employees of trade contractors.

For many years, OSHA has had an onsite consultation program that helps construction firms to abate workplace hazards. This is a free onsite consultation service to permit contractors to identify job hazards without risking citations or penalties if unsafe conditions discovered are corrected promptly. The consultants also assist these employers in designing company health and safety programs.

OSHA permits the U.S. Department of Labor to transfer enforcement of employment safety requirements to any state that demonstrates its ability to administer the provisions of the law at least as effectively as the federal government. These are referred to as "state programs." A number of states have such programs in effect, and half of the funding for these programs is provided by OSHA. OSHA requires that all state standards be at least as rigorous as OSHA standards. In states that have state programs, job site inspections are conducted by state inspectors and violations are processed by a state agency.

## 15.9 OSHA HAZARD COMMUNICATION STANDARD

This Occupational Safety and Health Administration Hazard Communication Standard (HAZCOM) became effective for the construction industry in 1988, and is intended to address comprehensively the

issue of classifying the potential hazards of chemicals, and communicating information concerning hazards and appropriate protective measures to employees, and to preempt any legislative or regulatory enactments of a state, or political subdivision of a state, pertaining to this subject. Classifying the potential hazards of chemicals and communicating information concerning hazards and appropriate protective measures to employees may include, for example, but is not limited to, provisions for: developing and maintaining a written hazard communication program for the workplace, including lists of hazardous chemicals present; labeling of containers of chemicals in the workplace, as well as of containers of chemicals being shipped to other workplaces; preparation and distribution of safety data sheets to employees and downstream employers; and development and implementation of employee training programs regarding hazards of chemicals and protective measures. Under Section 18 of the act, no state or political subdivision of a state may adopt or enforce any requirement relating to the issue addressed by this federal standard, except pursuant to a federally approved state plan.

The objective of HAZCOM is to inform workers in American industry about the chemical hazards to which they are exposed during the performance of their job duties. The law makes the employer responsible for communicating this information to his employees. In order to do this, the employer must perform four duties:

- *Written plan*. All workplaces where employees are exposed to hazardous chemicals must have a written plan that describes how the standard will be implemented in that facility.
- *Labels*. All containers of hazardous chemicals must be labeled, tagged, or marked with the identity of the material and appropriate hazard warnings.
- *Safety data sheets (SDSs)*. Chemical manufacturers and importers are required to obtain or develop an SDS for each hazardous chemical they produce or import. Distributors are responsible for ensuring that their customers are provided a copy of these SDSs. Employers must have an SDS for each hazardous chemical they use.
- *Training*. Each employee who may be exposed to hazardous chemicals when working must be provided information and trained prior to initial assignment to work with a hazardous chemical, and whenever the hazard changes.

An effective HAZCOM program depends on the credibility of management's involvement in the program; inclusion of employees in safety and health decisions; rigorous work site analysis to identify hazards and potential hazards, including those which could result from a change in work site conditions or practices; stringent prevention and control measures; and thorough training. It addresses hazards whether or not they are regulated by government standards.

## 15.10 MULTIEMPLOYER WORK SITES

Although OSHA requires that each employer provide his employees with employment and a place of employment that is free from recognized hazards, the matter of duty and responsibility under the act can become very involved on a multiemployer site such as a construction project. On a workplace of this type, employees of different employers are subjected to common hazards that exist at the site, and such hazards are often created by different employers. Who is responsible for safety violations under these circumstances has been a confused issue for some time.

To properly assign culpability for an infraction of the standards on multiemployer work sites, current OSHA policy establishes four categories of employers on such sites:

- *Creating employer*. The employer who actually creates the hazard.
- *Exposing employer*. The employer whose employees are exposed to hazards.

- *Correcting employer*. The employer who has the responsibility for actually correcting the hazard.
- *Controlling employer*. The employer who is responsible, by contract or through actual practice, for safety and health conditions on the work site, that is, the employer who has the authority for ensuring that the hazardous condition is corrected.

It should be noted that a contractor (employer) may fall into more than one of these categories with regard to a specific occurrence. Additionally, more than one contractor may be issued an OSHA citation with regard to a certain occurrence.

An example may serve to illustrate. A masonry subcontractor erects a scaffold in such a way that one or more OSHA standards are violated. The employees of the masonry subcontractor utilize the scaffold for the performance of their work. With the consent of the masonry subcontractor, workers employed by the general contractor on the project also use the scaffold. When OSHA inspects the site, the first subcontractor, the masonry subcontractor, would be found to be the creating employer, and would be subject to citation. Both the masonry subcontractor and the general contractor would be found to be exposing contractors, because their employees were exposed to the hazards. The masonry subcontractor would be the correcting contractor. The general contractor would be found to be the controlling contractor. OSHA citations would be issued to both the masonry subcontractor and to the general contractor, with both receiving more than one citation for their roles as defined above.

OSHA policy also provides that one of the employers on a multiemployer site may be excused from citation, or may be found to hold a lesser degree of responsibility, if it can meet any of a number of conditions set forth in OSHA standards for the purpose. If all employers at the site meet the conditions for being excused, the employer best able to have corrected the hazard or to ensure its correction is issued the citation. The controlling employer can be cited even though no employees of that employer were exposed to the condition.

A prime contractor or a subcontractor cannot delegate or contract away its responsibility under the act. A general contractor can however, include a clause in its subcontracts requiring the subcontractor to reimburse the general contractor for any losses sustained by reason of the subcontractor's failure to abide by safety regulations or general duty of care in conducting its activities at the job site. To assure that safety and health requirements are met, the general contractor is well advised to see that its subcontract agreements require scrupulous adherence to safety and health regulations on the part of the subcontractors.

## 15.11 CONTRACT SAFETY REQUIREMENTS

Construction contracts routinely contain provisions requiring the prime contractor to conform to all applicable laws, ordinances, rules, and regulations that pertain to project safety. Prime contractors, in turn, extend this responsibility to the subcontractors through specific wording to this effect in the subcontractor agreements. Contracts with some public agencies require that the contractor conform with the requirements of the safety code of that particular agency. These standards constitute a contractual obligation with which the contractor must comply or be in breach of contract. Many state highway departments include a safety code in their construction contracts. Some federal agencies, including the U.S. Army Corps of Engineers, the Naval Facilities Engineering Command, and the U.S. Bureau of Reclamation, and others use construction contracts that include health and safety standards in their provisions.

Although construction projects for these agencies are not exempted from OSHA, this act provides that these agencies may continue to use their own safety codes and enforce them. Contractors on

such projects are required to observe OSHA standards as well as those contractual requirements that OSHA does not cover, or that are more stringent than those of OSHA.

Some private, as well as some public, owners play an active role in ensuring that the contractor implement and enforce a rigorous safety program on the project site during the construction process. Frequently today, owners require contractors to furnish information concerning their existing company safety programs, and sometimes copies of their safety policies and programs, as prequalifying elements before being allowed to bid. Additionally, owners frequently require contractors to disclose their safety records, and/or their experience modifier ratings (see Chapter 8) before being allowed to bid. The bidding documents typically include safety specifications, and the owner works closely with the contractor on safety matters during the contract period.

Labor agreements may also impose contractual safety requirements on the contractor. The NLRB has ruled that safety regulations, as an essential part of the terms and conditions of employment, are mandatory subjects of collective bargaining whenever either party places the issue on the bargaining table.

## 15.12 WORK INJURY AND ILLNESS RECORDING

OSHA requires that employers keep certain records pertaining to recordable occupational injuries and illnesses.

Reportable cases are the following:

1. Occupational deaths, regardless of the time between injury and death, or the length of the illness.
2. Occupational injuries that involve one or more of the following: loss of consciousness, restriction of work or motion, transfer to another job, or medical treatment other than first aid.
3. Occupational illnesses that involve one or more of the following: loss of consciousness, restriction of work or motion, transfer to another job, or medical treatment other than first aid.

Recordable cases are classified as follows:

1. *Total recordable cases*. The sum of all recordable occupational injuries and illnesses, including deaths, lost-workday cases, and nonfatal cases without lost workdays.
2. *Deaths*.
3. *Total lost-workday cases*. The sum of cases involving days away from work and/or days of restricted activity.
4. *Nonfatal cases without lost workdays*. The sum of cases that are recordable injuries or illnesses which do not result in death or lost workdays, either days away from work or days of restricted activity.
5. *Total lost workdays*. The sum of days away from work and days of restricted work activity.

## 15.13 WORK INJURY AND ILLNESS RATES

As a means of analyzing, summarizing, and presenting workplace injury and illness data, incidence rates are computed and published for employers of all kinds, including contractors. An incidence rate is the number of recordable injuries and illnesses among a given number of full-time workers (usually 100 full-time workers) over a given time (usually one year). When a contractor has calculated

$$\text{Total Recordable Case Incidence Rate} = \frac{\text{Total Number of Injuries or Illnesses} \times 200{,}000}{\text{Total Number of Hours Worked by All Employees}}$$

The 200,000 number in the formula represents the number of hours 100 employees working 40 hours per week, 50 weeks per year would work, and provides the standard base for calculating incidence rates.

**Figure 15.1** Calculation of Total Recordable Case Incidence Rate

$$\text{DART Incidence Rate} = \frac{(\text{Days Away from Work} + \text{Days of Restricted Work or Job Transfer}) \times 200{,}000}{\text{Total Number of Hours Worked by All Employees}}$$

**Figure 15.2** Calculation of DART Incidence Rate

his incidence rate, he can track it over time, analyzing for trends, or he can compare his company's incidence rate with that of other companies. The Bureau of Labor Statistics (BLS) conducts surveys of occupational injuries and illnesses each year and publishes incidence rates by industry, by employer size, and so on.

To determine his incidence rate, a contractor can count the number of entries on his OSHA Form 300, or consult his OSHA Form 300A. Incidence rates can be calculated on different bases, as the contractor might choose.

A total recordable case incidence rate would be calculated as shown in Figure 15.1.

Sometimes an incidence rate called the DART (days away from work, days of restricted work activity or job transfer) is calculated. The DART incidence rate would be calculated as shown in Figure 15.2.

Incidence rate statistics compiled by the Bureau of Labor Statistics of the U.S. Department of Labor show that the construction industry consistently has one of the worst safety records of all American industries, despite the adoption of OSHA and the application of all of the other safety-minded factors described in this chapter. As noted in the introduction to this chapter, safety consciousness, policies, practices, and mind-sets cannot be reinforced too often or too emphatically.

## 15.14 OSHA AND INDUSTRY TRADE ASSOCIATIONS, CONSTRUCTION COMPANIES, AND INDIVIDUAL WORKERS ARE MAKING A DIFFERENCE

In four decades, OSHA and state programs, coupled with the efforts of employers, safety and health professionals, unions, and advocates, have had a dramatic effect on workplace safety. Since 1970, workplace fatalities have been reduced by more than 65 percent and occupational injury and illness rates have declined by 67 percent. At the same time, U.S. employment has almost doubled.

Worker deaths in America are down, on average, from about 38 worker deaths a day in 1970, to 12 per day in 2012, the most recent year for which statistics have been compiled. Worker injuries and illnesses are down, from a total incidence rate of 10.9 in 1972, to 3.4 in 2011.

## 15.15 ECONOMIC BENEFITS OF SAFETY

In addition to the all-important humanitarian aspects of workplace safety, there is an additional compelling economic motivation in accident prevention. The fact is, a number of financial benefits accrue

to the contractor who conducts field operations in a safe manner and whose accident experience is low. The most immediate and obvious economic gain is the savings realized because of accidents that do not happen. Discussion was provided in a previous section regarding the direct and indirect costs of accidents that are not covered by insurance, and the fact that these costs can constitute serious financial loss for the contractor.

Additionally, studies have shown that construction workers appreciate and value job safety in the workplace, even though they sometimes tend to be careless in their work habits. Employees who feel that their contractor employers are genuinely concerned about safety, and who see tangible evidence of this concern, are more likely to be loyal and cooperative workers, and to be motivated to work safely. The incorporation of safety planning and safety measures of every kind as a part of the mind-set that pervades the entire company, and as an integral part of all construction operations, conveys a powerful message that safety is an important part of everything the contractor does. This, in turn, builds high employee morale and employee loyalty. Safety is one of the potent forces that make workers proud of the company they work for, and proud of the manner in which they perform their jobs, and proud of their record in preventing accidents. The fruits of a safety-first mind-set and high worker morale are higher production and better workmanship, two economic benefits of huge significance.

Another important financial benefit that accrues directly to the contractor as a result of fewer workplace accidents is the reduced cost of workers' compensation insurance premiums, stemming from reduced experience modifier ratings (EMRs), which are determined for all contractors individually and are used by insurance companies to determine the premiums for workers' compensation insurance. As discussed more fully in Chapter 8, a contractor's EMR value is derived directly from the contractor's accident history. The EMR serves as a modifier to the contractor's basic rate, called the manual rate, for his required workers' compensation insurance. If two contractors are bidding or negotiating for the contract award on the same project, and one has an EMR of 0.8 while the other has an EMR of 1.1, the contractor having the lower EMR acquires a significant competitive advantage. Additionally, it should be noted that many owners use contractors' EMR values as an element of prequalification for bidding or negotiating contracts for construction projects and/or as an element in scoring and evaluating contractors' proposals.

Additionally, safety is also an extremely important aspect of public relations. There are few other functions the contractor can engage in that have as much potential for generating public good will and positive public relations, and for avoiding negative reactions from the public, as the contractor making it clear that he maintains at all times and in every way, an active focus on safety in every aspect of his work.

## 15.16 SAFETY SERVICES OF CONTRACTOR ASSOCIATIONS

Local chapters of contractor organizations such as the Associated General Contractors of America (AGC) and the Associated Builders and Contractors (ABC) provide an array of invaluable services in providing their members with safety services of all kinds. The professional staffs of these and other similar organizations provide their members with a wide variety of safety publications, manuals, videos, and in-person training programs on every aspect of workplace safety. Many of these associations have written guides and outlines for contractors' safety program development, and standards to promote and assist the membership with their company safety programs. Many of these associations maintain a full time safety expert on their staff in metropolitan areas, for ready access and use by member contractors. These safety specialists can perform training on job sites or in-house

for contractors, can provide safety consulting services, and can perform job site safety reviews and mock OSHA inspections.

## 15.17 THE ROLE OF MANAGEMENT IN SAFETY

Top management of a construction contracting company bears the ultimate responsibility for the company's safety policies, as well as the company's safety philosophy and mind-set. Management provides for safety awareness and safety training. Company management is ultimately responsible for the accident record compiled by company employees. The impetus for safety consciousness and improved safety performance must emanate from this level.

Legislation and court decisions charge the employer with the responsibility to:

- Provide a safe and healthful place to work.
- Provide safe appliances, tools, and equipment.
- Enforce safety rules.
- Provide instructions and training regarding potential hazards to employees.

Construction companies must now comply with a number of federal and state regulations, with the prime responsibility for safety residing with company management. There is a growing vulnerability of upper and middle managers to personal and criminal liability arising from lawsuits that result from workplace injuries. If a company acts in wanton, willful, or reckless disregard for the safety of its employees, its management can be prosecuted, and managers are becoming more vulnerable to these types of lawsuits.

The attitude of management toward safe work practices will invariably be reflected by the company's project managers, superintendents, and supervisors and, in turn, by the craft workers. An atmosphere of top-level concern and action keeps everyone in the company mindful of safety at all times. Conversely, if the top executives are not sincerely and demonstrably interested in preventing accidents and injuries, and if this mind-set is not continuously conveyed, this attitude will be perceived by managers and craft workers, and will be reflected as a lesser degree of concern on their part. This must not be allowed to happen.

If employee cooperation and participation are to be obtained, the accident control program must start with the genuine and demonstrated interest and support of company management. In addition, management must provide adequate support in the form of dedicating adequate funds and other resources to assure the successful operation of all of the aspects of a comprehensive safety program.

Every level of company management therefore, must reflect a sincere and continuous concern for safety, and must set a good example of compliance with safety regulations. The logical beginning for a construction contracting company is a written company safety policy, produced by top management and communicated clearly to everyone in the company. This policy should contain clearly written rules and standards regarding every aspect of safety and should convey the message in unmistakable terms that management intends to enforce its policies at all times. The policy should contain the additional note that management plans to fully support the policy with a program of continuous training, and that management will provide whatever safety apparatus and personal protective equipment (PPE) is needed, in order to ensure safety in the workplace. This policy should be widely publicized so that all employees become familiar with it, especially with the aspects that pertain directly to them.

A carefully worded safety policy, signed by the company president, that is personally and forcefully brought to the attention of every employee will emphasize management's desire and

determination to reduce accidents. In addition, a written policy is essential to the enforcement of safety rules by supervisors. It is important that company management place the administration and enforcement of the safety policy directly in the mainstream of company operations. Safety must be included as a company objective, along with productivity and quality performance.

Top administrators should provide timely credit and commendation for good safety performance whenever and wherever it occurs. The attendance of executives at employee safety meetings will impress workers with management's sincere desire to eliminate job accidents and to promulgate safety in the workplace.

It is recommended that company records be maintained in such a way that they can break down company accidents by project, so that top management can see where safety problems exist. Field supervisors should be evaluated for promotions and salary increases in terms of their accident records as well as their records of production and cost management. Including safety performance in employee evaluations for promotions and salary have proven to be an effective means of reducing job accidents and enhancing safety in the workplace.

## 15.18 THE COMPANY SAFETY PROGRAM

A written company safety program is every bit as much a part of a contractor's business as estimating and project management. The company safety program should include specific descriptions of:

- The company's safety organization.
- Safety meetings, and classes, and seminars.
- Safety training and personal protection.
- First aid training.
- Cardiopulmonary resuscitation (CPR) and automatic external defibrillator (AED) training.
- Fire prevention.
- Safety documentation and record keeping.
- Job site inspection.
- Accident reporting.
- Near miss reporting.
- Hazard reporting.

Fundamentally, the company safety plan must comprehensively and in detailed fashion identify specific job hazards and provide for training the employees to conduct their work consistently in a safe manner that will minimize the risk of injury. The cause of an accident is an unsafe act or an unsafe condition. Statistics show that 85 percent of all construction job accidents are the direct result of unsafe acts (behavior) and 15 percent of all such accidents are the direct result of unsafe conditions. This is a fact that must be recognized and communicated by a company safety program and indicates that working conditions must be maintained so as to eliminate both unsafe acts and unsafe conditions.

An unsafe condition is a physical circumstance, or a mechanical fault or defect that could cause an accident. Such a condition can result from inadequate safety planning, and is a consequence of the way the job is planned or the manner in which it is conducted. In most cases, unsafe conditions can be corrected by enhancing awareness and providing training, which will result in changing job procedures and the work environment.

An unsafe act is the failure of an individual to follow correct procedures, or failure to use the proper work methods. These are caused by personal carelessness or lack of safety training. Such acts can be prevented by safety education for the individual worker, and by enforcement of safety regulations. Because insurance company studies clearly show that an unsafe act by a worker is present in the vast majority of all construction accidents, the company safety plan should certainly direct itself specifically to this point, and the emphasis should provide a highly personal focus. Merely checking the field work for unsafe conditions will not suffice.

Training programs to assist supervisors with the safety planning on all aspects of their projects, and to educate workers on how to properly perform their tasks, are essential to any company plan. The U.S. Department of Labor, American National Standards Institute, National Safety Council, American Society of Safety Engineers, construction trade associations, and others provide various kinds of aid and assistance with regard to safety training and instruction. Organized labor plays an active role in health and safety training and sponsors educational programs in this regard. First aid training sponsored by local offices of the American Red Cross can be a valuable part of the company safety training program. Company safety directors and safety specialists employed by contractor professional associations are invaluable resources for training of all kinds.

In addition, most insurance companies offer a variety of loss-prevention services. Safety products, training programs, job site visits, reviews of company safety efforts, and services on special problems are among the services provided by insurance companies.

Rules, safety devices, mechanical safeguards, and PPE are important to the prevention of job accidents, but the mental attitude of the workers is even more significant. Until an awareness of their individual responsibility and a desire to ensure their personal safety are established in the minds of all employees, efforts to reduce accidents will not be fully effective. Accident prevention in construction is largely a human relations problem and can be achieved primarily through education, training, enforcement of policies and standards, persuasion, and unrelenting vigilance. People cause accidents, and only people can prevent them. The company plan must emphasize the personal approach to job safety, and management efforts at all levels should be directed to this point.

Because of differences in organization, type of activity, and scope of operations, each contractor must develop an individualized accident prevention plan that fits his own particular circumstances. Job hazards differ considerably among different types of projects such as housing, building, highway, heavy, utility, and industrial construction, a fact that must be reflected by the detailed workings of each contractor's safety program.

Overall responsibility for the company's safety program should be placed with an individual who is capable, energetic, qualified, and genuinely interested in safety in the workplace. This person may be a company executive, a certified safety professional, or a qualified and motivated staff assistant. It is important that this person have the authority to carry out his functions effectively. He is made responsible for project safety planning, safety training, distribution and use of safety equipment, maintenance of first aid facilities on the projects, acquisition, maintenance, and availability of PPE and other safety appliances of all kinds, provision of AEDs, job inspections, investigation of accidents, writing and filing of accident reports, documentation and record keeping regarding safety training, and other associated duties.

Company safety meetings of supervisory personnel, held at regular intervals, can also be very effective for the contractor. A formal program consisting of a guest safety speaker or a film may be presented. Information concerning how the company ranked in state and national safety awards and recognitions, and statistical ratings can be discussed. Accompanying this could be a discussion of recent company lost-time accidents, with information on how they could have been prevented.

Regular safety inspections of each project and a detailed investigation of all lost-time accidents are important aspects of a company safety plan. All near-misses should be reported and analyzed. Safety competitions between company projects for the best safety records may also be conducted, as well as special recognitions provided for project managers, superintendents, and supervisors for exemplary safety practices or performance records. The participation of rank-and-file craft workers can also be encouraged through the awarding of cash prizes for their safety suggestions and slogans.

A contractor's safety program must also pay special attention to the training of personnel who operate heavy trucks and the enforcement of safety regulations that pertain. Compliance with drug-testing rules, vehicle inspections, maintenance standards, driver qualification and licensing, driving time limitations, and accident-reporting requirements are mandatory and require special attention. Trucking safety regulations require that well-qualified and properly rested drivers operate properly maintained vehicles. Driver qualification requires background investigation, study of driving record, written and road tests, medical examination, and drug testing. Federal and state regulations also have strict requirements pertaining to inspection and maintenance of trucks and trailers. Recent safety laws are now being applied to all firms that use trucks and buses. Similar standards should also be effected for all equipment operators on company job sites.

## 15.19 THE PROJECT SAFETY PLAN

Accident prevention aimed at the avoidance of specific occurrences must be planned into each construction project, and into each activity or operation performed on the project. The ever-changing nature of a project during the course of construction does not allow for the detection and elimination of hazards purely on an experience basis, and makes it imperative that monitoring efforts continuously evaluate existing conditions for new hazards. The contractor should establish as an essential part of the planning for each project the particular hazards that the proposed methods, procedures, and equipment will create, and then should devise an accident prevention plan to mitigate them.

Relying on company safety policies, developing a basic safety plan for the project, establishing safety policies and procedures for the project, and relying on their own knowledge and experience, the project manager and superintendent can commence field operations and implement the plan. The following additional procedural steps are suggested for the conduct of the safety program throughout the course of construction activities:

1. Assign prime responsibility for the project safety plan and its enforcement to the project manager and the superintendent, and communicate to everyone on the project that these managers are responsible for all aspects of safety. Under their direction, each craft foreman or supervisor is made responsible for all aspects of safety as they pertain to his group. It is the foreman who is with the crew all of the time, and it is the foreman who must watch for unsafe practices or conditions, and who must promote safety by instruction, precept, and example. On large projects there may be a safety engineer who coordinates the overall plan and devotes his time and energies exclusively to matters of safety, first aid, sanitation, fire prevention, and other such activities.
2. Make suitable and adequate first aid facilities readily available. These facilities may range from a well-supplied first aid kit on small projects to a nurse-staffed infirmary on very large ones. On the usual job with no professional medical assistance available on the site, first aid training for supervisors and foremen is essential, and is sometimes contractually required.

Telephone numbers of the nearest hospital facilities and ambulance service should be stored in cell phones, personal digital assistants, laptops, and tablet computers for ready reference, and should be posted at key locations around the job site as well. First aid kits should be dust-proof and easily available, and employees must be informed regarding their locations. First aid kits must be checked at frequent intervals for any needed replenishment or replacement of contents.

3. Provide safety indoctrination and training for all new personnel to acquaint them with the company safety policy, to provide training and direction and rules needed for performing their work in a safe manner, and to stress that strict conformance with all safety policies and regulations is a condition of employment. Special safety instruction must be provided for particularly hazardous work. Every employee should be instructed to report immediately any injury, however minor, to his foreman and to obtain suitable first aid treatment. Employees should be trained to immediately report any unsafe condition they observe, or any unsafe act by another employee.
4. This training should be documented, and employee signatures obtained on acknowledgments that they have received this training by date, time, and place, and records maintained and filed so as to be accessible. These records should be archived at the conclusion of the project, for the length of time indicated by the records retention provisions of company policy.
5. Insist on the wearing and proper use of personal protective clothing and equipment by all workers at all times, with no exceptions allowed.
6. Conduct periodic "toolbox" safety talks and demonstrations on the project for all work crews. Information regarding the proper use of tools and equipment, the handling of materials, the building of scaffolds, and proper operation of equipment can be topics of meaningful job site safety meetings. Additionally, recent hazards abatement, near-misses, and accidents on the project can be discussed and analyzed. The material that is presented should be specific, practical, and pertinent to current operations. Suggestions for improved safety should be solicited from the workers. These toolbox talks should be documented, and workers' attendance recorded, and records should be maintained.
7. Utilize safety posters, safety instruction cards, and warning signs. Prominent display of the project accident record, as well as notices that remind workers of the specific project safety requirements, can be very effective.
8. Periodic meetings of the superintendent, craft foremen, and other supervisors are essential to review job safety and to make necessary revisions to the program. Investigate all lost-time accidents and near-misses, and devise corrective measures to prevent their recurrence.
9. Provide adequate, suitable, and easily accessible firefighting equipment and materials. Because welding and flame cutting are among the most frequent causes of construction fires, special regulations must apply to these activities, including the use of a designated "watch person" at the site of the welding and flame cutting operations. OSHA requires that a "fire watch" be present during any "hot work." The fire watch must remain at the site of the work for not less than 30 minutes after completion of said work. Specific areas should be provided for the storage of flammable, combustible, and explosive materials.
10. Establish a program of regular periodic job safety inspections. The inspection team should include the company safety specialist and the top field supervisor. Notes of safety violations

and job hazards should be made, and immediate action taken to correct them. Each violation or hazard must be followed through to completion or correction.

11. Insist on good project housekeeping. Designated storage areas for materials, tools, and supplies should be maintained and used. Rubbish and waste material should be removed promptly from the area of operations.
12. See that regular equipment maintenance includes safety inspection. This maintenance should include inspection of accident hazards such as frayed cables, bad tires, slipping clutches, and improper electrical grounds. Inspection and maintenance must not be limited to mechanical equipment, but should also be extended to scaffolding, towers, ladders, and other non-operating items.
13. Utilize the services of the safety specialists and the other resources available from contractor professional associations.
14. Seek and obtain the full cooperation of all subcontractors on the project. All of the measures previously described must include subcontractor personnel as well.

The contractor's safety planning should also include the regular practice of conducting job hazard analyses, also known as job safety analyses. On each activity taking place in the project, and especially if the activity contains some element of risk or potential danger, the foreman or superintendent assembles the crew who will perform the work and performs the analysis with them. Key elements of the analysis include the following:

1. Break the activity or task down to its elementary steps.
2. List and discuss all potential safety hazards in each step.
3. List and discuss corrections for each hazard.
4. All members of the crew sign and date a form attesting that they have participated in the job hazard analysis.
5. These forms should be submitted to the controlling contractor before the work begins on the activity.

Job hazard analyses have been shown time after time, to be of tremendous value in promoting safety and avoiding accidents on job sites. Their use is not required by OSHA, but is highly recommended on all projects and on all types of construction.

## 15.20 OWNERS' REQUIREMENTS REGARDING SAFETY POLICIES AND PLANS

It is important to note that owners impose a number of safety requirements with regard to their construction projects today. Not only do owners require disclosure of contractors' EMR factors as noted earlier, but additionally, many owners require submittal by the contractor of his company safety policy, and his specific safety plan for the project being considered. This information may be included among the elements of the prequalification requirements established by the owner before the contractor can submit a proposal for the project, or it may be requested as part of a competitive sealed proposal submittal for evaluation by the owner. The contractor's company and project safety policies and plans also are typically included in the discussion when negotiated contracts are formed.

Additionally, many owners have their own safety policies and procedures pertaining to their company or for the project location or facility where the contractor will be working. Owners commonly require the contractor to sign an acknowledgement that he and his management personnel have read, and understand, and agree to abide by, all of the provisions of the owner's safety policies.

## 15.21 THE FIELD SUPERVISOR

Top management has the overall responsibility for establishing safety policies, procedures, and safe working conditions throughout the company. However, most of the policies, and most of what is planned and established must reach the craft workers on each project by way of the field supervisor. The craft foremen truly are key participants in the success of any company and project safety plan.

To be effective, any campaign for the prevention of accidents in construction must be communicated to the individual workers in a clear, practical, and understandable form. Although the executives of the company may prescribe safe practices, it is the foreman, who has regular daily contact with the craft workers, and who plans and directs their work, who plays a dominant role in implementing the company safety policy.

Construction workers tend to mirror their supervisors' attitude toward safety. For this reason, the wholehearted cooperation of the superintendent and all of the craft labor foremen is indispensable to the success of any safety program. The best way for supervisors to promote safety and accident prevention in the workplace is to unfailingly practice what they preach. A worker is much more likely to follow a supervisor's example than that same supervisor's instructions. If supervisors break a safety rule, they not only reduce the importance of the rule but also lose some of the confidence and trust of their workers. If the field supervisors clearly believe in safety and reflect that fact constantly by their every word and deed, then the craft workers can be expected to be much more cognizant of the advantages of safe work practices and the costly results of any alternative.

It is largely up to the supervisors to find and control the potential hazards on the job. They must teach by doing and must be able to demonstrate the safe way to perform any particular function or job activity. Job instructions to workers should include not only what is to be done, but also how it is to be done. Accident potential decreases when the worker is given complete procedural instructions in advance.

Safety regulations must be enforced. The workers must be taught safe practices and must be required to follow them. Safety discipline is a very important aspect of an accident prevention program. If a rule has been established, the supervisor must always enforce it. An established safety regulation that is not enforced will not be obeyed. If a rule is enforced only some of the time, a worker who is reprimanded for a violation will feel that he is being singled out and that he is being unfairly discriminated against. Those who violate a rule and are not reprimanded will begin to believe the regulation is not important because it is not enforced. The supervisor must also, of course, exercise care to separate personal feelings from the enforcement of safety discipline.

The objective of safety discipline is to improve the safety performance of the crew. Workers who are convinced that a safety procedure is designed to protect their welfare are much more likely to support its enforcement. Similarly, workers are more likely to accept a reprimand if they believe that the standard or rule is for their own protection and is enforced uniformly. A spirit of group responsibility for safety among crews helps to establish a self-disciplining attitude with regard to safety matters of all kinds.

## 15.22 ACCIDENT RECORDS

The keeping of accident records is an important component of a company's safety and health program. These records serve to pinpoint the locations and underlying causes of job injuries and illnesses, information that is vital to the planning of more effective accident prevention programs. These records also provide information on the efficacy of the overall safety effort, and provide statistical information with regard to how the company compares with other construction firms. Accurate, complete, and detailed records can be invaluable in defending against charges of safety law violations, or claims for damages. Accident information can be valuable in quite another way. It can be used to arouse the competitive spirit of workers and supervisors on the various projects in a company to establish a safety record that compares favorably with the experience of other projects or with their own past record, or that surpasses the record of their peers on other projects the company is performing.

Accident recording and reporting might be thought of as beginning with the first aid log that is maintained on each project. Every job injury or illness is made a matter of record, regardless of how inconsequential it may appear to be. A daily record book is maintained where entry is made of the date, name of the employee affected, nature of the injury or illness, first aid treatment provided on the site, and any further information deemed desirable.

This is followed by a first report of injury, which is required by workers' compensation laws in most states. Such a report is prepared for every incident that requires off-site medical treatment, regardless whether time is lost from work or not. Another report that is used by many construction companies is prepared by the appropriate foreman for each recordable injury or illness, and is directed toward analyzing the accident and determining how it could have been prevented.

OSHA requires that occupational injury and illness records be kept in a prescribed OSHA format, for all employees. These records were discussed in a previous section of this chapter.

## 15.23 PROTECTION OF THE PUBLIC

An additional and extremely important aspect of a company's safety policies and accident prevention program includes providing for the safety of the general public, in all ways and at all times. It has been documented repeatedly that people are innately curious about construction projects and construction operations. It has also been shown that people are capable of many thoughtless or careless actions in their attempts to observe construction operations. The contracting firm must reconcile itself to the fact that members of the public will wish to see what is happening on the construction site. Many contractors have found that if an attempt is made to shut people out completely, they will often feel compelled to climb over the fences, follow trucks through the gates, or perform some other clasically human but equally hazardous act. Verbal admonitions or warning signs seem to have little effect, and positive action must be taken to protect the public against its own unthinking actions. Many contractors believe that the best method may be for the contractor to allow the public to view the proceedings from controlled vantage points, such as "observation portholes" in the job fence, or by the provision of a safe viewing platform outside the job fence. The contractor who provides means for the public to see the work and simultaneously be protected from its hazards is wise from the standpoint of both safety and public relations.

The problem of protecting the public becomes even more difficult during weekends and at other times when job operations are not in progress. Children, in particular, seem to find construction projects irresistible, and insurance company records and contractors' case studies are filled with cases of harm coming to youngsters playing on projects during the contractor's nonworking hours.

On projects located in areas where children are likely to be present, the job safety plan must make specific provision for this additional hazard.

## 15.24 THE COST OF A SAFETY PROGRAM

An effective company safety program does, of course, require the commitment of money and other resources by the contractor. However, the overriding fact is that comprehensive safety considerations are absolutely essential for the proper conduct of a construction business. But there is an important distinction that must be recognized between safety costs and other items of company expense. It has been well demonstrated that the costs of safety programs are more than compensated for by savings on accidents that do not happen. Additionally, many contractors will hasten to assert that the cost of an effective safety program is an investment, and the investment continues to pay dividends of all kinds to the company.

Accident reports make it evident that most job accidents can be prevented at only moderate—and frequently no—additional cost. The additional expense involved in building a proper scaffold, shoring an excavation, grounding a portable electric tool, or otherwise performing the work in a safe and controlled manner is insignificant compared to the costs of accident or injury. The contractor cannot look on its safety program as an extra source of expense. Rather, because an effective accident prevention program is necessary to achieve fast-moving, smoothly functioning jobs, any costs entailed should be considered merely as normal business expenses associated with efficient operation of the company.

## 15.25 SUMMARY AND CONCLUSIONS

Safety, in all of its aspects, is required by law in all types of construction contracting, and is driven by the imperative of humanitarian considerations. Despite the fact that construction is fraught with hazards of all kinds, an overarching precept of those who own, and manage, and work in construction companies, is that safety must permeate all aspects of the business enterprise, must be a component of the mind-set, and must be one of the drivers of all that is done by those who work in a construction company.

## CHAPTER 15 REVIEW QUESTIONS

1. State the improvement in the safety record in the construction industry since the adoption of OSHA.
2. Discuss owners' emphasizing their wish to have contractors who construct their projects do so safely, and the use of mechanisms on the part of owners such as prequalification, requiring adherence to the owner's safety program, requiring contractors to disclose their EMRs, and telling those contractors having an EMR greater than the value the owner has chosen that they need not submit a proposal to the owner, requiring contractors to furnish the owner copies of their safety policies and their safety program, and so on.
3. Discuss the economic impact of an accident on a construction project and include at least five examples of direct and indirect costs.
4. List and define the contractor's four obligations with regard to HAZCOM.
5. Define and discuss the definitions of *creating employer, exposing employer, correcting employer,* and *controlling employer* with regard to culpability for hazards or accidents on a multiemployer construction job site.

6. Define *incidence rate* and *DART incidence rate*.
7. Is the body of law governing health safety on construction job sites primarily state or federal law? Explain.
8. Define and discuss the importance of safety planning and hazard analysis for all activities to be performed on the job site.
9. What obligations does the Occupational Safety and Health Act impose on an employer?
10. Define and discuss the significance of OSHA Form 300.
11. Define and describe the document which provides a summary of the specific provisions of the OSHA legislation which pertain to the construction industry.
12. List three economic benefits that a construction contractor can expect to derive from a fully functional safety program.

# Appendix A

# Instructions to Bidders

1. **Contract Documents.** The Notice to Bidders, the Instructions to Bidders, the General Conditions, the Supplementary Conditions, the Drawings and Specifications, the Contractor's Proposal Form, and the Agreement as finally negotiated compose the Contract Documents.

   Copies of these documents can be obtained from the office of Jones and Smith, Architect-Engineers, 142 Welsh St., Portland, Ohio, upon deposit of $100.00 for each set thereof, said deposit being refundable upon return of the documents in good order within 10 days after the bidding date.

2. **Printed Form for Proposal.** All proposals must be made upon the Contractor's Proposal Form attached hereto and should give the amounts bid for the work, both in words and in figures, and must be signed and acknowledged by the Contractor. In order to ensure consideration, the Proposal should be enclosed in a sealed envelope marked "Proposal for Municipal Airport Terminal Building to be opened at 2:30 P.M. (EST), May 19, 20—," showing the return address of the sender and addressed to John Doe, City Manager, Portland, Ohio.

   If the proposal is made by a partnership, it shall contain the names of each partner and shall be signed in the firm name, followed by the signature of the person authorized to sign. If the proposal is made by a corporation, it shall be signed by the name of the corporation, followed by the written signature of the officer signing, and the printed or typewritten designation of the office he holds in the corporation, together with the corporation seal. All blank spaces in the proposal form shall be properly filled in.

3. **Alternatives.** Each bidder shall submit with his proposal, on forms provided, alternate proposals stating the differences in price (additions or deductions) from the base bid for substituting, omitting, or changing the materials or construction from that shown on the drawings and as specified in a manner as described in the Division "Alternate Proposals" of these specifications.

   The difference in price shall include all omissions, additions, and adjustments of all trades as may be necessary because of each change, substitution, or omission as described.

4. **Payment of Employees.** For work done in the State of Ohio the payment of employees of the Contractor and any and all subcontractors shall comply with the current minimum wage scale as published by the Labor Commission of the State of Ohio, a copy of which is made a part of the Supplementary Conditions.

   The Contractor and each of his subcontractors shall pay each of their employees engaged in work on the project under this contract in full, less deductions made mandatory by law, and not less often than once each week. All forms required by local authorities, the State of Ohio, and the United States Government, shall be properly submitted.

5. **Telegraphic Modification.** Any bidder may modify his bid by telegraphic communication at any time prior to the scheduled closing time for receipt of bids provided such telegraphic communication is

received by the City Manager prior to said closing time, and provided further that the City Manager is satisfied that a written confirmation of such telegraphic modification over the signature of the bidder was mailed prior to said closing time. If such written confirmation is not received within two (2) days from said closing time, no consideration will be given to the said telegraphic modification.

6. **Delivery of Proposals.** It is the bidder's responsibility to deliver his proposal at the proper time to the proper place. The mere fact that a proposal was dispatched will not be considered. The bidder must have the proposal actually delivered. Any proposal received after the scheduled closing time will be returned unopened to the bidder.

7. **Opening of Proposals.** At 2:30 P.M. (E.S.T.), May 19, 20—, in the Office of the City Manager, City Hall, Portland, Ohio, each and every proposal (except those which have been withdrawn in accordance with Item 10, "Withdrawal of Proposals,") received prior to the scheduled closing time for receipt of proposals, will be publicly opened and read aloud, irrespective of any irregularities or informalities in such proposals.

8. **Alterations in Proposal.** Except as otherwise provided herein, proposals which are incomplete or which are conditioned in any way or which contain erasures not authenticated as provided herein or items not called for in the proposal or which may have been altered or are not in conformity with the law, may be rejected as informal.

   The proposal form invites bids on definite plans and specifications. Only the amounts and information asked on the proposal form furnished will be considered as the bid. Each bidder shall bid upon the work exactly as specified and as provided in the proposal.

9. **Erasures.** The proposal submitted must not contain erasures, interlineations, or other corrections unless each such correction is suitably authenticated by affixing in the margin immediately opposite the correction the surname or surnames of the person or persons signing the bid.

10. **Withdrawal of Proposals.** At any time prior to the scheduled closing time for receipt of proposals, any bidder may withdraw his proposal, either personally or by telegraphic or written request. If withdrawal is made personally, proper receipt shall be given therefore.

    After the scheduled closing time for the receipt of proposals and before award of contract, no bidder will be permitted to withdraw his proposal unless said award is delayed for a period exceeding thirty (30) days. Negligence on the part of the bidder in preparing his bid confers no rights for the withdrawal of the proposal after it has been opened.

11. **Determination of Low Bid.** In making award of contract, the owner reserves the right to take into consideration the plant facilities of the bidders and the bidder's ability to complete the contract within the time specified in the proposal. The owner also reserves the right to evaluate factors that in his opinion would affect the final total cost.

12. **Rejection of Proposals.** The owner reserves the right to reject any or all proposals. Without limiting the generality of the foregoing, any proposal which is incomplete, obscure, or irregular may be rejected; any proposal which omits a bid for any one or more items in the price sheet may be rejected; any proposal in which unit prices are omitted or in which unit prices are obviously unbalanced may be rejected; any proposal accompanied by an insufficient or irregular certified check, cashier's check, or bid bond may be rejected.

13. **Proposal and Performance Guarantees.** A certified check, cashier's check, or bid bond for an amount equal to least five percent (5%) of the total amount bid shall accompany each proposal as evidence of good faith and as a guarantee that if awarded the Contract, the bidder will execute the Contract and give bond as required. The successful bidder's check or bid bond will be retained until

he has entered into a satisfactory contract and furnished required contract bonds. The owner reserves the right to hold the certified checks, cashier's checks, or bid bonds of the three lowest bidders, until the successful bidder has entered into a contract and furnished the required contract bonds.

14. **Acceptance of Proposals.** Within thirty (30) days after receipt of the proposals the owner will act upon them. The acceptance of a proposal will be a Notice of Acceptance in writing signed by a duly authorized representative of the owner and no other act of the owner shall constitute the acceptance of a proposal. The acceptance of a proposal shall bind the successful bidder to execute the Contract. The rights and obligations provided for in the Contract shall become effective and binding upon the parties only upon its formal execution.
15. **Time for Executing Contract and Providing Contract Bond.** Any contractor whose proposal shall be accepted will be required to execute the Contract and furnish contract bonds as required within ten (10) days after notice that the Contract has been awarded to him. Failure or neglect to do so shall constitute a breach of the agreement effected by the acceptance of the proposal.
16. **Prices.** In the event of a discrepancy between the prices quoted in words and those quoted in figures in the proposal, the words shall control. The prices are to include the furnishing of all materials, plant, equipment, tools, and all other facilities, and the performance of all labor and services necessary or proper for the completion of the work except as may be otherwise expressly provided in the Contract Documents.
17. **Examination of Drawings.** Bidders shall thoroughly examine and be familiar with the drawings and specifications. The failure or omission of any bidder to receive or examine any form, instrument, addendum, or other document shall in no way relieve any bidder from any obligation with respect to his proposal or to the Contract. The submission of a bid shall be taken as prima facie evidence of compliance with this Section.
18. **Interpretations.** No oral interpretations will be made to any bidder as to the meaning of the drawings and specifications or other contract documents. Every request for such an interpretation shall be made in writing and addressed and forwarded to the owner's authorized representative (Architect-Engineer) five (5) or more days before the date fixed for opening of proposals. Every interpretation made to a bidder will be in the form of an addendum to the Contract Documents which, if issued, will be sent as promptly as is practicable to all persons to whom the drawings and specifications have been issued. All such addenda shall become part of the Contract Documents.
19. **Postponement of Date for Opening Proposals.** The owner reserves the right to postpone the date of presentation and opening of proposals and will give telegraphic notice of any such postponement to each interested party.

# Appendix B

# AIA Document B101-2007 Standard Form of Agreement between Owner and Architect

American Institute of Architects

# AIA® Document B101™ – 2007

## *Standard Form of Agreement Between Owner and Architect*

**AGREEMENT** made as of the day of
in the year of
*(In words, indicate day, month and year)*

**BETWEEN** the Architect's client identified as the Owner:
*(Name, address and other information)*

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

and the Architect:
*(Name, address and other information)*

for the following Project:
*(Name, location and detailed description)*

The Owner and Architect agree as follows.

TABLE OF ARTICLES



## ARTICLE 1 INITIAL INFORMATION

**§ 1.1** This Agreement is based on the Initial Information set forth in this Article 1 and in optional Exhibit A, Initial Information:

(*Complete Exhibit A, Initial Information, and incorporate it into the Agreement at Section 13.2, or state below Initial Information such as details of the Project's site and program, Owner's contractors and consultants, Architect's consultants, Owner's budget for the Cost of the Work, authorized representatives, anticipated procurement method, and other information relevant to the Project.)*

**§ 1.2** The Owner's anticipated dates for commencement of construction and Substantial Completion of the Work are set forth below:

**.1** Commencement of construction date:

**.2** Substantial Completion date:

**§ 1.3** The Owner and Architect may rely on the Initial Information. Both parties, however, recognize that such information may materially change and, in that event, the Owner and the Architect shall appropriately adjust the schedule, the Architect's services and the Architect's compensation.

## ARTICLE 2 ARCHITECT'S RESPONSIBILITIES

**§ 2.1** The Architect shall provide the professional services as set forth in this Agreement.

**§ 2.2** The Architect shall perform its services consistent with the professional skill and care ordinarily provided by architects practicing in the same or similar locality under the same or similar circumstances. The Architect shall perform its services as expeditiously as is consistent with such professional skill and care and the orderly progress of the Project.

**§ 2.3** The Architect shall identify a representative authorized to act on behalf of the Architect with respect to the Project.

**§ 2.4** Except with the Owner's knowledge and consent, the Architect shall not engage in any activity, or accept any employment, interest or contribution that would reasonably appear to compromise the Architect's professional judgment with respect to this Project.

**§ 2.5** The Architect shall maintain the following insurance for the duration of this Agreement. If any of the requirements set forth below exceed the types and limits the Architect normally maintains, the Owner shall reimburse the Architect for any additional cost:
*(Identify types and limits of insurance coverage, and other insurance requirements applicable to the Agreement, if any.)*

**.1** General Liability

**.2** Automobile Liability

**.3** Workers' Compensation

**.4** Professional Liability

## ARTICLE 3 SCOPE OF ARCHITECT'S BASIC SERVICES

**§ 3.1** The Architect's Basic Services consist of those described in Article 3 and include usual and customary structural, mechanical, and electrical engineering services. Services not set forth in Article 3 are Additional Services.

**§ 3.1.1** The Architect shall manage the Architect's services, consult with the Owner, research applicable design criteria, attend Project meetings, communicate with members of the Project team and report progress to the Owner.

**§ 3.1.2** The Architect shall coordinate its services with those services provided by the Owner and the Owner's consultants. The Architect shall be entitled to rely on the accuracy and completeness of services and information furnished by the Owner and the Owner's consultants. The Architect shall provide prompt written notice to the Owner if the Architect becomes aware of any error, omission or inconsistency in such services or information.

**§ 3.1.3** As soon as practicable after the date of this Agreement, the Architect shall submit for the Owner's approval a schedule for the performance of the Architect's services. The schedule initially shall include anticipated dates for the commencement of construction and for Substantial Completion of the Work as set forth in the Initial Information. The schedule shall include allowances for periods of time required for the Owner's review, for the performance of the Owner's consultants, and for approval of submissions by authorities having jurisdiction over the Project. Once approved by the Owner, time limits established by the schedule shall not, except for reasonable cause, be exceeded by the Architect or Owner. With the Owner's approval, the Architect shall adjust the schedule, if necessary as the Project proceeds until the commencement of construction.

**§ 3.1.4** The Architect shall not be responsible for an Owner's directive or substitution made without the Architect's approval.

**§ 3.1.5** The Architect shall, at appropriate times, contact the governmental authorities required to approve the Construction Documents and the entities providing utility services to the Project. In designing the Project, the Architect shall respond to applicable design requirements imposed by such governmental authorities and by such entities providing utility services.

**§ 3.1.6** The Architect shall assist the Owner in connection with the Owner's responsibility for filing documents required for the approval of governmental authorities having jurisdiction over the Project.

**§ 3.2 SCHEMATIC DESIGN PHASE SERVICES**

**§ 3.2.1** The Architect shall review the program and other information furnished by the Owner, and shall review laws, codes, and regulations applicable to the Architect's services.

**§ 3.2.2** The Architect shall prepare a preliminary evaluation of the Owner's program, schedule, budget for the Cost of the Work, Project site, and the proposed procurement or delivery method and other Initial Information, each in terms of the other, to ascertain the requirements of the Project. The Architect shall notify the Owner of (1) any inconsistencies discovered in the information, and (2) other information or consulting services that may be reasonably needed for the Project.

**§ 3.2.3** The Architect shall present its preliminary evaluation to the Owner and shall discuss with the Owner alternative approaches to design and construction of the Project, including the feasibility of incorporating environmentally responsible design approaches. The Architect shall reach an understanding with the Owner regarding the requirements of the Project.

**§ 3.2.4** Based on the Project's requirements agreed upon with the Owner, the Architect shall prepare and present for the Owner's approval a preliminary design illustrating the scale and relationship of the Project components.

**§ 3.2.5** Based on the Owner's approval of the preliminary design, the Architect shall prepare Schematic Design Documents for the Owner's approval. The Schematic Design Documents shall consist of drawings and other documents including a site plan, if appropriate, and preliminary building plans, sections and elevations; and may include some combination of study models, perspective sketches, or digital modeling. Preliminary selections of major building systems and construction materials shall be noted on the drawings or described in writing.

**§ 3.2.5.1** The Architect shall consider environmentally responsible design alternatives, such as material choices and building orientation, together with other considerations based on program and aesthetics, in developing a design that is consistent with the Owner's program, schedule and budget for the Cost of the Work. The Owner may obtain other environmentally responsible design services under Article 4.

**§ 3.2.5.2** The Architect shall consider the value of alternative materials, building systems and equipment, together with other considerations based on program and aesthetics in developing a design for the Project that is consistent with the Owner's program, schedule and budget for the Cost of the Work.

**§ 3.2.6** The Architect shall submit to the Owner an estimate of the Cost of the Work prepared in accordance with Section 6.3.

**§ 3.2.7** The Architect shall submit the Schematic Design Documents to the Owner, and request the Owner's approval.

**§ 3.3 DESIGN DEVELOPMENT PHASE SERVICES**

**§ 3.3.1** Based on the Owner's approval of the Schematic Design Documents, and on the Owner's authorization of any adjustments in the Project requirements and the budget for the Cost of the Work, the Architect shall prepare Design Development Documents for the Owner's approval. The Design Development Documents shall illustrate and describe the development of the approved Schematic Design Documents and shall consist of drawings and other documents including plans, sections, elevations, typical construction details, and diagrammatic layouts of building systems to fix and describe the size and character of the Project as to architectural, structural, mechanical and electrical systems, and such other elements as may be appropriate. The Design Development Documents shall also include outline specifications that identify major materials and systems and establish in general their quality levels.

**§ 3.3.2** The Architect shall update the estimate of the Cost of the Work.

**§ 3.3.3** The Architect shall submit the Design Development documents to the Owner, advise the Owner of any adjustments to the estimate of the Cost of the Work, and request the Owner's approval.

**§ 3.4 CONSTRUCTION DOCUMENTS PHASE SERVICES**

**§ 3.4.1** Based on the Owner's approval of the Design Development Documents, and on the Owner's authorization of any adjustments in the Project requirements and the budget for the Cost of the Work, the Architect shall prepare Construction Documents for the Owner's approval. The Construction Documents shall illustrate and describe the further development of the approved Design Development Documents and shall consist of Drawings and

Specifications setting forth in detail the quality levels of materials and systems and other requirements for the construction of the Work. The Owner and Architect acknowledge that in order to construct the Work the Contractor will provide additional information, including Shop Drawings, Product Data, Samples and other similar submittals, which the Architect shall review in accordance with Section 3.6.4.

**§ 3.4.2** The Architect shall incorporate into the Construction Documents the design requirements of governmental authorities having jurisdiction over the Project.

**§ 3.4.3** During the development of the Construction Documents, the Architect shall assist the Owner in the development and preparation of (1) bidding and procurement information that describes the time, place and conditions of bidding, including bidding or proposal forms; (2) the form of agreement between the Owner and Contractor; and (3) the Conditions of the Contract for Construction (General, Supplementary and other Conditions). The Architect shall also compile a project manual that includes the Conditions of the Contract for Construction and Specifications and may include bidding requirements and sample forms.

**§ 3.4.4** The Architect shall update the estimate for the Cost of the Work.

**§ 3.4.5** The Architect shall submit the Construction Documents to the Owner, advise the Owner of any adjustments to the estimate of the Cost of the Work, take any action required under Section 6.5, and request the Owner's approval.

**§ 3.5 BIDDING OR NEGOTIATION PHASE SERVICES**

**§ 3.5.1 GENERAL**

The Architect shall assist the Owner in establishing a list of prospective contractors. Following the Owner's approval of the Construction Documents, the Architect shall assist the Owner in (1) obtaining either competitive bids or negotiated proposals; (2) confirming responsiveness of bids or proposals; (3) determining the successful bid or proposal, if any; and, (4) awarding and preparing contracts for construction.

**§ 3.5.2 COMPETITIVE BIDDING**

**§ 3.5.2.1** Bidding Documents shall consist of bidding requirements and proposed Contract Documents.

**§ 3.5.2.2** The Architect shall assist the Owner in bidding the Project by

- **.1** procuring the reproduction of Bidding Documents for distribution to prospective bidders;
- **.2** distributing the Bidding Documents to prospective bidders, requesting their return upon completion of the bidding process, and maintaining a log of distribution and retrieval and of the amounts of deposits, if any, received from and returned to prospective bidders;
- **.3** organizing and conducting a pre-bid conference for prospective bidders;
- **.4** preparing responses to questions from prospective bidders and providing clarifications and interpretations of the Bidding Documents to all prospective bidders in the form of addenda; and
- **.5** organizing and conducting the opening of the bids, and subsequently documenting and distributing the bidding results, as directed by the Owner.

**§ 3.5.2.3** The Architect shall consider requests for substitutions, if the Bidding Documents permit substitutions, and shall prepare and distribute addenda identifying approved substitutions to all prospective bidders.

**§ 3.5.3 NEGOTIATED PROPOSALS**

**§ 3.5.3.1** Proposal Documents shall consist of proposal requirements and proposed Contract Documents.

**§ 3.5.3.2** The Architect shall assist the Owner in obtaining proposals by

- **.1** procuring the reproduction of Proposal Documents for distribution to prospective contractors, and requesting their return upon completion of the negotiation process;
- **.2** organizing and participating in selection interviews with prospective contractors; and
- **.3** participating in negotiations with prospective contractors, and subsequently preparing a summary report of the negotiation results, as directed by the Owner.

**§ 3.5.3.3** The Architect shall consider requests for substitutions, if the Proposal Documents permit substitutions, and shall prepare and distribute addenda identifying approved substitutions to all prospective contractors.

**§ 3.6 CONSTRUCTION PHASE SERVICES**

**§ 3.6.1 GENERAL**

**§ 3.6.1.1** The Architect shall provide administration of the Contract between the Owner and the Contractor as set forth below and in AIA Document A201™–2007, General Conditions of the Contract for Construction. If the Owner and Contractor modify AIA Document A201–2007, those modifications shall not affect the Architect's services under this Agreement unless the Owner and the Architect amend this Agreement.

**§ 3.6.1.2** The Architect shall advise and consult with the Owner during the Construction Phase Services. The Architect shall have authority to act on behalf of the Owner only to the extent provided in this Agreement. The Architect shall not have control over, charge of, or responsibility for the construction means, methods, techniques, sequences or procedures, or for safety precautions and programs in connection with the Work, nor shall the Architect be responsible for the Contractor's failure to perform the Work in accordance with the requirements of the Contract Documents. The Architect shall be responsible for the Architect's negligent acts or omissions, but shall not have control over or charge of, and shall not be responsible for, acts or omissions of the Contractor or of any other persons or entities performing portions of the Work.

**§ 3.6.1.3** Subject to Section 4.3, the Architect's responsibility to provide Construction Phase Services commences with the award of the Contract for Construction and terminates on the date the Architect issues the final Certificate for Payment.

**§ 3.6.2 EVALUATIONS OF THE WORK**

**§ 3.6.2.1** The Architect shall visit the site at intervals appropriate to the stage of construction, or as otherwise required in Section 4.3.3, to become generally familiar with the progress and quality of the portion of the Work completed, and to determine, in general, if the Work observed is being performed in a manner indicating that the Work, when fully completed, will be in accordance with the Contract Documents. However, the Architect shall not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the Work. On the basis of the site visits, the Architect shall keep the Owner reasonably informed about the progress and quality of the portion of the Work completed, and report to the Owner (1) known deviations from the Contract Documents and from the most recent construction schedule submitted by the Contractor, and (2) defects and deficiencies observed in the Work.

**§ 3.6.2.2** The Architect has the authority to reject Work that does not conform to the Contract Documents. Whenever the Architect considers it necessary or advisable, the Architect shall have the authority to require inspection or testing of the Work in accordance with the provisions of the Contract Documents, whether or not such Work is fabricated, installed or completed. However, neither this authority of the Architect nor a decision made in good faith either to exercise or not to exercise such authority shall give rise to a duty or responsibility of the Architect to the Contractor, Subcontractors, material and equipment suppliers, their agents or employees or other persons or entities performing portions of the Work.

**§ 3.6.2.3** The Architect shall interpret and decide matters concerning performance under, and requirements of, the Contract Documents on written request of either the Owner or Contractor. The Architect's response to such requests shall be made in writing within any time limits agreed upon or otherwise with reasonable promptness.

**§ 3.6.2.4** Interpretations and decisions of the Architect shall be consistent with the intent of and reasonably inferable from the Contract Documents and shall be in writing or in the form of drawings. When making such interpretations and decisions, the Architect shall endeavor to secure faithful performance by both Owner and Contractor, shall not show partiality to either, and shall not be liable for results of interpretations or decisions rendered in good faith. The Architect's decisions on matters relating to aesthetic effect shall be final if consistent with the intent expressed in the Contract Documents.

**§ 3.6.2.5** Unless the Owner and Contractor designate another person to serve as an Initial Decision Maker, as that term is defined in AIA Document A201–2007, the Architect shall render initial decisions on Claims between the Owner and Contractor as provided in the Contract Documents.

**§ 3.6.3 CERTIFICATES FOR PAYMENT TO CONTRACTOR**

**§ 3.6.3.1** The Architect shall review and certify the amounts due the Contractor and shall issue certificates in such amounts. The Architect's certification for payment shall constitute a representation to the Owner, based on the Architect's evaluation of the Work as provided in Section 3.6.2 and on the data comprising the Contractor's Application for Payment, that, to the best of the Architect's knowledge, information and belief, the Work has

progressed to the point indicated and that the quality of the Work is in accordance with the Contract Documents. The foregoing representations are subject (1) to an evaluation of the Work for conformance with the Contract Documents upon Substantial Completion, (2) to results of subsequent tests and inspections, (3) to correction of minor deviations from the Contract Documents prior to completion, and (4) to specific qualifications expressed by the Architect.

**§ 3.6.3.2** The issuance of a Certificate for Payment shall not be a representation that the Architect has (1) made exhaustive or continuous on-site inspections to check the quality or quantity of the Work, (2) reviewed construction means, methods, techniques, sequences or procedures, (3) reviewed copies of requisitions received from Subcontractors and material suppliers and other data requested by the Owner to substantiate the Contractor's right to payment, or (4) ascertained how or for what purpose the Contractor has used money previously paid on account of the Contract Sum.

**§ 3.6.3.3** The Architect shall maintain a record of the Applications and Certificates for Payment.

**§ 3.6.4 SUBMITTALS**

**§ 3.6.4.1** The Architect shall review the Contractor's submittal schedule and shall not unreasonably delay or withhold approval. The Architect's action in reviewing submittals shall be taken in accordance with the approved submittal schedule or, in the absence of an approved submittal schedule, with reasonable promptness while allowing sufficient time in the Architect's professional judgment to permit adequate review.

**§ 3.6.4.2** In accordance with the Architect-approved submittal schedule, the Architect shall review and approve or take other appropriate action upon the Contractor's submittals such as Shop Drawings, Product Data and Samples, but only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. Review of such submittals is not for the purpose of determining the accuracy and completeness of other information such as dimensions, quantities, and installation or performance of equipment or systems, which are the Contractor's responsibility. The Architect's review shall not constitute approval of safety precautions or, unless otherwise specifically stated by the Architect, of any construction means, methods, techniques, sequences or procedures. The Architect's approval of a specific item shall not indicate approval of an assembly of which the item is a component.

**§ 3.6.4.3** If the Contract Documents specifically require the Contractor to provide professional design services or certifications by a design professional related to systems, materials or equipment, the Architect shall specify the appropriate performance and design criteria that such services must satisfy. The Architect shall review shop drawings and other submittals related to the Work designed or certified by the design professional retained by the Contractor that bear such professional's seal and signature when submitted to the Architect. The Architect shall be entitled to rely upon the adequacy, accuracy and completeness of the services, certifications and approvals performed or provided by such design professionals.

**§ 3.6.4.4** Subject to the provisions of Section 4.3, the Architect shall review and respond to requests for information about the Contract Documents. The Architect shall set forth in the Contract Documents the requirements for requests for information. Requests for information shall include, at a minimum, a detailed written statement that indicates the specific Drawings or Specifications in need of clarification and the nature of the clarification requested. The Architect's response to such requests shall be made in writing within any time limits agreed upon, or otherwise with reasonable promptness. If appropriate, the Architect shall prepare and issue supplemental Drawings and Specifications in response to requests for information.

**§ 3.6.4.5** The Architect shall maintain a record of submittals and copies of submittals supplied by the Contractor in accordance with the requirements of the Contract Documents.

**§ 3.6.5 CHANGES IN THE WORK**

**§ 3.6.5.1** The Architect may authorize minor changes in the Work that are consistent with the intent of the Contract Documents and do not involve an adjustment in the Contract Sum or an extension of the Contract Time. Subject to the provisions of Section 4.3, the Architect shall prepare Change Orders and Construction Change Directives for the Owner's approval and execution in accordance with the Contract Documents.

**§ 3.6.5.2** The Architect shall maintain records relative to changes in the Work.

**§ 3.6.6 PROJECT COMPLETION**

**§ 3.6.6.1** The Architect shall conduct inspections to determine the date or dates of Substantial Completion and the date of final completion; issue Certificates of Substantial Completion; receive from the Contractor and forward to the Owner, for the Owner's review and records, written warranties and related documents required by the Contract Documents and assembled by the Contractor; and issue a final Certificate for Payment based upon a final inspection indicating the Work complies with the requirements of the Contract Documents.

**§ 3.6.6.2** The Architect's inspections shall be conducted with the Owner to check conformance of the Work with the requirements of the Contract Documents and to verify the accuracy and completeness of the list submitted by the Contractor of Work to be completed or corrected.

**§ 3.6.6.3** When the Work is found to be substantially complete, the Architect shall inform the Owner about the balance of the Contract Sum remaining to be paid the Contractor, including the amount to be retained from the Contract Sum, if any, for final completion or correction of the Work.

**§ 3.6.6.4** The Architect shall forward to the Owner the following information received from the Contractor: (1) consent of surety or sureties, if any, to reduction in or partial release of retainage or the making of final payment; (2) affidavits, receipts, releases and waivers of liens or bonds indemnifying the Owner against liens; and (3) any other documentation required of the Contractor under the Contract Documents.

**§ 3.6.6.5** Upon request of the Owner, and prior to the expiration of one year from the date of Substantial Completion, the Architect shall, without additional compensation, conduct a meeting with the Owner to review the facility operations and performance.

**ARTICLE 4 ADDITIONAL SERVICES**

**§ 4.1** Additional Services listed below are not included in Basic Services but may be required for the Project. The Architect shall provide the listed Additional Services only if specifically designated in the table below as the Architect's responsibility, and the Owner shall compensate the Architect as provided in Section 11.2.
*(Designate the Additional Services the Architect shall provide in the second column of the table below. In the third column indicate whether the service description is located in Section 4.2 or in an attached exhibit. If in an exhibit, identify the exhibit.)*

| Additional Services | | Responsibility *(Architect, Owner or Not Provided)* | Location of Service Description *(Section 4.2 below or in an exhibit attached to this document and identified below)* |
|---|---|---|---|
| **§ 4.1.1** | Programming | | |
| **§ 4.1.2** | Multiple preliminary designs | | |
| **§ 4.1.3** | Measured drawings | | |
| **§ 4.1.4** | Existing facilities surveys | | |
| **§ 4.1.5** | Site Evaluation and Planning (B203™–2007) | | |
| **§ 4.1.6** | Building information modeling | | |
| **§ 4.1.7** | Civil engineering | | |
| **§ 4.1.8** | Landscape design | | |
| **§ 4.1.9** | Architectural Interior Design (B252™–2007) | | |
| **§ 4.1.10** | Value Analysis (B204™–2007) | | |
| **§ 4.1.11** | Detailed cost estimating | | |
| **§ 4.1.12** | On-site project representation | | |
| **§ 4.1.13** | Conformed construction documents | | |
| **§ 4.1.14** | As-designed record drawings | | |
| **§ 4.1.15** | As-constructed record drawings | | |
| **§ 4.1.16** | Post occupancy evaluation | | |
| **§ 4.1.17** | Facility Support Services (B210™–2007) | | |
| **§ 4.1.18** | Tenant-related services | | |
| **§ 4.1.19** | Coordination of Owner's consultants | | |
| **§ 4.1.20** | Telecommunications/data design | | |

| **Additional Services** | | **Responsibility** *(Architect, Owner or Not Provided)* | **Location of Service Description** *(Section 4.2 below or in an exhibit attached to this document and identified below)* |
|---|---|---|---|
| **§ 4.1.21** | Security Evaluation and Planning (B206™–2007) | | |
| **§ 4.1.22** | Commissioning (B211™–2007) | | |
| **§ 4.1.23** | Extensive environmentally responsible design | | |
| **§ 4.1.24** | LEED® Certification (B214™–2007) | | |
| **§ 4.1.25** | Fast-track design services | | |
| **§ 4.1.26** | Historic Preservation (B205™–2007) | | |
| **§ 4.1.27** | Furniture, Finishings, and Equipment Design (B253™–2007) | | |
| **§ 4.1.28** | Other | | |
| | | | |
| | | | |

**§ 4.2** Insert a description of each Additional Service designated in Section 4.1 as the Architect's responsibility, if not further described in an exhibit attached to this document.

**§ 4.3** Additional Services may be provided after execution of this Agreement, without invalidating the Agreement. Except for services required due to the fault of the Architect, any Additional Services provided in accordance with this Section 4.3 shall entitle the Architect to compensation pursuant to Section 11.3 and an appropriate adjustment in the Architect's schedule.

**§ 4.3.1** Upon recognizing the need to perform the following Additional Services, the Architect shall notify the Owner with reasonable promptness and explain the facts and circumstances giving rise to the need. The Architect shall not proceed to provide the following services until the Architect receives the Owner's written authorization:

**.1** Services necessitated by a change in the Initial Information, previous instructions or approvals given by the Owner, or a material change in the Project including, but not limited to, size, quality, complexity, the Owner's schedule or budget for Cost of the Work, or procurement or delivery method;

**.2** Services necessitated by the Owner's request for extensive environmentally responsible design alternatives, such as unique system designs, in-depth material research, energy modeling, or LEED® certification;

**.3** Changing or editing previously prepared Instruments of Service necessitated by the enactment or revision of codes, laws or regulations or official interpretations;

**.4** Services necessitated by decisions of the Owner not rendered in a timely manner or any other failure of performance on the part of the Owner or the Owner's consultants or contractors;

**.5** Preparing digital data for transmission to the Owner's consultants and contractors, or to other Owner authorized recipients;

**.6** Preparation of design and documentation for alternate bid or proposal requests proposed by the Owner;

**.7** Preparation for, and attendance at, a public presentation, meeting or hearing;

**.8** Preparation for, and attendance at a dispute resolution proceeding or legal proceeding, except where the Architect is party thereto;

**.9** Evaluation of the qualifications of bidders or persons providing proposals;

**.10** Consultation concerning replacement of Work resulting from fire or other cause during construction; or

**.11** Assistance to the Initial Decision Maker, if other than the Architect.

**§ 4.3.2** To avoid delay in the Construction Phase, the Architect shall provide the following Additional Services, notify the Owner with reasonable promptness, and explain the facts and circumstances giving rise to the need. If the Owner

subsequently determines that all or parts of those services are not required, the Owner shall give prompt written notice to the Architect, and the Owner shall have no further obligation to compensate the Architect for those services:

.1 Reviewing a Contractor's submittal out of sequence from the submittal schedule agreed to by the Architect;

.2 Responding to the Contractor's requests for information that are not prepared in accordance with the Contract Documents or where such information is available to the Contractor from a careful study and comparison of the Contract Documents, field conditions, other Owner-provided information, Contractor-prepared coordination drawings, or prior Project correspondence or documentation;

.3 Preparing Change Orders and Construction Change Directives that require evaluation of Contractor's proposals and supporting data, or the preparation or revision of Instruments of Service;

.4 Evaluating an extensive number of Claims as the Initial Decision Maker;

.5 Evaluating substitutions proposed by the Owner or Contractor and making subsequent revisions to Instruments of Service resulting therefrom; or

.6 To the extent the Architect's Basic Services are affected, providing Construction Phase Services 60 days after (1) the date of Substantial Completion of the Work or (2) the anticipated date of Substantial Completion identified in Initial Information, whichever is earlier.

**§ 4.3.3** The Architect shall provide Construction Phase Services exceeding the limits set forth below as Additional Services. When the limits below are reached, the Architect shall notify the Owner:

.1 ( ) reviews of each Shop Drawing, Product Data item, sample and similar submittal of the Contractor

.2 ( ) visits to the site by the Architect over the duration of the Project during construction

.3 ( ) inspections for any portion of the Work to determine whether such portion of the Work is substantially complete in accordance with the requirements of the Contract Documents

.4 ( ) inspections for any portion of the Work to determine final completion

**§ 4.3.4** If the services covered by this Agreement have not been completed within ( ) months of the date of this Agreement, through no fault of the Architect, extension of the Architect's services beyond that time shall be compensated as Additional Services.

## ARTICLE 5 OWNER'S RESPONSIBILITIES

**§ 5.1** Unless otherwise provided for under this Agreement, the Owner shall provide information in a timely manner regarding requirements for and limitations on the Project, including a written program which shall set forth the Owner's objectives, schedule, constraints and criteria, including space requirements and relationships, flexibility, expandability, special equipment, systems and site requirements. Within 15 days after receipt of a written request from the Architect, the Owner shall furnish the requested information as necessary and relevant for the Architect to evaluate, give notice of or enforce lien rights.

**§ 5.2** The Owner shall establish and periodically update the Owner's budget for the Project, including (1) the budget for the Cost of the Work as defined in Section 6.1; (2) the Owner's other costs; and, (3) reasonable contingencies related to all of these costs. If the Owner significantly increases or decreases the Owner's budget for the Cost of the Work, the Owner shall notify the Architect. The Owner and the Architect shall thereafter agree to a corresponding change in the Project's scope and quality.

**§ 5.3** The Owner shall identify a representative authorized to act on the Owner's behalf with respect to the Project. The Owner shall render decisions and approve the Architect's submittals in a timely manner in order to avoid unreasonable delay in the orderly and sequential progress of the Architect's services.

**§ 5.4** The Owner shall furnish surveys to describe physical characteristics, legal limitations and utility locations for the site of the Project, and a written legal description of the site. The surveys and legal information shall include, as applicable, grades and lines of streets, alleys, pavements and adjoining property and structures; designated wetlands; adjacent drainage; rights-of-way, restrictions, easements, encroachments, zoning, deed restrictions, boundaries and contours of the site; locations, dimensions and necessary data with respect to existing buildings, other improvements and trees; and information concerning available utility services and lines, both public and private, above and below grade, including inverts and depths. All the information on the survey shall be referenced to a Project benchmark.

**§ 5.5** The Owner shall furnish services of geotechnical engineers, which may include but are not limited to test borings, test pits, determinations of soil bearing values, percolation tests, evaluations of hazardous materials, seismic evaluation, ground corrosion tests and resistivity tests, including necessary operations for anticipating subsoil conditions, with written reports and appropriate recommendations.

**§ 5.6** The Owner shall coordinate the services of its own consultants with those services provided by the Architect. Upon the Architect's request, the Owner shall furnish copies of the scope of services in the contracts between the Owner and the Owner's consultants. The Owner shall furnish the services of consultants other than those designated in this Agreement, or authorize the Architect to furnish them as an Additional Service, when the Architect requests such services and demonstrates that they are reasonably required by the scope of the Project. The Owner shall require that its consultants maintain professional liability insurance as appropriate to the services provided.

**§ 5.7** The Owner shall furnish tests, inspections and reports required by law or the Contract Documents, such as structural, mechanical, and chemical tests, tests for air and water pollution, and tests for hazardous materials.

**§ 5.8** The Owner shall furnish all legal, insurance and accounting services, including auditing services, that may be reasonably necessary at any time for the Project to meet the Owner's needs and interests.

**§ 5.9** The Owner shall provide prompt written notice to the Architect if the Owner becomes aware of any fault or defect in the Project, including errors, omissions or inconsistencies in the Architect's Instruments of Service.

**§ 5.10** Except as otherwise provided in this Agreement, or when direct communications have been specially authorized, the Owner shall endeavor to communicate with the Contractor and the Architect's consultants through the Architect about matters arising out of or relating to the Contract Documents. The Owner shall promptly notify the Architect of any direct communications that may affect the Architect's services.

**§ 5.11** Before executing the Contract for Construction, the Owner shall coordinate the Architect's duties and responsibilities set forth in the Contract for Construction with the Architect's services set forth in this Agreement. The Owner shall provide the Architect a copy of the executed agreement between the Owner and Contractor, including the General Conditions of the Contract for Construction.

**§ 5.12** The Owner shall provide the Architect access to the Project site prior to commencement of the Work and shall obligate the Contractor to provide the Architect access to the Work wherever it is in preparation or progress.

## ARTICLE 6 COST OF THE WORK

**§ 6.1** For purposes of this Agreement, the Cost of the Work shall be the total cost to the Owner to construct all elements of the Project designed or specified by the Architect and shall include contractors' general conditions costs, overhead and profit. The Cost of the Work does not include the compensation of the Architect, the costs of the land, rights-of-way, financing, contingencies for changes in the Work or other costs that are the responsibility of the Owner.

**§ 6.2** The Owner's budget for the Cost of the Work is provided in Initial Information, and may be adjusted throughout the Project as required under Sections 5.2, 6.4 and 6.5. Evaluations of the Owner's budget for the Cost of the Work, the preliminary estimate of the Cost of the Work and updated estimates of the Cost of the Work prepared by the Architect, represent the Architect's judgment as a design professional. It is recognized, however, that neither the Architect nor the Owner has control over the cost of labor, materials or equipment; the Contractor's methods of determining bid prices; or competitive bidding, market or negotiating conditions. Accordingly, the Architect cannot and does not warrant or represent that bids or negotiated prices will not vary from the Owner's budget for the Cost of the Work or from any estimate of the Cost of the Work or evaluation prepared or agreed to by the Architect.

**§ 6.3** In preparing estimates of the Cost of Work, the Architect shall be permitted to include contingencies for design, bidding and price escalation; to determine what materials, equipment, component systems and types of construction are to be included in the Contract Documents; to make reasonable adjustments in the program and scope of the Project; and to include in the Contract Documents alternate bids as may be necessary to adjust the estimated Cost of the Work to meet the Owner's budget for the Cost of the Work. The Architect's estimate of the Cost of the Work shall be based on current area, volume or similar conceptual estimating techniques. If the Owner requests detailed cost estimating services, the Architect shall provide such services as an Additional Service under Article 4.

**§ 6.4** If the Bidding or Negotiation Phase has not commenced within 90 days after the Architect submits the Construction Documents to the Owner, through no fault of the Architect, the Owner's budget for the Cost of the Work shall be adjusted to reflect changes in the general level of prices in the applicable construction market.

**§ 6.5** If at any time the Architect's estimate of the Cost of the Work exceeds the Owner's budget for the Cost of the Work, the Architect shall make appropriate recommendations to the Owner to adjust the Project's size, quality or budget for the Cost of the Work, and the Owner shall cooperate with the Architect in making such adjustments.

**§ 6.6** If the Owner's budget for the Cost of the Work at the conclusion of the Construction Documents Phase Services is exceeded by the lowest bona fide bid or negotiated proposal, the Owner shall

**.1** give written approval of an increase in the budget for the Cost of the Work;
**.2** authorize rebidding or renegotiating of the Project within a reasonable time;
**.3** terminate in accordance with Section 9.5;
**.4** in consultation with the Architect, revise the Project program, scope, or quality as required to reduce the Cost of the Work; or
**.5** implement any other mutually acceptable alternative.

**§ 6.7** If the Owner chooses to proceed under Section 6.6.4, the Architect, without additional compensation, shall modify the Construction Documents as necessary to comply with the Owner's budget for the Cost of the Work at the conclusion of the Construction Documents Phase Services, or the budget as adjusted under Section 6.6.1. The Architect's modification of the Construction Documents shall be the limit of the Architect's responsibility under this Article 6.

**ARTICLE 7 COPYRIGHTS AND LICENSES**

**§ 7.1** The Architect and the Owner warrant that in transmitting Instruments of Service, or any other information, the transmitting party is the copyright owner of such information or has permission from the copyright owner to transmit such information for its use on the Project. If the Owner and Architect intend to transmit Instruments of Service or any other information or documentation in digital form, they shall endeavor to establish necessary protocols governing such transmissions.

**§ 7.2** The Architect and the Architect's consultants shall be deemed the authors and owners of their respective Instruments of Service, including the Drawings and Specifications, and shall retain all common law, statutory and other reserved rights, including copyrights. Submission or distribution of Instruments of Service to meet official regulatory requirements or for similar purposes in connection with the Project is not to be construed as publication in derogation of the reserved rights of the Architect and the Architect's consultants.

**§ 7.3** Upon execution of this Agreement, the Architect grants to the Owner a nonexclusive license to use the Architect's Instruments of Service solely and exclusively for purposes of constructing, using, maintaining, altering and adding to the Project, provided that the Owner substantially performs its obligations, including prompt payment of all sums when due, under this Agreement. The Architect shall obtain similar nonexclusive licenses from the Architect's consultants consistent with this Agreement. The license granted under this section permits the Owner to authorize the Contractor, Subcontractors, Sub-subcontractors, and material or equipment suppliers, as well as the Owner's consultants and separate contractors, to reproduce applicable portions of the Instruments of Service solely and exclusively for use in performing services or construction for the Project. If the Architect rightfully terminates this Agreement for cause as provided in Section 9.4, the license granted in this Section 7.3 shall terminate.

**§ 7.3.1** In the event the Owner uses the Instruments of Service without retaining the author of the Instruments of Service, the Owner releases the Architect and Architect's consultant(s) from all claims and causes of action arising from such uses. The Owner, to the extent permitted by law, further agrees to indemnify and hold harmless the Architect and its consultants from all costs and expenses, including the cost of defense, related to claims and causes of action asserted by any third person or entity to the extent such costs and expenses arise from the Owner's use of the Instruments of Service under this Section 7.3.1. The terms of this Section 7.3.1 shall not apply if the Owner rightfully terminates this Agreement for cause under Section 9.4.

**§ 7.4** Except for the licenses granted in this Article 7, no other license or right shall be deemed granted or implied under this Agreement. The Owner shall not assign, delegate, sublicense, pledge or otherwise transfer any license granted herein to another party without the prior written agreement of the Architect. Any unauthorized use of the

Instruments of Service shall be at the Owner's sole risk and without liability to the Architect and the Architect's consultants.

**ARTICLE 8 CLAIMS AND DISPUTES**

**§ 8.1 GENERAL**

**§ 8.1.1** The Owner and Architect shall commence all claims and causes of action, whether in contract, tort, or otherwise, against the other arising out of or related to this Agreement in accordance with the requirements of the method of binding dispute resolution selected in this Agreement within the period specified by applicable law, but in any case not more than 10 years after the date of Substantial Completion of the Work. The Owner and Architect waive all claims and causes of action not commenced in accordance with this Section 8.1.1.

**§ 8.1.2** To the extent damages are covered by property insurance, the Owner and Architect waive all rights against each other and against the contractors, consultants, agents and employees of the other for damages, except such rights as they may have to the proceeds of such insurance as set forth in AIA Document A201–2007, General Conditions of the Contract for Construction. The Owner or the Architect, as appropriate, shall require of the contractors, consultants, agents and employees of any of them similar waivers in favor of the other parties enumerated herein.

**§ 8.1.3** The Architect and Owner waive consequential damages for claims, disputes or other matters in question arising out of or relating to this Agreement. This mutual waiver is applicable, without limitation, to all consequential damages due to either party's termination of this Agreement, except as specifically provided in Section 9.7.

**§ 8.2 MEDIATION**

**§ 8.2.1** Any claim, dispute or other matter in question arising out of or related to this Agreement shall be subject to mediation as a condition precedent to binding dispute resolution. If such matter relates to or is the subject of a lien arising out of the Architect's services, the Architect may proceed in accordance with applicable law to comply with the lien notice or filing deadlines prior to resolution of the matter by mediation or by binding dispute resolution.

**§ 8.2.2** The Owner and Architect shall endeavor to resolve claims, disputes and other matters in question between them by mediation which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Mediation Procedures in effect on the date of the Agreement. A request for mediation shall be made in writing, delivered to the other party to the Agreement, and filed with the person or entity administering the mediation. The request may be made concurrently with the filing of a complaint or other appropriate demand for binding dispute resolution but, in such event, mediation shall proceed in advance of binding dispute resolution proceedings, which shall be stayed pending mediation for a period of 60 days from the date of filing, unless stayed for a longer period by agreement of the parties or court order. If an arbitration proceeding is stayed pursuant to this section, the parties may nonetheless proceed to the selection of the arbitrator(s) and agree upon a schedule for later proceedings.

**§ 8.2.3** The parties shall share the mediator's fee and any filing fees equally. The mediation shall be held in the place where the Project is located, unless another location is mutually agreed upon. Agreements reached in mediation shall be enforceable as settlement agreements in any court having jurisdiction thereof.

**§ 8.2.4** If the parties do not resolve a dispute through mediation pursuant to this Section 8.2, the method of binding dispute resolution shall be the following:
*(Check the appropriate box. If the Owner and Architect do not select a method of binding dispute resolution below, or do not subsequently agree in writing to a binding dispute resolution method other than litigation, the dispute will be resolved in a court of competent jurisdiction.)*

☐ Arbitration pursuant to Section 8.3 of this Agreement

☐ Litigation in a court of competent jurisdiction

☐ Other *(Specify)*

**§ 8.3 ARBITRATION**

**§ 8.3.1** If the parties have selected arbitration as the method for binding dispute resolution in this Agreement, any claim, dispute or other matter in question arising out of or related to this Agreement subject to, but not resolved by, mediation shall be subject to arbitration which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Arbitration Rules in effect on the date of this Agreement. A demand for arbitration shall be made in writing, delivered to the other party to this Agreement, and filed with the person or entity administering the arbitration.

**§ 8.3.1.1** A demand for arbitration shall be made no earlier than concurrently with the filing of a request for mediation, but in no event shall it be made after the date when the institution of legal or equitable proceedings based on the claim, dispute or other matter in question would be barred by the applicable statute of limitations. For statute of limitations purposes, receipt of a written demand for arbitration by the person or entity administering the arbitration shall constitute the institution of legal or equitable proceedings based on the claim, dispute or other matter in question.

**§ 8.3.2** The foregoing agreement to arbitrate and other agreements to arbitrate with an additional person or entity duly consented to by parties to this Agreement shall be specifically enforceable in accordance with applicable law in any court having jurisdiction thereof.

**§ 8.3.3** The award rendered by the arbitrator(s) shall be final, and judgment may be entered upon it in accordance with applicable law in any court having jurisdiction thereof.

**§ 8.3.4 CONSOLIDATION OR JOINDER**

**§ 8.3.4.1** Either party, at its sole discretion, may consolidate an arbitration conducted under this Agreement with any other arbitration to which it is a party provided that (1) the arbitration agreement governing the other arbitration permits consolidation; (2) the arbitrations to be consolidated substantially involve common questions of law or fact; and (3) the arbitrations employ materially similar procedural rules and methods for selecting arbitrator(s).

**§ 8.3.4.2** Either party, at its sole discretion, may include by joinder persons or entities substantially involved in a common question of law or fact whose presence is required if complete relief is to be accorded in arbitration, provided that the party sought to be joined consents in writing to such joinder. Consent to arbitration involving an additional person or entity shall not constitute consent to arbitration of any claim, dispute or other matter in question not described in the written consent.

**§ 8.3.4.3** The Owner and Architect grant to any person or entity made a party to an arbitration conducted under this Section 8.3, whether by joinder or consolidation, the same rights of joinder and consolidation as the Owner and Architect under this Agreement.

**ARTICLE 9 TERMINATION OR SUSPENSION**

**§ 9.1** If the Owner fails to make payments to the Architect in accordance with this Agreement, such failure shall be considered substantial nonperformance and cause for termination or, at the Architect's option, cause for suspension of performance of services under this Agreement. If the Architect elects to suspend services, the Architect shall give seven days' written notice to the Owner before suspending services. In the event of a suspension of services, the Architect shall have no liability to the Owner for delay or damage caused the Owner because of such suspension of services. Before resuming services, the Architect shall be paid all sums due prior to suspension and any expenses incurred in the interruption and resumption of the Architect's services. The Architect's fees for the remaining services and the time schedules shall be equitably adjusted.

**§ 9.2** If the Owner suspends the Project, the Architect shall be compensated for services performed prior to notice of such suspension. When the Project is resumed, the Architect shall be compensated for expenses incurred in the interruption and resumption of the Architect's services. The Architect's fees for the remaining services and the time schedules shall be equitably adjusted.

**§ 9.3** If the Owner suspends the Project for more than 90 cumulative days for reasons other than the fault of the Architect, the Architect may terminate this Agreement by giving not less than seven days' written notice.

**§ 9.4** Either party may terminate this Agreement upon not less than seven days' written notice should the other party fail substantially to perform in accordance with the terms of this Agreement through no fault of the party initiating the termination.

**§ 9.5** The Owner may terminate this Agreement upon not less than seven days' written notice to the Architect for the Owner's convenience and without cause.

**§ 9.6** In the event of termination not the fault of the Architect, the Architect shall be compensated for services performed prior to termination, together with Reimbursable Expenses then due and all Termination Expenses as defined in Section 9.7.

**§ 9.7** Termination Expenses are in addition to compensation for the Architect's services and include expenses directly attributable to termination for which the Architect is not otherwise compensated, plus an amount for the Architect's anticipated profit on the value of the services not performed by the Architect.

**§ 9.8** The Owner's rights to use the Architect's Instruments of Service in the event of a termination of this Agreement are set forth in Article 7 and Section 11.9.

**ARTICLE 10 MISCELLANEOUS PROVISIONS**

**§ 10.1** This Agreement shall be governed by the law of the place where the Project is located, except that if the parties have selected arbitration as the method of binding dispute resolution, the Federal Arbitration Act shall govern Section 8.3.

**§ 10.2** Terms in this Agreement shall have the same meaning as those in AIA Document A201–2007, General Conditions of the Contract for Construction.

**§ 10.3** The Owner and Architect, respectively, bind themselves, their agents, successors, assigns and legal representatives to this Agreement. Neither the Owner nor the Architect shall assign this Agreement without the written consent of the other, except that the Owner may assign this Agreement to a lender providing financing for the Project if the lender agrees to assume the Owner's rights and obligations under this Agreement.

**§ 10.4** If the Owner requests the Architect to execute certificates, the proposed language of such certificates shall be submitted to the Architect for review at least 14 days prior to the requested dates of execution. If the Owner requests the Architect to execute consents reasonably required to facilitate assignment to a lender, the Architect shall execute all such consents that are consistent with this Agreement, provided the proposed consent is submitted to the Architect for review at least 14 days prior to execution. The Architect shall not be required to execute certificates or consents that would require knowledge, services or responsibilities beyond the scope of this Agreement.

**§ 10.5** Nothing contained in this Agreement shall create a contractual relationship with or a cause of action in favor of a third party against either the Owner or Architect.

**§ 10.6** Unless otherwise required in this Agreement, the Architect shall have no responsibility for the discovery, presence, handling, removal or disposal of, or exposure of persons to, hazardous materials or toxic substances in any form at the Project site.

**§ 10.7** The Architect shall have the right to include photographic or artistic representations of the design of the Project among the Architect's promotional and professional materials. The Architect shall be given reasonable access to the completed Project to make such representations. However, the Architect's materials shall not include the Owner's confidential or proprietary information if the Owner has previously advised the Architect in writing of the specific information considered by the Owner to be confidential or proprietary. The Owner shall provide professional credit for the Architect in the Owner's promotional materials for the Project.

**§ 10.8** If the Architect or Owner receives information specifically designated by the other party as "confidential" or "business proprietary," the receiving party shall keep such information strictly confidential and shall not disclose it to any other person except to (1) its employees, (2) those who need to know the content of such information in order to perform services or construction solely and exclusively for the Project, or (3) its consultants and contractors whose contracts include similar restrictions on the use of confidential information.

**ARTICLE 11 COMPENSATION**

**§ 11.1** For the Architect's Basic Services described under Article 3, the Owner shall compensate the Architect as follows:
*(Insert amount of, or basis for, compensation.)*

**§ 11.2** For Additional Services designated in Section 4.1, the Owner shall compensate the Architect as follows:
*(Insert amount of, or basis for, compensation. If necessary, list specific services to which particular methods of compensation apply.)*

**§ 11.3** For Additional Services that may arise during the course of the Project, including those under Section 4.3, the Owner shall compensate the Architect as follows:
*(Insert amount of, or basis for, compensation.)*

**§ 11.4** Compensation for Additional Services of the Architect's consultants when not included in Section 11.2 or 11.3, shall be the amount invoiced to the Architect plus percent ( %), or as otherwise stated below:

**§ 11.5** Where compensation for Basic Services is based on a stipulated sum or percentage of the Cost of the Work, the compensation for each phase of services shall be as follows:

| | | |
|---|---|---|
| Schematic Design Phase: | percent ( | %) |
| Design Development Phase: | percent ( | %) |
| Construction Documents Phase: | percent ( | %) |
| Bidding or Negotiation Phase: | percent ( | %) |
| Construction Phase: | percent ( | %) |
| Total Basic Compensation | one hundred percent ( | 100.00%) |

**§ 11.6** When compensation is based on a percentage of the Cost of the Work and any portions of the Project are deleted or otherwise not constructed, compensation for those portions of the Project shall be payable to the extent services are performed on those portions, in accordance with the schedule set forth in Section 11.5 based on (1) the lowest bona fide bid or negotiated proposal, or (2) if no such bid or proposal is received, the most recent estimate of the Cost of the Work for such portions of the Project. The Architect shall be entitled to compensation in accordance with this Agreement for all services performed whether or not the Construction Phase is commenced.

**§ 11.7** The hourly billing rates for services of the Architect and the Architect's consultants, if any, are set forth below. The rates shall be adjusted in accordance with the Architect's and Architect's consultants' normal review practices.
*(If applicable, attach an exhibit of hourly billing rates or insert them below.)*

**§ 11.8 COMPENSATION FOR REIMBURSABLE EXPENSES**

**§ 11.8.1** Reimbursable Expenses are in addition to compensation for Basic and Additional Services and include expenses incurred by the Architect and the Architect's consultants directly related to the Project, as follows:

**.1** Transportation and authorized out-of-town travel and subsistence;
**.2** Long distance services, dedicated data and communication services, teleconferences, Project Web sites, and extranets;
**.3** Fees paid for securing approval of authorities having jurisdiction over the Project;
**.4** Printing, reproductions, plots, standard form documents;
**.5** Postage, handling and delivery;
**.6** Expense of overtime work requiring higher than regular rates, if authorized in advance by the Owner;
**.7** Renderings, models, mock-ups, professional photography, and presentation materials requested by the Owner;
**.8** Architect's Consultant's expense of professional liability insurance dedicated exclusively to this Project, or the expense of additional insurance coverage or limits if the Owner requests such insurance in excess of that normally carried by the Architect's consultants;
**.9** All taxes levied on professional services and on reimbursable expenses;
**.10** Site office expenses; and
**.11** Other similar Project-related expenditures.

**§ 11.8.2** For Reimbursable Expenses the compensation shall be the expenses incurred by the Architect and the Architect's consultants plus percent ( %) of the expenses incurred.

**§ 11.9 COMPENSATION FOR USE OF ARCHITECT'S INSTRUMENTS OF SERVICE**

If the Owner terminates the Architect for its convenience under Section 9.5, or the Architect terminates this Agreement under Section 9.3, the Owner shall pay a licensing fee as compensation for the Owner's continued use of the Architect's Instruments of Service solely for purposes of completing, using and maintaining the Project as follows:

**§ 11.10 PAYMENTS TO THE ARCHITECT**

**§ 11.10.1** An initial payment of Dollars ($ ) shall be made upon execution of this Agreement and is the minimum payment under this Agreement. It shall be credited to the Owner's account in the final invoice.

**§ 11.10.2** Unless otherwise agreed, payments for services shall be made monthly in proportion to services performed. Payments are due and payable upon presentation of the Architect's invoice. Amounts unpaid ( ) days after the invoice date shall bear interest at the rate entered below, or in the absence thereof at the legal rate prevailing from time to time at the principal place of business of the Architect.
*(Insert rate of monthly or annual interest agreed upon.)*

**§ 11.10.3** The Owner shall not withhold amounts from the Architect's compensation to impose a penalty or liquidated damages on the Architect, or to offset sums requested by or paid to contractors for the cost of changes in the Work unless the Architect agrees or has been found liable for the amounts in a binding dispute resolution proceeding.

**§ 11.10.4** Records of Reimbursable Expenses, expenses pertaining to Additional Services, and services performed on the basis of hourly rates shall be available to the Owner at mutually convenient times.

**ARTICLE 12 SPECIAL TERMS AND CONDITIONS**

Special terms and conditions that modify this Agreement are as follows:

**ARTICLE 13 SCOPE OF THE AGREEMENT**

**§ 13.1** This Agreement represents the entire and integrated agreement between the Owner and the Architect and supersedes all prior negotiations, representations or agreements, either written or oral. This Agreement may be amended only by written instrument signed by both Owner and Architect.

**§ 13.2** This Agreement is comprised of the following documents listed below:

**.1** AIA Document B101™–2007, Standard Form Agreement Between Owner and Architect

**.2** AIA Document E201™–2007, Digital Data Protocol Exhibit, if completed, or the following:

**.3** Other documents:
*(List other documents, if any, including Exhibit A, Initial Information, and additional scopes of service, if any, forming part of the Agreement.)*



This Agreement entered into as of the day and year first written above.

| | |
|---|---|
| **OWNER** *(Signature)* | **ARCHITECT** *(Signature)* |
| *(Printed name and title)* | *(Printed name and title)* |

**CAUTION: You should sign an original AIA Contract Document, on which this text appears in RED. An original assures that changes will not be obscured.**

# AIA® Document B101™ – 2007 Exhibit A

## *Initial Information*

**for the following PROJECT:**
*(Name and location or address)*

**THE OWNER:**
*(Name and address)*

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

**THE ARCHITECT:**
*(Name and address)*

This Agreement is based on the following information.
*(Note the disposition for the following items by inserting the requested information or a statement such as "not applicable," "unknown at time of execution" or "to be determined later by mutual agreement.")*

**ARTICLE A.1 PROJECT INFORMATION**

**§ A.1.1** The Owner's program for the Project:
*(Identify documentation or state the manner in which the program will be developed.)*

**§ A.1.2** The Project's physical characteristics:
*(Identify or describe, if appropriate, size, location, dimensions, or other pertinent information, such as geotechnical reports; site, boundary and topographic surveys; traffic and utility studies; availability of public and private utilities and services; legal description of the site; etc.)*

**§ A.1.3** The Owner's budget for the Cost of the Work, as defined in Section 6.1:
*(Provide total, and if known, a line item break down.)*

**§ A.1.4** The Owner's other anticipated scheduling information, if any, not provided in Section 1.2:

**§ A.1.5** The Owner intends the following procurement or delivery method for the Project:
*(Identify method such as competitive bid, negotiated contract, or construction management.)*

**§ A.1.6** Other Project information:
*(Identify special characteristics or needs of the Project not provided elsewhere, such as environmentally responsible design or historic preservation requirements.)*

**ARTICLE A.2 PROJECT TEAM**

**§ A.2.1** The Owner identifies the following representative in accordance with Section 5.3:
*(List name, address and other information.)*

**§ A.2.2** The persons or entities, in addition to the Owner's representative, who are required to review the Architect's submittals to the Owner are as follows:
*(List name, address and other information.)*

**§ A.2.3** The Owner will retain the following consultants and contractors:
*(List discipline and, if known, identify them by name and address.)*

**§ A.2.4** The Architect identifies the following representative in accordance with Section 2.3:
*(List name, address and other information.)*

**§ A.2.5** The Architect will retain the consultants identified in Sections A.2.5.1 and A.2.5.2.
*(List discipline and, if known, identify them by name and address.)*

**§ A.2.5.1** Consultants retained under Basic Services:

**.1** Structural Engineer

**.2** Mechanical Engineer

**.3** Electrical Engineer

**§ A.2.5.2** Consultants retained under Additional Services:

**§ A.2.6** Other Initial Information on which the Agreement is based:
*(Provide other Initial Information.)*

# Appendix C

# Construction Specification Institute MasterFormat 2014

The basic organizational structure of the *MasterFormat*® groups and subgroups, including division numbers and titles, is as follows:

Procurement and Contracting Requirements Group
- Division 00—Procurement and Contracting Requirements

Specifications Group

General Requirements *Subgroup*:
- Division 01—General Requirements

Facility Construction *Subgroup*:
- 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 for future expansion)
- Division 16— (Reserved)
- Division 17— (Reserved)
- Division 18— (Reserved)
- Division 19— (Reserved)

Facility Services *Subgroup*:
- Division 20— (Reserved)
- Division 21—Fire Supression
- Division 22—Plumbing
- Division 23—Heating, Ventilating, and Air-Conditioning
- Division 24— (Reserved)
- Division 25—Integrated Automation
- Division 26—Electrical
- Division 27—Communications
- Division 28—Electronic Safety and Security
- Division 29— (Reserved)

Site and Infrastructure *Subgroup*:
- 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 and Waste Control Equipment
- Division 45—Industry-Specific Manufacturing Equipment
- Division 46—Water and Wastewater Equipment
- Division 47— (Reserved)
- Division 48—Electrical Power Generation
- Division 49— (Reserved)

Construction Specifications Institute

# Appendix D

# AIA Document A201-2007 General Conditions of the Contract for Construction

American Institute of Architects

# AIA® Document A201™ – 2007

## *General Conditions of the Contract for Construction*

**for the following PROJECT:**
*(Name and location or address)*

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

**THE OWNER:**
*(Name and address)*

**THE ARCHITECT:**
*(Name and address)*

**TABLE OF ARTICLES**







Init.
/

**INDEX**
(Numbers and Topics in Bold are Section Headings)

**ARTICLE 1 GENERAL PROVISIONS**

**§ 1.1 BASIC DEFINITIONS**

**§ 1.1.1 THE CONTRACT DOCUMENTS**

The Contract Documents are enumerated in the Agreement between the Owner and Contractor (hereinafter the Agreement) and consist of the Agreement, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, Addenda issued prior to execution of the Contract, other documents listed in the Agreement and Modifications issued after execution of the Contract. A Modification is (1) a written amendment to the Contract signed by both parties, (2) a Change Order, (3) a Construction Change Directive or (4) a written order for a minor change in the Work issued by the Architect. Unless specifically enumerated in the Agreement, the Contract Documents do not include the advertisement or invitation to bid, Instructions to Bidders, sample forms, other information furnished by the Owner in anticipation of receiving bids or proposals, the Contractor's bid or proposal, or portions of Addenda relating to bidding requirements.

**§ 1.1.2 THE CONTRACT**

The Contract Documents form the Contract for Construction. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations or agreements, either written or oral. The Contract may be amended or modified only by a Modification. The Contract Documents shall not be construed to create a contractual relationship of any kind (1) between the Contractor and the Architect or the Architect's consultants, (2) between the Owner and a Subcontractor or a Sub-subcontractor, (3) between the Owner and the Architect or the Architect's consultants or (4) between any persons or entities other than the Owner and the Contractor. The Architect shall, however, be entitled to performance and enforcement of obligations under the Contract intended to facilitate performance of the Architect's duties.

**§ 1.1.3 THE WORK**

The term "Work" means the construction and services required by the Contract Documents, whether completed or partially completed, and includes all other labor, materials, equipment and services provided or to be provided by the Contractor to fulfill the Contractor's obligations. The Work may constitute the whole or a part of the Project.

**§ 1.1.4 THE PROJECT**

The Project is the total construction of which the Work performed under the Contract Documents may be the whole or a part and which may include construction by the Owner and by separate contractors.

**§ 1.1.5 THE DRAWINGS**

The Drawings are the graphic and pictorial portions of the Contract Documents showing the design, location and dimensions of the Work, generally including plans, elevations, sections, details, schedules and diagrams.

**§ 1.1.6 THE SPECIFICATIONS**

The Specifications are that portion of the Contract Documents consisting of the written requirements for materials, equipment, systems, standards and workmanship for the Work, and performance of related services.

**§ 1.1.7 INSTRUMENTS OF SERVICE**

Instruments of Service are representations, in any medium of expression now known or later developed, of the tangible and intangible creative work performed by the Architect and the Architect's consultants under their respective professional services agreements. Instruments of Service may include, without limitation, studies, surveys, models, sketches, drawings, specifications, and other similar materials.

**§ 1.1.8 INITIAL DECISION MAKER**

The Initial Decision Maker is the person identified in the Agreement to render initial decisions on Claims in accordance with Section 15.2 and certify termination of the Agreement under Section 14.2.2.

**§ 1.2 CORRELATION AND INTENT OF THE CONTRACT DOCUMENTS**

**§ 1.2.1** The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work by the Contractor. The Contract Documents are complementary, and what is required by one shall be as binding as if required by all; performance by the Contractor shall be required only to the extent consistent with the Contract Documents and reasonably inferable from them as being necessary to produce the indicated results.

**§ 1.2.2** Organization of the Specifications into divisions, sections and articles, and arrangement of Drawings shall not control the Contractor in dividing the Work among Subcontractors or in establishing the extent of Work to be performed by any trade.

**§ 1.2.3** Unless otherwise stated in the Contract Documents, words that have well-known technical or construction industry meanings are used in the Contract Documents in accordance with such recognized meanings.

### § 1.3 CAPITALIZATION

Terms capitalized in these General Conditions include those that are (1) specifically defined, (2) the titles of numbered articles or (3) the titles of other documents published by the American Institute of Architects.

### § 1.4 INTERPRETATION

In the interest of brevity the Contract Documents frequently omit modifying words such as "all" and "any" and articles such as "the" and "an," but the fact that a modifier or an article is absent from one statement and appears in another is not intended to affect the interpretation of either statement.

### § 1.5 OWNERSHIP AND USE OF DRAWINGS, SPECIFICATIONS AND OTHER INSTRUMENTS OF SERVICE

**§ 1.5.1** The Architect and the Architect's consultants shall be deemed the authors and owners of their respective Instruments of Service, including the Drawings and Specifications, and will retain all common law, statutory and other reserved rights, including copyrights. The Contractor, Subcontractors, Sub-subcontractors, and material or equipment suppliers shall not own or claim a copyright in the Instruments of Service. Submittal or distribution to meet official regulatory requirements or for other purposes in connection with this Project is not to be construed as publication in derogation of the Architect's or Architect's consultants' reserved rights.

**§ 1.5.2** The Contractor, Subcontractors, Sub-subcontractors and material or equipment suppliers are authorized to use and reproduce the Instruments of Service provided to them solely and exclusively for execution of the Work. All copies made under this authorization shall bear the copyright notice, if any, shown on the Instruments of Service. The Contractor, Subcontractors, Sub-subcontractors, and material or equipment suppliers may not use the Instruments of Service on other projects or for additions to this Project outside the scope of the Work without the specific written consent of the Owner, Architect and the Architect's consultants.

### § 1.6 TRANSMISSION OF DATA IN DIGITAL FORM

If the parties intend to transmit Instruments of Service or any other information or documentation in digital form, they shall endeavor to establish necessary protocols governing such transmissions, unless otherwise already provided in the Agreement or the Contract Documents.

## ARTICLE 2 OWNER

### § 2.1 GENERAL

**§ 2.1.1** The Owner is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Owner shall designate in writing a representative who shall have express authority to bind the Owner with respect to all matters requiring the Owner's approval or authorization. Except as otherwise provided in Section 4.2.1, the Architect does not have such authority. The term "Owner" means the Owner or the Owner's authorized representative.

**§ 2.1.2** The Owner shall furnish to the Contractor within fifteen days after receipt of a written request, information necessary and relevant for the Contractor to evaluate, give notice of or enforce mechanic's lien rights. Such information shall include a correct statement of the record legal title to the property on which the Project is located, usually referred to as the site, and the Owner's interest therein.

### § 2.2 INFORMATION AND SERVICES REQUIRED OF THE OWNER

**§ 2.2.1** Prior to commencement of the Work, the Contractor may request in writing that the Owner provide reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract. Thereafter, the Contractor may only request such evidence if (1) the Owner fails to make payments to the Contractor as the Contract Documents require; (2) a change in the Work materially changes the Contract Sum; or (3) the Contractor identifies in writing a reasonable concern regarding the Owner's ability to make payment when due. The Owner shall furnish such evidence as a condition precedent to commencement or continuation of the Work or the portion of the Work affected by a material change. After the Owner furnishes the evidence, the Owner shall not materially vary such financial arrangements without prior notice to the Contractor.

**§ 2.2.2** Except for permits and fees that are the responsibility of the Contractor under the Contract Documents, including those required under Section 3.7.1, the Owner shall secure and pay for necessary approvals, easements, assessments and charges required for construction, use or occupancy of permanent structures or for permanent changes in existing facilities.

**§ 2.2.3** The Owner shall furnish surveys describing physical characteristics, legal limitations and utility locations for the site of the Project, and a legal description of the site. The Contractor shall be entitled to rely on the accuracy of information furnished by the Owner but shall exercise proper precautions relating to the safe performance of the Work.

**§ 2.2.4** The Owner shall furnish information or services required of the Owner by the Contract Documents with reasonable promptness. The Owner shall also furnish any other information or services under the Owner's control and relevant to the Contractor's performance of the Work with reasonable promptness after receiving the Contractor's written request for such information or services.

**§ 2.2.5** Unless otherwise provided in the Contract Documents, the Owner shall furnish to the Contractor one copy of the Contract Documents for purposes of making reproductions pursuant to Section 1.5.2.

### § 2.3 OWNER'S RIGHT TO STOP THE WORK

If the Contractor fails to correct Work that is not in accordance with the requirements of the Contract Documents as required by Section 12.2 or repeatedly fails to carry out Work in accordance with the Contract Documents, the Owner may issue a written order to the Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, the right of the Owner to stop the Work shall not give rise to a duty on the part of the Owner to exercise this right for the benefit of the Contractor or any other person or entity, except to the extent required by Section 6.1.3.

### § 2.4 OWNER'S RIGHT TO CARRY OUT THE WORK

If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents and fails within a ten-day period after receipt of written notice from the Owner to commence and continue correction of such default or neglect with diligence and promptness, the Owner may, without prejudice to other remedies the Owner may have, correct such deficiencies. In such case an appropriate Change Order shall be issued deducting from payments then or thereafter due the Contractor the reasonable cost of correcting such deficiencies, including Owner's expenses and compensation for the Architect's additional services made necessary by such default, neglect or failure. Such action by the Owner and amounts charged to the Contractor are both subject to prior approval of the Architect. If payments then or thereafter due the Contractor are not sufficient to cover such amounts, the Contractor shall pay the difference to the Owner.

## ARTICLE 3 CONTRACTOR

### § 3.1 GENERAL

**§ 3.1.1** The Contractor is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Contractor shall be lawfully licensed, if required in the jurisdiction where the Project is located. The Contractor shall designate in writing a representative who shall have express authority to bind the Contractor with respect to all matters under this Contract. The term "Contractor" means the Contractor or the Contractor's authorized representative.

**§ 3.1.2** The Contractor shall perform the Work in accordance with the Contract Documents.

**§ 3.1.3** The Contractor shall not be relieved of obligations to perform the Work in accordance with the Contract Documents either by activities or duties of the Architect in the Architect's administration of the Contract, or by tests, inspections or approvals required or performed by persons or entities other than the Contractor.

### § 3.2 REVIEW OF CONTRACT DOCUMENTS AND FIELD CONDITIONS BY CONTRACTOR

**§ 3.2.1** Execution of the Contract by the Contractor is a representation that the Contractor has visited the site, become generally familiar with local conditions under which the Work is to be performed and correlated personal observations with requirements of the Contract Documents.

**§ 3.2.2** Because the Contract Documents are complementary, the Contractor shall, before starting each portion of the Work, carefully study and compare the various Contract Documents relative to that portion of the Work, as well as the information furnished by the Owner pursuant to Section 2.2.3, shall take field measurements of any existing conditions related to that portion of the Work, and shall observe any conditions at the site affecting it. These obligations are for the purpose of facilitating coordination and construction by the Contractor and are not for the purpose of discovering errors, omissions, or inconsistencies in the Contract Documents; however, the Contractor shall promptly report to the Architect any errors, inconsistencies or omissions discovered by or made known to the Contractor as a request for information in such form as the Architect may require. It is recognized that the Contractor's review is made in the Contractor's capacity as a contractor and not as a licensed design professional, unless otherwise specifically provided in the Contract Documents.

**§ 3.2.3** The Contractor is not required to ascertain that the Contract Documents are in accordance with applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, but the Contractor shall promptly report to the Architect any nonconformity discovered by or made known to the Contractor as a request for information in such form as the Architect may require.

**§ 3.2.4** If the Contractor believes that additional cost or time is involved because of clarifications or instructions the Architect issues in response to the Contractor's notices or requests for information pursuant to Sections 3.2.2 or 3.2.3, the Contractor shall make Claims as provided in Article 15. If the Contractor fails to perform the obligations of Sections 3.2.2 or 3.2.3, the Contractor shall pay such costs and damages to the Owner as would have been avoided if the Contractor had performed such obligations. If the Contractor performs those obligations, the Contractor shall not be liable to the Owner or Architect for damages resulting from errors, inconsistencies or omissions in the Contract Documents, for differences between field measurements or conditions and the Contract Documents, or for nonconformities of the Contract Documents to applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities.

### § 3.3 SUPERVISION AND CONSTRUCTION PROCEDURES

**§ 3.3.1** The Contractor shall supervise and direct the Work, using the Contractor's best skill and attention. The Contractor shall be solely responsible for, and have control over, construction means, methods, techniques, sequences and procedures and for coordinating all portions of the Work under the Contract, unless the Contract Documents give other specific instructions concerning these matters. If the Contract Documents give specific instructions concerning construction means, methods, techniques, sequences or procedures, the Contractor shall evaluate the jobsite safety thereof and, except as stated below, shall be fully and solely responsible for the jobsite safety of such means, methods, techniques, sequences or procedures. If the Contractor determines that such means, methods, techniques, sequences or procedures may not be safe, the Contractor shall give timely written notice to the Owner and Architect and shall not proceed with that portion of the Work without further written instructions from the Architect. If the Contractor is then instructed to proceed with the required means, methods, techniques, sequences or procedures without acceptance of changes proposed by the Contractor, the Owner shall be solely responsible for any loss or damage arising solely from those Owner-required means, methods, techniques, sequences or procedures.

**§ 3.3.2** The Contractor shall be responsible to the Owner for acts and omissions of the Contractor's employees, Subcontractors and their agents and employees, and other persons or entities performing portions of the Work for, or on behalf of, the Contractor or any of its Subcontractors.

**§ 3.3.3** The Contractor shall be responsible for inspection of portions of Work already performed to determine that such portions are in proper condition to receive subsequent Work.

### § 3.4 LABOR AND MATERIALS

**§ 3.4.1** Unless otherwise provided in the Contract Documents, the Contractor shall provide and pay for labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other facilities and services necessary for proper execution and completion of the Work, whether temporary or permanent and whether or not incorporated or to be incorporated in the Work.

**§ 3.4.2** Except in the case of minor changes in the Work authorized by the Architect in accordance with Sections 3.12.8 or 7.4, the Contractor may make substitutions only with the consent of the Owner, after evaluation by the Architect and in accordance with a Change Order or Construction Change Directive.

**§ 3.4.3** The Contractor shall enforce strict discipline and good order among the Contractor's employees and other persons carrying out the Work. The Contractor shall not permit employment of unfit persons or persons not properly skilled in tasks assigned to them.

**§ 3.5 WARRANTY**

The Contractor warrants to the Owner and Architect that materials and equipment furnished under the Contract will be of good quality and new unless the Contract Documents require or permit otherwise. The Contractor further warrants that the Work will conform to the requirements of the Contract Documents and will be free from defects, except for those inherent in the quality of the Work the Contract Documents require or permit. Work, materials, or equipment not conforming to these requirements may be considered defective. The Contractor's warranty excludes remedy for damage or defect caused by abuse, alterations to the Work not executed by the Contractor, improper or insufficient maintenance, improper operation, or normal wear and tear and normal usage. If required by the Architect, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment.

**§ 3.6 TAXES**

The Contractor shall pay sales, consumer, use and similar taxes for the Work provided by the Contractor that are legally enacted when bids are received or negotiations concluded, whether or not yet effective or merely scheduled to go into effect.

**§ 3.7 PERMITS, FEES, NOTICES, AND COMPLIANCE WITH LAWS**

**§ 3.7.1** Unless otherwise provided in the Contract Documents, the Contractor shall secure and pay for the building permit as well as for other permits, fees, licenses, and inspections by government agencies necessary for proper execution and completion of the Work that are customarily secured after execution of the Contract and legally required at the time bids are received or negotiations concluded.

**§ 3.7.2** The Contractor shall comply with and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities applicable to performance of the Work.

**§ 3.7.3** If the Contractor performs Work knowing it to be contrary to applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, the Contractor shall assume appropriate responsibility for such Work and shall bear the costs attributable to correction.

**§ 3.7.4 Concealed or Unknown Conditions.** If the Contractor encounters conditions at the site that are (1) subsurface or otherwise concealed physical conditions that differ materially from those indicated in the Contract Documents or (2) unknown physical conditions of an unusual nature that differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Documents, the Contractor shall promptly provide notice to the Owner and the Architect before conditions are disturbed and in no event later than 21 days after first observance of the conditions. The Architect will promptly investigate such conditions and, if the Architect determines that they differ materially and cause an increase or decrease in the Contractor's cost of, or time required for, performance of any part of the Work, will recommend an equitable adjustment in the Contract Sum or Contract Time, or both. If the Architect determines that the conditions at the site are not materially different from those indicated in the Contract Documents and that no change in the terms of the Contract is justified, the Architect shall promptly notify the Owner and Contractor in writing, stating the reasons. If either party disputes the Architect's determination or recommendation, that party may proceed as provided in Article 15.

**§ 3.7.5** If, in the course of the Work, the Contractor encounters human remains or recognizes the existence of burial markers, archaeological sites or wetlands not indicated in the Contract Documents, the Contractor shall immediately suspend any operations that would affect them and shall notify the Owner and Architect. Upon receipt of such notice, the Owner shall promptly take any action necessary to obtain governmental authorization required to resume the operations. The Contractor shall continue to suspend such operations until otherwise instructed by the Owner but shall continue with all other operations that do not affect those remains or features. Requests for adjustments in the Contract Sum and Contract Time arising from the existence of such remains or features may be made as provided in Article 15.

**§ 3.8 ALLOWANCES**

**§ 3.8.1** The Contractor shall include in the Contract Sum all allowances stated in the Contract Documents. Items covered by allowances shall be supplied for such amounts and by such persons or entities as the Owner may direct,

but the Contractor shall not be required to employ persons or entities to whom the Contractor has reasonable objection.

**§ 3.8.2** Unless otherwise provided in the Contract Documents,

**.1** allowances shall cover the cost to the Contractor of materials and equipment delivered at the site and all required taxes, less applicable trade discounts;

**.2** Contractor's costs for unloading and handling at the site, labor, installation costs, overhead, profit and other expenses contemplated for stated allowance amounts shall be included in the Contract Sum but not in the allowances; and

**.3** whenever costs are more than or less than allowances, the Contract Sum shall be adjusted accordingly by Change Order. The amount of the Change Order shall reflect (1) the difference between actual costs and the allowances under Section 3.8.2.1 and (2) changes in Contractor's costs under Section 3.8.2.2.

**§ 3.8.3** Materials and equipment under an allowance shall be selected by the Owner with reasonable promptness.

### § 3.9 SUPERINTENDENT

**§ 3.9.1** The Contractor shall employ a competent superintendent and necessary assistants who shall be in attendance at the Project site during performance of the Work. The superintendent shall represent the Contractor, and communications given to the superintendent shall be as binding as if given to the Contractor.

**§ 3.9.2** The Contractor, as soon as practicable after award of the Contract, shall furnish in writing to the Owner through the Architect the name and qualifications of a proposed superintendent. The Architect may reply within 14 days to the Contractor in writing stating (1) whether the Owner or the Architect has reasonable objection to the proposed superintendent or (2) that the Architect requires additional time to review. Failure of the Architect to reply within the 14 day period shall constitute notice of no reasonable objection.

**§ 3.9.3** The Contractor shall not employ a proposed superintendent to whom the Owner or Architect has made reasonable and timely objection. The Contractor shall not change the superintendent without the Owner's consent, which shall not unreasonably be withheld or delayed.

### § 3.10 CONTRACTOR'S CONSTRUCTION SCHEDULES

**§ 3.10.1** The Contractor, promptly after being awarded the Contract, shall prepare and submit for the Owner's and Architect's information a Contractor's construction schedule for the Work. The schedule shall not exceed time limits current under the Contract Documents, shall be revised at appropriate intervals as required by the conditions of the Work and Project, shall be related to the entire Project to the extent required by the Contract Documents, and shall provide for expeditious and practicable execution of the Work.

**§ 3.10.2** The Contractor shall prepare a submittal schedule, promptly after being awarded the Contract and thereafter as necessary to maintain a current submittal schedule, and shall submit the schedule(s) for the Architect's approval. The Architect's approval shall not unreasonably be delayed or withheld. The submittal schedule shall (1) be coordinated with the Contractor's construction schedule, and (2) allow the Architect reasonable time to review submittals. If the Contractor fails to submit a submittal schedule, the Contractor shall not be entitled to any increase in Contract Sum or extension of Contract Time based on the time required for review of submittals.

**§ 3.10.3** The Contractor shall perform the Work in general accordance with the most recent schedules submitted to the Owner and Architect.

### § 3.11 DOCUMENTS AND SAMPLES AT THE SITE

The Contractor shall maintain at the site for the Owner one copy of the Drawings, Specifications, Addenda, Change Orders and other Modifications, in good order and marked currently to indicate field changes and selections made during construction, and one copy of approved Shop Drawings, Product Data, Samples and similar required submittals. These shall be available to the Architect and shall be delivered to the Architect for submittal to the Owner upon completion of the Work as a record of the Work as constructed.

**§ 3.12 SHOP DRAWINGS, PRODUCT DATA AND SAMPLES**

**§ 3.12.1** Shop Drawings are drawings, diagrams, schedules and other data specially prepared for the Work by the Contractor or a Subcontractor, Sub-subcontractor, manufacturer, supplier or distributor to illustrate some portion of the Work.

**§ 3.12.2** Product Data are illustrations, standard schedules, performance charts, instructions, brochures, diagrams and other information furnished by the Contractor to illustrate materials or equipment for some portion of the Work.

**§ 3.12.3** Samples are physical examples that illustrate materials, equipment or workmanship and establish standards by which the Work will be judged.

**§ 3.12.4** Shop Drawings, Product Data, Samples and similar submittals are not Contract Documents. Their purpose is to demonstrate the way by which the Contractor proposes to conform to the information given and the design concept expressed in the Contract Documents for those portions of the Work for which the Contract Documents require submittals. Review by the Architect is subject to the limitations of Section 4.2.7. Informational submittals upon which the Architect is not expected to take responsive action may be so identified in the Contract Documents. Submittals that are not required by the Contract Documents may be returned by the Architect without action.

**§ 3.12.5** The Contractor shall review for compliance with the Contract Documents, approve and submit to the Architect Shop Drawings, Product Data, Samples and similar submittals required by the Contract Documents in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness and in such sequence as to cause no delay in the Work or in the activities of the Owner or of separate contractors.

**§ 3.12.6** By submitting Shop Drawings, Product Data, Samples and similar submittals, the Contractor represents to the Owner and Architect that the Contractor has (1) reviewed and approved them, (2) determined and verified materials, field measurements and field construction criteria related thereto, or will do so and (3) checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents.

**§ 3.12.7** The Contractor shall perform no portion of the Work for which the Contract Documents require submittal and review of Shop Drawings, Product Data, Samples or similar submittals until the respective submittal has been approved by the Architect.

**§ 3.12.8** The Work shall be in accordance with approved submittals except that the Contractor shall not be relieved of responsibility for deviations from requirements of the Contract Documents by the Architect's approval of Shop Drawings, Product Data, Samples or similar submittals unless the Contractor has specifically informed the Architect in writing of such deviation at the time of submittal and (1) the Architect has given written approval to the specific deviation as a minor change in the Work, or (2) a Change Order or Construction Change Directive has been issued authorizing the deviation. The Contractor shall not be relieved of responsibility for errors or omissions in Shop Drawings, Product Data, Samples or similar submittals by the Architect's approval thereof.

**§ 3.12.9** The Contractor shall direct specific attention, in writing or on resubmitted Shop Drawings, Product Data, Samples or similar submittals, to revisions other than those requested by the Architect on previous submittals. In the absence of such written notice, the Architect's approval of a resubmission shall not apply to such revisions.

**§ 3.12.10** The Contractor shall not be required to provide professional services that constitute the practice of architecture or engineering unless such services are specifically required by the Contract Documents for a portion of the Work or unless the Contractor needs to provide such services in order to carry out the Contractor's responsibilities for construction means, methods, techniques, sequences and procedures. The Contractor shall not be required to provide professional services in violation of applicable law. If professional design services or certifications by a design professional related to systems, materials or equipment are specifically required of the Contractor by the Contract Documents, the Owner and the Architect will specify all performance and design criteria that such services must satisfy. The Contractor shall cause such services or certifications to be provided by a properly licensed design professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings and other submittals prepared by such professional. Shop Drawings and other submittals related to the Work designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to the Architect. The Owner and the Architect shall be entitled

to rely upon the adequacy, accuracy and completeness of the services, certifications and approvals performed or provided by such design professionals, provided the Owner and Architect have specified to the Contractor all performance and design criteria that such services must satisfy. Pursuant to this Section 3.12.10, the Architect will review, approve or take other appropriate action on submittals only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Contractor shall not be responsible for the adequacy of the performance and design criteria specified in the Contract Documents.

**§ 3.13 USE OF SITE**

The Contractor shall confine operations at the site to areas permitted by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities and the Contract Documents and shall not unreasonably encumber the site with materials or equipment.

**§ 3.14 CUTTING AND PATCHING**

**§ 3.14.1** The Contractor shall be responsible for cutting, fitting or patching required to complete the Work or to make its parts fit together properly. All areas requiring cutting, fitting and patching shall be restored to the condition existing prior to the cutting, fitting and patching, unless otherwise required by the Contract Documents.

**§ 3.14.2** The Contractor shall not damage or endanger a portion of the Work or fully or partially completed construction of the Owner or separate contractors by cutting, patching or otherwise altering such construction, or by excavation. The Contractor shall not cut or otherwise alter such construction by the Owner or a separate contractor except with written consent of the Owner and of such separate contractor; such consent shall not be unreasonably withheld. The Contractor shall not unreasonably withhold from the Owner or a separate contractor the Contractor's consent to cutting or otherwise altering the Work.

**§ 3.15 CLEANING UP**

**§ 3.15.1** The Contractor shall keep the premises and surrounding area free from accumulation of waste materials or rubbish caused by operations under the Contract. At completion of the Work, the Contractor shall remove waste materials, rubbish, the Contractor's tools, construction equipment, machinery and surplus materials from and about the Project.

**§ 3.15.2** If the Contractor fails to clean up as provided in the Contract Documents, the Owner may do so and Owner shall be entitled to reimbursement from the Contractor.

**§ 3.16 ACCESS TO WORK**

The Contractor shall provide the Owner and Architect access to the Work in preparation and progress wherever located.

**§ 3.17 ROYALTIES, PATENTS AND COPYRIGHTS**

The Contractor shall pay all royalties and license fees. The Contractor shall defend suits or claims for infringement of copyrights and patent rights and shall hold the Owner and Architect harmless from loss on account thereof, but shall not be responsible for such defense or loss when a particular design, process or product of a particular manufacturer or manufacturers is required by the Contract Documents, or where the copyright violations are contained in Drawings, Specifications or other documents prepared by the Owner or Architect. However, if the Contractor has reason to believe that the required design, process or product is an infringement of a copyright or a patent, the Contractor shall be responsible for such loss unless such information is promptly furnished to the Architect.

**§ 3.18 INDEMNIFICATION**

**§ 3.18.1** To the fullest extent permitted by law the Contractor shall indemnify and hold harmless the Owner, Architect, Architect's consultants, and agents and employees of any of them from and against claims, damages, losses and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work, provided that such claim, damage, loss or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), but only to the extent caused by the negligent acts or omissions of the Contractor, a Subcontractor, anyone directly or indirectly employed by them or anyone for whose acts they may be liable, regardless of whether or not such claim, damage, loss or expense is caused in part by a party indemnified hereunder. Such obligation shall not be construed to negate, abridge, or reduce

other rights or obligations of indemnity that would otherwise exist as to a party or person described in this Section 3.18.

**§ 3.18.2** In claims against any person or entity indemnified under this Section 3.18 by an employee of the Contractor, a Subcontractor, anyone directly or indirectly employed by them or anyone for whose acts they may be liable, the indemnification obligation under Section 3.18.1 shall not be limited by a limitation on amount or type of damages, compensation or benefits payable by or for the Contractor or a Subcontractor under workers' compensation acts, disability benefit acts or other employee benefit acts.

## ARTICLE 4 ARCHITECT

### § 4.1 GENERAL

**§ 4.1.1** The Owner shall retain an architect lawfully licensed to practice architecture or an entity lawfully practicing architecture in the jurisdiction where the Project is located. That person or entity is identified as the Architect in the Agreement and is referred to throughout the Contract Documents as if singular in number.

**§ 4.1.2** Duties, responsibilities and limitations of authority of the Architect as set forth in the Contract Documents shall not be restricted, modified or extended without written consent of the Owner, Contractor and Architect. Consent shall not be unreasonably withheld.

**§ 4.1.3** If the employment of the Architect is terminated, the Owner shall employ a successor architect as to whom the Contractor has no reasonable objection and whose status under the Contract Documents shall be that of the Architect.

### § 4.2 ADMINISTRATION OF THE CONTRACT

**§ 4.2.1** The Architect will provide administration of the Contract as described in the Contract Documents and will be an Owner's representative during construction until the date the Architect issues the final Certificate For Payment. The Architect will have authority to act on behalf of the Owner only to the extent provided in the Contract Documents.

**§ 4.2.2** The Architect will visit the site at intervals appropriate to the stage of construction, or as otherwise agreed with the Owner, to become generally familiar with the progress and quality of the portion of the Work completed, and to determine in general if the Work observed is being performed in a manner indicating that the Work, when fully completed, will be in accordance with the Contract Documents. However, the Architect will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the Work. The Architect will not have control over, charge of, or responsibility for, the construction means, methods, techniques, sequences or procedures, or for the safety precautions and programs in connection with the Work, since these are solely the Contractor's rights and responsibilities under the Contract Documents, except as provided in Section 3.3.1.

**§ 4.2.3** On the basis of the site visits, the Architect will keep the Owner reasonably informed about the progress and quality of the portion of the Work completed, and report to the Owner (1) known deviations from the Contract Documents and from the most recent construction schedule submitted by the Contractor, and (2) defects and deficiencies observed in the Work. The Architect will not be responsible for the Contractor's failure to perform the Work in accordance with the requirements of the Contract Documents. The Architect will not have control over or charge of and will not be responsible for acts or omissions of the Contractor, Subcontractors, or their agents or employees, or any other persons or entities performing portions of the Work.

### § 4.2.4 COMMUNICATIONS FACILITATING CONTRACT ADMINISTRATION

Except as otherwise provided in the Contract Documents or when direct communications have been specially authorized, the Owner and Contractor shall endeavor to communicate with each other through the Architect about matters arising out of or relating to the Contract. Communications by and with the Architect's consultants shall be through the Architect. Communications by and with Subcontractors and material suppliers shall be through the Contractor. Communications by and with separate contractors shall be through the Owner.

**§ 4.2.5** Based on the Architect's evaluations of the Contractor's Applications for Payment, the Architect will review and certify the amounts due the Contractor and will issue Certificates for Payment in such amounts.

**§ 4.2.6** The Architect has authority to reject Work that does not conform to the Contract Documents. Whenever the Architect considers it necessary or advisable, the Architect will have authority to require inspection or testing of the

Work in accordance with Sections 13.5.2 and 13.5.3, whether or not such Work is fabricated, installed or completed. However, neither this authority of the Architect nor a decision made in good faith either to exercise or not to exercise such authority shall give rise to a duty or responsibility of the Architect to the Contractor, Subcontractors, material and equipment suppliers, their agents or employees, or other persons or entities performing portions of the Work.

**§ 4.2.7** The Architect will review and approve, or take other appropriate action upon, the Contractor's submittals such as Shop Drawings, Product Data and Samples, but only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Architect's action will be taken in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness while allowing sufficient time in the Architect's professional judgment to permit adequate review. Review of such submittals is not conducted for the purpose of determining the accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment or systems, all of which remain the responsibility of the Contractor as required by the Contract Documents. The Architect's review of the Contractor's submittals shall not relieve the Contractor of the obligations under Sections 3.3, 3.5 and 3.12. The Architect's review shall not constitute approval of safety precautions or, unless otherwise specifically stated by the Architect, of any construction means, methods, techniques, sequences or procedures. The Architect's approval of a specific item shall not indicate approval of an assembly of which the item is a component.

**§ 4.2.8** The Architect will prepare Change Orders and Construction Change Directives, and may authorize minor changes in the Work as provided in Section 7.4. The Architect will investigate and make determinations and recommendations regarding concealed and unknown conditions as provided in Section 3.7.4.

**§ 4.2.9** The Architect will conduct inspections to determine the date or dates of Substantial Completion and the date of final completion; issue Certificates of Substantial Completion pursuant to Section 9.8; receive and forward to the Owner, for the Owner's review and records, written warranties and related documents required by the Contract and assembled by the Contractor pursuant to Section 9.10; and issue a final Certificate for Payment pursuant to Section 9.10.

**§ 4.2.10** If the Owner and Architect agree, the Architect will provide one or more project representatives to assist in carrying out the Architect's responsibilities at the site. The duties, responsibilities and limitations of authority of such project representatives shall be as set forth in an exhibit to be incorporated in the Contract Documents.

**§ 4.2.11** The Architect will interpret and decide matters concerning performance under, and requirements of, the Contract Documents on written request of either the Owner or Contractor. The Architect's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness.

**§ 4.2.12** Interpretations and decisions of the Architect will be consistent with the intent of, and reasonably inferable from, the Contract Documents and will be in writing or in the form of drawings. When making such interpretations and decisions, the Architect will endeavor to secure faithful performance by both Owner and Contractor, will not show partiality to either and will not be liable for results of interpretations or decisions rendered in good faith.

**§ 4.2.13** The Architect's decisions on matters relating to aesthetic effect will be final if consistent with the intent expressed in the Contract Documents.

**§ 4.2.14** The Architect will review and respond to requests for information about the Contract Documents. The Architect's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness. If appropriate, the Architect will prepare and issue supplemental Drawings and Specifications in response to the requests for information.

## ARTICLE 5 SUBCONTRACTORS

### § 5.1 DEFINITIONS

**§ 5.1.1** A Subcontractor is a person or entity who has a direct contract with the Contractor to perform a portion of the Work at the site. The term "Subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Subcontractor or an authorized representative of the Subcontractor. The term "Subcontractor" does not include a separate contractor or subcontractors of a separate contractor.

**§ 5.1.2** A Sub-subcontractor is a person or entity who has a direct or indirect contract with a Subcontractor to perform a portion of the Work at the site. The term "Sub-subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Sub-subcontractor or an authorized representative of the Sub-subcontractor.

**§ 5.2 AWARD OF SUBCONTRACTS AND OTHER CONTRACTS FOR PORTIONS OF THE WORK**

**§ 5.2.1** Unless otherwise stated in the Contract Documents or the bidding requirements, the Contractor, as soon as practicable after award of the Contract, shall furnish in writing to the Owner through the Architect the names of persons or entities (including those who are to furnish materials or equipment fabricated to a special design) proposed for each principal portion of the Work. The Architect may reply within 14 days to the Contractor in writing stating (1) whether the Owner or the Architect has reasonable objection to any such proposed person or entity or (2) that the Architect requires additional time for review. Failure of the Owner or Architect to reply within the 14-day period shall constitute notice of no reasonable objection.

**§ 5.2.2** The Contractor shall not contract with a proposed person or entity to whom the Owner or Architect has made reasonable and timely objection. The Contractor shall not be required to contract with anyone to whom the Contractor has made reasonable objection.

**§ 5.2.3** If the Owner or Architect has reasonable objection to a person or entity proposed by the Contractor, the Contractor shall propose another to whom the Owner or Architect has no reasonable objection. If the proposed but rejected Subcontractor was reasonably capable of performing the Work, the Contract Sum and Contract Time shall be increased or decreased by the difference, if any, occasioned by such change, and an appropriate Change Order shall be issued before commencement of the substitute Subcontractor's Work. However, no increase in the Contract Sum or Contract Time shall be allowed for such change unless the Contractor has acted promptly and responsively in submitting names as required.

**§ 5.2.4** The Contractor shall not substitute a Subcontractor, person or entity previously selected if the Owner or Architect makes reasonable objection to such substitution.

**§ 5.3 SUBCONTRACTUAL RELATIONS**

By appropriate agreement, written where legally required for validity, the Contractor shall require each Subcontractor, to the extent of the Work to be performed by the Subcontractor, to be bound to the Contractor by terms of the Contract Documents, and to assume toward the Contractor all the obligations and responsibilities, including the responsibility for safety of the Subcontractor's Work, which the Contractor, by these Documents, assumes toward the Owner and Architect. Each subcontract agreement shall preserve and protect the rights of the Owner and Architect under the Contract Documents with respect to the Work to be performed by the Subcontractor so that subcontracting thereof will not prejudice such rights, and shall allow to the Subcontractor, unless specifically provided otherwise in the subcontract agreement, the benefit of all rights, remedies and redress against the Contractor that the Contractor, by the Contract Documents, has against the Owner. Where appropriate, the Contractor shall require each Subcontractor to enter into similar agreements with Sub-subcontractors. The Contractor shall make available to each proposed Subcontractor, prior to the execution of the subcontract agreement, copies of the Contract Documents to which the Subcontractor will be bound, and, upon written request of the Subcontractor, identify to the Subcontractor terms and conditions of the proposed subcontract agreement that may be at variance with the Contract Documents. Subcontractors will similarly make copies of applicable portions of such documents available to their respective proposed Sub-subcontractors.

**§ 5.4 CONTINGENT ASSIGNMENT OF SUBCONTRACTS**

**§ 5.4.1** Each subcontract agreement for a portion of the Work is assigned by the Contractor to the Owner, provided that

**.1** assignment is effective only after termination of the Contract by the Owner for cause pursuant to Section 14.2 and only for those subcontract agreements that the Owner accepts by notifying the Subcontractor and Contractor in writing; and

**.2** assignment is subject to the prior rights of the surety, if any, obligated under bond relating to the Contract.

When the Owner accepts the assignment of a subcontract agreement, the Owner assumes the Contractor's rights and obligations under the subcontract.

**§ 5.4.2** Upon such assignment, if the Work has been suspended for more than 30 days, the Subcontractor's compensation shall be equitably adjusted for increases in cost resulting from the suspension.

**§ 5.4.3** Upon such assignment to the Owner under this Section 5.4, the Owner may further assign the subcontract to a successor contractor or other entity. If the Owner assigns the subcontract to a successor contractor or other entity, the Owner shall nevertheless remain legally responsible for all of the successor contractor's obligations under the subcontract.

## ARTICLE 6 CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS

### § 6.1 OWNER'S RIGHT TO PERFORM CONSTRUCTION AND TO AWARD SEPARATE CONTRACTS

**§ 6.1.1** The Owner reserves the right to perform construction or operations related to the Project with the Owner's own forces, and to award separate contracts in connection with other portions of the Project or other construction or operations on the site under Conditions of the Contract identical or substantially similar to these including those portions related to insurance and waiver of subrogation. If the Contractor claims that delay or additional cost is involved because of such action by the Owner, the Contractor shall make such Claim as provided in Article 15.

**§ 6.1.2** When separate contracts are awarded for different portions of the Project or other construction or operations on the site, the term "Contractor" in the Contract Documents in each case shall mean the Contractor who executes each separate Owner-Contractor Agreement.

**§ 6.1.3** The Owner shall provide for coordination of the activities of the Owner's own forces and of each separate contractor with the Work of the Contractor, who shall cooperate with them. The Contractor shall participate with other separate contractors and the Owner in reviewing their construction schedules. The Contractor shall make any revisions to the construction schedule deemed necessary after a joint review and mutual agreement. The construction schedules shall then constitute the schedules to be used by the Contractor, separate contractors and the Owner until subsequently revised.

**§ 6.1.4** Unless otherwise provided in the Contract Documents, when the Owner performs construction or operations related to the Project with the Owner's own forces, the Owner shall be deemed to be subject to the same obligations and to have the same rights that apply to the Contractor under the Conditions of the Contract, including, without excluding others, those stated in Article 3, this Article 6 and Articles 10, 11 and 12.

### § 6.2 MUTUAL RESPONSIBILITY

**§ 6.2.1** The Contractor shall afford the Owner and separate contractors reasonable opportunity for introduction and storage of their materials and equipment and performance of their activities, and shall connect and coordinate the Contractor's construction and operations with theirs as required by the Contract Documents.

**§ 6.2.2** If part of the Contractor's Work depends for proper execution or results upon construction or operations by the Owner or a separate contractor, the Contractor shall, prior to proceeding with that portion of the Work, promptly report to the Architect apparent discrepancies or defects in such other construction that would render it unsuitable for such proper execution and results. Failure of the Contractor so to report shall constitute an acknowledgment that the Owner's or separate contractor's completed or partially completed construction is fit and proper to receive the Contractor's Work, except as to defects not then reasonably discoverable.

**§ 6.2.3** The Contractor shall reimburse the Owner for costs the Owner incurs that are payable to a separate contractor because of the Contractor's delays, improperly timed activities or defective construction. The Owner shall be responsible to the Contractor for costs the Contractor incurs because of a separate contractor's delays, improperly timed activities, damage to the Work or defective construction.

**§ 6.2.4** The Contractor shall promptly remedy damage the Contractor wrongfully causes to completed or partially completed construction or to property of the Owner, separate contractors as provided in Section 10.2.5.

**§ 6.2.5** The Owner and each separate contractor shall have the same responsibilities for cutting and patching as are described for the Contractor in Section 3.14.

**§ 6.3 OWNER'S RIGHT TO CLEAN UP**

If a dispute arises among the Contractor, separate contractors and the Owner as to the responsibility under their respective contracts for maintaining the premises and surrounding area free from waste materials and rubbish, the Owner may clean up and the Architect will allocate the cost among those responsible.

**ARTICLE 7 CHANGES IN THE WORK**

**§ 7.1 GENERAL**

**§ 7.1.1** Changes in the Work may be accomplished after execution of the Contract, and without invalidating the Contract, by Change Order, Construction Change Directive or order for a minor change in the Work, subject to the limitations stated in this Article 7 and elsewhere in the Contract Documents.

**§ 7.1.2** A Change Order shall be based upon agreement among the Owner, Contractor and Architect; a Construction Change Directive requires agreement by the Owner and Architect and may or may not be agreed to by the Contractor; an order for a minor change in the Work may be issued by the Architect alone.

**§ 7.1.3** Changes in the Work shall be performed under applicable provisions of the Contract Documents, and the Contractor shall proceed promptly, unless otherwise provided in the Change Order, Construction Change Directive or order for a minor change in the Work.

**§ 7.2 CHANGE ORDERS**

**§ 7.2.1** A Change Order is a written instrument prepared by the Architect and signed by the Owner, Contractor and Architect stating their agreement upon all of the following:

**.1** The change in the Work;
**.2** The amount of the adjustment, if any, in the Contract Sum; and
**.3** The extent of the adjustment, if any, in the Contract Time.

**§ 7.3 CONSTRUCTION CHANGE DIRECTIVES**

**§ 7.3.1** A Construction Change Directive is a written order prepared by the Architect and signed by the Owner and Architect, directing a change in the Work prior to agreement on adjustment, if any, in the Contract Sum or Contract Time, or both. The Owner may by Construction Change Directive, without invalidating the Contract, order changes in the Work within the general scope of the Contract consisting of additions, deletions or other revisions, the Contract Sum and Contract Time being adjusted accordingly.

**§ 7.3.2** A Construction Change Directive shall be used in the absence of total agreement on the terms of a Change Order.

**§ 7.3.3** If the Construction Change Directive provides for an adjustment to the Contract Sum, the adjustment shall be based on one of the following methods:

**.1** Mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation;
**.2** Unit prices stated in the Contract Documents or subsequently agreed upon;
**.3** Cost to be determined in a manner agreed upon by the parties and a mutually acceptable fixed or percentage fee; or
**.4** As provided in Section 7.3.7.

**§ 7.3.4** If unit prices are stated in the Contract Documents or subsequently agreed upon, and if quantities originally contemplated are materially changed in a proposed Change Order or Construction Change Directive so that application of such unit prices to quantities of Work proposed will cause substantial inequity to the Owner or Contractor, the applicable unit prices shall be equitably adjusted.

**§ 7.3.5** Upon receipt of a Construction Change Directive, the Contractor shall promptly proceed with the change in the Work involved and advise the Architect of the Contractor's agreement or disagreement with the method, if any, provided in the Construction Change Directive for determining the proposed adjustment in the Contract Sum or Contract Time.

**§ 7.3.6** A Construction Change Directive signed by the Contractor indicates the Contractor's agreement therewith, including adjustment in Contract Sum and Contract Time or the method for determining them. Such agreement shall be effective immediately and shall be recorded as a Change Order.

**§ 7.3.7** If the Contractor does not respond promptly or disagrees with the method for adjustment in the Contract Sum, the Architect shall determine the method and the adjustment on the basis of reasonable expenditures and savings of those performing the Work attributable to the change, including, in case of an increase in the Contract Sum, an amount for overhead and profit as set forth in the Agreement, or if no such amount is set forth in the Agreement, a reasonable amount. In such case, and also under Section 7.3.3.3, the Contractor shall keep and present, in such form as the Architect may prescribe, an itemized accounting together with appropriate supporting data. Unless otherwise provided in the Contract Documents, costs for the purposes of this Section 7.3.7 shall be limited to the following:

**.1** Costs of labor, including social security, old age and unemployment insurance, fringe benefits required by agreement or custom, and workers' compensation insurance;

**.2** Costs of materials, supplies and equipment, including cost of transportation, whether incorporated or consumed;

**.3** Rental costs of machinery and equipment, exclusive of hand tools, whether rented from the Contractor or others;

**.4** Costs of premiums for all bonds and insurance, permit fees, and sales, use or similar taxes related to the Work; and

**.5** Additional costs of supervision and field office personnel directly attributable to the change.

**§ 7.3.8** The amount of credit to be allowed by the Contractor to the Owner for a deletion or change that results in a net decrease in the Contract Sum shall be actual net cost as confirmed by the Architect. When both additions and credits covering related Work or substitutions are involved in a change, the allowance for overhead and profit shall be figured on the basis of net increase, if any, with respect to that change.

**§ 7.3.9** Pending final determination of the total cost of a Construction Change Directive to the Owner, the Contractor may request payment for Work completed under the Construction Change Directive in Applications for Payment. The Architect will make an interim determination for purposes of monthly certification for payment for those costs and certify for payment the amount that the Architect determines, in the Architect's professional judgment, to be reasonably justified. The Architect's interim determination of cost shall adjust the Contract Sum on the same basis as a Change Order, subject to the right of either party to disagree and assert a Claim in accordance with Article 15.

**§ 7.3.10** When the Owner and Contractor agree with a determination made by the Architect concerning the adjustments in the Contract Sum and Contract Time, or otherwise reach agreement upon the adjustments, such agreement shall be effective immediately and the Architect will prepare a Change Order. Change Orders may be issued for all or any part of a Construction Change Directive.

### § 7.4 MINOR CHANGES IN THE WORK

The Architect has authority to order minor changes in the Work not involving adjustment in the Contract Sum or extension of the Contract Time and not inconsistent with the intent of the Contract Documents. Such changes will be effected by written order signed by the Architect and shall be binding on the Owner and Contractor.

## ARTICLE 8 TIME

### § 8.1 DEFINITIONS

**§ 8.1.1** Unless otherwise provided, Contract Time is the period of time, including authorized adjustments, allotted in the Contract Documents for Substantial Completion of the Work.

**§ 8.1.2** The date of commencement of the Work is the date established in the Agreement.

**§ 8.1.3** The date of Substantial Completion is the date certified by the Architect in accordance with Section 9.8.

**§ 8.1.4** The term "day" as used in the Contract Documents shall mean calendar day unless otherwise specifically defined.

### § 8.2 PROGRESS AND COMPLETION

**§ 8.2.1** Time limits stated in the Contract Documents are of the essence of the Contract. By executing the Agreement the Contractor confirms that the Contract Time is a reasonable period for performing the Work.

**§ 8.2.2** The Contractor shall not knowingly, except by agreement or instruction of the Owner in writing, prematurely commence operations on the site or elsewhere prior to the effective date of insurance required by Article 11 to be

furnished by the Contractor and Owner. The date of commencement of the Work shall not be changed by the effective date of such insurance.

**§ 8.2.3** The Contractor shall proceed expeditiously with adequate forces and shall achieve Substantial Completion within the Contract Time.

**§ 8.3 DELAYS AND EXTENSIONS OF TIME**

**§ 8.3.1** If the Contractor is delayed at any time in the commencement or progress of the Work by an act or neglect of the Owner or Architect, or of an employee of either, or of a separate contractor employed by the Owner; or by changes ordered in the Work; or by labor disputes, fire, unusual delay in deliveries, unavoidable casualties or other causes beyond the Contractor's control; or by delay authorized by the Owner pending mediation and arbitration; or by other causes that the Architect determines may justify delay, then the Contract Time shall be extended by Change Order for such reasonable time as the Architect may determine.

**§ 8.3.2** Claims relating to time shall be made in accordance with applicable provisions of Article 15.

**§ 8.3.3** This Section 8.3 does not preclude recovery of damages for delay by either party under other provisions of the Contract Documents.

**ARTICLE 9 PAYMENTS AND COMPLETION**

**§ 9.1 CONTRACT SUM**

The Contract Sum is stated in the Agreement and, including authorized adjustments, is the total amount payable by the Owner to the Contractor for performance of the Work under the Contract Documents.

**§ 9.2 SCHEDULE OF VALUES**

Where the Contract is based on a stipulated sum or Guaranteed Maximum Price, the Contractor shall submit to the Architect, before the first Application for Payment, a schedule of values allocating the entire Contract Sum to the various portions of the Work and prepared in such form and supported by such data to substantiate its accuracy as the Architect may require. This schedule, unless objected to by the Architect, shall be used as a basis for reviewing the Contractor's Applications for Payment.

**§ 9.3 APPLICATIONS FOR PAYMENT**

**§ 9.3.1** At least ten days before the date established for each progress payment, the Contractor shall submit to the Architect an itemized Application for Payment prepared in accordance with the schedule of values, if required under Section 9.2., for completed portions of the Work. Such application shall be notarized, if required, and supported by such data substantiating the Contractor's right to payment as the Owner or Architect may require, such as copies of requisitions from Subcontractors and material suppliers, and shall reflect retainage if provided for in the Contract Documents.

**§ 9.3.1.1** As provided in Section 7.3.9, such applications may include requests for payment on account of changes in the Work that have been properly authorized by Construction Change Directives, or by interim determinations of the Architect, but not yet included in Change Orders.

**§ 9.3.1.2** Applications for Payment shall not include requests for payment for portions of the Work for which the Contractor does not intend to pay a Subcontractor or material supplier, unless such Work has been performed by others whom the Contractor intends to pay.

**§ 9.3.2** Unless otherwise provided in the Contract Documents, payments shall be made on account of materials and equipment delivered and suitably stored at the site for subsequent incorporation in the Work. If approved in advance by the Owner, payment may similarly be made for materials and equipment suitably stored off the site at a location agreed upon in writing. Payment for materials and equipment stored on or off the site shall be conditioned upon compliance by the Contractor with procedures satisfactory to the Owner to establish the Owner's title to such materials and equipment or otherwise protect the Owner's interest, and shall include the costs of applicable insurance, storage and transportation to the site for such materials and equipment stored off the site.

**§ 9.3.3** The Contractor warrants that title to all Work covered by an Application for Payment will pass to the Owner no later than the time of payment. The Contractor further warrants that upon submittal of an Application for Payment all Work for which Certificates for Payment have been previously issued and payments received from the

Owner shall, to the best of the Contractor's knowledge, information and belief, be free and clear of liens, claims, security interests or encumbrances in favor of the Contractor, Subcontractors, material suppliers, or other persons or entities making a claim by reason of having provided labor, materials and equipment relating to the Work.

### § 9.4 CERTIFICATES FOR PAYMENT

**§ 9.4.1** The Architect will, within seven days after receipt of the Contractor's Application for Payment, either issue to the Owner a Certificate for Payment, with a copy to the Contractor, for such amount as the Architect determines is properly due, or notify the Contractor and Owner in writing of the Architect's reasons for withholding certification in whole or in part as provided in Section 9.5.1.

**§ 9.4.2** The issuance of a Certificate for Payment will constitute a representation by the Architect to the Owner, based on the Architect's evaluation of the Work and the data comprising the Application for Payment, that, to the best of the Architect's knowledge, information and belief, the Work has progressed to the point indicated and that the quality of the Work is in accordance with the Contract Documents. The foregoing representations are subject to an evaluation of the Work for conformance with the Contract Documents upon Substantial Completion, to results of subsequent tests and inspections, to correction of minor deviations from the Contract Documents prior to completion and to specific qualifications expressed by the Architect. The issuance of a Certificate for Payment will further constitute a representation that the Contractor is entitled to payment in the amount certified. However, the issuance of a Certificate for Payment will not be a representation that the Architect has (1) made exhaustive or continuous on-site inspections to check the quality or quantity of the Work, (2) reviewed construction means, methods, techniques, sequences or procedures, (3) reviewed copies of requisitions received from Subcontractors and material suppliers and other data requested by the Owner to substantiate the Contractor's right to payment, or (4) made examination to ascertain how or for what purpose the Contractor has used money previously paid on account of the Contract Sum.

### § 9.5 DECISIONS TO WITHHOLD CERTIFICATION

**§ 9.5.1** The Architect may withhold a Certificate for Payment in whole or in part, to the extent reasonably necessary to protect the Owner, if in the Architect's opinion the representations to the Owner required by Section 9.4.2 cannot be made. If the Architect is unable to certify payment in the amount of the Application, the Architect will notify the Contractor and Owner as provided in Section 9.4.1. If the Contractor and Architect cannot agree on a revised amount, the Architect will promptly issue a Certificate for Payment for the amount for which the Architect is able to make such representations to the Owner. The Architect may also withhold a Certificate for Payment or, because of subsequently discovered evidence, may nullify the whole or a part of a Certificate for Payment previously issued, to such extent as may be necessary in the Architect's opinion to protect the Owner from loss for which the Contractor is responsible, including loss resulting from acts and omissions described in Section 3.3.2, because of

- **.1** defective Work not remedied;
- **.2** third party claims filed or reasonable evidence indicating probable filing of such claims unless security acceptable to the Owner is provided by the Contractor;
- **.3** failure of the Contractor to make payments properly to Subcontractors or for labor, materials or equipment;
- **.4** reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum;
- **.5** damage to the Owner or a separate contractor;
- **.6** reasonable evidence that the Work will not be completed within the Contract Time, and that the unpaid balance would not be adequate to cover actual or liquidated damages for the anticipated delay; or
- **.7** repeated failure to carry out the Work in accordance with the Contract Documents.

**§ 9.5.2** When the above reasons for withholding certification are removed, certification will be made for amounts previously withheld.

**§ 9.5.3** If the Architect withholds certification for payment under Section 9.5.1.3, the Owner may, at its sole option, issue joint checks to the Contractor and to any Subcontractor or material or equipment suppliers to whom the Contractor failed to make payment for Work properly performed or material or equipment suitably delivered. If the Owner makes payments by joint check, the Owner shall notify the Architect and the Architect will reflect such payment on the next Certificate for Payment.

### § 9.6 PROGRESS PAYMENTS

**§ 9.6.1** After the Architect has issued a Certificate for Payment, the Owner shall make payment in the manner and within the time provided in the Contract Documents, and shall so notify the Architect.

**§ 9.6.2** The Contractor shall pay each Subcontractor no later than seven days after receipt of payment from the Owner the amount to which the Subcontractor is entitled, reflecting percentages actually retained from payments to the Contractor on account of the Subcontractor's portion of the Work. The Contractor shall, by appropriate agreement with each Subcontractor, require each Subcontractor to make payments to Sub-subcontractors in a similar manner.

**§ 9.6.3** The Architect will, on request, furnish to a Subcontractor, if practicable, information regarding percentages of completion or amounts applied for by the Contractor and action taken thereon by the Architect and Owner on account of portions of the Work done by such Subcontractor.

**§ 9.6.4** The Owner has the right to request written evidence from the Contractor that the Contractor has properly paid Subcontractors and material and equipment suppliers amounts paid by the Owner to the Contractor for subcontracted Work. If the Contractor fails to furnish such evidence within seven days, the Owner shall have the right to contact Subcontractors to ascertain whether they have been properly paid. Neither the Owner nor Architect shall have an obligation to pay or to see to the payment of money to a Subcontractor, except as may otherwise be required by law.

**§ 9.6.5** Contractor payments to material and equipment suppliers shall be treated in a manner similar to that provided in Sections 9.6.2, 9.6.3 and 9.6.4.

**§ 9.6.6** A Certificate for Payment, a progress payment, or partial or entire use or occupancy of the Project by the Owner shall not constitute acceptance of Work not in accordance with the Contract Documents.

**§ 9.6.7** Unless the Contractor provides the Owner with a payment bond in the full penal sum of the Contract Sum, payments received by the Contractor for Work properly performed by Subcontractors and suppliers shall be held by the Contractor for those Subcontractors or suppliers who performed Work or furnished materials, or both, under contract with the Contractor for which payment was made by the Owner. Nothing contained herein shall require money to be placed in a separate account and not commingled with money of the Contractor, shall create any fiduciary liability or tort liability on the part of the Contractor for breach of trust or shall entitle any person or entity to an award of punitive damages against the Contractor for breach of the requirements of this provision.

**§ 9.7 FAILURE OF PAYMENT**

If the Architect does not issue a Certificate for Payment, through no fault of the Contractor, within seven days after receipt of the Contractor's Application for Payment, or if the Owner does not pay the Contractor within seven days after the date established in the Contract Documents the amount certified by the Architect or awarded by binding dispute resolution, then the Contractor may, upon seven additional days' written notice to the Owner and Architect, stop the Work until payment of the amount owing has been received. The Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of shut-down, delay and start-up, plus interest as provided for in the Contract Documents.

**§ 9.8 SUBSTANTIAL COMPLETION**

**§ 9.8.1** Substantial Completion is the stage in the progress of the Work when the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work for its intended use.

**§ 9.8.2** When the Contractor considers that the Work, or a portion thereof which the Owner agrees to accept separately, is substantially complete, the Contractor shall prepare and submit to the Architect a comprehensive list of items to be completed or corrected prior to final payment. Failure to include an item on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

**§ 9.8.3** Upon receipt of the Contractor's list, the Architect will make an inspection to determine whether the Work or designated portion thereof is substantially complete. If the Architect's inspection discloses any item, whether or not included on the Contractor's list, which is not sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work or designated portion thereof for its intended use, the Contractor shall, before issuance of the Certificate of Substantial Completion, complete or correct such item upon notification by the Architect. In such case, the Contractor shall then submit a request for another inspection by the Architect to determine Substantial Completion.

**§ 9.8.4** When the Work or designated portion thereof is substantially complete, the Architect will prepare a Certificate of Substantial Completion that shall establish the date of Substantial Completion, shall establish responsibilities of the Owner and Contractor for security, maintenance, heat, utilities, damage to the Work and insurance, and shall fix the time within which the Contractor shall finish all items on the list accompanying the Certificate. Warranties required by the Contract Documents shall commence on the date of Substantial Completion of the Work or designated portion thereof unless otherwise provided in the Certificate of Substantial Completion.

**§ 9.8.5** The Certificate of Substantial Completion shall be submitted to the Owner and Contractor for their written acceptance of responsibilities assigned to them in such Certificate. Upon such acceptance and consent of surety, if any, the Owner shall make payment of retainage applying to such Work or designated portion thereof. Such payment shall be adjusted for Work that is incomplete or not in accordance with the requirements of the Contract Documents.

**§ 9.9 PARTIAL OCCUPANCY OR USE**

**§ 9.9.1** The Owner may occupy or use any completed or partially completed portion of the Work at any stage when such portion is designated by separate agreement with the Contractor, provided such occupancy or use is consented to by the insurer as required under Section 11.3.1.5 and authorized by public authorities having jurisdiction over the Project. Such partial occupancy or use may commence whether or not the portion is substantially complete, provided the Owner and Contractor have accepted in writing the responsibilities assigned to each of them for payments, retainage, if any, security, maintenance, heat, utilities, damage to the Work and insurance, and have agreed in writing concerning the period for correction of the Work and commencement of warranties required by the Contract Documents. When the Contractor considers a portion substantially complete, the Contractor shall prepare and submit a list to the Architect as provided under Section 9.8.2. Consent of the Contractor to partial occupancy or use shall not be unreasonably withheld. The stage of the progress of the Work shall be determined by written agreement between the Owner and Contractor or, if no agreement is reached, by decision of the Architect.

**§ 9.9.2** Immediately prior to such partial occupancy or use, the Owner, Contractor and Architect shall jointly inspect the area to be occupied or portion of the Work to be used in order to determine and record the condition of the Work.

**§ 9.9.3** Unless otherwise agreed upon, partial occupancy or use of a portion or portions of the Work shall not constitute acceptance of Work not complying with the requirements of the Contract Documents.

**§ 9.10 FINAL COMPLETION AND FINAL PAYMENT**

**§ 9.10.1** Upon receipt of the Contractor's written notice that the Work is ready for final inspection and acceptance and upon receipt of a final Application for Payment, the Architect will promptly make such inspection and, when the Architect finds the Work acceptable under the Contract Documents and the Contract fully performed, the Architect will promptly issue a final Certificate for Payment stating that to the best of the Architect's knowledge, information and belief, and on the basis of the Architect's on-site visits and inspections, the Work has been completed in accordance with terms and conditions of the Contract Documents and that the entire balance found to be due the Contractor and noted in the final Certificate is due and payable. The Architect's final Certificate for Payment will constitute a further representation that conditions listed in Section 9.10.2 as precedent to the Contractor's being entitled to final payment have been fulfilled.

**§ 9.10.2** Neither final payment nor any remaining retained percentage shall become due until the Contractor submits to the Architect (1) an affidavit that payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which the Owner or the Owner's property might be responsible or encumbered (less amounts withheld by Owner) have been paid or otherwise satisfied, (2) a certificate evidencing that insurance required by the Contract Documents to remain in force after final payment is currently in effect and will not be canceled or allowed to expire until at least 30 days' prior written notice has been given to the Owner, (3) a written statement that the Contractor knows of no substantial reason that the insurance will not be renewable to cover the period required by the Contract Documents, (4) consent of surety, if any, to final payment and (5), if required by the Owner, other data establishing payment or satisfaction of obligations, such as receipts, releases and waivers of liens, claims, security interests or encumbrances arising out of the Contract, to the extent and in such form as may be designated by the Owner. If a Subcontractor refuses to furnish a release or waiver required by the Owner, the Contractor may furnish a bond satisfactory to the Owner to indemnify the Owner against such lien. If such lien remains unsatisfied after payments are made, the Contractor shall refund to the Owner all money that the Owner may be compelled to pay in discharging such lien, including all costs and reasonable attorneys' fees.

**§ 9.10.3** If, after Substantial Completion of the Work, final completion thereof is materially delayed through no fault of the Contractor or by issuance of Change Orders affecting final completion, and the Architect so confirms, the Owner shall, upon application by the Contractor and certification by the Architect, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed and accepted. If the remaining balance for Work not fully completed or corrected is less than retainage stipulated in the Contract Documents, and if bonds have been furnished, the written consent of surety to payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by the Contractor to the Architect prior to certification of such payment. Such payment shall be made under terms and conditions governing final payment, except that it shall not constitute a waiver of claims.

**§ 9.10.4** The making of final payment shall constitute a waiver of Claims by the Owner except those arising from

- **.1** liens, Claims, security interests or encumbrances arising out of the Contract and unsettled;
- **.2** failure of the Work to comply with the requirements of the Contract Documents; or
- **.3** terms of special warranties required by the Contract Documents.

**§ 9.10.5** Acceptance of final payment by the Contractor, a Subcontractor or material supplier shall constitute a waiver of claims by that payee except those previously made in writing and identified by that payee as unsettled at the time of final Application for Payment.

**ARTICLE 10 PROTECTION OF PERSONS AND PROPERTY**

**§ 10.1 SAFETY PRECAUTIONS AND PROGRAMS**

The Contractor shall be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the performance of the Contract.

**§ 10.2 SAFETY OF PERSONS AND PROPERTY**

**§ 10.2.1** The Contractor shall take reasonable precautions for safety of, and shall provide reasonable protection to prevent damage, injury or loss to

- **.1** employees on the Work and other persons who may be affected thereby;
- **.2** the Work and materials and equipment to be incorporated therein, whether in storage on or off the site, under care, custody or control of the Contractor or the Contractor's Subcontractors or Sub-subcontractors; and
- **.3** other property at the site or adjacent thereto, such as trees, shrubs, lawns, walks, pavements, roadways, structures and utilities not designated for removal, relocation or replacement in the course of construction.

**§ 10.2.2** The Contractor shall comply with and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities bearing on safety of persons or property or their protection from damage, injury or loss.

**§ 10.2.3** The Contractor shall erect and maintain, as required by existing conditions and performance of the Contract, reasonable safeguards for safety and protection, including posting danger signs and other warnings against hazards, promulgating safety regulations and notifying owners and users of adjacent sites and utilities.

**§ 10.2.4** When use or storage of explosives or other hazardous materials or equipment or unusual methods are necessary for execution of the Work, the Contractor shall exercise utmost care and carry on such activities under supervision of properly qualified personnel.

**§ 10.2.5** The Contractor shall promptly remedy damage and loss (other than damage or loss insured under property insurance required by the Contract Documents) to property referred to in Sections 10.2.1.2 and 10.2.1.3 caused in whole or in part by the Contractor, a Subcontractor, a Sub-subcontractor, or anyone directly or indirectly employed by any of them, or by anyone for whose acts they may be liable and for which the Contractor is responsible under Sections 10.2.1.2 and 10.2.1.3, except damage or loss attributable to acts or omissions of the Owner or Architect or anyone directly or indirectly employed by either of them, or by anyone for whose acts either of them may be liable, and not attributable to the fault or negligence of the Contractor. The foregoing obligations of the Contractor are in addition to the Contractor's obligations under Section 3.18.

**§ 10.2.6** The Contractor shall designate a responsible member of the Contractor's organization at the site whose duty shall be the prevention of accidents. This person shall be the Contractor's superintendent unless otherwise designated by the Contractor in writing to the Owner and Architect.

**§ 10.2.7** The Contractor shall not permit any part of the construction or site to be loaded so as to cause damage or create an unsafe condition.

**§ 10.2.8 INJURY OR DAMAGE TO PERSON OR PROPERTY**
If either party suffers injury or damage to person or property because of an act or omission of the other party, or of others for whose acts such party is legally responsible, written notice of such injury or damage, whether or not insured, shall be given to the other party within a reasonable time not exceeding 21 days after discovery. The notice shall provide sufficient detail to enable the other party to investigate the matter.

**§ 10.3 HAZARDOUS MATERIALS**
**§ 10.3.1** The Contractor is responsible for compliance with any requirements included in the Contract Documents regarding hazardous materials. If the Contractor encounters a hazardous material or substance not addressed in the Contract Documents and if reasonable precautions will be inadequate to prevent foreseeable bodily injury or death to persons resulting from a material or substance, including but not limited to asbestos or polychlorinated biphenyl (PCB), encountered on the site by the Contractor, the Contractor shall, upon recognizing the condition, immediately stop Work in the affected area and report the condition to the Owner and Architect in writing.

**§ 10.3.2** Upon receipt of the Contractor's written notice, the Owner shall obtain the services of a licensed laboratory to verify the presence or absence of the material or substance reported by the Contractor and, in the event such material or substance is found to be present, to cause it to be rendered harmless. Unless otherwise required by the Contract Documents, the Owner shall furnish in writing to the Contractor and Architect the names and qualifications of persons or entities who are to perform tests verifying the presence or absence of such material or substance or who are to perform the task of removal or safe containment of such material or substance. The Contractor and the Architect will promptly reply to the Owner in writing stating whether or not either has reasonable objection to the persons or entities proposed by the Owner. If either the Contractor or Architect has an objection to a person or entity proposed by the Owner, the Owner shall propose another to whom the Contractor and the Architect have no reasonable objection. When the material or substance has been rendered harmless, Work in the affected area shall resume upon written agreement of the Owner and Contractor. By Change Order, the Contract Time shall be extended appropriately and the Contract Sum shall be increased in the amount of the Contractor's reasonable additional costs of shut-down, delay and start-up.

**§ 10.3.3** To the fullest extent permitted by law, the Owner shall indemnify and hold harmless the Contractor, Subcontractors, Architect, Architect's consultants and agents and employees of any of them from and against claims, damages, losses and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work in the affected area if in fact the material or substance presents the risk of bodily injury or death as described in Section 10.3.1 and has not been rendered harmless, provided that such claim, damage, loss or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), except to the extent that such damage, loss or expense is due to the fault or negligence of the party seeking indemnity.

**§ 10.3.4** The Owner shall not be responsible under this Section 10.3 for materials or substances the Contractor brings to the site unless such materials or substances are required by the Contract Documents. The Owner shall be responsible for materials or substances required by the Contract Documents, except to the extent of the Contractor's fault or negligence in the use and handling of such materials or substances.

**§ 10.3.5** The Contractor shall indemnify the Owner for the cost and expense the Owner incurs (1) for remediation of a material or substance the Contractor brings to the site and negligently handles, or (2) where the Contractor fails to perform its obligations under Section 10.3.1, except to the extent that the cost and expense are due to the Owner's fault or negligence.

**§ 10.3.6** If, without negligence on the part of the Contractor, the Contractor is held liable by a government agency for the cost of remediation of a hazardous material or substance solely by reason of performing Work as required by the Contract Documents, the Owner shall indemnify the Contractor for all cost and expense thereby incurred.

**§ 10.4 EMERGENCIES**

In an emergency affecting safety of persons or property, the Contractor shall act, at the Contractor's discretion, to prevent threatened damage, injury or loss. Additional compensation or extension of time claimed by the Contractor on account of an emergency shall be determined as provided in Article 15 and Article 7.

**ARTICLE 11 INSURANCE AND BONDS**

**§ 11.1 CONTRACTOR'S LIABILITY INSURANCE**

**§ 11.1.1** The Contractor shall purchase from and maintain in a company or companies lawfully authorized to do business in the jurisdiction in which the Project is located such insurance as will protect the Contractor from claims set forth below which may arise out of or result from the Contractor's operations and completed operations under the Contract and for which the Contractor may be legally liable, whether such operations be by the Contractor or by a Subcontractor or by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable:

**.1** Claims under workers' compensation, disability benefit and other similar employee benefit acts that are applicable to the Work to be performed;

**.2** Claims for damages because of bodily injury, occupational sickness or disease, or death of the Contractor's employees;

**.3** Claims for damages because of bodily injury, sickness or disease, or death of any person other than the Contractor's employees;

**.4** Claims for damages insured by usual personal injury liability coverage;

**.5** Claims for damages, other than to the Work itself, because of injury to or destruction of tangible property, including loss of use resulting therefrom;

**.6** Claims for damages because of bodily injury, death of a person or property damage arising out of ownership, maintenance or use of a motor vehicle;

**.7** Claims for bodily injury or property damage arising out of completed operations; and

**.8** Claims involving contractual liability insurance applicable to the Contractor's obligations under Section 3.18.

**§ 11.1.2** The insurance required by Section 11.1.1 shall be written for not less than limits of liability specified in the Contract Documents or required by law, whichever coverage is greater. Coverages, whether written on an occurrence or claims-made basis, shall be maintained without interruption from the date of commencement of the Work until the date of final payment and termination of any coverage required to be maintained after final payment, and, with respect to the Contractor's completed operations coverage, until the expiration of the period for correction of Work or for such other period for maintenance of completed operations coverage as specified in the Contract Documents.

**§ 11.1.3** Certificates of insurance acceptable to the Owner shall be filed with the Owner prior to commencement of the Work and thereafter upon renewal or replacement of each required policy of insurance. These certificates and the insurance policies required by this Section 11.1 shall contain a provision that coverages afforded under the policies will not be canceled or allowed to expire until at least 30 days' prior written notice has been given to the Owner. An additional certificate evidencing continuation of liability coverage, including coverage for completed operations, shall be submitted with the final Application for Payment as required by Section 9.10.2 and thereafter upon renewal or replacement of such coverage until the expiration of the time required by Section 11.1.2. Information concerning reduction of coverage on account of revised limits or claims paid under the General Aggregate, or both, shall be furnished by the Contractor with reasonable promptness.

**§ 11.1.4** The Contractor shall cause the commercial liability coverage required by the Contract Documents to include (1) the Owner, the Architect and the Architect's Consultants as additional insureds for claims caused in whole or in part by the Contractor's negligent acts or omissions during the Contractor's operations; and (2) the Owner as an additional insured for claims caused in whole or in part by the Contractor's negligent acts or omissions during the Contractor's completed operations.

**§ 11.2 OWNER'S LIABILITY INSURANCE**

The Owner shall be responsible for purchasing and maintaining the Owner's usual liability insurance.

**§ 11.3 PROPERTY INSURANCE**

**§ 11.3.1** Unless otherwise provided, the Owner shall purchase and maintain, in a company or companies lawfully authorized to do business in the jurisdiction in which the Project is located, property insurance written on a builder's

risk "all-risk" or equivalent policy form in the amount of the initial Contract Sum, plus value of subsequent Contract Modifications and cost of materials supplied or installed by others, comprising total value for the entire Project at the site on a replacement cost basis without optional deductibles. Such property insurance shall be maintained, unless otherwise provided in the Contract Documents or otherwise agreed in writing by all persons and entities who are beneficiaries of such insurance, until final payment has been made as provided in Section 9.10 or until no person or entity other than the Owner has an insurable interest in the property required by this Section 11.3 to be covered, whichever is later. This insurance shall include interests of the Owner, the Contractor, Subcontractors and Sub-subcontractors in the Project.

**§ 11.3.1.1** Property insurance shall be on an "all-risk" or equivalent policy form and shall include, without limitation, insurance against the perils of fire (with extended coverage) and physical loss or damage including, without duplication of coverage, theft, vandalism, malicious mischief, collapse, earthquake, flood, windstorm, falsework, testing and startup, temporary buildings and debris removal including demolition occasioned by enforcement of any applicable legal requirements, and shall cover reasonable compensation for Architect's and Contractor's services and expenses required as a result of such insured loss.

**§ 11.3.1.2** If the Owner does not intend to purchase such property insurance required by the Contract and with all of the coverages in the amount described above, the Owner shall so inform the Contractor in writing prior to commencement of the Work. The Contractor may then effect insurance that will protect the interests of the Contractor, Subcontractors and Sub-subcontractors in the Work, and by appropriate Change Order the cost thereof shall be charged to the Owner. If the Contractor is damaged by the failure or neglect of the Owner to purchase or maintain insurance as described above, without so notifying the Contractor in writing, then the Owner shall bear all reasonable costs properly attributable thereto.

**§ 11.3.1.3** If the property insurance requires deductibles, the Owner shall pay costs not covered because of such deductibles.

**§ 11.3.1.4** This property insurance shall cover portions of the Work stored off the site, and also portions of the Work in transit.

**§ 11.3.1.5** Partial occupancy or use in accordance with Section 9.9 shall not commence until the insurance company or companies providing property insurance have consented to such partial occupancy or use by endorsement or otherwise. The Owner and the Contractor shall take reasonable steps to obtain consent of the insurance company or companies and shall, without mutual written consent, take no action with respect to partial occupancy or use that would cause cancellation, lapse or reduction of insurance.

**§ 11.3.2 BOILER AND MACHINERY INSURANCE**

The Owner shall purchase and maintain boiler and machinery insurance required by the Contract Documents or by law, which shall specifically cover such insured objects during installation and until final acceptance by the Owner; this insurance shall include interests of the Owner, Contractor, Subcontractors and Sub-subcontractors in the Work, and the Owner and Contractor shall be named insureds.

**§ 11.3.3 LOSS OF USE INSURANCE**

The Owner, at the Owner's option, may purchase and maintain such insurance as will insure the Owner against loss of use of the Owner's property due to fire or other hazards, however caused. The Owner waives all rights of action against the Contractor for loss of use of the Owner's property, including consequential losses due to fire or other hazards however caused.

**§ 11.3.4** If the Contractor requests in writing that insurance for risks other than those described herein or other special causes of loss be included in the property insurance policy, the Owner shall, if possible, include such insurance, and the cost thereof shall be charged to the Contractor by appropriate Change Order.

**§ 11.3.5** If during the Project construction period the Owner insures properties, real or personal or both, at or adjacent to the site by property insurance under policies separate from those insuring the Project, or if after final payment property insurance is to be provided on the completed Project through a policy or policies other than those insuring the Project during the construction period, the Owner shall waive all rights in accordance with the terms of Section 11.3.7 for damages caused by fire or other causes of loss covered by this separate property insurance. All separate policies shall provide this waiver of subrogation by endorsement or otherwise.

**§ 11.3.6** Before an exposure to loss may occur, the Owner shall file with the Contractor a copy of each policy that includes insurance coverages required by this Section 11.3. Each policy shall contain all generally applicable conditions, definitions, exclusions and endorsements related to this Project. Each policy shall contain a provision that the policy will not be canceled or allowed to expire, and that its limits will not be reduced, until at least 30 days' prior written notice has been given to the Contractor.

**§ 11.3.7 WAIVERS OF SUBROGATION**

The Owner and Contractor waive all rights against (1) each other and any of their subcontractors, sub-subcontractors, agents and employees, each of the other, and (2) the Architect, Architect's consultants, separate contractors described in Article 6, if any, and any of their subcontractors, sub-subcontractors, agents and employees, for damages caused by fire or other causes of loss to the extent covered by property insurance obtained pursuant to this Section 11.3 or other property insurance applicable to the Work, except such rights as they have to proceeds of such insurance held by the Owner as fiduciary. The Owner or Contractor, as appropriate, shall require of the Architect, Architect's consultants, separate contractors described in Article 6, if any, and the subcontractors, sub-subcontractors, agents and employees of any of them, by appropriate agreements, written where legally required for validity, similar waivers each in favor of other parties enumerated herein. The policies shall provide such waivers of subrogation by endorsement or otherwise. A waiver of subrogation shall be effective as to a person or entity even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, did not pay the insurance premium directly or indirectly, and whether or not the person or entity had an insurable interest in the property damaged.

**§ 11.3.8** A loss insured under the Owner's property insurance shall be adjusted by the Owner as fiduciary and made payable to the Owner as fiduciary for the insureds, as their interests may appear, subject to requirements of any applicable mortgagee clause and of Section 11.3.10. The Contractor shall pay Subcontractors their just shares of insurance proceeds received by the Contractor, and by appropriate agreements, written where legally required for validity, shall require Subcontractors to make payments to their Sub-subcontractors in similar manner.

**§ 11.3.9** If required in writing by a party in interest, the Owner as fiduciary shall, upon occurrence of an insured loss, give bond for proper performance of the Owner's duties. The cost of required bonds shall be charged against proceeds received as fiduciary. The Owner shall deposit in a separate account proceeds so received, which the Owner shall distribute in accordance with such agreement as the parties in interest may reach, or as determined in accordance with the method of binding dispute resolution selected in the Agreement between the Owner and Contractor. If after such loss no other special agreement is made and unless the Owner terminates the Contract for convenience, replacement of damaged property shall be performed by the Contractor after notification of a Change in the Work in accordance with Article 7.

**§ 11.3.10** The Owner as fiduciary shall have power to adjust and settle a loss with insurers unless one of the parties in interest shall object in writing within five days after occurrence of loss to the Owner's exercise of this power; if such objection is made, the dispute shall be resolved in the manner selected by the Owner and Contractor as the method of binding dispute resolution in the Agreement. If the Owner and Contractor have selected arbitration as the method of binding dispute resolution, the Owner as fiduciary shall make settlement with insurers or, in the case of a dispute over distribution of insurance proceeds, in accordance with the directions of the arbitrators.

**§ 11.4 PERFORMANCE BOND AND PAYMENT BOND**

**§ 11.4.1** The Owner shall have the right to require the Contractor to furnish bonds covering faithful performance of the Contract and payment of obligations arising thereunder as stipulated in bidding requirements or specifically required in the Contract Documents on the date of execution of the Contract.

**§ 11.4.2** Upon the request of any person or entity appearing to be a potential beneficiary of bonds covering payment of obligations arising under the Contract, the Contractor shall promptly furnish a copy of the bonds or shall authorize a copy to be furnished.

**ARTICLE 12 UNCOVERING AND CORRECTION OF WORK**

**§ 12.1 UNCOVERING OF WORK**

**§ 12.1.1** If a portion of the Work is covered contrary to the Architect's request or to requirements specifically expressed in the Contract Documents, it must, if requested in writing by the Architect, be uncovered for the Architect's examination and be replaced at the Contractor's expense without change in the Contract Time.

**§ 12.1.2** If a portion of the Work has been covered that the Architect has not specifically requested to examine prior to its being covered, the Architect may request to see such Work and it shall be uncovered by the Contractor. If such Work is in accordance with the Contract Documents, costs of uncovering and replacement shall, by appropriate Change Order, be at the Owner's expense. If such Work is not in accordance with the Contract Documents, such costs and the cost of correction shall be at the Contractor's expense unless the condition was caused by the Owner or a separate contractor in which event the Owner shall be responsible for payment of such costs.

**§ 12.2 CORRECTION OF WORK**

**§ 12.2.1 BEFORE OR AFTER SUBSTANTIAL COMPLETION**

The Contractor shall promptly correct Work rejected by the Architect or failing to conform to the requirements of the Contract Documents, whether discovered before or after Substantial Completion and whether or not fabricated, installed or completed. Costs of correcting such rejected Work, including additional testing and inspections, the cost of uncovering and replacement, and compensation for the Architect's services and expenses made necessary thereby, shall be at the Contractor's expense.

**§ 12.2.2 AFTER SUBSTANTIAL COMPLETION**

**§ 12.2.2.1** In addition to the Contractor's obligations under Section 3.5, if, within one year after the date of Substantial Completion of the Work or designated portion thereof or after the date for commencement of warranties established under Section 9.9.1, or by terms of an applicable special warranty required by the Contract Documents, any of the Work is found to be not in accordance with the requirements of the Contract Documents, the Contractor shall correct it promptly after receipt of written notice from the Owner to do so unless the Owner has previously given the Contractor a written acceptance of such condition. The Owner shall give such notice promptly after discovery of the condition. During the one-year period for correction of Work, if the Owner fails to notify the Contractor and give the Contractor an opportunity to make the correction, the Owner waives the rights to require correction by the Contractor and to make a claim for breach of warranty. If the Contractor fails to correct nonconforming Work within a reasonable time during that period after receipt of notice from the Owner or Architect, the Owner may correct it in accordance with Section 2.4.

**§ 12.2.2.2** The one-year period for correction of Work shall be extended with respect to portions of Work first performed after Substantial Completion by the period of time between Substantial Completion and the actual completion of that portion of the Work.

**§ 12.2.2.3** The one-year period for correction of Work shall not be extended by corrective Work performed by the Contractor pursuant to this Section 12.2.

**§ 12.2.3** The Contractor shall remove from the site portions of the Work that are not in accordance with the requirements of the Contract Documents and are neither corrected by the Contractor nor accepted by the Owner.

**§ 12.2.4** The Contractor shall bear the cost of correcting destroyed or damaged construction, whether completed or partially completed, of the Owner or separate contractors caused by the Contractor's correction or removal of Work that is not in accordance with the requirements of the Contract Documents.

**§ 12.2.5** Nothing contained in this Section 12.2 shall be construed to establish a period of limitation with respect to other obligations the Contractor has under the Contract Documents. Establishment of the one-year period for correction of Work as described in Section 12.2.2 relates only to the specific obligation of the Contractor to correct the Work, and has no relationship to the time within which the obligation to comply with the Contract Documents may be sought to be enforced, nor to the time within which proceedings may be commenced to establish the Contractor's liability with respect to the Contractor's obligations other than specifically to correct the Work.

**§ 12.3 ACCEPTANCE OF NONCONFORMING WORK**

If the Owner prefers to accept Work that is not in accordance with the requirements of the Contract Documents, the Owner may do so instead of requiring its removal and correction, in which case the Contract Sum will be reduced as appropriate and equitable. Such adjustment shall be effected whether or not final payment has been made.

**ARTICLE 13 MISCELLANEOUS PROVISIONS**

**§ 13.1 GOVERNING LAW**

The Contract shall be governed by the law of the place where the Project is located except that, if the parties have selected arbitration as the method of binding dispute resolution, the Federal Arbitration Act shall govern Section 15.4.

**§ 13.2 SUCCESSORS AND ASSIGNS**

**§ 13.2.1** The Owner and Contractor respectively bind themselves, their partners, successors, assigns and legal representatives to covenants, agreements and obligations contained in the Contract Documents. Except as provided in Section 13.2.2, neither party to the Contract shall assign the Contract as a whole without written consent of the other. If either party attempts to make such an assignment without such consent, that party shall nevertheless remain legally responsible for all obligations under the Contract.

**§ 13.2.2** The Owner may, without consent of the Contractor, assign the Contract to a lender providing construction financing for the Project, if the lender assumes the Owner's rights and obligations under the Contract Documents. The Contractor shall execute all consents reasonably required to facilitate such assignment.

**§ 13.3 WRITTEN NOTICE**

Written notice shall be deemed to have been duly served if delivered in person to the individual, to a member of the firm or entity, or to an officer of the corporation for which it was intended; or if delivered at, or sent by registered or certified mail or by courier service providing proof of delivery to, the last business address known to the party giving notice.

**§ 13.4 RIGHTS AND REMEDIES**

**§ 13.4.1** Duties and obligations imposed by the Contract Documents and rights and remedies available thereunder shall be in addition to and not a limitation of duties, obligations, rights and remedies otherwise imposed or available by law.

**§ 13.4.2** No action or failure to act by the Owner, Architect or Contractor shall constitute a waiver of a right or duty afforded them under the Contract, nor shall such action or failure to act constitute approval of or acquiescence in a breach there under, except as may be specifically agreed in writing.

**§ 13.5 TESTS AND INSPECTIONS**

**§ 13.5.1** Tests, inspections and approvals of portions of the Work shall be made as required by the Contract Documents and by applicable laws, statutes, ordinances, codes, rules and regulations or lawful orders of public authorities. Unless otherwise provided, the Contractor shall make arrangements for such tests, inspections and approvals with an independent testing laboratory or entity acceptable to the Owner, or with the appropriate public authority, and shall bear all related costs of tests, inspections and approvals. The Contractor shall give the Architect timely notice of when and where tests and inspections are to be made so that the Architect may be present for such procedures. The Owner shall bear costs of (1) tests, inspections or approvals that do not become requirements until after bids are received or negotiations concluded, and (2) tests, inspections or approvals where building codes or applicable laws or regulations prohibit the Owner from delegating their cost to the Contractor.

**§ 13.5.2** If the Architect, Owner or public authorities having jurisdiction determine that portions of the Work require additional testing, inspection or approval not included under Section 13.5.1, the Architect will, upon written authorization from the Owner, instruct the Contractor to make arrangements for such additional testing, inspection or approval by an entity acceptable to the Owner, and the Contractor shall give timely notice to the Architect of when and where tests and inspections are to be made so that the Architect may be present for such procedures. Such costs, except as provided in Section 13.5.3, shall be at the Owner's expense.

**§ 13.5.3** If such procedures for testing, inspection or approval under Sections 13.5.1 and 13.5.2 reveal failure of the portions of the Work to comply with requirements established by the Contract Documents, all costs made necessary by such failure including those of repeated procedures and compensation for the Architect's services and expenses shall be at the Contractor's expense.

**§ 13.5.4** Required certificates of testing, inspection or approval shall, unless otherwise required by the Contract Documents, be secured by the Contractor and promptly delivered to the Architect.

**§ 13.5.5** If the Architect is to observe tests, inspections or approvals required by the Contract Documents, the Architect will do so promptly and, where practicable, at the normal place of testing.

**§ 13.5.6** Tests or inspections conducted pursuant to the Contract Documents shall be made promptly to avoid unreasonable delay in the Work.

### § 13.6 INTEREST

Payments due and unpaid under the Contract Documents shall bear interest from the date payment is due at such rate as the parties may agree upon in writing or, in the absence thereof, at the legal rate prevailing from time to time at the place where the Project is located.

### § 13.7 TIME LIMITS ON CLAIMS

The Owner and Contractor shall commence all claims and causes of action, whether in contract, tort, breach of warranty or otherwise, against the other arising out of or related to the Contract in accordance with the requirements of the final dispute resolution method selected in the Agreement within the time period specified by applicable law, but in any case not more than 10 years after the date of Substantial Completion of the Work. The Owner and Contractor waive all claims and causes of action not commenced in accordance with this Section 13.7.

## ARTICLE 14 TERMINATION OR SUSPENSION OF THE CONTRACT

### § 14.1 TERMINATION BY THE CONTRACTOR

**§ 14.1.1** The Contractor may terminate the Contract if the Work is stopped for a period of 30 consecutive days through no act or fault of the Contractor or a Subcontractor, Sub-subcontractor or their agents or employees or any other persons or entities performing portions of the Work under direct or indirect contract with the Contractor, for any of the following reasons:

- **.1** Issuance of an order of a court or other public authority having jurisdiction that requires all Work to be stopped;
- **.2** An act of government, such as a declaration of national emergency that requires all Work to be stopped;
- **.3** Because the Architect has not issued a Certificate for Payment and has not notified the Contractor of the reason for withholding certification as provided in Section 9.4.1, or because the Owner has not made payment on a Certificate for Payment within the time stated in the Contract Documents; or
- **.4** The Owner has failed to furnish to the Contractor promptly, upon the Contractor's request, reasonable evidence as required by Section 2.2.1.

**§ 14.1.2** The Contractor may terminate the Contract if, through no act or fault of the Contractor or a Subcontractor, Sub-subcontractor or their agents or employees or any other persons or entities performing portions of the Work under direct or indirect contract with the Contractor, repeated suspensions, delays or interruptions of the entire Work by the Owner as described in Section 14.3 constitute in the aggregate more than 100 percent of the total number of days scheduled for completion, or 120 days in any 365-day period, whichever is less.

**§ 14.1.3** If one of the reasons described in Section 14.1.1 or 14.1.2 exists, the Contractor may, upon seven days' written notice to the Owner and Architect, terminate the Contract and recover from the Owner payment for Work executed, including reasonable overhead and profit, costs incurred by reason of such termination, and damages.

**§ 14.1.4** If the Work is stopped for a period of 60 consecutive days through no act or fault of the Contractor or a Subcontractor or their agents or employees or any other persons performing portions of the Work under contract with the Contractor because the Owner has repeatedly failed to fulfill the Owner's obligations under the Contract Documents with respect to matters important to the progress of the Work, the Contractor may, upon seven additional days' written notice to the Owner and the Architect, terminate the Contract and recover from the Owner as provided in Section 14.1.3.

### § 14.2 TERMINATION BY THE OWNER FOR CAUSE

**§ 14.2.1** The Owner may terminate the Contract if the Contractor

- **.1** repeatedly refuses or fails to supply enough properly skilled workers or proper materials;
- **.2** fails to make payment to Subcontractors for materials or labor in accordance with the respective agreements between the Contractor and the Subcontractors;
- **.3** repeatedly disregards applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of a public authority; or
- **.4** otherwise is guilty of substantial breach of a provision of the Contract Documents.

**§ 14.2.2** When any of the above reasons exist, the Owner, upon certification by the Initial Decision Maker that sufficient cause exists to justify such action, may without prejudice to any other rights or remedies of the Owner and after giving the Contractor and the Contractor's surety, if any, seven days' written notice, terminate employment of the Contractor and may, subject to any prior rights of the surety:

.1 Exclude the Contractor from the site and take possession of all materials, equipment, tools, and construction equipment and machinery thereon owned by the Contractor;

.2 Accept assignment of subcontracts pursuant to Section 5.4; and

.3 Finish the Work by whatever reasonable method the Owner may deem expedient. Upon written request of the Contractor, the Owner shall furnish to the Contractor a detailed accounting of the costs incurred by the Owner in finishing the Work.

**§ 14.2.3** When the Owner terminates the Contract for one of the reasons stated in Section 14.2.1, the Contractor shall not be entitled to receive further payment until the Work is finished.

**§ 14.2.4** If the unpaid balance of the Contract Sum exceeds costs of finishing the Work, including compensation for the Architect's services and expenses made necessary thereby, and other damages incurred by the Owner and not expressly waived, such excess shall be paid to the Contractor. If such costs and damages exceed the unpaid balance, the Contractor shall pay the difference to the Owner. The amount to be paid to the Contractor or Owner, as the case may be, shall be certified by the Initial Decision Maker, upon application, and this obligation for payment shall survive termination of the Contract.

**§ 14.3 SUSPENSION BY THE OWNER FOR CONVENIENCE**

**§ 14.3.1** The Owner may, without cause, order the Contractor in writing to suspend, delay or interrupt the Work in whole or in part for such period of time as the Owner may determine.

**§ 14.3.2** The Contract Sum and Contract Time shall be adjusted for increases in the cost and time caused by suspension, delay or interruption as described in Section 14.3.1. Adjustment of the Contract Sum shall include profit. No adjustment shall be made to the extent

.1 that performance is, was or would have been so suspended, delayed or interrupted by another cause for which the Contractor is responsible; or

.2 that an equitable adjustment is made or denied under another provision of the Contract.

**§ 14.4 TERMINATION BY THE OWNER FOR CONVENIENCE**

**§ 14.4.1** The Owner may, at any time, terminate the Contract for the Owner's convenience and without cause.

**§ 14.4.2** Upon receipt of written notice from the Owner of such termination for the Owner's convenience, the Contractor shall

.1 cease operations as directed by the Owner in the notice;

.2 take actions necessary, or that the Owner may direct, for the protection and preservation of the Work; and

.3 except for Work directed to be performed prior to the effective date of termination stated in the notice, terminate all existing subcontracts and purchase orders and enter into no further subcontracts and purchase orders.

**§ 14.4.3** In case of such termination for the Owner's convenience, the Contractor shall be entitled to receive payment for Work executed, and costs incurred by reason of such termination, along with reasonable overhead and profit on the Work not executed.

**ARTICLE 15 CLAIMS AND DISPUTES**

**§ 15.1 CLAIMS**

**§ 15.1.1 DEFINITION**

A Claim is a demand or assertion by one of the parties seeking, as a matter of right, payment of money, or other relief with respect to the terms of the Contract. The term "Claim" also includes other disputes and matters in question between the Owner and Contractor arising out of or relating to the Contract. The responsibility to substantiate Claims shall rest with the party making the Claim.

**§ 15.1.2 NOTICE OF CLAIMS**

Claims by either the Owner or Contractor must be initiated by written notice to the other party and to the Initial Decision Maker with a copy sent to the Architect, if the Architect is not serving as the Initial Decision Maker.

Claims by either party must be initiated within 21 days after occurrence of the event giving rise to such Claim or within 21 days after the claimant first recognizes the condition giving rise to the Claim, whichever is later.

**§ 15.1.3 CONTINUING CONTRACT PERFORMANCE**

Pending final resolution of a Claim, except as otherwise agreed in writing or as provided in Section 9.7 and Article 14, the Contractor shall proceed diligently with performance of the Contract and the Owner shall continue to make payments in accordance with the Contract Documents. The Architect will prepare Change Orders and issue Certificates for Payment in accordance with the decisions of the Initial Decision Maker.

**§ 15.1.4 CLAIMS FOR ADDITIONAL COST**

If the Contractor wishes to make a Claim for an increase in the Contract Sum, written notice as provided herein shall be given before proceeding to execute the Work. Prior notice is not required for Claims relating to an emergency endangering life or property arising under Section 10.4.

**§ 15.1.5 CLAIMS FOR ADDITIONAL TIME**

**§ 15.1.5.1** If the Contractor wishes to make a Claim for an increase in the Contract Time, written notice as provided herein shall be given. The Contractor's Claim shall include an estimate of cost and of probable effect of delay on progress of the Work. In the case of a continuing delay, only one Claim is necessary.

**§ 15.1.5.2** If adverse weather conditions are the basis for a Claim for additional time, such Claim shall be documented by data substantiating that weather conditions were abnormal for the period of time, could not have been reasonably anticipated and had an adverse effect on the scheduled construction.

**§ 15.1.6 CLAIMS FOR CONSEQUENTIAL DAMAGES**

The Contractor and Owner waive Claims against each other for consequential damages arising out of or relating to this Contract. This mutual waiver includes

.1 damages incurred by the Owner for rental expenses, for losses of use, income, profit, financing, business and reputation, and for loss of management or employee productivity or of the services of such persons; and

.2 damages incurred by the Contractor for principal office expenses including the compensation of personnel stationed there, for losses of financing, business and reputation, and for loss of profit except anticipated profit arising directly from the Work.

This mutual waiver is applicable, without limitation, to all consequential damages due to either party's termination in accordance with Article 14. Nothing contained in this Section 15.1.6 shall be deemed to preclude an award of liquidated damages, when applicable, in accordance with the requirements of the Contract Documents.

**§ 15.2 INITIAL DECISION**

**§ 15.2.1** Claims, excluding those arising under Sections 10.3, 10.4, 11.3.9, and 11.3.10, shall be referred to the Initial Decision Maker for initial decision. The Architect will serve as the Initial Decision Maker, unless otherwise indicated in the Agreement. Except for those Claims excluded by this Section 15.2.1, an initial decision shall be required as a condition precedent to mediation of any Claim arising prior to the date final payment is due, unless 30 days have passed after the Claim has been referred to the Initial Decision Maker with no decision having been rendered. Unless the Initial Decision Maker and all affected parties agree, the Initial Decision Maker will not decide disputes between the Contractor and persons or entities other than the Owner.

**§ 15.2.2** The Initial Decision Maker will review Claims and within ten days of the receipt of a Claim take one or more of the following actions: (1) request additional supporting data from the claimant or a response with supporting data from the other party, (2) reject the Claim in whole or in part, (3) approve the Claim, (4) suggest a compromise, or (5) advise the parties that the Initial Decision Maker is unable to resolve the Claim if the Initial Decision Maker lacks sufficient information to evaluate the merits of the Claim or if the Initial Decision Maker concludes that, in the Initial Decision Maker's sole discretion, it would be inappropriate for the Initial Decision Maker to resolve the Claim.

**§ 15.2.3** In evaluating Claims, the Initial Decision Maker may, but shall not be obligated to, consult with or seek information from either party or from persons with special knowledge or expertise who may assist the Initial Decision Maker in rendering a decision. The Initial Decision Maker may request the Owner to authorize retention of such persons at the Owner's expense.

**§ 15.2.4** If the Initial Decision Maker requests a party to provide a response to a Claim or to furnish additional supporting data, such party shall respond, within ten days after receipt of such request, and shall either (1) provide a response on the requested supporting data, (2) advise the Initial Decision Maker when the response or supporting data will be furnished or (3) advise the Initial Decision Maker that no supporting data will be furnished. Upon receipt of the response or supporting data, if any, the Initial Decision Maker will either reject or approve the Claim in whole or in part.

**§ 15.2.5** The Initial Decision Maker will render an initial decision approving or rejecting the Claim, or indicating that the Initial Decision Maker is unable to resolve the Claim. This initial decision shall (1) be in writing; (2) state the reasons therefor; and (3) notify the parties and the Architect, if the Architect is not serving as the Initial Decision Maker, of any change in the Contract Sum or Contract Time or both. The initial decision shall be final and binding on the parties but subject to mediation and, if the parties fail to resolve their dispute through mediation, to binding dispute resolution.

**§ 15.2.6** Either party may file for mediation of an initial decision at any time, subject to the terms of Section 15.2.6.1.

**§ 15.2.6.1** Either party may, within 30 days from the date of an initial decision, demand in writing that the other party file for mediation within 60 days of the initial decision. If such a demand is made and the party receiving the demand fails to file for mediation within the time required, then both parties waive their rights to mediate or pursue binding dispute resolution proceedings with respect to the initial decision.

**§ 15.2.7** In the event of a Claim against the Contractor, the Owner may, but is not obligated to, notify the surety, if any, of the nature and amount of the Claim. If the Claim relates to a possibility of a Contractor's default, the Owner may, but is not obligated to, notify the surety and request the surety's assistance in resolving the controversy.

**§ 15.2.8** If a Claim relates to or is the subject of a mechanic's lien, the party asserting such Claim may proceed in accordance with applicable law to comply with the lien notice or filing deadlines.

**§ 15.3 MEDIATION**

**§ 15.3.1** Claims, disputes, or other matters in controversy arising out of or related to the Contract except those waived as provided for in Sections 9.10.4, 9.10.5, and 15.1.6 shall be subject to mediation as a condition precedent to binding dispute resolution.

**§ 15.3.2** The parties shall endeavor to resolve their Claims by mediation which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Mediation Procedures in effect on the date of the Agreement. A request for mediation shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the mediation. The request may be made concurrently with the filing of binding dispute resolution proceedings but, in such event, mediation shall proceed in advance of binding dispute resolution proceedings, which shall be stayed pending mediation for a period of 60 days from the date of filing, unless stayed for a longer period by agreement of the parties or court order. If an arbitration is stayed pursuant to this Section 15.3.2, the parties may nonetheless proceed to the selection of the arbitrator(s) and agree upon a schedule for later proceedings.

**§ 15.3.3** The parties shall share the mediator's fee and any filing fees equally. The mediation shall be held in the place where the Project is located, unless another location is mutually agreed upon. Agreements reached in mediation shall be enforceable as settlement agreements in any court having jurisdiction thereof.

**§ 15.4 ARBITRATION**

**§ 15.4.1** If the parties have selected arbitration as the method for binding dispute resolution in the Agreement, any Claim subject to, but not resolved by, mediation shall be subject to arbitration which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Arbitration Rules in effect on the date of the Agreement. A demand for arbitration shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the arbitration. The party filing a notice of demand for arbitration must assert in the demand all Claims then known to that party on which arbitration is permitted to be demanded.

**§ 15.4.1.1** A demand for arbitration shall be made no earlier than concurrently with the filing of a request for mediation, but in no event shall it be made after the date when the institution of legal or equitable proceedings based on the Claim would be barred by the applicable statute of limitations. For statute of limitations purposes, receipt of a written demand for arbitration by the person or entity administering the arbitration shall constitute the institution of legal or equitable proceedings based on the Claim.

**§ 15.4.2** The award rendered by the arbitrator or arbitrators shall be final, and judgment may be entered upon it in accordance with applicable law in any court having jurisdiction thereof.

**§ 15.4.3** The foregoing agreement to arbitrate and other agreements to arbitrate with an additional person or entity duly consented to by parties to the Agreement shall be specifically enforceable under applicable law in any court having jurisdiction thereof.

**§ 15.4.4 CONSOLIDATION OR JOINDER**

**§ 15.4.4.1** Either party, at its sole discretion, may consolidate an arbitration conducted under this Agreement with any other arbitration to which it is a party provided that (1) the arbitration agreement governing the other arbitration permits consolidation, (2) the arbitrations to be consolidated substantially involve common questions of law or fact, and (3) the arbitrations employ materially similar procedural rules and methods for selecting arbitrator(s).

**§ 15.4.4.2** Either party, at its sole discretion, may include by joinder persons or entities substantially involved in a common question of law or fact whose presence is required if complete relief is to be accorded in arbitration, provided that the party sought to be joined consents in writing to such joinder. Consent to arbitration involving an additional person or entity shall not constitute consent to arbitration of any claim, dispute or other matter in question not described in the written consent.

**§ 15.4.4.3** The Owner and Contractor grant to any person or entity made a party to an arbitration conducted under this Section 15.4, whether by joinder or consolidation, the same rights of joinder and consolidation as the Owner and Contractor under this Agreement.

# Appendix E

# Supplementary Conditions

1. **Location of the Project.** The general location of the work covered in this specification is Portland, Ohio.
2. **Scope of the Work.** The work to be performed under this Contract consists of furnishing all plant, materials, equipment, supplies, labor, and transportation, including fuel, power, and water, and performing all work in strict accordance with specifications, schedules, and drawings, all of which are made a part hereof, and including such detail drawings as may be furnished by the Architect-Engineer from time to time during the construction.
3. **Examination of Site.** Bidders should visit the site of the building, compare the drawings and specifications with any work in place, and inform themselves of all conditions, including other work, if any, being performed. Failure to visit the site will in no way relieve the successful bidder from the necessity of furnishing any materials or performing any work that may be required to complete the work in accordance with drawings and specifications.
4. **Laying out Work.** The Contractor shall, immediately upon entering the project site for the purpose of beginning work, locate all Owner-provided reference points and take such action as is necessary to prevent their destruction, lay out his own work and be responsible for all lines, elevations, and measurements of buildings, grading, paving, utilities, and other work executed by him under the Contract.
5. **Commencement, Prosecution, and Completion.**
   - **a.** The Contractor will be required to commence work under this Contract within ten (10) calendar days after the date of receipt by him of Notice to Proceed, to prosecute said work with faithfulness and energy and to complete the entire work, ready for use, within 380 calendar days after receipt of Notice to Proceed. The time stated for completion shall include final cleanup of the premises.
   - **b.** It is mutually agreed that the time for the commencement and completion of the work will materially affect the progress of other work and that the Owner will suffer financial damages in an amount not now possible to ascertain if this work is not completed on schedule, and in view of these facts, it is agreed that the owner will withhold from the Contractor, as liquidated damages and not as a penalty, the sum of $100.00 per day for each calendar day that the work remains uncompleted beyond the date specified for the completion of the work.
   - **c.** If completion of the work to be performed under the terms of this Contract is delayed by reasons of delay in the performance of any work to be performed by the Owner, or other contractors, and which is essential to the work performed under this Contract, such delay shall not constitute a basis for any claim against the Owner, but the time of performance will be extended for a period equal to such delay or as otherwise mutually agreed upon.

6. **Watchman.** The Contractor shall employ a responsible watchman to guard the site and premises at all times except during regular working hours, from the beginning of work until acceptance by the Owner.
7. **Owner-Furnished Materials and Equipment.** With the following exception there will be no Owner-furnished materials and/or equipment.
   a. Hardware consisting of removable cylinders for locks will be Owner-furnished and installed by the contractor as specified herein.
8. **Taxes.** Except as may be otherwise provided in this Contract, the contract price is to include all applicable federal, state, and local taxes, but does not include any tax from which the Contractor is exempt. Upon request of the Contractor, the Owner shall furnish a tax exemption certificate or similar evidence of exemption with respect to any such tax not included in the contract price pursuant to this provision.
9. **Rates of Wages.**
   a. There shall be paid each laborer or mechanic of the Contractor or subcontractor engaged in work on the project under this Contract in the trade or occupation listed below, not less than the hourly wage rate opposite the same, regardless of any contractual relationship which may be alleged to exist between the Contractor or any subcontractor and such laborers and mechanics.

| Classification | Wage Rates per Hour |
|---|---|
| Asbestos workers | $28.16 |
| Bricklayers | $28.69 |
| Carpenters | $27.33 |
| Cement masons | $25.67 |
| Electricians | $28.79 |
| Glaziers | $25.80 |
| Ironworkers | $26.71 |
| Lathers | $26.91 |
| Linoleum layers | $25.14 |
| Marble setters | $28.72 |
| Mosaic and terrazzo workers | $27.33 |
| Painters | $25.39 |
| Plasterers | $27.54 |
| Plumbers | $28.99 |
| Roofers | $25.46 |
| Sheet metal workers | $27.88 |
| Steamfitters | $28.93 |
| Stonemasons | $28.69 |
| Tile setters | $27.33 |
| Waterproofers | $25.46 |
| | |
| LABORERS | |
| Air and power tool operator | $19.14 |
| Cement mason tender | $19.14 |

(*Continues*)

| Classification | Wage Rates per Hour |
|---|---|
| Power buggy operator | $19.35 |
| Sandblaster, potman, nozzleman | $19.35 |
| Mason tender | $19.35 |
| Pipe layer, nonmetallic, sewer and drainage | $19.70 |
| Pumpcrete nozzle placement man | $18.84 |
| Carpenter tender | $18.52 |
| Unskilled and common laborer | $18.52 |
| Concrete buggy operator | $18.52 |
| Concrete puddler | $19.35 |
| Vibrator operator | $19.35 |
| | |
| POWER EQUIPMENT OPERATORS | |
| Air compressor, power plant, pump operator | $21.78 |
| Gunite and pumpcrete machine | $22.47 |
| Concrete mixers over 1 $yd^3$ | $22.47 |
| Concrete batching plants | $22.47 |
| Cranes, hysters, side boom tractors | $22.06 |
| Winch truck | $22.06 |
| Hoists: | |
| One drum | $22.89 |
| Two or more drums | $23.65 |
| Guy and stiff leg derricks | $23.65 |
| Loaders: | |
| Front end | $20.95 |
| Elevating belt, fork lift | $22.47 |
| Pile driver | $22.47 |
| Sheeps foot rollers | $21.02 |
| Rubber tired rollers | $21.02 |
| Shovel, backhoe, clamshell, dragline, under 3/4 $yd^3$ | $21.78 |
| Shovel, backhoe, clamshell, dragline, over 3/4 $yd^3$ | $22.41 |
| Loaders, bulldozers, patrol, scraper | $22.68 |
| Trenching machine | $21.78 |
| | |
| TRUCK DRIVERS | |
| Dumpster | $20.74 |
| Dump trucks: | |
| Batch and under 8 $yd^3$ | $20.19 |
| 8 and over $yd^3$ | $20.53 |
| Lowboy, heavy equipment | $21.30 |
| Lowboy, light equipment | $20.60 |
| Flat bed truck, under 1/2 ton | $20.19 |
| Pickup truck | $20.12 |

| Classification | Wage Rates per Hour |
|---|---|
| Transit mix | $20.81 |
| Tank truck, no trailer | $20.39 |
| Tank truck, with trailer | $20.53 |
| Swamper or riding helper | $18.52 |
| Welders: receive rate prescribed for craft performing operation to which welding is incidental. | |

**b.** The foregoing specified wage rates are minimum rates only, and the Owner will not consider any claims for additional compensation made by the Contractor because of payment by the Contractor or any wage rate in excess of the applicable rate contained in this Contract. All disputes in regard to the payment of wages in excess of these specified in this Contract shall be adjusted by the Contractor.

**10. Temporary Facilities.** The Contractor shall furnish materials and labor to build all temporary buildings on the project site for use during the construction of the project. All such buildings and/or utilities shall remain the property of the Contractor and shall be removed by him, at his expense, upon completion of the work under this Contract.

**a.** *Sanitary Facilities*. The Contractor shall provide and maintain ample toilet accommodations for all workmen employed on the project under this Contract. The latrines shall be weather tight, fly-proof, and shall conform to the standards established by the Owner. Toilets shall be flush-type water closets connected to the sewer, and/or chemical type. Toilet facilities shall be maintained in sanitary condition as approved by the Architect-Engineer at all times during the work on this project.

**b.** *Temporary Enclosures*. The Contractor shall provide protection against entry, rain, wind, frost, and heat, at all times, and shall maintain all materials, apparatus, equipment, and fixtures free from damage and injury.

**c.** *Temporary Heat*. The Contractor shall provide temporary heat at all times when weather conditions are such that good construction will be hampered and delayed. Uniform temperature, not lower than 50°F shall be maintained at all times, including Saturdays, Sundays, and holidays, in that portion of the building where plastering, ceramic tile work, resilient flooring, and painting are being performed. When the permanent heating system is used to provide temporary heat requirements, all costs of operation shall be at the expense of the Contractor.

**d.** *Water Supply*. Water supply for all trades for construction uses and domestic consumption shall be provided and paid for by the Contractor. Temporary lines and connections shall be removed in a manner satisfactory to the Architect-Engineer before final acceptance of work under this Contract.

**e.** *Electricity*. Electric current required for power and light for all trades, for construction uses and temporary lines, lamps, and equipment as required, shall be provided, connected, and maintained by the Contractor at his expense and shall be removed in like manner at the completion of construction work.

**f.** *Telephone*. The Contractor shall provide and pay for such telephone service as he may require.

11. **Shop Drawings.** The Contractor shall submit to the Architect-Engineer for approval five copies of all shop drawings as may be required. These drawings shall be complete and shall contain all required detailed information. If approved by the Architect-Engineer, each copy of the drawings will be identified as having received such approval by being so stamped and dated. The Contractor shall make any corrections required by the Architect-Engineer. Two sets of all shop drawings will be retained by the Architect-Engineer and three sets will be returned to the Contractor. The approval of the drawings by the Architect-Engineer shall not be construed as a complete check but will indicate only that the general method of construction and detailing is satisfactory. Approval of such drawings will not relieve the Contractor of the responsibility of any error which may exist as the Contractor shall be responsible for the dimensions and design of adequate connections, details, and satisfactory construction of all work.
12. **Plan of Operations.** The Contractor shall coordinate his work with the operations and work of the Owner and other contractors, as directed by the Architect-Engineer.
13. **Reporting of Cost Information.** The Owner will need cost information regarding certain items of property which will be furnished or installed under this Contract. Accordingly, at the written request of the Architect-Engineer, the Contractor shall furnish to the Owner cost information pertaining to such items of property furnished or installed under this Contract as the Architect-Engineer may designate, in such form and in such detail as may be required.
14. **Field Office.** The Contractor shall provide adequate facilities for inspection of the project, including office space of not less than 100 square feet of floor space, properly heated, ventilated, and lighted, on the site of the project, for the exclusive use of the Architect-Engineer's representative. The Contractor shall construct a built-in work table approximately 3′6″ wide by 6′0″ long in the field office and plan racks as directed by the Architect-Engineer.
15. **Payment.** Partial payments under the Contract shall be made at the request of the Contractor once each month, based upon partial estimates to be furnished by the Contractor and approved by the Architect-Engineer. In making such partial payments, there shall be retained 10 percent of the estimated amounts until final completion and acceptance of all work covered by the Contract; provided, however, that the Architect-Engineer at any time after 50 percent of the work has been completed, if he finds that satisfactory progress is being made, with written consent of surety, shall recommend that the remaining partial payments be paid in full. Payments for work, under subcontracts of the Contractor, shall be subject to the above conditions applying to the Contract after the work under a subcontract has been 50 percent completed. In preparing estimates for partial payments, the material delivered on the site and preparatory work done may be taken into consideration.
16. **Construction Schedule.** Immediately after execution and delivery of the Contract, and before the first partial payment is made, the Contractor shall deliver to the Architect-Engineer an estimated construction progress schedule showing the proposed dates of commencement and completion of each of the various subdivisions of the work required under the Contract, and the anticipated amount of each monthly payment that will become due the Contractor in accordance with the progress schedule. The Contractor shall also furnish on forms to be supplied by the Owner (a) a detailed estimate giving a complete breakdown of the contract price and (b) periodical itemized estimates of work done for the purpose of making partial payments thereon.
17. **Drawings Furnished.** Subparagraph 4.2.1, of General Conditions, shall be changed to read as follows: "The Architect-Engineer shall furnish free of charge 25 sets of working Drawings and 25 sets

of Specifications. The Contractor shall pay the cost of reproduction for all other copies of Drawings and Specifications furnished to him."

18. **Permits.** Subparagraph 3.13.1, of General Conditions, shall be modified as follows: "The Owner shall procure the required building permit at no cost to the Contractor."

19. **Insurance.**

    **a.** Subparagraph 11.2.1 of General Conditions shall be modified as follows: "The Contractor shall procure, maintain, and pay for Owner's contingent liability insurance. The amount of Owner's contingent liability insurance shall be $100,000 for one person and $300,000 for one accident. A certificate of insurance shall be filed with the Architect-Engineer."

    **b.** Subparagraph 11.3.1 of General Conditions shall be modified as follows: "The Contractor shall procure, maintain, and pay for fire insurance in the amount of 100 percent of the insurable value of the Project and, in addition, shall procure, maintain, and pay for insurance to protect the Owner from damage by hail, tornado, and hurricane upon the entire work in the amount of 100 percent of the insurable value thereof. Certificates of insurance shall be filed with the Architect-Engineer."

20. **Cleaning Up.** Subparagraph 3.15.1 of General Conditions shall be modified as follows: "In addition to removal of rubbish and leaving the work broom-clean, the Contractor shall remove stains, spots, marks, and dirt from decorated work; clean hardware; remove paint spots and smears from all surfaces; clean light and plumbing fixtures, and wash all concrete, tile, and terrazzo floors."

# Appendix F

# Sample Lump-Sum Proposal Form, with Reference to Addenda, and Alternates

*Place:* Portland, Ohio
*Date:* May 19, 20--

PROPOSAL of The Blank Construction Company, Inc., a corporation organized and existing under the laws of the State of Ohio, a partnership consisting of _____

_____

_____

an individual doing business as _____

TO: The City of Portland, Ohio
PROJECT: Municipal Airport Terminal Building
For the City of Portland, Ohio

Gentlemen:

The Undersigned, in compliance with your Invitation for Bids for the General Construction of the above-described project, having examined the drawings and specifications with related contract documents carefully, with all addenda thereto, and the site of the work, and being familiar with all of the conditions surrounding the construction of the proposed project, hereby proposes to furnish all plant, labor, equipment, appliances, supplies, and materials and to perform all work for the construction of the project as required by and in strict accordance with the contract documents, specifications, schedules, and drawings with all addenda issued by the Architect-Engineer, at the prices stated below.

The Undersigned hereby acknowledges receipt of the following Addenda:
Addendum No. 1 dated April 28, 20—.
Addendum No. 2 dated May 6, 20—.

**BASE PROPOSAL:** For all work described in the detailed specifications and shown on the contract drawings for the building, I (or We) agree to perform all the work for the sum of five million, five hundred four thousand, nine hundred seventy four and no/100 ($5,504,974.00) dollars.

(Amount shall be shown in both written form and figures. In case of discrepancy between the written amount and the figures, the written amount will govern.)

The above-stated compensation covers all expenses incurred in performing the work, including premium for contract bonds, required under the contract documents, of which this proposal is a part.

**ALTERNATE NO. 1: QUARRY TILE IN PLACE OF TERRAZZO**: If the substitutions specified under this alternate are made, you may (~~deduct from~~) (add to) the base proposal the sum of nine thousand, seven hundred fourteen and no/100 ($9,714.00) dollars.

**ALTERNATE NO. 2: CHANGE STRUCTURAL GLAZED TILE TO BRICK IN CONCOURSE**: If the substitutions specified under this alternate are made, you may (deduct from) (~~add to~~) the base proposal the sum of four thousand, two hundred eighty and no/100 ($4,280.00) dollars.

**ALTERNATE NO. 3: OMIT KITCHEN EQUIPMENT**: If the substitutions specified under this alternate are made, you may (deduct from) (~~add to~~) the base proposal the sum of sixty-six thousand, seven hundred twenty three and no/100 ($66,723.00) dollars.

**BID SECURITY**: Attached cashier's check (certified check) (Bid Bond) payable without condition, in the sum of 5% of maximum possible bid amount ($_____) dollars (equal to 5% of the largest possible combination) is to become the property of the City of Portland, Ohio, in the event the Contract and contract bonds are not executed within the time set forth hereinafter, as liquidated damages for the delay and additional work caused thereby.

**CONTRACT SECURITY**: The Undersigned hereby agrees, if awarded the contract, to furnish the contract bonds, as specified, with the Hartford Accident and Indemnity Company Surety Company of Hartford, Connecticut.

Upon receipt of notice of the acceptance of this bid, the Undersigned hereby agrees that he will execute and deliver the formal written Contract in the form prescribed, in accordance with the bid as accepted and that he will give contract bonds, all within ten days after the prescribed forms are presented to him for signature.

If awarded the Contract, the Undersigned proposes to commence work within 10 calendar days after receipt of notice to proceed and to fully complete all of the work under his Contract, ready for occupancy, within 380 calendar days thereafter.

Respectfully submitted,

*Company:* The Blank Construction Company, Inc.
*By:* K.O. Acme
*Title:* Vice-President
*Address:* 1938 Cranbrook Lane
*City/State:* Portland, Ohio
*Phone:* (216)-344-5507

SEAL:
(*If bid is by a Corporation*)

# Appendix G

# AIA Document A101-2007 Standard Form of Agreement between Owner and Contractor Where the Basis of Payment is a Stipulated Sum

American Institute of Architects

# AIA® Document A101™ – 2007

## *Standard Form of Agreement Between Owner and Contractor where the basis of payment is a Stipulated Sum*

**AGREEMENT** made as of the day of
in the year
*(In words, indicate day, month and year)*

**BETWEEN** the Owner:
*(Name, address and other information)*

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

AIA Document A201™–2007, General Conditions of the Contract for Construction, is adopted in this document by reference. Do not use with other general conditions unless this document is modified.

and the Contractor:
*(Name, address and other information)*

for the following Project:
*(Name, location, and detailed description)*

The Architect:
*(Name, address and other information)*

The Owner and Contractor agree as follows.

TABLE OF ARTICLES



**ARTICLE 1 THE CONTRACT DOCUMENTS**

The Contract Documents consist of this Agreement, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, Addenda issued prior to execution of this Agreement, other documents listed in this Agreement and Modifications issued after execution of this Agreement, all of which form the Contract, and are as fully a part of the Contract as if attached to this Agreement or repeated herein. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations or agreements, either written or oral. An enumeration of the Contract Documents, other than a Modification, appears in Article 9.

**ARTICLE 2 THE WORK OF THIS CONTRACT**

The Contractor shall fully execute the Work described in the Contract Documents, except as specifically indicated in the Contract Documents to be the responsibility of others.

**ARTICLE 3 DATE OF COMMENCEMENT AND SUBSTANTIAL COMPLETION**

**§ 3.1** The date of commencement of the Work shall be the date of this Agreement unless a different date is stated below or provision is made for the date to be fixed in a notice to proceed issued by the Owner.

*(Insert the date of commencement if it differs from the date of this Agreement or, if applicable, state that the date will be fixed in a notice to proceed.)*

If, prior to the commencement of the Work, the Owner requires time to file mortgages and other security interests, the Owner's time requirement shall be as follows:

**§ 3.2** The Contract Time shall be measured from the date of commencement.



Init.

/

**§ 3.3** The Contractor shall achieve Substantial Completion of the entire Work not later than
( ) days from the date of commencement, or as follows:
*(Insert number of calendar days. Alternatively, a calendar date may be used when coordinated with the date of commencement. If appropriate, insert requirements for earlier Substantial Completion of certain portions of the Work.)*

, subject to adjustments of this Contract Time as provided in the Contract Documents.
*(Insert provisions, if any, for liquidated damages relating to failure to achieve Substantial Completion on time or for bonus payments for early completion of the Work.)*

**ARTICLE 4 CONTRACT SUM**

**§ 4.1** The Owner shall pay the Contractor the Contract Sum in current funds for the Contractor's performance of the Contract. The Contract Sum shall be
Dollars ($ ), subject to additions and deductions as provided in the Contract Documents.

**§ 4.2** The Contract Sum is based upon the following alternates, if any, which are described in the Contract Documents and are hereby accepted by the Owner:
*(State the numbers or other identification of accepted alternates. If the bidding or proposal documents permit the Owner to accept other alternates subsequent to the execution of this Agreement, attach a schedule of such other alternates showing the amount for each and the date when that amount expires.)*

**§ 4.3** Unit prices, if any:
*(Identify and state the unit price; state quantity limitations, if any, to which the unit price will be applicable.)*

| Item | Units and Limitations | Price Per Unit |
|---|---|---|

**§ 4.4** Allowances included in the Contract Sum, if any:
*(Identify allowance and state exclusions, if any, from the allowance price.)*

| Item | Price |
|---|---|

**ARTICLE 5 PAYMENTS**

**§ 5.1 PROGRESS PAYMENTS**

**§ 5.1.1** Based upon Applications for Payment submitted to the Architect by the Contractor and Certificates for Payment issued by the Architect, the Owner shall make progress payments on account of the Contract Sum to the Contractor as provided below and elsewhere in the Contract Documents.

**§ 5.1.2** The period covered by each Application for Payment shall be one calendar month ending on the last day of the month, or as follows:

**§ 5.1.3** Provided that an Application for Payment is received by the Architect not later than the ( ) day of a month, the Owner shall make payment of the certified amount to the Contractor not later than the ( ) day of the ( ) month. If an Application for Payment is received by the Architect after the application date fixed above, payment shall be made by the Owner not later than ( ) days after the Architect receives the Application for Payment.
*(Federal, state or local laws may require payment within a certain period of time.)*

**§ 5.1.4** Each Application for Payment shall be based on the most recent schedule of values submitted by the Contractor in accordance with the Contract Documents. The schedule of values shall allocate the entire Contract Sum among the various portions of the Work. The schedule of values shall be prepared in such form and supported by such data to substantiate its accuracy as the Architect may require. This schedule, unless objected to by the Architect, shall be used as a basis for reviewing the Contractor's Applications for Payment.

**§ 5.1.5** Applications for Payment shall show the percentage of completion of each portion of the Work as of the end of the period covered by the Application for Payment.

**§ 5.1.6** Subject to other provisions of the Contract Documents, the amount of each progress payment shall be computed as follows:

**.1** Take that portion of the Contract Sum properly allocable to completed Work as determined by multiplying the percentage completion of each portion of the Work by the share of the Contract Sum allocated to that portion of the Work in the schedule of values, less retainage of percent ( %). Pending final determination of cost to the Owner of changes in the Work, amounts not in dispute shall be included as provided in Section 7.3.9 of AIA Document A201™–2007, General Conditions of the Contract for Construction;

**.2** Add that portion of the Contract Sum properly allocable to materials and equipment delivered and suitably stored at the site for subsequent incorporation in the completed construction (or, if approved in advance by the Owner, suitably stored off the site at a location agreed upon in writing), less retainage of percent ( %);

**.3** Subtract the aggregate of previous payments made by the Owner; and

**.4** Subtract amounts, if any, for which the Architect has withheld or nullified a Certificate for Payment as provided in Section 9.5 of AIA Document A201–2007.

**§ 5.1.7** The progress payment amount determined in accordance with Section 5.1.6 shall be further modified under the following circumstances:

**.1** Add, upon Substantial Completion of the Work, a sum sufficient to increase the total payments to the full amount of the Contract Sum, less such amounts as the Architect shall determine for incomplete Work, retainage applicable to such work and unsettled claims; and
*(Section 9.8.5 of AIA Document A201–2007 requires release of applicable retainage upon Substantial Completion of Work with consent of surety, if any.)*

**.2** Add, if final completion of the Work is thereafter materially delayed through no fault of the Contractor, any additional amounts payable in accordance with Section 9.10.3 of AIA Document A201–2007.

**§ 5.1.8** Reduction or limitation of retainage, if any, shall be as follows:
*(If it is intended, prior to Substantial Completion of the entire Work, to reduce or limit the retainage resulting from the percentages inserted in Sections 5.1.6.1 and 5.1.6.2 above, and this is not explained elsewhere in the Contract Documents, insert here provisions for such reduction or limitation.)*

**§ 5.1.9** Except with the Owner's prior approval, the Contractor shall not make advance payments to suppliers for materials or equipment which have not been delivered and stored at the site.

**§ 5.2 FINAL PAYMENT**

**§ 5.2.1** Final payment, constituting the entire unpaid balance of the Contract Sum, shall be made by the Owner to the Contractor when

**.1** the Contractor has fully performed the Contract except for the Contractor's responsibility to correct Work as provided in Section 12.2.2 of AIA Document A201–2007, and to satisfy other requirements, if any, which extend beyond final payment; and

**.2** a final Certificate for Payment has been issued by the Architect.

**§ 5.2.2** The Owner's final payment to the Contractor shall be made no later than 30 days after the issuance of the Architect's final Certificate for Payment, or as follows:

**ARTICLE 6 DISPUTE RESOLUTION**

**§ 6.1 INITIAL DECISION MAKER**

The Architect will serve as Initial Decision Maker pursuant to Section 15.2 of AIA Document A201–2007, unless the parties appoint below another individual, not a party to this Agreement, to serve as Initial Decision Maker.
*(If the parties mutually agree, insert the name, address and other contact information of the Initial Decision Maker, if other than the Architect.)*

**§ 6.2 BINDING DISPUTE RESOLUTION**

For any Claim subject to, but not resolved by, mediation pursuant to Section 15.3 of AIA Document A201–2007, the method of binding dispute resolution shall be as follows:
*(Check the appropriate box. If the Owner and Contractor do not select a method of binding dispute resolution below, or do not subsequently agree in writing to a binding dispute resolution method other than litigation, Claims will be resolved by litigation in a court of competent jurisdiction.)*

☐ Arbitration pursuant to Section 15.4 of AIA Document A201–2007

☐ Litigation in a court of competent jurisdiction

☐ Other *(Specify)*

**ARTICLE 7 TERMINATION OR SUSPENSION**

**§ 7.1** The Contract may be terminated by the Owner or the Contractor as provided in Article 14 of AIA Document A201–2007.

**§ 7.2** The Work may be suspended by the Owner as provided in Article 14 of AIA Document A201–2007.

**ARTICLE 8 MISCELLANEOUS PROVISIONS**

**§ 8.1** Where reference is made in this Agreement to a provision of AIA Document A201–2007 or another Contract Document, the reference refers to that provision as amended or supplemented by other provisions of the Contract Documents.

**§ 8.2** Payments due and unpaid under the Contract shall bear interest from the date payment is due at the rate stated below, or in the absence thereof, at the legal rate prevailing from time to time at the place where the Project is located.
*(Insert rate of interest agreed upon, if any.)*

**§ 8.3** The Owner's representative:
*(Name, address and other information)*

**§ 8.4** The Contractor's representative:
*(Name, address and other information)*

**§ 8.5** Neither the Owner's nor the Contractor's representative shall be changed without ten days written notice to the other party.

**§ 8.6** Other provisions:

**ARTICLE 9 ENUMERATION OF CONTRACT DOCUMENTS**

**§ 9.1** The Contract Documents, except for Modifications issued after execution of this Agreement, are enumerated in the sections below.

**§ 9.1.1** The Agreement is this executed AIA Document A101–2007, Standard Form of Agreement Between Owner and Contractor.

**§ 9.1.2** The General Conditions are AIA Document A201–2007, General Conditions of the Contract for Construction.

**§ 9.1.3** The Supplementary and other Conditions of the Contract:

| Document | Title | Date | Pages |
|---|---|---|---|

**§ 9.1.4** The Specifications:
*(Either list the Specifications here or refer to an exhibit attached to this Agreement.)*

| Section | Title | Date | Pages |
|---|---|---|---|

**§ 9.1.5** The Drawings:
*(Either list the Drawings here or refer to an exhibit attached to this Agreement.)*

| Number | Title | Date |
|---|---|---|

**§ 9.1.6** The Addenda, if any:

| Number | Date | Pages |
|---|---|---|

Portions of Addenda relating to bidding requirements are not part of the Contract Documents unless the bidding requirements are also enumerated in this Article 9.

**§ 9.1.7** Additional documents, if any, forming part of the Contract Documents:

**.1** AIA Document E201™–2007, Digital Data Protocol Exhibit, if completed by the parties, or the following:

**.2** Other documents, if any, listed below:
*(List here any additional documents that are intended to form part of the Contract Documents. AIA Document A201–2007 provides that bidding requirements such as advertisement or invitation to bid, Instructions to Bidders, sample forms and the Contractor's bid are not part of the Contract Documents unless enumerated in this Agreement. They should be listed here only if intended to be part of the Contract Documents.)*

**ARTICLE 10 INSURANCE AND BONDS**

The Contractor shall purchase and maintain insurance and provide bonds as set forth in Article 11 of AIA Document A201–2007.
*(State bonding requirements, if any, and limits of liability for insurance required in Article 11 of AIA Document A201–2007.)*

This Agreement entered into as of the day and year first written above.

| **OWNER** *(Signature)* | **CONTRACTOR** *(Signature)* |
|---|---|
| *(Printed name and title)* | *(Printed name and title)* |

**CAUTION: You should sign an original AIA Contract Document, on which this text appears in RED. An original assures that changes will not be obscured.**

# Appendix H

# AIA Document A102-2007, Standard Form of Agreement between Owner and Contractor Where the Basis of Payment is the Cost of the Work Plus a Fee with a Guaranteed Maximum Price

American Institute of Architects

# AIA® Document A102™ – 2007

## *Standard Form of Agreement Between Owner and Contractor where the basis of payment is the Cost of the Work Plus a Fee with a Guaranteed Maximum Price*

**AGREEMENT** made as of the day of
in the year
*(In words, indicate day, month and year)*

**BETWEEN** the Owner:
*(Name, address and other information)*

and the Contractor:
*(Name, address and other information)*

for the following Project:
*(Name, location, and detailed description)*

The Architect:
*(Name, address and other information)*

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

This document is not intended for use in competitive bidding.

AIA Document A201™–2007, General Conditions of the Contract for Construction, is adopted in this document by reference. Do not use with other general conditions unless this document is modified.



The Owner and Contractor agree as follows.

TABLE OF ARTICLES



**ARTICLE 1 THE CONTRACT DOCUMENTS**

The Contract Documents consist of this Agreement, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, Addenda issued prior to execution of this Agreement, other documents listed in this Agreement and Modifications issued after execution of this Agreement, all of which form the Contract, and are as fully a part of the Contract as if attached to this Agreement or repeated herein. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations or agreements, either written or oral. If anything in the other Contract Documents, other than a Modification, is inconsistent with this Agreement, this Agreement shall govern.

**ARTICLE 2 THE WORK OF THIS CONTRACT**

The Contractor shall fully execute the Work described in the Contract Documents, except as specifically indicated in the Contract Documents to be the responsibility of others.

**ARTICLE 3 RELATIONSHIP OF THE PARTIES**

The Contractor accepts the relationship of trust and confidence established by this Agreement and covenants with the Owner to cooperate with the Architect and exercise the Contractor's skill and judgment in furthering the interests of the Owner; to furnish efficient business administration and supervision; to furnish at all times an adequate supply of workers and materials; and to perform the Work in an expeditious and economical manner consistent with the Owner's interests. The Owner agrees to furnish and approve, in a timely manner, information required by the Contractor and to make payments to the Contractor in accordance with the requirements of the Contract Documents.

**ARTICLE 4 DATE OF COMMENCEMENT AND SUBSTANTIAL COMPLETION**

**§ 4.1** The date of commencement of the Work shall be the date of this Agreement unless a different date is stated below or provision is made for the date to be fixed in a notice to proceed issued by the Owner.
*(Insert the date of commencement, if it differs from the date of this Agreement or, if applicable, state that the date will be fixed in a notice to proceed.)*

If, prior to commencement of the Work, the Owner requires time to file mortgages and other security interests, the Owner's time requirement shall be as follows:

**§ 4.2** The Contract Time shall be measured from the date of commencement.

**§ 4.3** The Contractor shall achieve Substantial Completion of the entire Work not later than
( ) days from the date of commencement, or as follows:
*(Insert number of calendar days. Alternatively, a calendar date may be used when coordinated with the date of commencement. If appropriate, insert requirements for earlier Substantial Completion of certain portions of the Work.)*

, subject to adjustments of this Contract Time as provided in the Contract Documents.
*(Insert provisions, if any, for liquidated damages relating to failure to achieve Substantial Completion on time, or for bonus payments for early completion of the Work.)*

**ARTICLE 5 CONTRACT SUM**

**§ 5.1.** The Owner shall pay the Contractor the Contract Sum in current funds for the Contractor's performance of the Contract. The Contract Sum is the Cost of the Work as defined in Article 7 plus the Contractor's Fee.

**§ 5.1.1** The Contractor's Fee:
*(State a lump sum, percentage of Cost of the Work or other provision for determining the Contractor's Fee.)*

**§ 5.1.2** The method of adjustment of the Contractor's Fee for changes in the Work:

**§ 5.1.3** Limitations, if any, on a Subcontractor's overhead and profit for increases in the cost of its portion of the Work:

**§ 5.1.4** Rental rates for Contractor-owned equipment shall not exceed percent ( %) of the standard rate paid at the place of the Project.

**§ 5.1.5** Unit prices, if any:
*(Identify and state the unit price; state the quantity limitations, if any, to which the unit price will be applicable.)*

| Item | Units and Limitations | Price Per Unit |
|---|---|---|

**§ 5.2 GUARANTEED MAXIMUM PRICE**

**§ 5.2.1** The Contract Sum is guaranteed by the Contractor not to exceed Dollars ($ ), subject to additions and deductions by Change Order as provided in the Contract Documents. Such maximum sum is referred to in the Contract Documents as the Guaranteed Maximum Price. Costs which would cause the Guaranteed Maximum Price to be exceeded shall be paid by the Contractor without reimbursement by the Owner.
*(Insert specific provisions if the Contractor is to participate in any savings.)*

**§ 5.2.2** The Guaranteed Maximum Price is based on the following alternates, if any, which are described in the Contract Documents and are hereby accepted by the Owner:
*(State the numbers or other identification of accepted alternates. If bidding or proposal documents permit the Owner to accept other alternates subsequent to the execution of this Agreement, attach a schedule of such other alternates showing the amount for each and the date when the amount expires.)*

**§ 5.2.3** Allowances included in the Guaranteed Maximum Price, if any:
*(Identify allowance and state exclusions, if any, from the allowance price.)*

| Item | Price |
|---|---|

**§ 5.2.4** Assumptions, if any, on which the Guaranteed Maximum Price is based:

**§ 5.2.5** To the extent that the Drawings and Specifications are anticipated to require further development by the Architect, the Contractor has provided in the Guaranteed Maximum Price for such further development consistent with the Contract Documents and reasonably inferable therefrom. Such further development does not include such things as changes in scope, systems, kinds and quality of materials, finishes or equipment, all of which, if required, shall be incorporated by Change Order.

**ARTICLE 6 CHANGES IN THE WORK**

**§ 6.1** Adjustments to the Guaranteed Maximum Price on account of changes in the Work may be determined by any of the methods listed in Section 7.3.3 of AIA Document A201–2007, General Conditions of the Contract for Construction.

**§ 6.2** In calculating adjustments to subcontracts (except those awarded with the Owner's prior consent on the basis of cost plus a fee), the terms "cost" and "fee" as used in Section 7.3.3.3 of AIA Document A201–2007 and the term "costs" as used in Section 7.3.7 of AIA Document A201–2007 shall have the meanings assigned to them in AIA Document A201–2007 and shall not be modified by Articles 5, 7 and 8 of this Agreement. Adjustments to subcontracts awarded with the Owner's prior consent on the basis of cost plus a fee shall be calculated in accordance with the terms of those subcontracts.

**§ 6.3** In calculating adjustments to the Guaranteed Maximum Price, the terms "cost" and "costs" as used in the above-referenced provisions of AIA Document A201–2007 shall mean the Cost of the Work as defined in Article 7 of this Agreement and the term "fee" shall mean the Contractor's Fee as defined in Section 5.1.1 of this Agreement.

**§ 6.4** If no specific provision is made in Article 5 for adjustment of the Contractor's Fee in the case of changes in the Work, or if the extent of such changes is such, in the aggregate, that application of the adjustment provisions of Article 5 will cause substantial inequity to the Owner or Contractor, the Contractor's Fee shall be equitably adjusted on the same basis that was used to establish the Fee for the original Work, and the Guaranteed Maximum Price shall be adjusted accordingly.

**ARTICLE 7 COSTS TO BE REIMBURSED**

**§ 7.1 COST OF THE WORK**

**§ 7.1.1** The term Cost of the Work shall mean costs necessarily incurred by the Contractor in the proper performance of the Work. Such costs shall be at rates not higher than the standard paid at the place of the Project except with prior consent of the Owner. The Cost of the Work shall include only the items set forth in this Article 7.

**§ 7.1.2** Where any cost is subject to the Owner's prior approval, the Contractor shall obtain this approval prior to incurring the cost. The parties shall endeavor to identify any such costs prior to executing this Agreement.

**§ 7.2 LABOR COSTS**

**§ 7.2.1** Wages of construction workers directly employed by the Contractor to perform the construction of the Work at the site or, with the Owner's prior approval, at off-site workshops.

**§ 7.2.2** Wages or salaries of the Contractor's supervisory and administrative personnel when stationed at the site with the Owner's prior approval.
*(If it is intended that the wages or salaries of certain personnel stationed at the Contractor's principal or other offices shall be included in the Cost of the Work, identify in Article 15, the personnel to be included, whether for all or only part of their time, and the rates at which their time will be charged to the Work.)*

**§ 7.2.3** Wages and salaries of the Contractor's supervisory or administrative personnel engaged at factories, workshops or on the road, in expediting the production or transportation of materials or equipment required for the Work, but only for that portion of their time required for the Work.

**§ 7.2.4** Costs paid or incurred by the Contractor for taxes, insurance, contributions, assessments and benefits required by law or collective bargaining agreements and, for personnel not covered by such agreements, customary benefits such as sick leave, medical and health benefits, holidays, vacations and pensions, provided such costs are based on wages and salaries included in the Cost of the Work under Sections 7.2.1 through 7.2.3.

**§ 7.2.5** Bonuses, profit sharing, incentive compensation and any other discretionary payments paid to anyone hired by the Contractor or paid to any Subcontractor or vendor, with the Owner's prior approval.

**§ 7.3 SUBCONTRACT COSTS**

Payments made by the Contractor to Subcontractors in accordance with the requirements of the subcontracts.

**§ 7.4 COSTS OF MATERIALS AND EQUIPMENT INCORPORATED IN THE COMPLETED CONSTRUCTION**

**§ 7.4.1** Costs, including transportation and storage, of materials and equipment incorporated or to be incorporated in the completed construction.

**§ 7.4.2** Costs of materials described in the preceding Section 7.4.1 in excess of those actually installed to allow for reasonable waste and spoilage. Unused excess materials, if any, shall become the Owner's property at the completion of the Work or, at the Owner's option, shall be sold by the Contractor. Any amounts realized from such sales shall be credited to the Owner as a deduction from the Cost of the Work.

**§ 7.5 COSTS OF OTHER MATERIALS AND EQUIPMENT, TEMPORARY FACILITIES AND RELATED ITEMS**

**§ 7.5.1** Costs of transportation, storage, installation, maintenance, dismantling and removal of materials, supplies, temporary facilities, machinery, equipment and hand tools not customarily owned by construction workers that are provided by the Contractor at the site and fully consumed in the performance of the Work. Costs of materials, supplies, temporary facilities, machinery, equipment and tools that are not fully consumed shall be based on the cost or value of the item at the time it is first used on the Project site less the value of the item when it is no longer used at the Project site. Costs for items not fully consumed by the Contractor shall mean fair market value.

**§ 7.5.2** Rental charges for temporary facilities, machinery, equipment and hand tools not customarily owned by construction workers that are provided by the Contractor at the site and costs of transportation, installation, minor repairs, dismantling and removal. The total rental cost of any Contractor-owned item may not exceed the purchase price of any comparable item. Rates of Contractor-owned equipment and quantities of equipment shall be subject to the Owner's prior approval.

**§ 7.5.3** Costs of removal of debris from the site of the Work and its proper and legal disposal.

**§ 7.5.4** Costs of document reproductions, facsimile transmissions and long-distance telephone calls, postage and parcel delivery charges, telephone service at the site and reasonable petty cash expenses of the site office.

**§ 7.5.5** Costs of materials and equipment suitably stored off the site at a mutually acceptable location, subject to the Owner's prior approval.

**§ 7.6 MISCELLANEOUS COSTS**

**§ 7.6.1** Premiums for that portion of insurance and bonds required by the Contract Documents that can be directly attributed to this Contract. Self-insurance for either full or partial amounts of the coverages required by the Contract Documents, with the Owner's prior approval.

**§ 7.6.2** Sales, use or similar taxes imposed by a governmental authority that are related to the Work and for which the Contractor is liable.

**§ 7.6.3** Fees and assessments for the building permit and for other permits, licenses and inspections for which the Contractor is required by the Contract Documents to pay.

**§ 7.6.4** Fees of laboratories for tests required by the Contract Documents, except those related to defective or nonconforming Work for which reimbursement is excluded by Section 13.5.3 of AIA Document A201–2007 or by other provisions of the Contract Documents, and which do not fall within the scope of Section 7.7.3.

**§ 7.6.5** Royalties and license fees paid for the use of a particular design, process or product required by the Contract Documents; the cost of defending suits or claims for infringement of patent rights arising from such requirement of the Contract Documents; and payments made in accordance with legal judgments against the Contractor resulting from such suits or claims and payments of settlements made with the Owner's consent. However, such costs of legal defenses, judgments and settlements shall not be included in the calculation of the Contractor's Fee or subject to the Guaranteed Maximum Price. If such royalties, fees and costs are excluded by the last sentence of Section 3.17 of AIA Document A201–2007 or other provisions of the Contract Documents, then they shall not be included in the Cost of the Work.

**§ 7.6.6** Costs for electronic equipment and software, directly related to the Work with the Owner's prior approval.

**§ 7.6.7** Deposits lost for causes other than the Contractor's negligence or failure to fulfill a specific responsibility in the Contract Documents.

**§ 7.6.8** Legal, mediation and arbitration costs, including attorneys' fees, other than those arising from disputes between the Owner and Contractor, reasonably incurred by the Contractor after the execution of this Agreement in the performance of the Work and with the Owner's prior approval, which shall not be unreasonably withheld.

**§ 7.6.9** Subject to the Owner's prior approval, expenses incurred in accordance with the Contractor's standard written personnel policy for relocation and temporary living allowances of the Contractor's personnel required for the Work.

**§ 7.6.10** That portion of the reasonable expenses of the Contractor's supervisory or administrative personnel incurred while traveling in discharge of duties connected with the Work.

**§ 7.7 OTHER COSTS AND EMERGENCIES**

**§ 7.7.1** Other costs incurred in the performance of the Work if, and to the extent, approved in advance in writing by the Owner.

**§ 7.7.2** Costs incurred in taking action to prevent threatened damage, injury or loss in case of an emergency affecting the safety of persons and property, as provided in Section 10.4 of AIA Document A201–2007.

**§ 7.7.3** Costs of repairing or correcting damaged or nonconforming Work executed by the Contractor, Subcontractors or suppliers, provided that such damaged or nonconforming Work was not caused by negligence or failure to fulfill a specific responsibility of the Contractor and only to the extent that the cost of repair or correction is not recovered by the Contractor from insurance, sureties, Subcontractors, suppliers, or others.

**§ 7.8 RELATED PARTY TRANSACTIONS**

**§ 7.8.1** For purposes of Section 7.8, the term "related party" shall mean a parent, subsidiary, affiliate or other entity having common ownership or management with the Contractor; any entity in which any stockholder in, or management employee of, the Contractor owns any interest in excess of ten percent in the aggregate; or any person or entity which has the right to control the business or affairs of the Contractor. The term "related party" includes any member of the immediate family of any person identified above.

**§ 7.8.2** If any of the costs to be reimbursed arise from a transaction between the Contractor and a related party, the Contractor shall notify the Owner of the specific nature of the contemplated transaction, including the identity of the related party and the anticipated cost to be incurred, before any such transaction is consummated or cost incurred. If the Owner, after such notification, authorizes the proposed transaction, then the cost incurred shall be included as a cost to be reimbursed, and the Contractor shall procure the Work, equipment, goods or service from the related party, as a Subcontractor, according to the terms of Article 10. If the Owner fails to authorize the transaction, the Contractor shall procure the Work, equipment, goods or service from some person or entity other than a related party according to the terms of Article 10.

**ARTICLE 8 COSTS NOT TO BE REIMBURSED**

**§ 8.1** The Cost of the Work shall not include the items listed below:

**.1** Salaries and other compensation of the Contractor's personnel stationed at the Contractor's principal office or offices other than the site office, except as specifically provided in Section 7.2. or as may be provided in Article 15;

**.2** Expenses of the Contractor's principal office and offices other than the site office;

**.3** Overhead and general expenses, except as may be expressly included in Article 7;

**.4** The Contractor's capital expenses, including interest on the Contractor's capital employed for the Work;

**.5** Except as provided in Section 7.7.3 of this Agreement, costs due to the negligence or failure of the Contractor, Subcontractors and suppliers or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable to fulfill a specific responsibility of the Contract;

**.6** Any cost not specifically and expressly described in Article 7; and

**.7** Costs, other than costs included in Change Orders approved by the Owner, that would cause the Guaranteed Maximum Price to be exceeded.

**ARTICLE 9 DISCOUNTS, REBATES AND REFUNDS**

**§ 9.1** Cash discounts obtained on payments made by the Contractor shall accrue to the Owner if (1) before making the payment, the Contractor included them in an Application for Payment and received payment from the Owner, or (2) the Owner has deposited funds with the Contractor with which to make payments; otherwise, cash discounts shall accrue to the Contractor. Trade discounts, rebates, refunds and amounts received from sales of surplus materials and equipment shall accrue to the Owner, and the Contractor shall make provisions so that they can be obtained.

**§ 9.2** Amounts that accrue to the Owner in accordance with the provisions of Section 9.1 shall be credited to the Owner as a deduction from the Cost of the Work.

**ARTICLE 10 SUBCONTRACTS AND OTHER AGREEMENTS**

**§ 10.1** Those portions of the Work that the Contractor does not customarily perform with the Contractor's own personnel shall be performed under subcontracts or by other appropriate agreements with the Contractor. The Owner may designate specific persons from whom, or entities from which, the Contractor shall obtain bids. The Contractor shall obtain bids from Subcontractors and from suppliers of materials or equipment fabricated especially for the Work and shall deliver such bids to the Architect. The Owner shall then determine, with the advice of the Contractor and the Architect, which bids will be accepted. The Contractor shall not be required to contract with anyone to whom the Contractor has reasonable objection.

**§ 10.2** When a specific bidder (1) is recommended to the Owner by the Contractor; (2) is qualified to perform that portion of the Work; and (3) has submitted a bid that conforms to the requirements of the Contract Documents without reservations or exceptions, but the Owner requires that another bid be accepted, then the Contractor may require that a Change Order be issued to adjust the Guaranteed Maximum Price by the difference between the bid of the person or entity recommended to the Owner by the Contractor and the amount of the subcontract or other agreement actually signed with the person or entity designated by the Owner.

**§ 10.3** Subcontracts or other agreements shall conform to the applicable payment provisions of this Agreement, and shall not be awarded on the basis of cost plus a fee without the prior consent of the Owner. If the Subcontract is awarded on a cost-plus a fee basis, the Contractor shall provide in the Subcontract for the Owner to receive the same audit rights with regard to the Subcontractor as the Owner receives with regard to the Contractor in Article 11, below.

**ARTICLE 11 ACCOUNTING RECORDS**

The Contractor shall keep full and detailed records and accounts related to the cost of the Work and exercise such controls as may be necessary for proper financial management under this Contract and to substantiate all costs incurred. The accounting and control systems shall be satisfactory to the Owner. The Owner and the Owner's auditors shall, during regular business hours and upon reasonable notice, be afforded access to, and shall be permitted to audit and copy, the Contractor's records and accounts, including complete documentation supporting accounting entries, books, correspondence, instructions, drawings, receipts, subcontracts, Subcontractor's proposals, purchase orders, vouchers, memoranda and other data relating to this Contract. The Contractor shall preserve these records for a period of three years after final payment, or for such longer period as may be required by law.

**ARTICLE 12 PAYMENTS**

**§ 12.1 PROGRESS PAYMENTS**

**§ 12.1.1** Based upon Applications for Payment submitted to the Architect by the Contractor and Certificates for Payment issued by the Architect, the Owner shall make progress payments on account of the Contract Sum to the Contractor as provided below and elsewhere in the Contract Documents.

**§ 12.1.2** The period covered by each Application for Payment shall be one calendar month ending on the last day of the month, or as follows:

**§ 12.1.3** Provided that an Application for Payment is received by the Architect not later than the ( ) day of a month, the Owner shall make payment of the certified amount to the Contractor not later than the ( ) day of the ( ) month. If an Application for Payment is received by the Architect after the application date fixed above, payment shall be made by the Owner not later than ( ) days after the Architect receives the Application for Payment.
*(Federal, state or local laws may require payment within a certain period of time.)*

**§ 12.1.4** With each Application for Payment, the Contractor shall submit payrolls, petty cash accounts, receipted invoices or invoices with check vouchers attached, and any other evidence required by the Owner or Architect to demonstrate that cash disbursements already made by the Contractor on account of the Cost of the Work equal or exceed (1) progress payments already received by the Contractor; less (2) that portion of those payments attributable to the Contractor's Fee; plus (3) payrolls for the period covered by the present Application for Payment.

**§ 12.1.5** Each Application for Payment shall be based on the most recent schedule of values submitted by the Contractor in accordance with the Contract Documents. The schedule of values shall allocate the entire Guaranteed Maximum Price among the various portions of the Work, except that the Contractor's Fee shall be shown as a single separate item.

The schedule of values shall be prepared in such form and supported by such data to substantiate its accuracy as the Architect may require. This schedule, unless objected to by the Architect, shall be used as a basis for reviewing the Contractor's Applications for Payment.

**§ 12.1.6** Applications for Payment shall show the percentage of completion of each portion of the Work as of the end of the period covered by the Application for Payment. The percentage of completion shall be the lesser of (1) the percentage of that portion of the Work which has actually been completed; or (2) the percentage obtained by dividing (a) the expense that has actually been incurred by the Contractor on account of that portion of the Work for which the Contractor has made or intends to make actual payment prior to the next Application for Payment by (b) the share of the Guaranteed Maximum Price allocated to that portion of the Work in the schedule of values.

**§ 12.1.7** Subject to other provisions of the Contract Documents, the amount of each progress payment shall be computed as follows:

**.1** Take that portion of the Guaranteed Maximum Price properly allocable to completed Work as determined by multiplying the percentage of completion of each portion of the Work by the share of the Guaranteed Maximum Price allocated to that portion of the Work in the schedule of values. Pending final determination of cost to the Owner of changes in the Work, amounts not in dispute shall be included as provided in Section 7.3.9 of AIA Document A201–2007;

**.2** Add that portion of the Guaranteed Maximum Price properly allocable to materials and equipment delivered and suitably stored at the site for subsequent incorporation in the Work, or if approved in advance by the Owner, suitably stored off the site at a location agreed upon in writing;

**.3** Add the Contractor's Fee, less retainage of percent ( %). The Contractor's Fee shall be computed upon the Cost of the Work at the rate stated in Section 5.1.1 or, if the Contractor's Fee is stated as a fixed sum in that Section, shall be an amount that bears the same ratio to that fixed-sum fee as the Cost of the Work bears to a reasonable estimate of the probable Cost of the Work upon its completion;

**.4** Subtract retainage of percent ( %) from that portion of the Work that the Contractor self-performs;

**.5** Subtract the aggregate of previous payments made by the Owner;

**.6** Subtract the shortfall, if any, indicated by the Contractor in the documentation required by Section 12.1.4 to substantiate prior Applications for Payment, or resulting from errors subsequently discovered by the Owner's auditors in such documentation; and

**.7** Subtract amounts, if any, for which the Architect has withheld or nullified a Certificate for Payment as provided in Section 9.5 of AIA Document A201–2007.

**§ 12.1.8** The Owner and the Contractor shall agree upon a (1) mutually acceptable procedure for review and approval of payments to Subcontractors and (2) the percentage of retainage held on Subcontracts, and the Contractor shall execute subcontracts in accordance with those agreements.

**§ 12.1.9** In taking action on the Contractor's Applications for Payment, the Architect shall be entitled to rely on the accuracy and completeness of the information furnished by the Contractor and shall not be deemed to represent that the Architect has made a detailed examination, audit or arithmetic verification of the documentation submitted in accordance with Section 12.1.4 or other supporting data; that the Architect has made exhaustive or continuous on-site inspections; or that the Architect has made examinations to ascertain how or for what purposes the Contractor has used amounts previously paid on account of the Contract. Such examinations, audits and verifications, if required by the Owner, will be performed by the Owner's auditors acting in the sole interest of the Owner.

**§ 12.2 FINAL PAYMENT**

**§ 12.2.1** Final payment, constituting the entire unpaid balance of the Contract Sum, shall be made by the Owner to the Contractor when

**.1** the Contractor has fully performed the Contract except for the Contractor's responsibility to correct Work as provided in Section 12.2.2 of AIA Document A201–2007, and to satisfy other requirements, if any, which extend beyond final payment;

**.2** the Contractor has submitted a final accounting for the Cost of the Work and a final Application for Payment; and

**.3** a final Certificate for Payment has been issued by the Architect.

**§ 12.2.2** The Owner's auditors will review and report in writing on the Contractor's final accounting within 30 days after delivery of the final accounting to the Architect by the Contractor. Based upon such Cost of the Work as the Owner's

auditors report to be substantiated by the Contractor's final accounting, and provided the other conditions of Section 12.2.1 have been met, the Architect will, within seven days after receipt of the written report of the Owner's auditors, either issue to the Owner a final Certificate for Payment with a copy to the Contractor, or notify the Contractor and Owner in writing of the Architect's reasons for withholding a certificate as provided in Section 9.5.1 of the AIA Document A201–2007. The time periods stated in this Section 12.2.2 supersede those stated in Section 9.4.1 of the AIA Document A201–2007. The Architect is not responsible for verifying the accuracy of the Contractor's final accounting.

**§ 12.2.3** If the Owner's auditors report the Cost of the Work as substantiated by the Contractor's final accounting to be less than claimed by the Contractor, the Contractor shall be entitled to request mediation of the disputed amount without seeking an initial decision pursuant to Section 15.2 of A201–2007. A request for mediation shall be made by the Contractor within 30 days after the Contractor's receipt of a copy of the Architect's final Certificate for Payment. Failure to request mediation within this 30-day period shall result in the substantiated amount reported by the Owner's auditors becoming binding on the Contractor. Pending a final resolution of the disputed amount, the Owner shall pay the Contractor the amount certified in the Architect's final Certificate for Payment.

**§ 12.2.4** The Owner's final payment to the Contractor shall be made no later than 30 days after the issuance of the Architect's final Certificate for Payment, or as follows:

**§ 12.2.5** If, subsequent to final payment and at the Owner's request, the Contractor incurs costs described in Article 7 and not excluded by Article 8 to correct defective or nonconforming Work, the Owner shall reimburse the Contractor such costs and the Contractor's Fee applicable thereto on the same basis as if such costs had been incurred prior to final payment, but not in excess of the Guaranteed Maximum Price. If the Contractor has participated in savings as provided in Section 5.2, the amount of such savings shall be recalculated and appropriate credit given to the Owner in determining the net amount to be paid by the Owner to the Contractor.

**ARTICLE 13 DISPUTE RESOLUTION**

**§ 13.1 INITIAL DECISION MAKER**

The Architect will serve as Initial Decision Maker pursuant to Section 15.2 of AIA Document A201–2007, unless the parties appoint below another individual, not a party to the Agreement, to serve as Initial Decision Maker.
*(If the parties mutually agree, insert the name, address and other contact information of the Initial Decision Maker, if other than the Architect.)*

**§ 13.2 BINDING DISPUTE RESOLUTION**

For any Claim subject to, but not resolved by mediation pursuant to Section 15.3 of AIA Document A201–2007, the method of binding dispute resolution shall be as follows:
*(Check the appropriate box. If the Owner and Contractor do not select a method of binding dispute resolution below, or do not subsequently agree in writing to a binding dispute resolution method other than litigation, Claims will be resolved by litigation in a court of competent jurisdiction.)*

☐ Arbitration pursuant to Section 15.4 of AIA Document A201–2007

☐ Litigation in a court of competent jurisdiction

☐ Other *(Specify)*

**ARTICLE 14 TERMINATION OR SUSPENSION**

**§ 14.1** Subject to the provisions of Section 14.2 below, the Contract may be terminated by the Owner or the Contractor as provided in Article 14 of AIA Document A201–2007.

**§ 14.2** If the Owner terminates the Contract for cause as provided in Article 14 of AIA Document A201–2007, the amount, if any, to be paid to the Contractor under Section 14.2.4 of AIA Document A201–2007 shall not cause the Guaranteed Maximum Price to be exceeded, nor shall it exceed an amount calculated as follows:

**.1** Take the Cost of the Work incurred by the Contractor to the date of termination;

**.2** Add the Contractor's Fee computed upon the Cost of the Work to the date of termination at the rate stated in Section 5.1.1 or, if the Contractor's Fee is stated as a fixed sum in that Section, an amount that bears the same ratio to that fixed-sum Fee as the Cost of the Work at the time of termination bears to a reasonable estimate of the probable Cost of the Work upon its completion; and

**.3** Subtract the aggregate of previous payments made by the Owner.

**§ 14.3** The Owner shall also pay the Contractor fair compensation, either by purchase or rental at the election of the Owner, for any equipment owned by the Contractor that the Owner elects to retain and that is not otherwise included in the Cost of the Work under Section 14.2.1. To the extent that the Owner elects to take legal assignment of subcontracts and purchase orders (including rental agreements), the Contractor shall, as a condition of receiving the payments referred to in this Article 14, execute and deliver all such papers and take all such steps, including the legal assignment of such subcontracts and other contractual rights of the Contractor, as the Owner may require for the purpose of fully vesting in the Owner the rights and benefits of the Contractor under such subcontracts or purchase orders.

**§ 14.4** The Work may be suspended by the Owner as provided in Article 14 of AIA Document A201–2007; in such case, the Guaranteed Maximum Price and Contract Time shall be increased as provided in Section 14.3.2 of AIA Document A201–2007, except that the term "profit" shall be understood to mean the Contractor's Fee as described in Sections 5.1.1 and Section 6.4 of this Agreement.

**ARTICLE 15 MISCELLANEOUS PROVISIONS**

**§ 15.1** Where reference is made in this Agreement to a provision of AIA Document A201–2007 or another Contract Document, the reference refers to that provision as amended or supplemented by other provisions of the Contract Documents.

**§ 15.2** Payments due and unpaid under the Contract shall bear interest from the date payment is due at the rate stated below, or in the absence thereof, at the legal rate prevailing from time to time at the place where the Project is located.
*(Insert rate of interest agreed upon, if any.)*

**§ 15.3** The Owner's representative:
*(Name, address and other information)*

**§ 15.4** The Contractor's representative:
*(Name, address and other information)*

**§ 15.5** Neither the Owner's nor the Contractor's representative shall be changed without ten days' written notice to the other party.

**§ 15.6** Other provisions:

**ARTICLE 16 ENUMERATION OF CONTRACT DOCUMENTS**

**§ 16.1** The Contract Documents, except for Modifications issued after execution of this Agreement, are enumerated in the sections below.

**§ 16.1.1** The Agreement is this executed AIA Document A102–2007, Standard Form of Agreement Between Owner and Contractor.

**§ 16.1.2** The General Conditions are AIA Document A201–2007, General Conditions of the Contract for Construction.

**§ 16.1.3** The Supplementary and other Conditions of the Contract:

| Document | Title | Date | Pages |
|---|---|---|---|

**§ 16.1.4** The Specifications:
*(Either list the Specifications here or refer to an exhibit attached to this Agreement.)*

| Section | Title | Date | Pages |
|---|---|---|---|

**§ 16.1.5** The Drawings:
*(Either list the Drawings here or refer to an exhibit attached to this Agreement.)*

| Number | Title | Date |
|---|---|---|

**§ 16.1.6** The Addenda, if any:

| Number | Date | Pages |
|---|---|---|

Portions of Addenda relating to bidding requirements are not part of the Contract Documents unless the bidding requirements are also enumerated in this Article 16.

**§ 16.1.7** Additional documents, if any, forming part of the Contract Documents:

**.1** AIA Document E201™–2007, Digital Data Protocol Exhibit, if completed by the parties, or the following:

**.2** Other documents, if any, listed below:

*(List here any additional documents that are intended to form part of the Contract Documents. AIA Document A201–2007 provides that bidding requirements such as advertisement or invitation to bid, Instructions to Bidders, sample forms and the Contractor's bid are not part of the Contract Documents unless enumerated in this Agreement. They should be listed here only if intended to be part of the Contract Documents.)*

**ARTICLE 17 INSURANCE AND BONDS**

The Contractor shall purchase and maintain insurance and provide bonds as set forth in Article 11 of AIA Document A201–2007.

*(State bonding requirements, if any, and limits of liability for insurance required in Article 11 of AIA Document A201–2007.)*



This Agreement entered into as of the day and year first written above.

| | |
|---|---|
| **OWNER** *(Signature)* | **CONTRACTOR** *(Signature)* |
| *(Printed name and title)* | *(Printed name and title)* |

**CAUTION: You should sign an original AIA Contract Document, on which this text appears in RED. An original assures that changes will not be obscured.**

# Appendix I

# AIA Document A310-2010 Bid Bond

American Institute of Architects

# AIA® Document A310™ – 2010

## *Bid Bond*

**CONTRACTOR:**
*(Name, legal status and address)*

**SURETY:**
*(Name, legal status and principal place of business)*

**OWNER:**
*(Name, legal status and address)*

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

Any singular reference to Contractor, Surety, Owner or other party shall be considered plural where applicable.

**BOND AMOUNT:**

**PROJECT:**
*(Name, location or address, and Project number, if any)*

The Contractor and Surety are bound to the Owner in the amount set forth above, for the payment of which the Contractor and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, as provided herein. The conditions of this Bond are such that if the Owner accepts the bid of the Contractor within the time specified in the bid documents, or within such time period as may be agreed to by the Owner and Contractor, and the Contractor either (1) enters into a contract with the Owner in accordance with the terms of such bid, and gives such bond or bonds as may be specified in the bidding or Contract Documents, with a surety admitted in the jurisdiction of the Project and otherwise acceptable to the Owner, for the faithful performance of such Contract and for the prompt payment of labor and material furnished in the prosecution thereof; or (2) pays to the Owner the difference, not to exceed the amount of this Bond, between the amount specified in said bid and such larger amount for which the Owner may in good faith contract with another party to perform the work covered by said bid, then this obligation shall be null and void, otherwise to remain in full force and effect. The Surety hereby waives any notice of an agreement between the Owner and Contractor to extend the time in which the Owner may accept the bid. Waiver of notice by the Surety shall not apply to any extension exceeding sixty (60) days in the aggregate beyond the time for acceptance of bids specified in the bid documents, and the Owner and Contractor shall obtain the Surety's consent for an extension beyond sixty (60) days.

If this Bond is issued in connection with a subcontractor's bid to a Contractor, the term Contractor in this Bond shall be deemed to be Subcontractor and the term Owner shall be deemed to be Contractor.

When this Bond has been furnished to comply with a statutory or other legal requirement in the location of the Project, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. When so furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

Signed and sealed this day of

| | |
|---|---|
| *(Witness)* | *(Principal)* *(Seal)* |
| | *(Title)* |
| *(Witness)* | *(Surety)* *(Seal)* |
| | *(Title)* |

**CAUTION: You should sign an original AIA Contract Document, on which this text appears in RED. An original assures that changes will not be obscured.**

# Appendix J

# AIA Document A312-2010 Performance Bond

American Institute of Architects

# AIA® Document A312™ – 2010

## *Performance Bond*

**CONTRACTOR:**
*(Name, legal status and address)*

**SURETY:**
*(Name, legal status and principal place of business)*

**OWNER:**
*(Name, legal status and address)*

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

Any singular reference to Contractor, Surety, Owner or other party shall be considered plural where applicable.

AIA Document A312–2010 combines two separate bonds, a Performance Bond and a Payment Bond, into one form. This is not a single combined Performance and Payment Bond.

**CONSTRUCTION CONTRACT**
Date:

Amount:

Description:
*(Name and location)*

**BOND**
Date:
*(Not earlier than Construction Contract Date)*

Amount:

Modifications to this Bond: ☐ None ☐ See Section 16

| **CONTRACTOR AS PRINCIPAL** | | **SURETY** | |
|---|---|---|---|
| Company: | *(Corporate Seal)* | Company: | *(Corporate Seal)* |
| Signature: | | Signature: | |
| Name and Title: | | Name and Title: | |

*(Any additional signatures appear on the last page of this Performance Bond.)*

*(FOR INFORMATION ONLY — Name, address and telephone)*

**AGENT** or **BROKER:**

**OWNER'S REPRESENTATIVE:**
*(Architect, Engineer or other party:)*

**§ 1** The Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to the Owner for the performance of the Construction Contract, which is incorporated herein by reference.

**§ 2** If the Contractor performs the Construction Contract, the Surety and the Contractor shall have no obligation under this Bond, except when applicable to participate in a conference as provided in Section 3.

**§ 3** If there is no Owner Default under the Construction Contract, the Surety's obligation under this Bond shall arise after

**.1** the Owner first provides notice to the Contractor and the Surety that the Owner is considering declaring a Contractor Default. Such notice shall indicate whether the Owner is requesting a conference among the Owner, Contractor and Surety to discuss the Contractor's performance. If the Owner does not request a conference, the Surety may, within five (5) business days after receipt of the Owner's notice, request such a conference. If the Surety timely requests a conference, the Owner shall attend. Unless the Owner agrees otherwise, any conference requested under this Section 3.1 shall be held within ten (10) business days of the Surety's receipt of the Owner's notice. If the Owner, the Contractor and the Surety agree, the Contractor shall be allowed a reasonable time to perform the Construction Contract, but such an agreement shall not waive the Owner's right, if any, subsequently to declare a Contractor Default;

**.2** the Owner declares a Contractor Default, terminates the Construction Contract and notifies the Surety; and

**.3** the Owner has agreed to pay the Balance of the Contract Price in accordance with the terms of the Construction Contract to the Surety or to a contractor selected to perform the Construction Contract.

**§ 4** Failure on the part of the Owner to comply with the notice requirement in Section 3.1 shall not constitute a failure to comply with a condition precedent to the Surety's obligations, or release the Surety from its obligations, except to the extent the Surety demonstrates actual prejudice.

**§ 5** When the Owner has satisfied the conditions of Section 3, the Surety shall promptly and at the Surety's expense take one of the following actions:

**§ 5.1** Arrange for the Contractor, with the consent of the Owner, to perform and complete the Construction Contract;

**§ 5.2** Undertake to perform and complete the Construction Contract itself, through its agents or independent contractors;

**§ 5.3** Obtain bids or negotiated proposals from qualified contractors acceptable to the Owner for a contract for performance and completion of the Construction Contract, arrange for a contract to be prepared for execution by the Owner and a contractor selected with the Owner's concurrence, to be secured with performance and payment bonds executed by a qualified surety equivalent to the bonds issued on the Construction Contract, and pay to the Owner the amount of damages as described in Section 7 in excess of the Balance of the Contract Price incurred by the Owner as a result of the Contractor Default; or

**§ 5.4** Waive its right to perform and complete, arrange for completion, or obtain a new contractor and with reasonable promptness under the circumstances:

**.1** After investigation, determine the amount for which it may be liable to the Owner and, as soon as practicable after the amount is determined, make payment to the Owner; or

**.2** Deny liability in whole or in part and notify the Owner, citing the reasons for denial.

**§ 6** If the Surety does not proceed as provided in Section 5 with reasonable promptness, the Surety shall be deemed to be in default on this Bond seven days after receipt of an additional written notice from the Owner to the Surety demanding that the Surety perform its obligations under this Bond, and the Owner shall be entitled to enforce any remedy available to the Owner. If the Surety proceeds as provided in Section 5.4, and the Owner refuses the payment or the Surety has denied liability, in whole or in part, without further notice the Owner shall be entitled to enforce any remedy available to the Owner.

**§ 7** If the Surety elects to act under Section 5.1, 5.2 or 5.3, then the responsibilities of the Surety to the Owner shall not be greater than those of the Contractor under the Construction Contract, and the responsibilities of the Owner to the Surety shall not be greater than those of the Owner under the Construction Contract. Subject to the commitment by the Owner to pay the Balance of the Contract Price, the Surety is obligated, without duplication, for

.1 the responsibilities of the Contractor for correction of defective work and completion of the Construction Contract;

.2 additional legal, design professional and delay costs resulting from the Contractor's Default, and resulting from the actions or failure to act of the Surety under Section 5; and

.3 liquidated damages, or if no liquidated damages are specified in the Construction Contract, actual damages caused by delayed performance or non-performance of the Contractor.

**§ 8** If the Surety elects to act under Section 5.1, 5.3 or 5.4, the Surety's liability is limited to the amount of this Bond.

**§ 9** The Surety shall not be liable to the Owner or others for obligations of the Contractor that are unrelated to the Construction Contract, and the Balance of the Contract Price shall not be reduced or set off on account of any such unrelated obligations. No right of action shall accrue on this Bond to any person or entity other than the Owner or its heirs, executors, administrators, successors and assigns.

**§ 10** The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders and other obligations.

**§ 11** Any proceeding, legal or equitable, under this Bond may be instituted in any court of competent jurisdiction in the location in which the work or part of the work is located and shall be instituted within two years after a declaration of Contractor Default or within two years after the Contractor ceased working or within two years after the Surety refuses or fails to perform its obligations under this Bond, whichever occurs first. If the provisions of this Paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.

**§ 12** Notice to the Surety, the Owner or the Contractor shall be mailed or delivered to the address shown on the page on which their signature appears.

**§ 13** When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. When so furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

**§ 14 Definitions**

**§ 14.1 Balance of the Contract Price.** The total amount payable by the Owner to the Contractor under the Construction Contract after all proper adjustments have been made, including allowance to the Contractor of any amounts received or to be received by the Owner in settlement of insurance or other claims for damages to which the Contractor is entitled, reduced by all valid and proper payments made to or on behalf of the Contractor under the Construction Contract.

**§ 14.2 Construction Contract.** The agreement between the Owner and Contractor identified on the cover page, including all Contract Documents and changes made to the agreement and the Contract Documents.

**§ 14.3 Contractor Default.** Failure of the Contractor, which has not been remedied or waived, to perform or otherwise to comply with a material term of the Construction Contract.

**§ 14.4 Owner Default.** Failure of the Owner, which has not been remedied or waived, to pay the Contractor as required under the Construction Contract or to perform and complete or comply with the other material terms of the Construction Contract.

**§ 14.5 Contract Documents.** All the documents that comprise the agreement between the Owner and Contractor.

**§ 15** If this Bond is issued for an agreement between a Contractor and subcontractor, the term Contractor in this Bond shall be deemed to be Subcontractor and the term Owner shall be deemed to be Contractor.

§ 16 Modifications to this bond are as follows:



*(Space is provided below for additional signatures of added parties, other than those appearing on the cover page.)*

| CONTRACTOR AS PRINCIPAL | | SURETY | |
|---|---|---|---|
| Company: | *(Corporate Seal)* | Company: | *(Corporate Seal)* |
| Signature: | | Signature: | |
| Name and Title: | | Name and Title: | |
| Address | | Address | |

**CAUTION: You should sign an original AIA Contract Document, on which this text appears in RED. An original assures that changes will not be obscured.**

# Appendix K

# AIA Document A312-2010 Payment Bond

American Institute of Architects

# AIA® Document A312™ – 2010

## *Payment Bond*

**CONTRACTOR:**
*(Name, legal status and address)*

**SURETY:**
*(Name, legal status and principal place of business)*

**OWNER:**
*(Name, legal status and address)*

**CONSTRUCTION CONTRACT**
Date:

Amount:

Description:
*(Name and location)*

**BOND**
Date:
*(Not earlier than Construction Contract Date)*

Amount:

Modifications to this Bond: ☐ None ☐ See Section 18

| **CONTRACTOR AS PRINCIPAL** | | **SURETY** | |
|---|---|---|---|
| Company: | *(Corporate Seal)* | Company: | *(Corporate Seal)* |
| Signature: | | Signature: | |
| Name and Title: | | Name and Title: | |

*(Any additional signatures appear on the last page of this Payment Bond.)*

*(FOR INFORMATION ONLY — Name, address and telephone)*

**AGENT** or **BROKER:**

**OWNER'S REPRESENTATIVE:**
*(Architect, Engineer or other party:)*

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

Any singular reference to Contractor, Surety, Owner or other party shall be considered plural where applicable.

AIA Document A312–2010 combines two separate bonds, a Performance Bond and a Payment Bond, into one form. This is not a single combined Performance and Payment Bond.

**§ 1** The Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to the Owner to pay for labor, materials and equipment furnished for use in the performance of the Construction Contract, which is incorporated herein by reference, subject to the following terms.

**§ 2** If the Contractor promptly makes payment of all sums due to Claimants, and defends, indemnifies and holds harmless the Owner from claims, demands, liens or suits by any person or entity seeking payment for labor, materials or equipment furnished for use in the performance of the Construction Contract, then the Surety and the Contractor shall have no obligation under this Bond.

**§ 3** If there is no Owner Default under the Construction Contract, the Surety's obligation to the Owner under this Bond shall arise after the Owner has promptly notified the Contractor and the Surety (at the address described in Section 13) of claims, demands, liens or suits against the Owner or the Owner's property by any person or entity seeking payment for labor, materials or equipment furnished for use in the performance of the Construction Contract and tendered defense of such claims, demands, liens or suits to the Contractor and the Surety.

**§ 4** When the Owner has satisfied the conditions in Section 3, the Surety shall promptly and at the Surety's expense defend, indemnify and hold harmless the Owner against a duly tendered claim, demand, lien or suit.

**§ 5** The Surety's obligations to a Claimant under this Bond shall arise after the following:

**§ 5.1** Claimants, who do not have a direct contract with the Contractor,

**.1** have furnished a written notice of non-payment to the Contractor, stating with substantial accuracy the amount claimed and the name of the party to whom the materials were, or equipment was, furnished or supplied or for whom the labor was done or performed, within ninety (90) days after having last performed labor or last furnished materials or equipment included in the Claim; and

**.2** have sent a Claim to the Surety (at the address described in Section 13).

**§ 5.2** Claimants, who are employed by or have a direct contract with the Contractor, have sent a Claim to the Surety (at the address described in Section 13).

**§ 6** If a notice of non-payment required by Section 5.1.1 is given by the Owner to the Contractor, that is sufficient to satisfy a Claimant's obligation to furnish a written notice of non-payment under Section 5.1.1.

**§ 7** When a Claimant has satisfied the conditions of Sections 5.1 or 5.2, whichever is applicable, the Surety shall promptly and at the Surety's expense take the following actions:

**§ 7.1** Send an answer to the Claimant, with a copy to the Owner, within sixty (60) days after receipt of the Claim, stating the amounts that are undisputed and the basis for challenging any amounts that are disputed; and

**§ 7.2** Pay or arrange for payment of any undisputed amounts.

**§ 7.3** The Surety's failure to discharge its obligations under Section 7.1 or Section 7.2 shall not be deemed to constitute a waiver of defenses the Surety or Contractor may have or acquire as to a Claim, except as to undisputed amounts for which the Surety and Claimant have reached agreement. If, however, the Surety fails to discharge its obligations under Section 7.1 or Section 7.2, the Surety shall indemnify the Claimant for the reasonable attorney's fees the Claimant incurs thereafter to recover any sums found to be due and owing to the Claimant.

**§ 8** The Surety's total obligation shall not exceed the amount of this Bond, plus the amount of reasonable attorney's fees provided under Section 7.3, and the amount of this Bond shall be credited for any payments made in good faith by the Surety.

**§ 9** Amounts owed by the Owner to the Contractor under the Construction Contract shall be used for the performance of the Construction Contract and to satisfy claims, if any, under any construction performance bond. By the Contractor furnishing and the Owner accepting this Bond, they agree that all funds earned by the Contractor in the performance of the Construction Contract are dedicated to satisfy obligations of the Contractor and Surety under this Bond, subject to the Owner's priority to use the funds for the completion of the work.

**§ 10** The Surety shall not be liable to the Owner, Claimants or others for obligations of the Contractor that are unrelated to the Construction Contract. The Owner shall not be liable for the payment of any costs or expenses of any Claimant under this Bond, and shall have under this Bond no obligation to make payments to, or give notice on behalf of, Claimants or otherwise have any obligations to Claimants under this Bond.

**§ 11** The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders and other obligations.

**§ 12** No suit or action shall be commenced by a Claimant under this Bond other than in a court of competent jurisdiction in the state in which the project that is the subject of the Construction Contract is located or after the expiration of one year from the date (1) on which the Claimant sent a Claim to the Surety pursuant to Section 5.1.2 or 5.2, or (2) on which the last labor or service was performed by anyone or the last materials or equipment were furnished by anyone under the Construction Contract, whichever of (1) or (2) first occurs. If the provisions of this Paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.

**§ 13** Notice and Claims to the Surety, the Owner or the Contractor shall be mailed or delivered to the address shown on the page on which their signature appears. Actual receipt of notice or Claims, however accomplished, shall be sufficient compliance as of the date received.

**§ 14** When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. When so furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

**§ 15** Upon request by any person or entity appearing to be a potential beneficiary of this Bond, the Contractor and Owner shall promptly furnish a copy of this Bond or shall permit a copy to be made.

**§ 16 Definitions**

**§ 16.1 Claim.** A written statement by the Claimant including at a minimum:

- **.1** the name of the Claimant;
- **.2** the name of the person for whom the labor was done, or materials or equipment furnished;
- **.3** a copy of the agreement or purchase order pursuant to which labor, materials or equipment was furnished for use in the performance of the Construction Contract;
- **.4** a brief description of the labor, materials or equipment furnished;
- **.5** the date on which the Claimant last performed labor or last furnished materials or equipment for use in the performance of the Construction Contract;
- **.6** the total amount earned by the Claimant for labor, materials or equipment furnished as of the date of the Claim;
- **.7** the total amount of previous payments received by the Claimant; and
- **.8** the total amount due and unpaid to the Claimant for labor, materials or equipment furnished as of the date of the Claim.

**§ 16.2 Claimant.** An individual or entity having a direct contract with the Contractor or with a subcontractor of the Contractor to furnish labor, materials or equipment for use in the performance of the Construction Contract. The term Claimant also includes any individual or entity that has rightfully asserted a claim under an applicable mechanic's lien or similar statute against the real property upon which the Project is located. The intent of this Bond shall be to include without limitation in the terms "labor, materials or equipment" that part of water, gas, power, light, heat, oil, gasoline, telephone service or rental equipment used in the Construction Contract, architectural and engineering services required for performance of the work of the Contractor and the Contractor's subcontractors, and all other items for which a mechanic's lien may be asserted in the jurisdiction where the labor, materials or equipment were furnished.

**§ 16.3 Construction Contract.** The agreement between the Owner and Contractor identified on the cover page, including all Contract Documents and all changes made to the agreement and the Contract Documents.

**§ 16.4 Owner Default.** Failure of the Owner, which has not been remedied or waived, to pay the Contractor as required under the Construction Contract or to perform and complete or comply with the other material terms of the Construction Contract.

**§ 16.5 Contract Documents.** All the documents that comprise the agreement between the Owner and Contractor.

**§ 17** If this Bond is issued for an agreement between a Contractor and subcontractor, the term Contractor in this Bond shall be deemed to be Subcontractor and the term Owner shall be deemed to be Contractor.

**§ 18** Modifications to this bond are as follows:



*(Space is provided below for additional signatures of added parties, other than those appearing on the cover page.)*

| **CONTRACTOR AS PRINCIPAL** | | **SURETY** | |
|---|---|---|---|
| Company: | *(Corporate Seal)* | Company: | *(Corporate Seal)* |
| Signature: | | Signature: | |
| Name and Title: | | Name and Title: | |
| Address | | Address | |

**CAUTION: You should sign an original AIA Contract Document, on which this text appears in RED. An original assures that changes will not be obscured.**

# Appendix L

# AGC Document 655 Standard Form of Agreement between Contractor and Subcontractor

Associated General Contractors of America

Project Name – Project No.
Subcontractor Name

**THE ASSOCIATED GENERAL CONTRACTORS OF AMERICA**

# AGC DOCUMENT NO. 655
# STANDARD FORM OF AGREEMENT BETWEEN CONTRACTOR AND SUBCONTRACTOR

## (Where the Contractor and Subcontractor Share the Risk of Owner Payment)



**TABLE OF ARTICLES**



This Agreement has important legal and insurance consequences. Consultation with an attorney and an insurance consultant is encouraged with respect to its completion or modification.





Initial _____

# AGC DOCUMENT NO.655
# STANDARD FORM OF AGREEMENT
# BETWEEN CONTRACTOR AND SUBCONTRACTOR
# (Where the Contractor and Subcontractor Share the Risk of Owner Payment)

**ARTICLE 1**

**AGREEMENT**

This Agreement is made this _____
by and between the
CONTRACTOR
(Name and Address) **James B. Pirtle Construction Co., Inc. dba Pirtle Construction Company**
5700 Griffin Road, Suite 200, Davie, FL 33314
(954) 797-0410

and the
SUBCONTRACTOR
(Name and Address)

for services in connection with the
SUBCONTRACT WORK
Furnish all necessary labor and material to provide a complete, operational and code compliant scope of work for the following specification sections and as further clarified in Exhibit A, the Project Plans and Specifications, General and Supplementary Conditions, General Requirements, and any other Conditions that exist within the Owner/Contractor Agreement and _____:

for the following
PROJECT

whose OWNER is
(Name and Address)

The ARCHITECT/ENGINEER for the Project is
(Name and Address)

**Notice to the parties shall be given at the above addresses.**

**ARTICLE 2**

**SCOPE OF WORK**

**2.1 SUBCONTRACT WORK** The Contractor contracts with the Subcontractor as an independent contractor to provide all labor, materials, equipment and services necessary or incidental to complete the work described in Article 1 for the Project in accordance with, and reasonably inferable from, that which is indicated in the Subcontract Documents, and consistent with the Progress Schedule, as may change from time to time. The Subcontractor shall perform the Subcontract Work under the general direction of the Contractor and in accordance with the Subcontract Documents.

**2.2 CONTRACTOR'S WORK** The Contractor's work is the construction and services required of the Contractor to fulfill its obligations pursuant to its agreement with the Owner (the Work). The Subcontract Work is a portion of the Work.

**2.3 SUBCONTRACT DOCUMENTS** The Subcontract Documents include this Agreement, the Owner-Contractor Agreement, special conditions, general conditions, specifications, drawings, addenda, Subcontract Change Orders, amendments and any pending and exercised alternates. The Contractor shall make available to the Subcontractor, prior to the execution of the Subcontract Agreement, copies of the Subcontract Documents to which the Subcontractor will be bound. The Subcontractor similarly shall make copies of applicable portions of the Subcontract Documents available to its proposed subcontractors and suppliers. Nothing shall prohibit the Subcontractor from obtaining copies of the Subcontract Documents from the Contractor at any time after the Subcontract Agreement is executed. The Subcontract Documents existing at the time of the execution of this Agreement are set forth in Article 13.

**2.4 CONFLICTS** In the event of a conflict between this Agreement and the other Subcontract Documents, this Agreement shall govern.

**2.5 EXTENT OF AGREEMENT** Nothing in this Agreement shall be construed to create a contractual relationship between persons or entities other than the Contractor and Subcontractor. This Agreement is solely for the benefit of the parties, represents the entire and integrated agreement between the parties, and supersedes all prior negotiations, representations, or agreements, either written or oral.

**2.6 DEFINITIONS**

**.1** Wherever the term Progress Schedule is used in this Agreement, it shall be read as Project Schedule when that term is used in the Subcontract Documents.

**.2** Whenever the term Change Order is used in this Agreement, it shall be read as Change Document when that term is used in the Subcontract Documents.

**.3** Unless otherwise indicated, the term Day shall mean calendar day.

**ARTICLE 3**

**SUBCONTRACTOR'S RESPONSIBILITIES**

**3.1** OBLIGATIONS The Contractor and Subcontractor are hereby mutually bound by the terms of this Subcontract. To the extent the terms of the prime contract between the Owner and Contractor apply to the work of the Subcontractor, then the Contractor hereby assumes toward the Subcontractor all the obligations, rights, duties, and redress that the Owner under the prime contract assumes toward the Contractor. In an identical way, the Subcontractor hereby assumes toward the Contractor all the same obligations, rights, duties, and redress that the Contractor assumes toward the Owner and Architect under the prime contract. In the event of an inconsistency among the documents, the specific terms of this Subcontract shall govern.

**3.2 RESPONSIBILITIES** The Subcontractor agrees to furnish its best skill and judgment in the performance of the Subcontract Work and to cooperate with the Contractor so that the Contractor may fulfill its obligations to the Owner. The Subcontractor shall furnish all of the labor, materials, equipment, and services, including but not limited to, competent **English speaking** supervision, shop drawings, samples, tools, and scaffolding as are necessary for the proper performance of the Subcontract Work. The Subcontractor shall provide the Contractor a list of its proposed subcontractors and suppliers, and be responsible for taking field dimensions, providing tests, obtaining required permits related to the Subcontract Work and affidavits, ordering of materials and all other actions as required to meet the Progress Schedule.

**3.3 INCONSISTENCIES AND OMISSIONS** The Subcontractor shall make a careful analysis and comparison of the drawings, specifications, other Subcontract Documents and information furnished by the Owner relative to the Subcontract Work. Such analysis and comparison shall be ~~solely~~ for the purpose of facilitating the Subcontract Work and ~~not~~ for the discovery of errors, inconsistencies or omissions in the Subcontract Documents, nor for ascertaining if the Subcontract Documents are in accordance with applicable laws, statutes, ordinances, building codes, rules or regulations. Should the Subcontractor discover any errors, inconsistencies or omissions in the Subcontract Documents, the Subcontractor shall report such discoveries to the Contractor in writing within three (3) days. Upon receipt of notice, the Contractor shall instruct the Subcontractor as to the measures to be taken and the Subcontractor shall comply with the Contractor's instructions. If the Subcontractor performs work knowing it to be contrary to any applicable laws, statutes, ordinances, building codes, rules or regulations without notice to the Contractor and advance approval by appropriate authorities, including the Contractor, the Subcontractor shall assume appropriate responsibility for such work and shall bear all associated costs, charges, fees and expenses necessarily incurred to remedy the violation. Nothing in this Paragraph 3.3 shall relieve the Subcontractor of responsibility for its own errors, inconsistencies and omissions.

**3.4 SITE VISITATION** Prior to performing any portion of the Subcontract Work, the Subcontractor shall conduct a visual inspection of the Project site to become generally familiar with local conditions and to correlate site observations with the Subcontract Documents. If the Subcontractor discovers any discrepancies between its site observations and the Subcontract Documents, such discrepancies shall be promptly reported to the Contractor.

**3.5 INCREASED COSTS AND/OR TIME** The Subcontractor may assert a Claim as provided in Article 7 if Contractor's clarifications or instructions in responses to requests for information are believed to require additional time or cost. If the Subcontractor fails to perform the reviews and comparisons required in Paragraphs 3.3 and 3.4, above, to the extent the Contractor is held liable to the Owner because of the Subcontractor's failure, the Subcontractor shall pay the costs and damages to the Contractor that would have been avoided if the Subcontractor had performed those obligations.

**3.6 COMMUNICATIONS** Unless otherwise provided in the Subcontract Documents and except for emergencies, Subcontractor shall direct all communications related to the Project to the Contractor.

**3.7 SUBMITTALS**

**3.7.1** The Subcontractor promptly shall submit for approval to the Contractor all shop drawings, samples, product data, manufacturers' literature and similar submittals required by the Subcontract Documents. The Subcontractor shall be responsible to the Contractor for the accuracy and conformity of its submittals to the Subcontract Documents. The Subcontractor shall prepare and deliver its submittals to the Contractor in a manner consistent with the Progress Schedule and in such time and sequence so as not to delay the Contractor or others in the performance of the Work. The approval of any Subcontractor submittal shall not be deemed to authorize deviations, substitutions or changes in the requirements of the Subcontract Documents unless express written approval is obtained from the Contractor and Owner authorizing such deviation, substitution or change. In the event that the Subcontract Documents do not contain submittal requirements pertaining to the Subcontract Work, the Subcontractor agrees upon request to submit in a timely fashion to the Contractor for approval any shop drawings, samples, product data, manufacturers' literature or similar submittals as may reasonably be required by the Contractor, Owner or Architect.

**3.7.2** The Contractor, Owner, and Architect are entitled to rely on the adequacy, accuracy and completeness of any professional certifications required by the Subcontract Documents concerning the performance criteria of systems, equipment or materials, including all relevant calculations and any governing performance requirements.

**3.7.3 AS-BUILT DOCUMENTS On a daily basis the subcontractor shall properly record on the project As-Builts or Record Documents the actual installation where the installation varies substantially from the work as originally shown. Exact locations and depths if applicable must be provided for concealed elements that would be difficult to locate at a later date. In addition to maintaining accurate as-built documents, the subcontractor will be required to record this information on an "Underground Sitework As-Built" document that will be maintained on the wall of the jobsite trailer for the use and review of all subcontractors. Prior to beginning work in an area the subcontractor shall be responsible to verify with the Underground Sitework As-Built document and the project superintendent that there are no potential conflicts that exist. Any subcontractor who fails to update the Underground Sitework As-Built drawing will be held responsible for and damage done by subsequent subcontractors to your underground work.**

**3.8 DESIGN DELEGATION**

**3.8.1** If the Subcontract Documents (1) specifically require the Subcontractor to provide design services and (2) specify all design and performance criteria, the Subcontractor shall provide those design services necessary to satisfactorily complete the Subcontract Work. Design services provided by the Subcontractor shall be procured from licensed design professionals retained by the Subcontractor as permitted by the law of the place where the Project is located (the Designer). The Designer's signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings and other submittals prepared by the Designer. Shop Drawings and other submittals related to the Subcontract Work designed, or certified by the Designer, if prepared by others, shall bear **both** the Subcontractor's and the Designer's written approvals when submitted to the Contractor. The Contractor shall be entitled to rely upon the adequacy, accuracy and completeness of the services, certifications or approvals performed by the Designer.

**3.8.2** If the Designer is an independent professional, the design services shall be procured pursuant to a separate agreement between the Subcontractor and the Designer. The Subcontractor-Designer agreement shall not provide for any limitation of liability, except to the extent that consequential damages are waived pursuant to Paragraph 5.4, or exclusion from participation in the multiparty proceedings requirement of Paragraph 11.4. ~~The Designer(s) is (are)~~ _____ _____ _____ _____

The subcontractor shall notify the Contractor in writing if it intends to change the Designer. The Subcontractor shall be responsible for conformance of its design with the information given and the design concept expressed in the Subcontract Documents. The Subcontractor shall not be responsible for the adequacy of the performance or design criteria required by the Subcontract Documents.

**3.8.3** The Subcontractor shall not be required to provide design services in violation of any applicable law.

**3.9 TEMPORARY SERVICES** Subcontractor's responsibilities for temporary services are set forth in Exhibit **D.**

**3.10 COORDINATION** The Subcontractor shall:

**.1** cooperate with the Contractor and all others whose work may interface with the Subcontract Work;

**.2** specifically note and immediately advise the Contractor of any such interface with the Subcontract Work; and

**.3** participate in the preparation of coordination drawings and work schedules in areas of congestion.

**3.11 SUBCONTRACTOR' REPRESENTATIVE** The Subcontractor shall designate a person, subject to Contractor's approval, who shall be the Subcontractor's authorized representative. This representative shall be the only person to whom the Contractor shall issue instructions, orders or directions, except in an emergency. The Subcontractor's representative is (**VENDOR CONTACT NAME)**,♦who is agreed to by the Contractor. **The subcontractor's representative or a designated member of his management staff who is familiar with the project is required to attend all project meetings if subcontractor is currently working on the project or is scheduled to begin within two weeks of the meeting date. The meetings will be scheduled in advance and are anticipated to be every week or every other week depending on the needs of the project. In the event that the subcontractors representative or designated member fails to attend the scheduled meetings the subcontractor will be penalized with a fine of $100 per incident.**

**3.12 TESTS AND INSPECTIONS** The Subcontractor shall schedule all required tests, approvals and inspections of the Subcontract Work at appropriate times so as not to delay the progress of the work. The Subcontractor shall give proper written notice to all required parties of such tests, approvals and inspections. The Subcontractor shall bear all expenses associated with tests, inspections and approvals required of the Subcontractor by the Subcontract Documents which, unless otherwise agreed to, shall be conducted by an independent testing laboratory or entity approved by the Contractor and Owner. Required certificates of testing, approval or inspection shall, unless otherwise required by the Subcontract Documents, be secured by the Subcontractor and promptly delivered to the Contractor.

**3.13 CLEANUP**

**3.13.1** The Subcontractor shall at all times during its performance of the Subcontract Work keep the work site clean and free from debris resulting from the Subcontract Work. Prior to discontinuing the Subcontract Work in an area, the Subcontractor shall clean the area and **place** ~~remove~~ all ~~its~~ rubbish **in dumpster provided by Contractor** and ~~its~~ **remove all** construction equipment, tools, machinery, ~~waste~~ and surplus materials. Subcontractor shall make provisions to minimize and continue dust and debris resulting from its construction activities. The Subcontractor shall not be held responsible for unclean conditions caused by others. The disposal of debris generated from site clearing or demolition operations shall be performed by the Subcontractor.

**3.13.2** If the Subcontractor fails to commence compliance with cleanup duties within forty-eight (48) hours after written notification from the Contractor of non-compliance, the Contractor may implement appropriate cleanup measures without further notice and the cost thereof shall be deducted from any amounts due or to become due the Subcontractor.

**3.14 SAFETY**

**3.14.1** The Subcontractor is required to perform the Subcontract Work in a safe and reasonable manner. The Subcontractor shall seek to avoid injury, loss or damage to persons or property by taking reasonable steps to protect:

**.1** employees and other persons at the site;

**.2** materials and equipment stored at the site or at off-site locations for use in performance of the Work; and

**.3** all property and structures located at the site and adjacent to work areas, whether or not said property or structures are part of the Project or involved in the Work.

**3.14.2** The Subcontractor shall give all required notices and comply with all applicable rules, regulations, orders and other lawful requirements established to prevent injury, loss or damage to persons or property.

**3.14.3** The Subcontractor shall implement appropriate safety measures pertaining to the Subcontract Work and the Project, including establishing safety rules, posting appropriate warnings and notices, erecting safety barriers, and establishing proper notice procedures to protect persons and property at the site and adjacent to the site from injury, loss or damage.

**3.14.4** The Subcontractor shall exercise extreme care in carrying out any of the Subcontract Work which involves explosive or other dangerous methods of construction or hazardous procedures, materials or equipment. The Subcontractor shall use properly qualified individuals or entities to carry out the Subcontract Work in a safe and reasonable manner so as to reduce the risk of bodily injury or properly damage.

**3.14.5** Damage or loss not insured under property insurance which may arise from the performance of the Subcontract Work, to the extent of the negligence attributed to such acts or omissions of the Subcontractor, or anyone for whose acts the Subcontractor may be liable, shall be promptly remedied by the Subcontractor, Damage or loss attributable to the acts or omissions of the Contractor and not to the Subcontractor shall be promptly remedied by the Contractor.

**3.14.6** The Subcontractor is required to designate an individual at the site in the employ of the Subcontractor who shall act as the Subcontractor's designated safety representative with a duty to prevent accidents. Unless otherwise identified by the Subcontractor in writing to the Contractor, the designated safety representative shall be the Subcontractor's project superintendent. **The Subcontractors designated safety representative must have training as a**

**Competent Person as required by OSHA Standards present at all times during the completion of that work that requires a Competent Person including but not limited to 1) Trenching and Excavation, 2) Lock out- Tag out, 3) Confined space, 4) Forklift Training, 5) Fall Protection and 6) Scaffolds.**

**3.14.7** The Subcontractor has an affirmative duty not to overload the structures or conditions at the site and shall take reasonable steps not to load any part of the structures or site so as to give rise to an unsafe condition or create an unreasonable risk of bodily injury or property damage. The Subcontractor shall have the right to request, in writing, from the Contractor loading information concerning the structures at the site.

**3.14.8** The Subcontractor shall give prompt written notice to the Contractor of any accident involving bodily injury requiring a physician's care, any property damage exceeding Five Hundred Dollars ($500.00) in value, or any failure that could have resulted in serious bodily injury, whether or not such an injury was sustained.

**3.14.9** Prevention of accidents at the site is the responsibility of the Contractor, Subcontractor, and all other subcontractors, persons and entities at the site. Establishment of a safety program by the Contractor shall not relieve the Subcontractor or other parties of their safety responsibilities. The Subcontractor shall establish its own safety program implementing safety measures, policies and standards conforming to those required or recommended by governmental and quasi-governmental authorities having jurisdiction and by the Contractor and Owner, including, but not limited to, requirements imposed by the Subcontract Documents. The Subcontractor shall comply with the reasonable recommendations of insurance companies having an interest in the Project, and shall stop any part of the Subcontract Work, which the Contractor deems unsafe until corrective measures satisfactory to the Contractor shall have been taken. The Contractor's failure to stop the Subcontractor's unsafe practices shall not relieve the Subcontractor of the responsibility therefor. The Subcontractor shall notify the Contractor immediately following an accident and promptly confirm the notice in writing. A detailed written report shall be furnished**.** ~~if requested by the Contractor. Each party to this Agreement~~ **Subcontractor** shall indemnify ~~the other party from and~~ **Contractor** against fines or penalties imposed as a result of safety violations, but only to the extent that such fines or penalties are caused by its failure to comply with applicable safety requirements.

**3.15 PROTECTION OF THE WORK** The Subcontractor shall take necessary precautions to properly protect the Subcontract Work and the work of others from damage caused by the Subcontractor's operations. Should the Subcontractor cause damage to the Work or property of the Owner, the Contractor or others, the Subcontractor shall promptly remedy such damage to the satisfaction of the Contractor, or the Contractor may remedy the damage and deduct its cost from any amounts due or to become due the Subcontractor, unless such costs are recovered under applicable property insurance.

**The Subcontractor shall take necessary precautions to properly protect stored materials from damage caused by extreme weather conditions. Should the Subcontractor fail to properly secure stored materials or containers used to store materials the Subcontractor shall promptly remedy such damage of stored materials to the satisfaction of the Contractor, or the Contractor may remedy the damage and deduct its cost from any amounts due or to become due the Subcontractor.**

**3.16 PERMITS, FEES, LICENSES AND TAXES** The Subcontractor shall give timely notices to authorities pertaining to the Subcontract Work, and shall be responsible for all permits, fees, licenses, assessments, inspections, testing and taxes necessary to complete the Subcontract Work in accordance with the Subcontract Documents. To the extent reimbursement is obtained by the Contractor from the Owner under the Owner-Contractor agreement, the Subcontractor shall be compensated for additional costs resulting from taxes enacted after the date of this Agreement.

**3.17 ASSIGNMENT OF SUBCONTRACT WORK** The Subcontractor shall not assign the whole nor any part of the Subcontract Work without prior written approval of the Contractor.

**3.18 HAZARDOUS MATERIALS** To the extent that the Contractor has rights or obligations under the Owner Contractor agreement or by law regarding hazardous materials as defined by the Subcontract Document within the scope of the Subcontract Work, the Subcontractor shall have the same rights or obligations.

**3.19 MATERIAL SAFETY DATA (MSD) SHEETS** The Subcontractor shall submit to the Contractor all Material Safety Data Sheets required by law for materials or substances necessary for the performance of the Subcontract Work. MSD sheets obtained by the Contractor from other subcontractors or sources shall be made available to the Subcontractor by the Contractor.

**3.20 LAYOUT RESPONSIBILITY AND LEVELS** The Contractor shall establish principal axis lines of the building and site, and benchmarks. The Subcontractor shall lay out and be strictly responsible for the accuracy of the Subcontract Work and for any loss or damage to the Contractor or others by reason of the Subcontractor's failure to lay out or perform Subcontract Work correctly. The Subcontractor shall exercise prudence so that the actual final conditions and details shall result in alignment of finish surfaces.

**3.21 WARRANTIES** The Subcontractor warrants that all materials and equipment furnished under this Agreement shall be new, unless otherwise specified, of good quality, in conformance with the Subcontract Documents, and free from defective workmanship and materials. Warranties shall commence on the date of Substantial Completion of the Work or a designated portion **unless stipulated otherwise in the contract documents.**

**3.22 UNCOVERING/CORRECTION OF**

**SUBCONTRACT WORK**

**3.22.1 UNCOVERING OF SUBCONTRACT WORK**

**3.22.1.1** If required in writing by the Contractor, the Subcontractor must uncover any portion of the Subcontract Work which has been covered by the Subcontractor in violation of the Subcontract Documents or contrary to a directive issued to the Subcontractor by the Contractor. Upon receipt of a written directive from the Contractor, the Subcontractor shall uncover such work for the Contractor's or Owner's inspection and restore the uncovered Subcontract Work to its original condition at the Subcontractors time and expense.

**3.22.1.2** The Contractor may direct the Subcontractor to uncover portions of the Subcontract Work for inspection by the Owner or Contractor at any time. The Subcontractor is required to uncover such work whether or not the Contractor or Owner had requested to inspect the Subcontract Work prior to it being covered. Except as provided in Clause 3.22.1.1, this Agreement shall be adjusted by change order for the cost and time of uncovering and restoring any work which is uncovered for inspection and proves to be installed in accordance with the Subcontract Documents, provided the Contractor had not previously instructed the Subcontractor to leave the work uncovered. If the Subcontractor uncovers work pursuant to a directive issued by the Contractor, and such work upon inspection does not comply with the Subcontract Documents, the Subcontractor shall be responsible for all costs and time of uncovering, correcting and restoring the work so as to make it conform to the Subcontract Documents. If the Contractor or some other entity for which the Subcontractor is not responsible caused the nonconforming condition, the Contractor shall be required to adjust this Agreement by change order for all such costs and time.

**3.22.2 CORRECTION OF WORK**

**3.22.2.1** If the Architect or Contractor rejects the Subcontract Work or the Subcontract Work is not in conformance with the Subcontract Documents, the Subcontractor shall promptly correct the Subcontract Work whether it had been fabricated, installed or completed. The Subcontractor shall be responsible for the costs of correcting such Subcontract Work, any additional testing, inspections, and compensation for services and expenses of the Architect and Contractor made necessary by the defective Subcontract Work.

**3.22.2.2** In addition to the Subcontractor's obligations under Paragraph 3.21, the Subcontractor agrees to promptly correct, after receipt of a written notice from the Contractor, all Subcontract Work performed under this Agreement which proves to be defective in workmanship or materials within a period of one year from the date of Substantial Completion of the Subcontract Work or for a longer period of time as may be required by specific warranties in the Subcontract Documents. Substantial Completion of the Subcontract Work, or of a designated portion, occurs on the date when construction is sufficiently complete in accordance with the Subcontract Documents so that the Owner can occupy or utilize the Project, or a designated portion, for the use for which it is intended. If, during the one-year period, the Contractor fails to provide the Subcontractor with prompt written notice of the discovery of defective or nonconforming Subcontract Work, the Contractor shall neither have the right to require the Subcontractor to correct such Subcontract Work nor the right to make claim for breach of warranty. If the Subcontractor fails to correct defective or nonconforming Subcontract Work within a reasonable time after receipt of notice from the Contractor, the Contractor may correct such Subcontract Work pursuant to Subparagraph 10.1.1.

**3.22.3** The Subcontractor's correction of Subcontract Work pursuant to this Paragraph 3.22 shall not extend the one-year period for the correction of Subcontract Work, but if Subcontract Work is first performed after Substantial Completion, the one year period for corrections shall be extended by the time period after Substantial Completion and the performance of that portion of Subcontract Work. The Subcontractor's obligation to correct Subcontract Work within one year as described in this Paragraph 3.22 does not limit the enforcement of Subcontractor's other obligations with regard to the Agreement and the Subcontract Documents.

**3.22.4** If the Subcontractor's correction or removal of Subcontract Work destroys or damages completed or partially completed work of the Owner, the Contractor or any separate contractors, the Subcontractor shall be responsible for the cost of correcting such destroyed or damaged construction.

**3.22.5** If portions of Subcontract Work which do not conform with the requirements of the Subcontract Documents are neither corrected by the Subcontractor nor accepted by the Contractor, the Subcontractor shall remove such Subcontract Work from the Project site if so directed by the Contractor.

**3.23 MATERIALS OR EQUIPMENT FURNISHED BY OTHERS** In the event the scope of the Subcontract Work Includes installation of materials or equipment furnished by others, it shall be the responsibility of the Subcontractor to exercise proper care in receiving, handling, storing and installing such items, unless otherwise provided in the Subcontract Documents. The Subcontractor shall examine the items provided and report to the Contractor in writing any items it may discover that do not conform to requirements of the Subcontract Documents. The Subcontractor shall not proceed to install non-conforming items without further instructions from the Contractor. Loss or damage due to acts or omissions of the Subcontractor shall be deducted from any amounts due or to become due the Subcontractor.

**3.24 SUBSTITUTIONS** No substitutions shall be made in the Subcontract Work unless permitted in the Subcontract Documents, and only upon the Subcontractor first receiving all approvals required under the Subcontract Documents for substitutions.

**3.25 USE OF CONTRACTOR'S EQUIPMENT** The Subcontractor, its agents, employees, subcontractors or suppliers shall use the Contractor's equipment only with the express written permission of the Contractor's designated representative and in accordance with the Contractor's terms and conditions for such use. If the Subcontractor or any of its

agents, employees, subcontractors or suppliers utilize any of the Contractor's equipment, including machinery, tools, scaffolding, hoists, lifts or similar items owned, leased or under the control of the Contractor, the Subcontractor shall defend, indemnify and be liable to the Contractor as provided in Article 9 for any loss or damage (including bodily injury or death) which may arise from such use, except to the extent that such loss or damage is caused by the negligence of the Contractor's employees operating the Contractor's equipment.

**3.26 WORK FOR OTHERS** Until final completion of the Subcontract Work, the Subcontractor agrees not to perform any work directly for the Owner or any tenants, or deal directly with the Owner's representatives in connection with the Subcontract Work, unless otherwise approved in writing by the Contractor.

**3.27 SUBCONTRACT BONDS**

**3.27.1** The Subcontractor ☒ shall ☐ shall not furnish to the Contractor, as the named Obligee, appropriate surety bonds to secure the faithful performance of the Subcontract Work and to satisfy all Subcontractor payment obligations related to Subcontract Work.

**3.27.2** If a performance or payment bond, or both, are required of the Subcontractor under this Agreement, the bonds shall be ~~in~~ **on** a form **provided by James B. Pirtle Construction Co., Inc. d/b/a Pirtle Construction Company** and by a surety mutually agreeable to the Contractor and Subcontractor, and in the full amount of the Subcontract Amount, unless otherwise specified. **In the event that materials for this subcontract agreement are purchased by the owner as part of the "Tax Recovery Program" for the purposes of saving the sales tax the Subcontractors Bonds shall be maintained as if the materials were purchased directly by the subcontractor in the full amount of the original subcontract agreement.**

**3.27.3** ~~The Subcontractor shall be reimbursed, without retainage, for the cost of any required performance or payment bonds simultaneously with the first progress payment.~~ The reimbursement amount for the subcontractor bonds shall not exceed **1.2** percent (**1.2**%) of the Subcontract Amount, which sum is included in the Subcontract Amount.

**3.27.4** In the event the Subcontractor shall fail to promptly provide any required bonds, the Contractor may terminate this Agreement and enter into a subcontract for the balance of the Subcontract Work with another subcontractor. All Contractor costs and expenses incurred by the Contractor as a result of said termination shall be paid by the Subcontractor.

**3.28 SYSTEMS AND EQUIPMENT STARTUP** With the assistance of the Owner's maintenance personnel and the Contractor, the Subcontractor shall direct the check-out and operation of systems and equipment for readiness, and assist in their initial startup and the testing of the Subcontract Work. **The start up and training for all major equipment and systems must be video recorded for the Owner's future use.**

**3.29 COMPLIANCE WITH LAWS** The Subcontractor agrees to be bound by, and at its own costs comply with, all federal, state and local laws, ordinances and regulations (the Laws) applicable to the Subcontract Work, including but not limited to, equal employment opportunity, minority business enterprise, women's business enterprise, disadvantaged business enterprise, safety and all other Laws with which the Contractor must comply. The Subcontractor shall be liable to the Contractor and the Owner for all loss, cost and expense attributable to any acts of commission or omission by the Subcontractor, its employees and agents resulting from the failure to comply with Laws, including, but not limited to, any fines, penalties or corrective measures, except as provided in Subparagraph 3.14.9.

**3.30 CONFIDENTIALITY** To the extent the Owner Contractor agreement provides for the confidentiality of any of the Owner's proprietary or otherwise confidential information disclosed in connection with the performance of this Agreement, the Subcontractor is equally bound by the Owner's confidentiality requirements.

**3.31 ROYALTIES, PATENTS AND COPYRIGHTS** The Subcontractor shall pay all royalties and license fees which may be due on the inclusion of any patented or copyrighted materials, methods or systems selected by the Subcontractor and incorporated in the Subcontract Work. The Subcontractor shall defend, indemnify and hold the Contractor and Owner harmless from all suits or claims for infringement of any patent rights or copyrights arising out of such selection. The Subcontractor shall be liable for all loss, including all costs, expenses, and attorneys fees, but shall not be responsible for such defense or loss when a particular design, process or product of a particular manufacturer or manufacturers is required by the Subcontract Documents. However, if the Subcontractor has reason to believe that a particular design, process or product required by the Subcontract Documents is an infringement of a patent, the Subcontractor shall promptly furnish such information to the Contractor or be responsible to the Contractor and Owner for any loss sustained as a result.

~~3.32 LABOR RELATIONS (Insert here any conditions, obligations or requirements relative to labor relations and their effect on the project. Legal counsel is recommended.)♦.~~

**ARTICLE 4**

**CONTRACTOR'S RESPONSIBILITIES**

**4.1 CONTRACTOR'S REPRESENTATIVE** The Contractor shall designate a person who shall be the Contractor's authorized representative. The Contractor's representative shall be the only person the Subcontractor shall look to for instructions, orders and/or directions, except in an emergency. The Contractor's representative ~~is~~ are **PIRTLE PROJECT EXECUTIVE AND PROJECT MANAGER.**

**4.2 PAYMENT BOND REVIEW** The Contractor ☒has ☐ has not provided the Owner a payment bond. The Contractor's payment bond for the Project, if any, shall be made available by the Contractor for review and copying by the Subcontractor.

**4.3 OWNER'S ABILITY TO PAY**

**4.3.1** The Subcontractor shall have the right upon request to receive from the Contractor such information as the Contractor has obtained relative to the Owner's financial ability to pay for the Work, including any subsequent material variation in such information. The Contractor, however, does not warrant the accuracy or completeness of the information provided by the Owner.

**4.3.2** If the Subcontractor does not receive the information referenced in Subparagraph 4.3.1 with regard to the Owners ability to pay for the Work as required by the Contract Documents, the Subcontractor may request the information from the Owner and/or the Owners lender.

**4.4 CONTRACTOR APPLICATION FOR PAYMENT** Upon request, the Contractor shall give the Subcontractor a copy of the most current Contractor application for payment reflecting the amounts approved and/or paid by the Owner for the Subcontract Work performed to date.

**4.5 INFORMATION OR SERVICES** The Subcontractor is entitled to request through the Contractor any information or services relevant to the performance of the Subcontract Work, which is under the Owner's control. To the extent the Contractor receives such information and services, the Contractor shall provide them to the Subcontractor. The Contractor, however, does not warrant the accuracy or completeness of the information provided by the Owner.

**4.6 STORAGE AREAS** The Contractor shall allocate adequate storage areas, if available, for the Subcontractor's materials and equipment during the course of the Subcontract Work. ~~Unless otherwise agreed upon, the Contractor shall reimburse the Subcontractor for the additional costs of having to relocate such storage areas at the direction of the Contractor.~~

**4.7 TIMELY COMMUNICATIONS** The Contractor shall transmit to the Subcontractor, with reasonable promptness, all submittals, transmittals, and written approvals relative to the Subcontract Work. Unless otherwise specified in the Subcontract Documents, communications by and with the Subcontractor's subcontractors, materialmen and suppliers shall be through the Subcontractor.

**4.8 USE OF SUBCONTRACTOR'S EQUIPMENT** The Contractor, its agents, employees or suppliers shall use the Subcontractor's equipment only with the express written permission of the Subcontractor's designated representative and in accordance with the Subcontractor's terms and conditions for such use. If the Contractor or any of its agents, employees or suppliers utilize any of the Subcontractor's equipment, including machinery, tools, scaffolding, hoists, lifts or similar items owned, leased or under the control of the Subcontractor, the Contractor shall defend, indemnify and be liable to the Subcontractor as provided in Article 9 for any loss or damage (including bodily injury or death) which may arise from such use, except to the extent that such loss or damage is caused by the negligence of the Subcontractor's employees operating the Subcontractor's equipment.

## ARTICLE 5

## PROGRESS SCHEDULE

**5.1 TIME IS OF THE ESSENCE** Time is of the essence for both parties. They mutually agree to see to the performance of their respective obligations so that the entire Project may be completed in accordance with the Subcontract Documents and particularly the Progress Schedule as set forth in Exhibit **C.**

**5.2 SCHEDULE OBLIGATIONS** The Subcontractor shall provide the Contractor with any scheduling information proposed by the Subcontractor for the Subcontract Work. In consultation with the Subcontractor, the Contractor shall prepare the schedule for performance of the Work (the Progress Schedule) and shall revise and update such schedule, as necessary, as the Work progresses. Both the Contractor and the Subcontractor shall be bound by the Progress Schedule. The Progress Schedule and all subsequent changes and additional details shall be submitted to the Subcontractor promptly and reasonably in advance of the required performance. The Contractor shall have the right to determine and, if necessary, change the time, order and priority in which the various portions of the Work shall be performed and all other matters relative to the Subcontract Work.

**5.3 DELAYS AND EXTENSIONS OF TIME**

**5.3.1 OWNER CAUSED DELAY** Subject to Subparagraph 5.3.2, if the commencement and/or progress of the Subcontract Work is delayed without the fault or responsibility of the Subcontractor, the time for the Subcontract Work shall be extended by Subcontract Change Order to the extent obtained by the Contractor under the Subcontract Documents, and the Progress Schedule shall be revised accordingly.

**5.3.2 CLAIMS RELATING TO OWNER** The Subcontractor agrees to initiate all claims for which the Owner is or may be liable in the manner and within the time limits provided in the Subcontract Documents for like claims by the Contractor upon the Owner and in sufficient time for the Contractor to initiate such claims against the Owner in accordance with the Subcontract Documents. At the Subcontractor's request and expense to the extent agreed upon in writing, the Contractor agrees to permit the Subcontractor to prosecute a claim in the name of the Contractor for the use and benefit of the Subcontractor in the manner provided in the Subcontract Documents for like claims by the Contractor upon the Owner.

**5.3.3 CONTRACTOR CAUSED DELAY** Nothing in this Article shall preclude the Subcontractor's recovery of delay damages caused by the Contractor.

**5.3.4 CLAIMS RELATING TO CONTRACTOR** The Subcontractor shall give the Contractor written notice of all claims not included in Subparagraph 5.3.2 within seven (7) days of the Subcontractor's knowledge of the facts giving rise to the event for which claim is made; otherwise, such claims

shall be deemed waived. All unresolved claims, disputes and other matters in question between the Contractor and the Subcontractor not relating to claims included in Subparagraph 5.3.2 shall be resolved in the manner provided in Article 1 1.

**5.3.5 DAMAGES** If the Subcontract Documents provide for liquidated or other damages for delay beyond the completion date set forth in the Subcontract Documents, and such damages are assessed, the Contractor may assess a share of the damages against the Subcontractor in proportion to the Subcontractor's share of the responsibility for the delay. However, the amount of such assessment shall not exceed the amount assessed against the Contractor. This Paragraph 5.3 shall not limit the Subcontractor's liability to the Contractor for the Contractor's actual delay damages caused by the Subcontractor's delay.

**5.4 MUTUAL WAIVER OF CONSEQUENTIAL DAMAGES**

**5.4.1** To the extent the Owner-Contractor agreement provides for a mutual waiver of consequential damages by the Owner and the Contractor, the Contractor and Subcontractor waive claims against each other for consequential damages arising out of or relating to this Agreement, including to the extent provided in the Owner-Contractor agreement, damages for principal office expenses and the compensation of personnel stationed there; loss of financing, business and reputation; and for loss of profit. Similarly, the Subcontractor shall obtain from its sub-subcontractors mutual waivers of consequential damages that correspond to the Subcontractor's waiver of consequential damages herein. To the extent applicable, this mutual waiver applies to consequential damages due to termination by the Contractor or the Owner in accordance with this Agreement or the Owner-Contractor agreement. To the extent the Owner-Contractor agreement does not preclude the award of liquidated damages, nothing contained in this Paragraph 5.4 shall preclude the imposition of such damages, if applicable in accordance with the requirements of the Subcontract Documents.

**5.4.2** To the extent the Owner-Contractor agreement provides for a mutual waiver of consequential damages by the Owner and the Contractor, damages for which the Contractor is liable to the Owner including those related to Subparagraph 9.1.1 are not consequential damages for the purpose of this waiver. Similarly, to the extent the Subcontractor-sub-subcontractor agreement provides for a mutual waiver of consequential damages by the Owner and the Contractor, damages for which the Subcontractor is liable to lower-tiered parties due to the fault of the Owner or Contractor are not consequential damages for the purpose of this waiver.

**ARTICLE 6**

**SUBCONTRACT AMOUNT**

As full compensation for performance of this Agreement, Contractor agrees to pay Subcontractor in current funds for the satisfactory performance of the Subcontract Work subject to all applicable provisions of the Subcontract:

(a) the fixed-price of Dollars _____ **($)** _____subject to additions and deductions as provided for in the Subcontract Documents; and/or

~~(b) unit prices in accordance with the attached schedule of Unit Prices and estimated quantities, which is incorporated by reference and identified as Exhibit and/or~~

~~(c) time and material rates and prices in accordance with the attached Schedule of Labor and Material Costs, which is incorporated by reference and identified as Exhibit _____~~.

The fixed-price, unit prices and/or time and material rates and prices are referred to as the Subcontract Amount.

**ARTICLE 7**

**CHANGES IN THE SUBCONTRACT WORK**

**7.1 SUBCONTRACT CHANGE ORDERS** When the Contractor orders in writing, the Subcontractor, without nullifying this Agreement, shall make any and all changes in the Subcontract Work which are within the general scope of this Agreement. Any adjustment in the Subcontract Amount or Subcontract Time shall be authorized by a Subcontract Change Order. No adjustments shall be made for any changes performed by the Subcontractor that have not been ordered by the Contractor. A Subcontract Change Order is a written instrument prepared by the Contractor and signed by the Subcontractor stating their agreement upon the change in the Subcontract Work.

**7.2 CONSTRUCTION CHANGE DIRECTIVES** ~~To the extent that the Subcontract Documents provide for Construction Change Directives in the absence of agreement on the terms of a Subcontract Change Order, t~~ **T**he Subcontractor shall promptly comply with the Construction Change Directive and be entitled to apply for interim payment if the Subcontract Documents so provide. **In the absence of a Subcontract change order, the Contractor may issue a Construction Change Directive to the Subcontractor. If determined that the subcontractor is entitled to additional cost as a result of the Construction Change Directive, it shall be in accordance with paragraphs 7.4 and 7.5.**

**7.3 UNKNOWN CONDITIONS** If in the performance of the Subcontract Work the Subcontractor finds latent, concealed or subsurface physical conditions which differ materially from those indicated in the Subcontract Documents or unknown physical conditions of an unusual nature, which differ materially from those ordinarily found to exist, and not generally recognized as inherent in the kind of work provided for in this Agreement, the Subcontract Amount and/or the Progress Schedule shall be equitably adjusted by a Subcontract Change Order within a reasonable time after the conditions are first observed. The adjustment which the Subcontractor may receive shall be limited to the adjustment the Contractor receives from the Owner on behalf of the

Subcontractor, or as otherwise provided under Subparagraph 5.3.2.

**7.4 ADJUSTMENTS IN SUBCONTRACT AMOUNT** If a Subcontract Change Order requires an adjustment in the Subcontract Amount, the adjustment shall be established by one of the following methods:

**.1** Itemized cost of labor, material and other cost in unit format.

**.2** mutual acceptance of an itemized lump sum;

**.3** unit prices as indicated in the Subcontract Documents or as subsequently agreed to by the parties; or

**.4** costs determined in a manner acceptable to the parties and a mutually acceptable fixed or percentage fee; or

**.5** another method provided in the Subcontract Documents.

**7.5 SUBSTANTIATION OF ADJUSTMENT** If the Subcontractor does not respond promptly or disputes the method of adjustment, the method and the adjustment shall be determined by the Contractor on the basis of reasonable expenditures and savings of those performing the Work attributable to the change, including, in the case of an increase in the Subcontract Amount, an allowance for overhead and profit of the percentage provided in Paragraph 7.6. The Subcontractor may contest the reasonableness of any adjustment determined by the Contractor. The Subcontractor shall maintain for the Contractor's review and approval an appropriately itemized and substantiated accounting of the following items attributable to the Subcontract Change Order:

**.1** labor costs, including Social Security, health, welfare, retirement and other fringe benefits as normally required, and state workers' compensation insurance;

**.2** costs of materials, supplies and equipment, whether incorporated in the Subcontract Work or consumed, including transportation costs;

**.3** costs of renting machinery and equipment other than hand tools;

**.4** costs of bond and insurance premiums, permit fees and taxes attributable to the change; and

**.5** costs of additional supervision and field office personnel services necessitated by the change.

**7.6** Adjustments shall be based on net change in Subcontractor's reasonable cost of performing the changed Subcontract Work plus, in case of a net increase in cost, an agreed upon sum for overhead and profit not to exceed **ten** percent (**10**%).

**7.7 NO OBLIGATION TO PERFORM** The Subcontractor shall not perform changes in the Subcontract Work until a Subcontract Change Order has been executed or written instructions have been issued in accordance with Paragraphs 7.2 and 7.9.

**7.8 EMERGENCIES** In an emergency affecting the safety of persons and/or property, the Subcontractor shall act, at its discretion, to prevent threatened damage, injury or loss. Any change in the Subcontract Amount and/or the Progress Schedule on account of emergency work shall be determined as provided in this Article.

**7.9 INCIDENTAL CHANGES** The Contractor may direct the Subcontractor to perform incidental changes in the Subcontract Work which do not involve adjustments in the Subcontract Amount or Subcontract Time. Incidental changes shall be consistent with the scope and intent of the Subcontract Documents. The Contractor shall initiate an incidental change in the Subcontract Work by issuing a written order to the Subcontractor. Such written notice shall be carried out promptly and are binding on the parties.

## ARTICLE 8

## PAYMENT

**8.1 SCHEDULE OF VALUES** As a condition to payment, the Subcontractor shall provide a schedule of values satisfactory to the Contractor not more than fifteen (15) days from the date of execution of this Agreement.

**8.2 PROGRESS PAYMENTS**

**8.2.1 APPLICATIONS** The Subcontractor's applications for payment shall be itemized and supported by substantiating data as required by the Subcontract Documents. If the Subcontractor is obligated to provide design services pursuant to Paragraph 3.8, Subcontractor's applications for payment shall show the Designer's fee and expenses as a separate cost item. The Subcontractor's application shall be notarized ~~if required~~ and if allowed under the Subcontract Documents may include properly authorized Subcontract Construction Change Directives. The Subcontractor's progress payment application for the Subcontract Work performed in the preceding payment period shall be submitted for approval of the Contractor in accordance with the schedule of values if required and Subparagraphs 8.2.2, 8.2.3, and 8.2.4. The Contractor shall incorporate the approved amount of the Subcontractor's progress payment application into the Contractor's payment application to the Owner for the same period and submit it to the Owner in a timely fashion. The Contractor shall immediately notify the Subcontractor of any changes in the amount requested on behalf on the Subcontractor.

**8.2.1.1 REQUIREMENTS The Subcontractor shall submit for approval documents such as Operation and Maintenance Manuals, Certifications, As-Builts, warranties, extra stock (Subcontractors are responsible to provide written documentation to Pirtle's Project Manager which shall include the type and quantity of material provided and the name, phone number and signature of**

**the owners representative who received the material), etc. as applicable and required by the contract documents prior to or upon completion of eighty percent (80%) of your subcontract agreement. The Subcontractor shall not be entitled to monies in excess of eighty percent (80%) until the provisions of this article are met.**

**8.2.2 RETAINAGE** The rate of retainage shall be **ten** percent (**10**%) which is equal to the percentage retained from the Contractor's payment by the Owner for the Subcontract Work. If the Subcontract Work is satisfactory and the Subcontract Documents provide for reduction of retainage at a specified percentage of completion, the Subcontractor's retainage shall also be reduced when the Subcontract Work has attained the same percentage of completion and the Contractor's retainage for the Subcontract Work has been so reduced by the Owner.

**8.2.3 TIME OF APPLICATION** The Subcontractor shall submit progress payment applications to the Contractor no later than the **20th of each month** ~~day of each payment period~~ for the Subcontract Work performed up to and including the **last** day of the payment period indicating work completed and, to the extent allowed under Subparagraph 8.2.4, materials suitably stored during the preceding payment period.

**8.2.4 STORED MATERIALS** Unless otherwise provided in the Subcontract Documents, and if approved in advance by the Owner, applications for payment may include materials and equipment not incorporated in the Subcontract Work but delivered to and suitably stored at the site. ~~or at some other location agreed upon in writing.~~ Approval of payment applications for such stored items on ~~or off~~ the site shall be conditioned upon submission by the Subcontractor of bills of sale and applicable insurance or such other procedures satisfactory to the Owner and Contractor to establish the Owner's title to such materials and equipment, or otherwise to protect the Owner's and Contractor's interest. ~~including transportation to the site.~~

**8.2.5 TIME OF PAYMENT** Receipt of payment by the Contractor from the Owner for the Subcontract Work is a condition precedent to payment by the Contractor to the Subcontractor. The Subcontractor hereby acknowledges that it relies on the credit of the Owner, not the Contractor for payment of Subcontract Work. Progress payments received from the Owner for the Subcontractor for satisfactory performance of the Subcontract Work shall be made no later than seven (7) days after receipt by the Contractor of payment from the Owner for the Subcontract Work.

**8.2.6 PAYMENT DELAY** If the Contractor has received payment from the Owner and if for any reason not the fault of the Subcontractor, the Subcontractor does not receive a progress payment from the Contractor within seven (7) days after the date such payment is due, as defined in Subparagraph 8.2.5, the Subcontractor, upon giving seven (7) days written notice to the Contractor, and without prejudice to and in addition to any other legal remedies, may stop work until payment of the full amount owing to the Subcontractor has been received. The Subcontract Amount and Time shall be adjusted by the amount of the Subcontractor's reasonable and verified cost of shutdown, delay, and startup, which shall be effected by an appropriate Subcontractor Change Order.

**8.2.7 PAYMENTS WITHHELD** The Contractor may reject a Subcontractor payment ~~application~~ **on all Pirtle projects** or nullify a previously approved Subcontractor payment application, in whole or in part, as may reasonably be necessary to protect the Contractor from loss or damage based upon

**.1** the Subcontractor's repeated failure to perform the Subcontract Work as required by this Agreement;

**.2** loss or damage arising out of or relating to this Agreement and caused by the Subcontractor to the Owner, Contractor or others to whom the Contractor may be liable;

**.3** the Subcontractor's failure to properly pay for labor, materials, equipment or supplies furnished in connection with the Subcontract Work;

**.4** rejected, nonconforming or defective Subcontract Workwhich has not been corrected in a timely fashion;

**.5** reasonable evidence of delay in performance of the Subcontract Work such that the Work will not be completed within the Subcontract Time, and that the unpaid balance of the Subcontract Amount is not sufficient to offset the liquidated damages or actual damages that may be sustain by the Contractor as a result of the anticipated delay caused by the Subcontractor;

**.6** reasonable evidence demonstrating that the unpaid balance of the Subcontract Amount is insufficient to cover the cost to complete the Subcontract Work;

**.7** third party claims involving the Subcontractor or reasonable evidence demonstrating that third party claims are likely to be filed unless and until the Subcontractor furnishes the Contractor with adequate security in the form of a surety bond, letter of credit or other collateral or commitment which are sufficient to discharge such claims if established.

The Contractor shall give written notice to the Subcontractor, at the time of disapproving or nullifying an application for payment stating its specific reasons for such disapproval or nullification. When the above reasons for disapproving or nullifying an application for payment are removed, payment will be made for amounts previously withheld. **Should the Subcontractor fail to fulfill its contract obligations on this project or other projects with the Contractor, the Contractor may withhold payments on other projects until obligations are fulfilled.**

**8.3 FINAL PAYMENT**

**8.3.1 APPLICATION** Upon acceptance of the Subcontract Work by the Owner and the Contractor and receipt from the Subcontractor of evidence of fulfillment of the Subcontractor's obligations in accordance with the Subcontract Documents and Subparagraph 8.3.2, the Contractor shall incorporate the Subcontractor's application for final payment into the Contractor's next application for payment to the Owner without delay, or notify the Subcontractor if there is a delay and the reasons therefor.

**8.3.2 REQUIREMENTS** Before the Contractor shall be required to incorporate the Subcontractor's application for final payment into the Contractor's next application for payment, the Subcontractor shall submit to the Contractor:

**.1** an affidavit that all payrolls, bills for materials and equipment, and other indebtedness connected with the Subcontract Work for which the Owner or its property or the Contractor or the Contractor's surety might in any way be liable, have been paid or otherwise satisfied;

**.2** consent of surety to final payment, if required;

**.3** satisfaction of required closeout procedures;

**.4** certification that insurance required by the Subcontract Documents to remain in effect beyond final payment pursuant to Clauses 9.2.3.1 and 9.2.6 is in effect and will not be cancelled or allowed to expire without at least thirty (30) days written notice to the Contractor unless a longer period is stipulated in this Agreement;

**.5** other data, if required by the Contractor or Owner, such as receipts, releases, and waivers of liens to the extent and in such form as may be designated by the Contractor or Owner

**.6** written warranties, equipment manuals, startup and testing required in Paragraph 3.28; and

**.7** as-built drawings if required by the Subcontract Documents.

**8.3.3 TIME OF PAYMENT** Receipt of final payment by the Contractor from the Owner for the Subcontract Work is a condition precedent to payment by the Contractor to the Subcontractor. The Subcontractor hereby acknowledges that it relies on the credit of the Owner, not the Contractor for payment of Subcontract Work. Final payment of the balance due of the Contract Price shall be made to the Subcontractor:

**.1** upon receipt of the Owner's waiver of all claims related to the Subcontract Work except for unsettled liens, unknown defective work, and non-compliance with the Subcontract Documents or warranties; and

**.2** within seven (7) days after receipt by the Contractor of final payment from the Owner for such Subcontract Work.

**8.3.4 FINAL PAYMENT DELAY** If the Owner or its designated agent does not issue a certificate for final payment or the Contractor does not receive such payment for any cause which is not the fault of the Subcontractor, the Contractor shall promptly inform the Subcontractor in writing. The Contractor shall also diligently pursue, with the assistance of the Subcontractor, the prompt release by the Owner of the final payment due for the Subcontract Work. At the Subcontractor's request and expense, to the extent agreed upon in writing, the Contractor shall institute reasonable legal remedies to mitigate the damages and pursue payment of the Subcontractor's final payment ~~including interest~~.

**8.3.5 WAIVER OF CLAIMS** Final payment shall constitute a waiver of all claims by the Subcontractor relating to the Subcontract Work, but shall in no way relieve the Subcontractor of liability for the obligations assumed under Paragraphs 3.21 and 3.22, or for faulty or defective work or services discovered after final payment.

**8.4 LATE PAYMENT INTEREST** To the extent obtained by the Contractor under the Subcontract Documents, progress payments or final payment due and unpaid under this Agreement shall bear interest from the date payment is due at the rate provided in the Subcontract Documents.

**8.5 CONTINUING OBLIGATIONS** Provided the Contractor is making payments on or has made payments to the Subcontractor in accordance with the terms of this Agreement, the Subcontractor shall reimburse the Contractor for any costs and expenses for any claim, obligation or lien asserted before or after final payment is made that arises from the performance of the Subcontract Work. The Subcontractor shall reimburse the Contractor for costs and expenses including attorneys' fees and costs and expenses incurred by the Contractor in satisfying, discharging or defending against any such claims, obligation or lien including any action brought or judgment recovered. In the event that any applicable law, statute, regulation or bond requires the Subcontractor to take any action prior to the expiration of the reasonable time for payment referenced in Subparagraph 8.2.5 in order to preserve or protect the Subcontractor's rights, if any, with respect to mechanic's lien or bond claims, then the Subcontractor may take that action prior to the expiration of the reasonable time for payment and such action will not create the reimbursement obligation recited above nor be in violation of this Agreement or considered premature for purposes of preserving and protecting the Subcontractor's rights.

**8.6 PAYMENT USE RESTRICTION** Payments received by the Subcontractor shall be used to satisfy the indebtedness owed by the Subcontractor to any person furnishing labor or materials, or both, for use in performing the Subcontract Work through the most current period applicable to progress payments received from the Contractor before it is used for any other purpose. In the same manner, payments received by the Contractor from the Owner for the Subcontract Work shall be dedicated to payment to the Subcontractor. This provision

shall bear on this Agreement only, and is not for the benefit of third parties. Moreover, it shall not be construed by the parties to this Agreement or third parties to require that dedicated sums of money or payments be deposited in separate accounts, or that there be other restrictions on commingling of funds. Neither shall these mutual covenants be construed to create any fiduciary duty on the Subcontractor or Contractor, nor create any tort cause of action or liability for breach of trust, punitive damages, or other equitable remedy or liability for alleged breach.

**8.7 PAYMENT USE VERIFICATION** If the Contractor has reason to believe that the Subcontractor is not complying with the payment terms of this Agreement, the Contractor shall have the right to contact the Subcontractor's subcontractors and suppliers to ascertain whether they are being paid by the Subcontractor in accordance with this Agreement.

**8.8 PARTIAL LIEN WAIVERS AND AFFIDAVITS** As a prerequisite for payments, the Subcontractor shall provide, in a form satisfactory to the Owner and Contractor, partial lien or claim waivers in the amount of the application for payment and affidavits covering its subcontractors and suppliers for completed Subcontract Work. Such waivers may be conditional upon payment. In no event shall Contractor require the Subcontractor to provide an unconditional waiver of lien or claim, either partial or final, prior to receiving payment or in an amount in excess of what it has been paid.

**8.9 SUBCONTRACTOR PAYMENT FAILURE** Upon payment by the Contractor, the Subcontractor shall promptly pay its subcontractors and suppliers the amounts to which they are entitled. In the event the Contractor has reason to believe that labor, material or other obligations incurred in the performance of the Subcontract Work are not being paid, the Contractor may give written notice of a potential claim or lien to the Subcontractor and may take any steps deemed necessary to assure that progress payments are utilized to pay such obligations, including but not limited to the issuance of joint checks. If upon receipt of notice, the Subcontractor does not (a) supply evidence to the satisfaction of the Contractor that the moneys owing have been paid or (b) post a bond indemnifying the Owner, the Contractor, the Contractor's surety, if any, and the premises from a claim or lien, the Contractor shall have the right to withhold from any payments due or to become due to the Subcontractor a reasonable amount to protect the Contractor from any and all loss, damage or expense including attorneys' fees that may arise out of or relate to any such claim or lien. **The Contractor reserves the right to require a joint check agreement between the Subcontractor and its subcontractors or suppliers.**

**8.10 SUBCONTRACTOR ASSIGNMENT OF PAYMENTS** The Subcontractor shall not assign any moneys due or to become due under this Agreement, without the written consent of the Contractor, unless the assignment is intended to create a new security interest within the scope of Article 9 of the Uniform Commercial Code. Should the Subcontractor assign all or any part of any moneys due or to become due under this Agreement to create a new security interest or for any other purpose, the instrument of assignment shall contain a clause to the effect that the assignee's right in and to any money due or to become due to the Subcontractor shall be subject to the claims of all persons, firms and corporations for services rendered or materials supplied for the performance of the Subcontract Work.

**8.11 PAYMENT NOT ACCEPTANCE** Payment to the Subcontractor does not constitute or imply acceptance of any portion of the Subcontract Work.

## ARTICLE 9

## INDEMNITY, INSURANCE AND WAIVER OF SUBROGATION

**9.1 INDEMNITY**

**9.1.1 INDEMNITY** To the fullest extent permitted by law, the Subcontractor shall defend, indemnify and hold harmless the Contractor, the Contractor's other subcontractors, the Architect/Engineer, the Owner and their agents, consultants and employees (the Indemnitees) from all claims for bodily injury and property damage that may arise from the performance of the Subcontract Work to the extent of the negligence attributed to such acts or omissions by the Subcontractor, the Subcontractor's subcontractors or anyone employed directly or indirectly by any of them or by anyone for whose acts any of them may be liable. **Subcontractor agrees that one percent of this contract amount represents specific consideration to subcontractor for the indemnification requirements set forth in this contract.**

**9.1.2 NO LIMITATION ON LIABILITY** In any and all claims against the Indemnitees by any employee of the Subcontractor, anyone directly or indirectly employed by the Subcontractor or anyone for whose acts the Subcontractor may be liable, the indemnification obligation shall not be limited in any way by any limitation on the amount or type of damages, compensation or benefits payable by or for the Subcontractor under workers' compensation acts, disability benefit acts or other employee benefit acts.

**9.2 INSURANCE**

**9.2.1 SUBCONTRACTOR'S INSURANCE** Before commencing the Subcontract Work, and as a condition of payment, the Subcontractor shall purchase and maintain insurance that will protect it from the claims arising out of its operations under this Agreement, whether the operations are by the Subcontractor, or any of its consultants or subcontractors or anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable.

**9.2.2 MINIMUM LIMITS OF LIABILITY** The Subcontractor shall maintain at least the limits of liability in a company satisfactory to the Contractor as set forth in Exhibit **E**.

**9.2.3 PROFESSIONAL LIABILITY INSURANCE**

~~9.2.3.1 PROFESSIONAL LIABILITY INSURANCE The Subcontractor shall require the Designer(s) to maintain Project Specific Professional Liability Insurance with a company satisfactory to the Contractor, including contractual liability insurance against the liability assumed in Paragraph 3.8, and including coverage for any professional liability caused by any of the Designer(s) consultants. Said insurance shall have specific minimum limits as set forth below:~~

~~Limit of $_____ per claim.~~

~~General Aggregate of $_____ for the subcontract services rendered.~~

~~The Professional Liability Insurance shall contain prior acts coverage sufficient to cover all subcontract services rendered by the Designer. Said insurance shall be continued in effect with an extended period of _____ years following final payment to the Designer.~~

~~Such insurance shall have a maximum deductible amount of $ _____ per occurrence. The deductible shall be paid by the Subcontractor or Designer.~~

~~9.2.3.2 The Subcontractor shall require the Designer to furnish to the Subcontractor and Contractor, before the Designer commences its services, a copy of its professional liability policy evidencing the coverages required in this Paragraph. No policy shall be cancelled or modified without thirty (30) days prior written notice to the Subcontractor and Contractor.~~

**9.2.4 NUMBER OF POLICIES** Commercial General Liability Insurance and other liability insurance may be arranged under a single policy for the full limits required or by a combination of underlying policies with the balance provided by an Excess or Umbrella Liability Policy.

**9.2.5 CANCELLATION, RENEWAL AND MODIFICATION** The Subcontractor shall maintain in effect all insurance coverages required under this Agreement at the Subcontractor's sole expense and with insurance companies acceptable to the Contractor. The policies shall contain a provision that coverage will not be cancelled or not renewed until at least thirty (30) days' prior written notice has been given to the Contractor. Certificates of insurance showing required coverage to be in force pursuant to Subparagraph 9.2.2 shall be filed with the Contractor prior to commencement of the Subcontract Work. In the event the Subcontractor fails to obtain or maintain any insurance coverage required under this Agreement, the Contractor may purchase such coverage as desired for the Contractor's benefit and charge the expense to the Subcontractor, or terminate this Agreement.

**9.2.6 CONTINUATION OF COVERAGE** The Subcontractor shall continue to carry Completed Operations Liability Insurance for at least **one** year**(s)** after either ninety (90) days following Substantial Completion of the Work or final payment to the Contractor, whichever is earlier. The Subcontractor shall furnish the Contractor evidence of such insurance at final payment and one year from final payment.

**9.2.7 BUILDER'S RISK INSURANCE**

**9.2.7.1** Upon written request of the Subcontractor, the Contractor shall provide the Subcontractor with a copy of the Builder's Risk policy of insurance or any other property or equipment insurance in force for the Project and procured by the Owner or Contractor. The Contractor will advise the Subcontractor if a Builder's Risk policy of insurance is not in force.

**9.2.7.2** If the Owner or Contractor has not purchased Builder's Risk insurance satisfactory to the Subcontractor, the Subcontractor may procure such insurance as will protect the interests of the Subcontractor, its subcontractors and their subcontractors in the Subcontract Work.

**9.2.7.3** If not covered under the Builder's Risk policy of insurance or any other property or equipment insurance required by the Subcontract Documents, the Subcontractor shall procure and maintain at the Subcontractor's own expense property and equipment insurance for the Subcontract Work including portions of the Subcontract Work stored off the site or in transit, when such portions of the Subcontract Work are to be included in an application for payment under Article 8.

**9.2.8 WAIVER OF SUBROGATION**

**9.2.8.1** The Contractor and Subcontractor waive all rights against each other, the Owner and the Architect/Engineer, and any of their respective consultants, subcontractors, and subsubcontractors, agents and employees, for damages caused by perils to the extent covered by the proceeds of the insurance provided in Clause 9.2.7.1, except such rights as they may have to the insurance proceeds. The Subcontractor shall require similar waivers from its subcontractors.

**9.2.9 ENDORSEMENT** If the policies of insurance referred to in this Article require an endorsement to provide for continued coverage where there is a waiver of subrogation, the owners of such policies will cause them to be so endorsed.

## ARTICLE 10

## CONTRACTOR'S RIGHT TO PERFORM SUBCONTRACTOR'S RESPONSIBILITIES AND TERMINATION OF AGREEMENT

**10.1 FAILURE OF PERFORMANCE**

**10.1.1 NOTICE TO CURE** If the Subcontractor refuses or fails to supply enough properly skilled workers, proper materials, or maintain the Progress Schedule, or fails to make prompt payment to its workers, subcontractors or suppliers, or disregards laws, ordinances, rules, regulations or orders of any public authority having jurisdiction, or otherwise is guilty of a material breach of a provision of this Agreement, the Subcontractor shall be deemed in default of this Agreement. If the Subcontractor fails within three (3) days after written notification to commence and continue satisfactory correction of the default with diligence and promptness, then the

Contractor without prejudice to any other rights or remedies, shall have the right to any or all of the following remedies:

.1 supply workers, materials, equipment and facilities as the Contractor deems necessary for the completion of the Subcontract Work or any part which the Subcontractor has failed to complete or perform after written notification, and charge the cost, including reasonable overhead, profit, attorneys' fees, costs and expenses to the Subcontractor;

.2 contract with one or more additional contractors to perform such part of the Subcontract Work as the Contractor determines will provide the most expeditious completion of the Work, and charge the cost to the Subcontractor as provided under Clause 10.1.1.1; and/or

.3 withhold any payments due or to become due the Subcontractor pending corrective action in amounts sufficient to cover losses and compel performance to the extent required by and to the satisfaction of the Contractor.

In the event of an emergency affecting the safety of persons or property, the Contractor may proceed as above without notice, but the Contractor shall give the Subcontractor notice promptly after the fact as a precondition of cost recovery.

**10.1.2 TERMINATION BY CONTRACTOR** If the Subcontractor fails to commence and satisfactorily continue correction of a default within three (3) days after written notification issued under Subparagraph 10.1.1, then the Contractor may, in lieu of or in addition to Subparagraph 10.1.1, issue a second written notification, to the Subcontractor and its surety, if any. Such notice shall state that if the Subcontractor fails to commence and continue correction of a default within ~~seven (7)~~ **three (3)** days of the written notification, the Agreement will be deemed terminated. A written notice of termination shall be issued by the Contractor to the Subcontractor at the time the Subcontractor is terminated. The Contractor may furnish those materials, equipment and/or employ such workers or subcontractors as the Contractor deems necessary to maintain the orderly progress of the Work, All costs incurred by the Contractor in performing the Subcontract Work, including reasonable overhead, profit and attorneys fees, costs and expenses, shall be deducted from any moneys due or to become due the Subcontractor. The Subcontractor shall be liable for the payment of any amount by which such expense may exceed the unpaid balance of the Subcontract Amount. At the Subcontractor's request, the Contractor shall provide a detailed accounting of the costs to finish the Subcontract Work.

**10.1.3 USE OF SUBCONTRACTOR'S EQUIPMENT** If the Contractor performs work under this Article, either directly or through other subcontractors, the Contractor or other subcontractors shall have the right to take and use any materials, implements, equipment, appliances or tools furnished by, or belonging to the Subcontractor and located at the Project site for the purpose of completing any remaining Subcontract Work. Immediately upon completion of the Subcontract Work, any remaining materials, implements, equipment, appliances or tools not consumed or incorporated in performance of the Subcontract Work, and furnished by, belonging to, or delivered to the Project by or on behalf of the Subcontractor, shall be returned to the Subcontractor in substantially the same condition as when they were taken, normal wear and tear excepted.

**10.2 BANKRUPTCY**

**10.2.1 TERMINATION ABSENT CURE** If the Subcontractor files a petition under the Bankruptcy Code, this Agreement shall terminate if the Subcontractor or the Subcontractor's trustee rejects the Agreement or, if there has been a default, the Subcontractor is unable to give adequate assurance that the Subcontractor will perform as required by this Agreement or otherwise is unable to comply with the requirements for assuming this Agreement under the applicable provisions of the Bankruptcy Code.

**10.2.2 INTERIM REMEDIES** If the Subcontractor is not performing in accordance with the Progress Schedule at the time a petition in bankruptcy is filed, or at any subsequent time, the Contractor, while awaiting the decision of the Subcontractor or its trustee to reject or to assume this Agreement and provide adequate assurance of its ability to perform, may avail itself of such remedies under this Article as are reasonably necessary to maintain the Progress Schedule, The Contractor may offset against any sums due or to become due the Subcontractor all costs incurred in pursuing any of the remedies provided including, but not limited to, reasonable overhead, profit and attorney's fees. The Subcontractor shall be liable for the payment of any amount by which costs incurred may exceed the unpaid balance of the Subcontract Price.

**10.3 SUSPENSION BY OWNER** Should the Owner suspend the Work or any part which includes the Subcontract Work and such suspension is not due to any act or omission of the Contractor, or any other person or entity for whose acts or omissions the Contractor may be liable, the Contractor shall notify the Subcontractor in writing and upon receiving notification the Subcontractor shall immediately suspend the Subcontract Work. In the event of Owner suspension, the Contractor's liability to the Subcontractor shall be limited to the extent of the Contractor's recovery on the Subcontractor's behalf under the Subcontract Documents. The Contractor agrees to cooperate with the Subcontractor, at the Subcontractor's expense, in the prosecution of any Subcontractor claim arising out of an Owner suspension and to permit the Subcontractor to prosecute the claim, in the name of the Contractor, for the use and benefit of the Subcontractor.

**10.4 TERMINATION BY OWNER** Should the Owner terminate its contract with the Contractor or any part which includes the Subcontract Work, the Contractor shall notify the Subcontractor in writing within three (3) days of the termination and upon written notification, this Agreement shall be terminated and the Subcontractor shall immediately stop the Subcontract Work, follow all of Contractor's instructions, and mitigate all costs. In the event of Owner termination, the Contractor's liability to the Subcontractor shall be limited to the

extent of the Contractor's recovery on the Subcontractor's behalf under the Subcontract Documents. The Contractor agrees to cooperate with the Subcontractor, at the Subcontractor's expense, in the prosecution of any Subcontractor claim arising out of the Owner termination and to permit the Subcontractor to prosecute the claim, in the name of the Contractor, for the use and benefit of the Subcontractor, or assign the claim to the Subcontractor.

**10.5 CONTINGENT ASSIGNMENT OF THIS AGREEMENT** The Contractor's contingent assignment of this Agreement to the Owner, as provided in the Owner-Contractor agreement, is effective when the Owner has terminated the Owner-Contractor agreement for cause and has accepted the assignment by notifying the Subcontractor in writing, This contingent assignment is subject to the prior rights of a surety that may be obligated under the Contractor's bond, if any. Subcontractor consents to such assignment and agrees to be bound to the assignee by the terms of this Agreement, provided that the assignee fulfills the obligations of the Contractor.

**10.6 SUSPENSION BY CONTRACTOR** The Contractor may order the Subcontractor in writing to suspend all or any part of the Subcontract Work for such period of time as may be determined to be appropriate for the convenience of the Contractor. Phased Work or interruptions of the Subcontract Work for short periods of time shall not be considered a suspension. The Subcontractor, after receipt of the Contractor's order, shall notify the Contractor in writing in sufficient time to permit the Contractor to provide timely notice to the Owner in accordance with the Owner-Contractor agreement of the effect of such order upon the Subcontract Work. The Subcontract Amount or Progress Schedule shall be adjusted by Subcontract Change Order for any increase in the time or cost of performance of this Agreement caused by such suspension. No claim under this Paragraph shall be allowed for any costs incurred more than fourteen (14) days prior to the Subcontractor's notice to the Contractor. Neither the Subcontract Amount nor the Progress Schedule shall be adjusted for any suspension, to the extent that performance would have been suspended, due in whole or in part to the fault or negligence of the Subcontractor or by a cause for which Subcontractor would have been responsible. The Subcontract Amount shall not be adjusted for any suspension to the extent that performance would have been suspended by a cause for which the Subcontractor would have been entitled only to a time extension under this Agreement.

**10.7 WRONGFUL EXERCISE** If the Contractor wrongfully exercises any option under this Article, the Contractor shall be liable to the Subcontractor solely for the reasonable value of Subcontract Work performed by the Subcontractor prior to the Contractor's wrongful action, including reasonable overhead and profit on the Subcontract Work performed, less prior payments made, together with reasonable overhead and profit on the Subcontract Work not executed, and other costs incurred by reason of such action.

**10.8 TERMINATION BY SUBCONTRACTOR** If the Subcontract Work has been stopped for thirty (30) days because the Subcontractor has not received progress payments or has been abandoned or suspended for an unreasonable period of time not due to the fault or neglect of the Subcontractor, then the Subcontractor may terminate this Agreement upon giving the Contractor seven (7) days' written notice. Upon such termination, Subcontractor shall be entitled to recover from the Contractor payment for all Subcontract Work satisfactorily performed but not yet paid for, including reasonable overhead, profit and attorneys fees, costs and expenses, subject to the terms of Paragraphs 8.2 and 8.3. The Contractor's liability for any other damages claimed by the Subcontractor under such circumstances shall be extinguished by the Contractor pursuing said damages and claims against the Owner, on the Subcontractor's behalf, in the manner provided for in Subparagraphs 10.3 and 10.4 of this Agreement.

## ARTICLE 11

## DISPUTE RESOLUTION

**11.1 INITIAL DISPUTE RESOLUTION** if a dispute arises out of or relates to this Agreement or its breach, the parties shall endeavor to settle the dispute first through direct discussions. If the dispute cannot be resolved through direct discussions, the parties shall participate in mediation under the Construction Industry Mediation Rules of the American Arbitration Association before recourse to any other form of binding dispute resolution. The location of the mediation shall be the location of the Project. Once a party files a request for mediation with the other party and with the American Arbitration Association, the parties agree to commence such mediation within thirty (30) days of filing of the request. Either party may terminate the mediation at any time after the first session, but the decision to terminate must be delivered in person to the other party and the mediator. Engaging in mediation is a condition precedent to any other form of binding dispute resolution.

**11.2 WORK CONTINUATION AND PAYMENT** Unless otherwise agreed in writing, the Subcontractor shall continue the Subcontract Work and maintain the Progress Schedule during any dispute resolution proceedings. If the Subcontractor continues to perform, the Contractor shall continue to make payments in accordance with this Agreement.

**11.3 NO LIMITATION OF RIGHTS OR REMEDIES** Nothing in this Article shall limit any rights or remedies not expressly waived by the Subcontractor which the Subcontractor may have under lien laws or payment bonds.

**11.4 MULTIPARTY PROCEEDING** The parties agree that to the extent permitted by Subcontract Document all parties necessary to resolve a claim shall be parties to the same dispute resolution proceeding. To the extent disputes between the Contractor and Subcontractor involve in whole or in part disputes between the Contractor and the Owner, disputes between the Subcontractor and the Contractor shall be decided by the same tribunal and in the same forum as disputes between the Contractor and the Owner.

**11.5 DISPUTES BETWEEN CONTRACTOR AND SUBCONTRACTOR** In the event that the provisions for

resolution of disputes between the Contractor and the Owner contained in the Subcontract Documents do not permit consolidation or joinder with disputes of third parties, such as the Subcontractor, resolution of disputes between the Subcontractor and the Contractor involving in whole or in part disputes between the Contractor and the Owner shall be stayed pending conclusion of any dispute resolution proceeding between the Contractor and the Owner. At the conclusion of those proceedings, disputes between the Subcontractor and the Contractor shall be submitted again to mediation pursuant to Paragraph 11.1. Any disputes not resolved by mediation shall be decided in the manner selected in the agreement between the Owner and the Contractor.

**11.6 COST OF DISPUTE RESOLUTION** The cost of any mediation proceeding shall be shared equally by the parties participating. The prevailing party in any dispute arising out of or relating to this Agreement or its breach that is resolved by a dispute resolution procedure designated in the Subcontract Documents shall be entitled to recover from the other party reasonable attorneys' fees, costs and expenses incurred by the prevailing party in connection with such dispute resolution process.

## ARTICLE 12

## MISCELLANEOUS PROVISIONS

**12.1 GOVERNING LAW** This Agreement shall be governed by the law in effect at the location of the Project.

**12.2 SEVERABILITY** The partial or complete invalidity of any one or more provisions of this Agreement shall not affect the validity or continuing force and effect of any other provision.

**12.3 NO WAIVER OF PERFORMANCE** The failure of either party to insist, in any one or more instances, upon the performance of any of the terms, covenants or conditions of this Agreement, or to exercise any of its rights, shall not be construed as a waiver or relinquishment of term, covenant, condition or right with respect to further performance.

**12.4 TITLES** The titles given to the Articles of this Agreement are for ease of reference only and shall not be relied upon or cited for any other purpose.

**12.5 OTHER PROVISIONS AND DOCUMENTS** Other provisions and documents applicable to the Subcontract Work are set forth in Exhibit **F.**

**12.6 JOINT DRAFTING** The parties expressly agree that this Agreement was jointly drafted, and that they both had opportunity to negotiate its terms and to obtain the assistance of counsel in reviewing its terms prior to execution. Therefore, this Agreement shall be construed neither against nor in favor of either party, but shall be construed in a neutral manner.

**ARTICLE 13**
**EXISTING SUBCONTRACT DOCUMENT**

As defined in Paragraph 2.3, the following Exhibits are a part of this Agreement.

EXHIBIT **A** The Subcontract Work, **page 1 of 4, dated** ~~pages.~~

EXHIBIT **B** The Drawings, Specifications, General and other conditions, addenda and other information, **page 1 of 4, dated** .

EXHIBIT **C** Progress Schedule, **page 1 of 4, dated** )~~pages~~.

~~EXHIBIT __ Alternates and Unit Prices, include dates when alternates and unit prices no longer apply, pages.~~

EXHIBIT **D** Temporary Services, stating specific responsibilities of the Subcontractor, **page x of 4, dated** ~~pages~~.

EXHIBIT **E** Insurance Provisions, **page x of 4, dated** ~~pages~~.

EXHIBIT **F** Other Provisions and Documents, **page x of 4, dated** .

This Agreement is entered into as of the date entered in Article 1.

CONTRACTOR:
**JAMES B. PIRTLE CONSTRUCTION CO., INC. DBA PIRTLE CONSTRUCTION COMPANY**

ATTEST: _____ BY: _____

Date: _____

PRINT NAME:

PRINT TITLE:

SUBCONTRACTOR:

ATTEST: _____ BY: _____

Date: _____

PRINT NAME: _____

PRINT TITLE: _____

11/98

# Appendix M

# AIA A401-2007 Standard Form of Agreement between Contractor and Subcontractor

American Institute of Architects

# AIA® Document Comparative

## *AIA Documents A401™ – 2007 and A401™ – 2007 SP*

AIA Document A401™–2007 SP, Standard Form of Agreement Between Contractor and Subcontractor, for use on a Sustainable Project, establishes the contractual relationship between the Contractor and Subcontractor on a sustainable project. A401–2007 SP is based on AIA Document A401™–2007, with modifications to coordinate its use with the other Sustainable Projects documents in the Conventional (A201) family of AIA Contract Documents. This comparative is based on AIA Document A401–2007. Additions to A401–2007 are underlined (addition), and deletions are stricken (~~deletion~~).

## TITLE

***Standard Form of Agreement Between Contractor and Subcontractor,*** *for use on a Sustainable Project*

## COVER PAGE

**AGREEMENT** made as of the _____ day of _____ in the year _____
*(In words, indicate day, month and year.)*

**BETWEEN** the Contractor:
*(Name, legal status, address and other information)*

and the Subcontractor:
*(Name, legal status, address and other information)*

The Contractor has made a contract for construction (hereinafter, the Prime Contract) dated: _____

with the Owner:
*(Name, legal status, address and other information)*

for the following Project:
*(Name, location and detailed description)*

The Prime Contract provides for the furnishing of labor, materials, equipment and services in connection with the construction of the Project. A copy of the Prime Contract, consisting of the Agreement Between Owner and Contractor (from which compensation amounts may be deleted) and the other Contract Documents enumerated therein, has been made available to the Subcontractor.

The Architect for the Project:
*(Name, legal status, address and other information)*

The Contractor and the Subcontractor agree as follows.

## TABLE OF ARTICLES



## ARTICLE 1

### ARTICLE 1 THE SUBCONTRACT DOCUMENTS

**§ 1.1** The Subcontract Documents consist of (1) this Agreement; (2) the Prime Contract, consisting of the Agreement between the Owner and Contractor and the other Contract Documents enumerated therein; (3) Modifications issued subsequent to the execution of the Agreement between the Owner and Contractor, whether before or after the execution of this Agreement; (4) other documents listed in Article 16 of this Agreement; and (5) Modifications to this Subcontract issued after execution of this Agreement. These form the Subcontract, and are as fully a part of the Subcontract as if attached to this Agreement or repeated herein. The Subcontract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations or agreements, either written or oral. An enumeration of the Subcontract Documents, other than Modifications issued subsequent to the execution of this Agreement, appears in Article 16.

**§ 1.2** Except to the extent of a conflict with a specific term or condition contained in the Subcontract Documents, the General Conditions governing this Subcontract shall be the AIA Document ~~A201™–2007~~A201™–2007 SP, General Conditions of the Contract for Construction, for use on a Sustainable Project.

**§ 1.3** The Subcontract may be amended or modified only by a Modification. The Subcontract Documents shall not be construed to create a contractual relationship of any kind (1) between the Architect and the Subcontractor, (2) between the Owner and the Subcontractor, or (3) between any persons or entities other than the Contractor and Subcontractor.

**§ 1.4** The Contractor shall make available the Subcontract Documents to the Subcontractor prior to execution of this Agreement, and thereafter, upon request, but the Contractor may charge the Subcontractor for the reasonable cost of reproduction.

## ARTICLE 2

### ARTICLE 2 MUTUAL RIGHTS AND RESPONSIBILITIES

The Contractor and Subcontractor shall be mutually bound by the terms of this Agreement and, to the extent that the provisions of AIA Document ~~A201–2007~~A201–2007 SP apply to this Agreement pursuant to Section 1.2 and provisions of the Prime Contract apply to the Work of the Subcontractor, the Contractor shall assume toward the Subcontractor all obligations and responsibilities that the Owner, under such documents, assumes toward the Contractor, and the Subcontractor shall assume toward the Contractor all obligations and responsibilities which the Contractor, under such

documents, assumes toward the Owner and the Architect. The Contractor shall have the benefit of all rights, remedies and redress against the Subcontractor that the Owner, under such documents, has against the Contractor, and the Subcontractor shall have the benefit of all rights, remedies and redress against the Contractor that the Contractor, under such documents, has against the Owner, insofar as applicable to this Subcontract. Where a provision of such documents is inconsistent with a provision of this Agreement, this Agreement shall govern.

## ARTICLE 3

### ARTICLE 3 CONTRACTOR

#### § 3.1 Services Provided by the Contractor

**§ 3.1.1** The Contractor shall cooperate with the Subcontractor in scheduling and performing the Contractor's Work to avoid conflicts or interference in the Subcontractor's Work and shall expedite written responses to submittals made by the Subcontractor in accordance with Section 4.1 and Article 5. Promptly after execution of this Agreement, the Contractor shall provide the Subcontractor copies of the Contractor's construction schedule and schedule of submittals, together with such additional scheduling details as will enable the Subcontractor to plan and perform the Subcontractor's Work properly. The Contractor shall promptly notify the Subcontractor of subsequent changes in the construction and submittal schedules and additional scheduling details.

**§ 3.1.2** The Contractor shall provide suitable areas for storage of the Subcontractor's materials and equipment during the course of the Work. Additional costs to the Subcontractor resulting from relocation of such storage areas at the direction of the Contractor, except as previously agreed upon, shall be reimbursed by the Contractor.

**§ 3.1.3** Except as provided in Article 14, the Contractor's equipment will be available to the Subcontractor only at the Contractor's discretion and on mutually satisfactory terms.

#### § 3.2 Communications

**§ 3.2.1** The Contractor shall promptly make available to the Subcontractor information, including information received from the Owner, that affects this Subcontract and that becomes available to the Contractor subsequent to execution of this Subcontract.

**§ 3.2.2** The Contractor shall not give instructions or orders directly to the Subcontractor's employees or to the Subcontractor's Sub-subcontractors or material suppliers unless such persons are designated as authorized representatives of the Subcontractor.

**§ 3.2.3** The Contractor shall permit the Subcontractor to request directly from the Architect information regarding the percentages of completion and the amount certified on account of Work done by the Subcontractor.

**§ 3.2.4** If hazardous substances of a type of which an employer is required by law to notify its employees are being used on the site by the Contractor, a subcontractor or anyone directly or indirectly employed by them (other than the Subcontractor), the Contractor shall, prior to harmful exposure of the Subcontractor's employees to such substance, give written notice of the chemical composition thereof to the Subcontractor in sufficient detail and time to permit the Subcontractor's compliance with such laws.

**§ 3.2.5** The Contractor shall furnish to the Subcontractor within 30 days after receipt of a written request, or earlier if so required by law, information necessary and relevant for the Subcontractor to evaluate, give notice of or enforce mechanic's lien rights. Such information shall include a correct statement of the record legal title to the property, usually referred to as the site, on which the Project is located and the Owner's interest therein.

**§ 3.2.6** If the Contractor asserts or defends a claim against the Owner that relates to the Work of the Subcontractor, the Contractor shall promptly make available to the Subcontractor all information relating to the portion of the claim that relates to the Work of the Subcontractor.

#### § 3.3 Claims by the Contractor

**§ 3.3.1** Liquidated damages for delay, if provided for in Section 9.3 of this Agreement, shall be assessed against the Subcontractor only to the extent caused by the Subcontractor or any person or entity for whose acts the Subcontractor may be liable, and in no case for delays or causes arising outside the scope of this Subcontract.

**§ 3.3.2** The Contractor's claims for the costs of services or materials provided due to the Subcontractor's failure to execute the Work shall require

.1 seven days' written notice prior to the Contractor's providing services or materials, except in an emergency; and

.2 written compilations to the Subcontractor of services and materials provided by the Contractor and charges for such services and materials no later than the fifteenth day of the month following the Contractor's providing such services or materials.

**§ 3.4 Contractor's Remedies**

If the Subcontractor defaults or neglects to carry out the Work in accordance with this Agreement and fails within five working days after receipt of written notice from the Contractor to commence and continue correction of such default or neglect with diligence and promptness, the Contractor may, by appropriate Modification, and without prejudice to any other remedy the Contractor may have, make good such deficiencies and may deduct the reasonable cost thereof from the payments then or thereafter due the Subcontractor.

## ARTICLE 4

**ARTICLE 4 SUBCONTRACTOR**

**§ 4.1 Execution and Progress of the Work**

**§ 4.1.1** For all Work the Subcontractor intends to subcontract, the Subcontractor shall enter into written agreements with Sub-subcontractors performing portions of the Work of this Subcontract by which the Subcontractor and the Sub-subcontractor are mutually bound, to the extent of the Work to be performed by the Sub-subcontractor, assuming toward each other all obligations and responsibilities that the Contractor and Subcontractor assume toward each other and having the benefit of all rights, remedies and redress each against the other that the Contractor and Subcontractor have by virtue of the provisions of this Agreement.

**§ 4.1.2** The Subcontractor shall supervise and direct the Subcontractor's Work, and shall cooperate with the Contractor in scheduling and performing the Subcontractor's Work to avoid conflict, delay in or interference with the Work of the Contractor, other subcontractors, the Owner, or separate contractors.

**§ 4.1.3** The Subcontractor shall promptly submit Shop Drawings, Product Data, Samples and similar submittals required by the Subcontract Documents with reasonable promptness and in such sequence as to cause no delay in the Work or in the activities of the Contractor or other subcontractors.

**§ 4.1.4** The Subcontractor shall furnish to the Contractor periodic progress reports on the Work of this Subcontract as mutually agreed, including information on the status of materials and equipment that may be in the course of preparation, manufacture, or transit.

**§ 4.1.5** The Subcontractor agrees that the Contractor and the Architect each have the authority to reject Work of the Subcontractor that does not conform to the Prime Contract. The Architect's decisions on matters relating to aesthetic effect shall be final and binding on the Subcontractor if consistent with the intent expressed in the Prime Contract.

**§ 4.1.6** The Subcontractor shall pay for all materials, equipment and labor used in connection with the performance of this Subcontract through the period covered by previous payments received from the Contractor, and shall furnish satisfactory evidence, when requested by the Contractor, to verify compliance with the above requirements.

**§ 4.1.7** The Subcontractor shall take necessary precautions to protect properly the work of other subcontractors from damage caused by operations under this Subcontract.

**§ 4.1.8** The Subcontractor shall cooperate with the Contractor, other subcontractors, the Owner, and separate contractors whose work might interfere with the Subcontractor's Work. The Subcontractor shall participate in the preparation of coordinated drawings in areas of congestion, if required by the Prime Contract, specifically noting and advising the Contractor of potential conflicts between the Work of the Subcontractor and that of the Contractor, other subcontractors, the Owner, or separate contractors.

**§ 4.2 Permits, Fees, Notices, and Compliance with Laws**

**§ 4.2.1** The Subcontractor shall give notices and comply with applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities bearing on performance of the Work of this Subcontract. The Subcontractor shall secure and pay for permits, fees, licenses and inspections by government agencies necessary for

proper execution and completion of the Subcontractor's Work, the furnishing of which is required of the Contractor by the Prime Contract.

**§ 4.2.2** The Subcontractor shall comply with Federal, state and local tax laws, social security acts, unemployment compensation acts and workers' compensation acts insofar as applicable to the performance of this Subcontract.

**§ 4.3 Safety Precautions and Procedures**

**§ 4.3.1** The Subcontractor shall take reasonable safety precautions with respect to performance of this Subcontract, shall comply with safety measures initiated by the Contractor and with applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities for the safety of persons and property in accordance with the requirements of the Prime Contract. The Subcontractor shall report to the Contractor within three days an injury to an employee or agent of the Subcontractor which occurred at the site.

**§ 4.3.2** If hazardous substances of a type of which an employer is required by law to notify its employees are being used on the site by the Subcontractor, the Subcontractor's Sub-subcontractors or anyone directly or indirectly employed by them, the Subcontractor shall, prior to harmful exposure of any employees on the site to such substance, give written notice of the chemical composition thereof to the Contractor in sufficient detail and time to permit compliance with such laws by the Contractor, other subcontractors and other employers on the site.

**§ 4.3.3** If reasonable precautions will be inadequate to prevent foreseeable bodily injury or death to persons resulting from a hazardous material or substance, including but not limited to asbestos or polychlorinated biphenyl (PCB), encountered on the site by the Subcontractor, the Subcontractor shall, upon recognizing the condition, immediately stop Work in the affected area and promptly report the condition to the Contractor in writing. When the material or substance has been rendered harmless, the Subcontractor's Work in the affected area shall resume upon written agreement of the Contractor and Subcontractor. The Subcontract Time shall be extended appropriately and the Subcontract Sum shall be increased in the amount of the Subcontractor's reasonable additional costs of demobilization, delay and remobilization, which adjustments shall be accomplished as provided in Article 5 of this Agreement.

**§ 4.3.4** To the fullest extent permitted by law, the Contractor shall indemnify and hold harmless the Subcontractor, the Subcontractor's Sub-subcontractors, and agents and employees of any of them from and against claims, damages, losses and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work in the affected area if in fact the material or substance presents the risk of bodily injury or death as described in Section 4.3.3 and has not been rendered harmless, provided that such claim, damage, loss or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself) except to the extent that such damage, loss or expense is due to the fault or negligence of the party seeking indemnity.

**§ 4.3.5** The Subcontractor shall indemnify the Contractor for the cost and expense the Contractor incurs (1) for remediation of a material or substance brought to the site and negligently handled by the Subcontractor or (2) where the Subcontractor fails to perform its obligations under Section 4.3.3, except to the extent that the cost and expense are due to the Contractor's fault or negligence.

**§ 4.4 Cleaning Up**

**§ 4.4.1** The Subcontractor shall keep the premises and surrounding area free from accumulation of waste materials or rubbish caused by operations performed under this Subcontract. The Subcontractor shall not be held responsible for conditions caused by other contractors or subcontractors. The Subcontractor shall also recycle, reuse, remove or dispose of materials as required by the Contract Documents.

**§ 4.4.2** The Subcontractor, in accordance with the Subcontract Documents, shall, to the extent applicable to Subcontractor's Work, prepare and submit to the Contractor a construction waste management and disposal plan setting forth the procedures and processes for salvaging, recycling or disposing of construction waste generated from the Project.

**§ 4.4.3** As provided under Section 3.3.2, if the Subcontractor fails to clean up as provided in the Subcontract Documents, the Contractor may charge the Subcontractor for the Subcontractor's appropriate share of cleanup costs.

**§ 4.5 Warranty**

**§ 4.5.1** The Subcontractor warrants to the Owner, Architect, and Contractor that materials and equipment furnished under this Subcontract will be of good quality and new unless the Subcontract Documents require or permit otherwise. The Subcontractor further warrants that the Work will conform to the requirements of the Subcontract Documents and will be free from defects, except for those inherent in the quality of the Work the Subcontract Documents require or permit. Work, materials, or equipment not conforming to these requirements may be considered defective. The

Subcontractor's warranty excludes remedy for damage or defect caused by abuse, alterations to the Work not executed by the Subcontractor, improper or insufficient maintenance, improper operation, or normal wear and tear under normal usage. If required by the Architect and Contractor, the Subcontractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment.

**§ 4.5.2** The Subcontractor shall perform the Sustainable Measures required to be performed by the Subcontractor in accordance with the Subcontract Documents; however, nothing contained in this Section 4.5 shall be construed as a guarantee or warranty by the Subcontractor that the Project will achieve the Sustainable Objective.

**§ 4.6 Indemnification**

**§ 4.6.1** To the fullest extent permitted by law, the Subcontractor shall indemnify and hold harmless the Owner, Contractor, Architect, Architect's consultants, and agents and employees of any of them from and against claims, damages, losses and expenses, including but not limited to attorney's fees, arising out of or resulting from performance of the Subcontractor's Work under this Subcontract, provided that any such claim, damage, loss or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), but only to the extent caused by the negligent acts or omissions of the Subcontractor, the Subcontractor's Sub-subcontractors, anyone directly or indirectly employed by them or anyone for whose acts they may be liable, regardless of whether or not such claim, damage, loss or expense is caused in part by a party indemnified hereunder. Such obligation shall not be construed to negate, abridge, or otherwise reduce other rights or obligations of indemnity which would otherwise exist as to a party or person described in this Section 4.6.

**§ 4.6.2** In claims against any person or entity indemnified under this Section 4.6 by an employee of the Subcontractor, the Subcontractor's Sub-subcontractors, anyone directly or indirectly employed by them or anyone for whose acts they may be liable, the indemnification obligation under Section 4.6.1 shall not be limited by a limitation on the amount or type of damages, compensation or benefits payable by or for the Subcontractor or the Subcontractor's Sub-subcontractors under workers' compensation acts, disability benefit acts or other employee benefit acts.

**§ 4.7 Remedies for Nonpayment**

If the Contractor does not pay the Subcontractor through no fault of the Subcontractor, within seven days from the time payment should be made as provided in this Agreement, the Subcontractor may, without prejudice to any other available remedies, upon seven additional days' written notice to the Contractor, stop the Work of this Subcontract until payment of the amount owing has been received. The Subcontract Sum shall, by appropriate Modification, be increased by the amount of the Subcontractor's reasonable costs of demobilization, delay and remobilization.

## ARTICLE 5

**ARTICLE 5 CHANGES IN THE WORK**

**§ 5.1** The Owner may make changes in the Work by issuing Modifications to the Prime Contract. Upon receipt of such a Modification issued subsequent to the execution of the Subcontract Agreement, the Contractor shall promptly notify the Subcontractor of the Modification. Unless otherwise directed by the Contractor, the Subcontractor shall not thereafter order materials or perform Work that would be inconsistent with the changes made by the Modification to the Prime Contract.

**§ 5.2** The Subcontractor may be ordered in writing by the Contractor, without invalidating this Subcontract, to make changes in the Work within the general scope of this Subcontract consisting of additions, deletions or other revisions, including those required by Modifications to the Prime Contract issued subsequent to the execution of this Agreement, the Subcontract Sum and the Subcontract Time being adjusted accordingly. The Subcontractor, prior to the commencement of such changed or revised Work, shall submit promptly to the Contractor written copies of a claim for adjustment to the Subcontract Sum and Subcontract Time for such revised Work in a manner consistent with requirements of the Subcontract Documents.

**§ 5.3** The Subcontractor shall make all claims promptly to the Contractor for additional cost, extensions of time and damages for delays or other causes in accordance with the Subcontract Documents. A claim which will affect or become part of a claim which the Contractor is required to make under the Prime Contract within a specified time period or in a specified manner shall be made in sufficient time to permit the Contractor to satisfy the requirements of the Prime Contract. Such claims shall be received by the Contractor not less than two working days preceding the time by which the Contractor's claim must be made. Failure of the Subcontractor to make such a timely claim shall bind the Subcontractor to the same consequences as those to which the Contractor is bound.

## ARTICLE 6

### ARTICLE 6 MEDIATION AND BINDING DISPUTE RESOLUTION

**§ 6.1 Mediation**

**§ 6.1.1** Any claim arising out of or related to this Subcontract, except those waived in this Subcontract, shall be subject to mediation as a condition precedent to binding dispute resolution.

**§ 6.1.2** The parties shall endeavor to resolve their claims by mediation which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Mediation Procedures in effect on the date of the Agreement. A request for mediation shall be made in writing, delivered to the other party to this Subcontract and filed with the person or entity administering the mediation. The request may be made concurrently with the filing of binding dispute resolution proceedings but, in such event, mediation shall proceed in advance of binding dispute resolution proceedings, which shall be stayed pending mediation for a period of 60 days from the date of filing, unless stayed for a longer period by agreement of the parties or court order. If an arbitration is stayed pursuant to this Section, the parties may nonetheless proceed to the selection of the arbitrators(s) and agree upon a schedule for later proceedings.

**§ 6.1.3** The parties shall share the mediator's fee and any filing fees equally. The mediation shall be held in the place where the Project is located, unless another location is mutually agreed upon. Agreements reached in mediation shall be enforceable as settlement agreements in any court having jurisdiction thereof.

**§ 6.2 Binding Dispute Resolution**

For any claim subject to, but not resolved by mediation pursuant to Section 6.1, the method of binding dispute resolution shall be as follows:
*(Check the appropriate box. If the Contractor and Subcontractor do not select a method of binding dispute resolution below, or do not subsequently agree in writing to a binding dispute resolution method other than litigation, claims will be resolved by litigation in a court of competent jurisdiction.)*

☐ Arbitration pursuant to Section 6.3 of this Agreement

☐ Litigation in a court of competent jurisdiction

☐ Other: *(Specify)*

**§ 6.3 Arbitration**

**§ 6.3.1** If the Contractor and Subcontractor have selected arbitration as the method of binding dispute resolution in Section 6.2, any claim subject to, but not resolved by, mediation shall be subject to arbitration which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Arbitration Rules in effect on the date of the Agreement. A demand for arbitration shall be made in writing, delivered to the other party to the Subcontract, and filed with the person or entity administering the arbitration. The party filing a notice of demand for arbitration must assert in the demand all claims then known to that party on which arbitration is permitted to be demanded.

**§ 6.3.2** A demand for arbitration shall be made no earlier than concurrently with the filing of a request for meditation but in no event shall it be made after the date when the institution of legal or equitable proceedings based on the claim would be barred by the applicable statute of limitations. For statute of limitations purposes, receipt of a written demand for arbitration by the person or entity administering the arbitration shall constitute the institution of legal or equitable proceedings based on the claim.

**§ 6.3.3** Either party, at its sole discretion, may consolidate an arbitration conducted under this Agreement with any other arbitration to which it is a party provided that (1) the arbitration agreement governing the other arbitration permits consolidation; (2) the arbitrations to be consolidated substantially involve common questions of law or fact; and (3) the arbitrations employ materially similar procedural rules and methods for selecting arbitrator(s).

**§ 6.3.4** Either party, at its sole discretion, may include by joinder persons or entities substantially involved in a common question of law or fact whose presence is required if complete relief is to be accorded in arbitration, provided that the party sought to be joined consents in writing to such joinder. Consent to arbitration involving an additional person or entity shall not constitute consent to arbitration of a claim not described in the written consent.

**§ 6.3.5** The Contractor and Subcontractor grant to any person or entity made a party to an arbitration conducted under this Section 6.3, whether by joinder or consolidation, the same rights of joinder and consolidation as the Contractor and Subcontractor under this Agreement.

**§ 6.3.6** This agreement to arbitrate and any other written agreement to arbitrate with an additional person or persons referred to herein shall be specifically enforceable under applicable law in any court having jurisdiction thereof. The award rendered by the arbitrator or arbitrators shall be final, and judgment may be entered upon it in accordance with applicable law in any court having jurisdiction thereof.

## ARTICLE 7

**ARTICLE 7 TERMINATION, SUSPENSION OR ASSIGNMENT OF THE SUBCONTRACT**

**§ 7.1 Termination by the Subcontractor**

The Subcontractor may terminate the Subcontract for the same reasons and under the same circumstances and procedures with respect to the Contractor as the Contractor may terminate with respect to the Owner under the Prime Contract, or for nonpayment of amounts due under this Subcontract for 60 days or longer. In the event of such termination by the Subcontractor for any reason which is not the fault of the Subcontractor, Sub-subcontractors or their agents or employees or other persons performing portions of the Work under contract with the Subcontractor, the Subcontractor shall be entitled to recover from the Contractor payment for Work executed and for proven loss with respect to materials, equipment, tools, and construction equipment and machinery, including reasonable overhead, profit and damages.

**§ 7.2 Termination by the Contractor**

**§ 7.2.1** If the Subcontractor repeatedly fails or neglects to carry out the Work in accordance with the Subcontract Documents or otherwise to perform in accordance with this Subcontract and fails within a ten-day period after receipt of written notice to commence and continue correction of such default or neglect with diligence and promptness, the Contractor may, by written notice to the Subcontractor and without prejudice to any other remedy the Contractor may have, terminate the Subcontract and finish the Subcontractor's Work by whatever method the Contractor may deem expedient. If the unpaid balance of the Subcontract Sum exceeds the expense of finishing the Subcontractor's Work and other damages incurred by the Contractor and not expressly waived, such excess shall be paid to the Subcontractor. If such expense and damages exceed such unpaid balance, the Subcontractor shall pay the difference to the Contractor.

**§ 7.2.2** If the Owner terminates the Prime Contract for the Owner's convenience, the Contractor shall promptly deliver written notice to the Subcontractor.

**§ 7.2.3** Upon receipt of written notice of termination, the Subcontractor shall

- **.1** cease operations as directed by the Contractor in the notice;
- **.2** take actions necessary, or that the Contractor may direct, for the protection and preservation of the Work; and
- **.3** except for Work directed to be performed prior to the effective date of termination stated in the notice, terminate all existing Sub-subcontracts and purchase orders and enter into no further Sub-subcontracts and purchase orders.

**§ 7.2.4** In case of such termination for the Owner's convenience, the Subcontractor shall be entitled to receive payment for Work executed, and costs incurred by reason of such termination, along with reasonable overhead and profit on the Work not executed.

**§ 7.3 Suspension by the Contractor for Convenience**

**§ 7.3.1** The Contractor may, without cause, order the Subcontractor in writing to suspend, delay or interrupt the Work of this Subcontract in whole or in part for such period of time as the Contractor may determine. In the event of suspension ordered by the Contractor, the Subcontractor shall be entitled to an equitable adjustment of the Subcontract Time and Subcontract Sum.

**§ 7.3.2** An adjustment shall be made for increases in the Subcontract Time and Subcontract Sum, including profit on the increased cost of performance, caused by suspension, delay or interruption. No adjustment shall be made to the extent that

- **.1** performance is, was or would have been so suspended, delayed or interrupted by another cause for which the Subcontractor is responsible; or
- **.2** an equitable adjustment is made or denied under another provision of this Subcontract.

**§ 7.4 Assignment of the Subcontract**

**§ 7.4.1** In the event the Owner terminates the Prime Contract for cause, this Subcontract is assigned to the Owner pursuant to Section 5.4 of AIA Document ~~A201–2007~~A201–2007 SP provided the Owner accepts the assignment.

**§ 7.4.2** Without the Contractor's written consent, the Subcontractor shall not assign the Work of this Subcontract, subcontract the whole of this Subcontract, or subcontract portions of this Subcontract.

## ARTICLE 8

**ARTICLE 8 THE WORK OF THIS SUBCONTRACT**

The Subcontractor shall execute the following portion of the Work described in the Subcontract Documents, including all labor, materials, equipment, services and other items required to complete such portion of the Work, except to the extent specifically indicated in the Subcontract Documents to be the responsibility of others.

*(Insert a precise description of the Work of this Subcontract, including a description of the Sustainable Measures in the Sustainability Plan applicable to the Work of this Subcontract, referring where appropriate to numbers of Drawings, sections of Specifications and pages of Addenda, Modifications and accepted alternates.)*

## ARTICLE 9

**ARTICLE 9 DATE OF COMMENCEMENT AND SUBSTANTIAL COMPLETION**

**§ 9.1** Subcontract Time is the period of time, including authorized adjustments, allotted in the Subcontract Documents for Substantial Completion of the Work described in the Subcontract Documents. The Subcontractor's date of commencement is the date from which the Subcontract Time of Section 9.3 is measured; it shall be the date of this Agreement, as first written above, unless a different date is stated below or provision is made for the date to be fixed in a notice to proceed issued by the Contractor.

*(Insert the date of commencement, if it differs from the date of this Agreement or, if applicable, state that the date will be fixed in a notice to proceed.)*

**§ 9.2** Unless the date of commencement is established by a notice to proceed issued by the Contractor, or the Contractor has commenced visible Work at the site under the Prime Contract, the Subcontractor shall notify the Contractor in writing not less than five days before commencing the Subcontractor's Work to permit the timely filing of mortgages, mechanic's liens and other security interests.

**§ 9.3** The Work of this Subcontract shall be substantially completed not later than _____.

*(Insert the calendar date or number of calendar days after the Subcontractor's date of commencement. Also insert any requirements for earlier substantial completion of certain portions of the Subcontractor's Work, if not stated elsewhere in the Subcontract Documents.)*

| Portion of Work | Substantial Completion Date |
|---|---|

, subject to adjustments of this Subcontract Time as provided in the Subcontract Documents.

*(Insert provisions, if any, for liquidated damages relating to failure to complete on time.)*

**§ 9.4** With respect to the obligations of both the Contractor and the Subcontractor, time is of the essence of this Subcontract.

**§ 9.5** No extension of time will be valid without the Contractor's written consent after claim made by the Subcontractor in accordance with Section 5.3.

## ARTICLE 10

**ARTICLE 10 SUBCONTRACT SUM**

**§ 10.1** The Contractor shall pay the Subcontractor in current funds for performance of the Subcontract the Subcontract Sum of _____ ($__), subject to additions and deductions as provided in the Subcontract Documents.

**§ 10.2** The Subcontract Sum is based upon the following alternates, if any, which are described in the Subcontract Documents and have been accepted by the Owner and the Contractor:
*(Insert the numbers or other identification of accepted alternates.)*

**§ 10.3** Unit prices, if any:
*(Identify and state the unit price, and state the quantity limitations, if any, to which the unit price will be applicable.)*

| Item | Units and Limitations | Price per Unit ($0.00) |
|---|---|---|

**§ 10.4** Allowances included in the Subcontract Sum, if any:
*(Identify allowance and state exclusions, if any, from the allowance price.)*

| Item | Price |
|---|---|

## ARTICLE 11

### ARTICLE 11 PROGRESS PAYMENTS

**§ 11.1** Based upon applications for payment submitted to the Contractor by the Subcontractor, corresponding to applications for payment submitted by the Contractor to the Architect, and certificates for payment issued by the Architect, the Contractor shall make progress payments on account of the Subcontract Sum to the Subcontractor as provided below and elsewhere in the Subcontract Documents. Unless the Contractor provides the Owner with a payment bond in the full penal sum of the Contract Sum, payments received by the Contractor and Subcontractor for Work properly performed by their contractors and suppliers shall be held by the Contractor and Subcontractor for those contractors or suppliers who performed Work or furnished materials, or both, under contract with the Contractor or Subcontractor for which payment was made to the Contractor by the Owner or to the Subcontractor by the Contractor, as applicable. Nothing contained herein shall require money to be placed in a separate account and not commingled with money of the Contractor or Subcontractor, shall create any fiduciary liability or tort liability on the part of the Contractor or Subcontractor for breach of trust or shall entitle any person or entity to an award of punitive damages against the Contractor or Subcontractor for breach of the requirements of this provision.

**§ 11.2** The period covered by each application for payment shall be one calendar month ending on the last day of the month, or as follows:

**§ 11.3** Provided an application for payment is received by the Contractor not later than the _____ day of a month, the Contractor shall include the Subcontractor's Work covered by that application in the next application for payment which the Contractor is entitled to submit to the Architect. The Contractor shall pay the Subcontractor each progress payment no later than seven working days after the Contractor receives payment from the Owner. If the Architect does not issue a certificate for payment or the Contractor does not receive payment for any cause which is not the fault of the Subcontractor, the Contractor shall pay the Subcontractor, on demand, a progress payment computed as provided in Sections 11.7, 11.8 and 11.9.

**§ 11.4** If the Subcontractor's application for payment is received by the Contractor after the application date fixed above, the Subcontractor's Work covered by it shall be included by the Contractor in the next application for payment submitted to the Architect.

**§ 11.5** The Subcontractor shall submit to the Contractor a schedule of values prior to submitting the Subcontractor's first Application for Payment. Each subsequent application for payment shall be based upon the most recent schedule of values submitted by the Subcontractor in accordance with the Subcontract Documents. The schedule of values shall allocate the entire Subcontract Sum among the various portions of the Subcontractor's Work and be prepared in such form and supported by such data to substantiate its accuracy as the Contractor may require. This schedule, unless objected to by the Contractor, shall be used as a basis for reviewing the Subcontractor's applications for payment.

**§ 11.6** Applications for payment submitted by the Subcontractor shall indicate the percentage of completion of each portion of the Subcontractor's Work as of the end of the period covered by the application for payment.

**§ 11.7** Subject to the provisions of the Subcontract Documents, the amount of each progress payment shall be computed as set forth in the sections below.

**§ 11.7.1** Take that portion of the Subcontract Sum properly allocable to completed Work as determined by multiplying the percentage completion of each portion of the Subcontractor's Work by the share of the total Subcontract Sum allocated to that portion of the Subcontractor's Work in the schedule of values, less that percentage actually retained, if any, from payments to the Contractor on account of the Work of the Subcontractor. Pending final determination of cost to the Contractor of changes in the Work that have been properly authorized by the Contractor, amounts not in dispute shall be included to the same extent provided in the Prime Contract, even though the Subcontract Sum has not yet been adjusted;

**§ 11.7.2** Add that portion of the Subcontract Sum properly allocable to materials and equipment delivered and suitably stored at the site by the Subcontractor for subsequent incorporation in the Subcontractor's Work or, if approved by the Contractor, suitably stored off the site at a location agreed upon in writing, less the same percentage retainage required by the Prime Contract to be applied to such materials and equipment in the Contractor's application for payment;

**§ 11.7.3** Subtract the aggregate of previous payments made by the Contractor; and

**§ 11.7.4** Subtract amounts, if any, calculated under Section 11.7.1 or 11.7.2 that are related to Work of the Subcontractor for which the Architect has withheld or nullified, in whole or in part, a certificate of payment for a cause that is the fault of the Subcontractor.

**§ 11.8** Upon the partial or entire disapproval by the Contractor of the Subcontractor's application for payment, the Contractor shall provide written notice to the Subcontractor. When the basis for the disapproval has been remedied, the Subcontractor shall be paid the amounts withheld.

**§ 11.9 Substantial Completion**

When the Subcontractor's Work or a designated portion thereof is substantially complete and in accordance with the requirements of the Prime Contract, the Contractor shall, upon application by the Subcontractor, make prompt application for payment for such Work. Within 30 days following issuance by the Architect of the certificate for payment covering such substantially completed Work, the Contractor shall, to the full extent allowed in the Prime Contract, make payment to the Subcontractor, deducting any portion of the funds for the Subcontractor's Work withheld in accordance with the certificate to cover costs of items to be completed or corrected by the Subcontractor. Such payment to the Subcontractor shall be the entire unpaid balance of the Subcontract Sum if a full release of retainage is allowed under the Prime Contract for the Subcontractor's Work prior to the completion of the entire Project. If the Prime Contract does not allow for a full release of retainage, then such payment shall be an amount which, when added to previous payments to the Subcontractor, will reduce the retainage on the Subcontractor's substantially completed Work to the same percentage of retainage as that on the Contractor's Work covered by the certificate.

## ARTICLE 12

**ARTICLE 12 FINAL PAYMENT**

**§ 12.1** Final payment, constituting the entire unpaid balance of the Subcontract Sum, shall be made by the Contractor to the Subcontractor when the Subcontractor's Work is fully performed in accordance with the requirements of the Subcontract Documents, the Architect has issued a certificate for payment covering the Subcontractor's completed Work and the Contractor has received payment from the Owner. If, for any cause which is not the fault of the Subcontractor, a certificate for payment is not issued or the Contractor does not receive timely payment or does not pay the Subcontractor within seven days after receipt of payment from the Owner, final payment to the Subcontractor shall be made upon demand.
*(Insert provisions for earlier final payment to the Subcontractor, if applicable.)*

**§ 12.2** Before issuance of the final payment, the Subcontractor, if required, shall submit evidence satisfactory to the Contractor that all payrolls, bills for materials and equipment, and all known indebtedness connected with the Subcontractor's Work have been satisfied. Acceptance of final payment by the Subcontractor shall constitute a waiver of claims by the Subcontractor, except those previously made in writing and identified by the Subcontractor as unsettled at the time of final application for payment.

## ARTICLE 13

**ARTICLE 13 INSURANCE AND BONDS**

**§ 13.1** The Subcontractor shall purchase and maintain insurance of the following types of coverage and limits of liability as will protect the Subcontractor from claims that may arise out of, or result from, the Subcontractor's operations and completed operations under the Subcontract:

| Type of Insurance or Bond | Limit of Liability or Bond Amount ($0.00) |
|---|---|

**§ 13.2** Coverages, whether written on an occurrence or claims-made basis, shall be maintained without interruption from the date of commencement of the Subcontractor's Work until the date of final payment and termination of any coverage required to be maintained after final payment to the Subcontractor, and, with respect to the Subcontractor's completed operations coverage, until the expiration of the period for correction of Work or for such other period for maintenance of completed operations coverage as specified in the Prime Contract.

**§ 13.3** Certificates of insurance acceptable to the Contractor shall be filed with the Contractor prior to commencement of the Subcontractor's Work. These certificates and the insurance policies required by this Article 13 shall contain a provision that coverages afforded under the policies will not be canceled or allowed to expire until at least 30 days' prior written notice has been given to the Contractor. If any of the foregoing insurance coverages are required to remain in force after final payment and are reasonably available, an additional certificate evidencing continuation of such coverage shall be submitted with the final application for payment as required in Article 12. If any information concerning reduction of coverage is not furnished by the insurer, it shall be furnished by the Subcontractor with reasonable promptness according to the Subcontractor's information and belief.

**§ 13.4** The Subcontractor shall cause the commercial liability coverage required by the Subcontract Documents to include: (1) the Contractor, the Owner, the Architect and the Architect's consultants as additional insureds for claims caused in whole or in part by the Subcontractor's negligent acts or omissions during the Subcontractor's operations; and (2) the Contractor as an additional insured for claims caused in whole or in part by the Subcontractor's negligent acts or omissions during the Subcontractor's completed operations.

**§ 13.5** The Contractor shall furnish to the Subcontractor satisfactory evidence of insurance required of the Contractor under the Prime Contract.

**§ 13.6** The Contractor shall promptly, upon request of the Subcontractor, furnish a copy or permit a copy to be made of any bond covering payment of obligations arising under the Subcontract.

**§ 13.7** Performance Bond and Payment Bond:
*(If the Subcontractor is to furnish bonds, insert the specific requirements here.)*

| Bond Type | Bond Amount ($0.00) | Bond Delivery Date | Bond Form |
|---|---|---|---|

**§ 13.8 Property Insurance**

**§ 13.8.1** When requested in writing, the Contractor shall provide the Subcontractor with copies of the property and equipment policies in effect for the Project. The Contractor shall notify the Subcontractor if the required property insurance policies are not in effect.

**§ 13.8.2** If the required property insurance is not in effect for the full value of the Subcontractor's Work, then the Subcontractor shall purchase insurance for the value of the Subcontractor's Work, and the Subcontractor shall be reimbursed for the cost of the insurance by an adjustment in the Subcontract Sum.

**§ 13.8.3** Property insurance for the Subcontractor's materials and equipment required for the Subcontractor's Work, stored off site or in transit and not covered by the Project property insurance, shall be paid for through the application for payment process.

**§ 13.9 Waivers of Subrogation**

The Contractor and Subcontractor waive all rights against (1) each other and any of their subcontractors, sub-subcontractors, agents and employees, each of the other, and (2) the Owner, the Architect, the Architect's consultants, separate contractors, and any of their subcontractors, sub-subcontractors, agents and employees for damages caused by

fire or other causes of loss to the extent covered by property insurance provided under the Prime Contract or other property insurance applicable to the Work, except such rights as they may have to proceeds of such insurance held by the Owner as a fiduciary. The Subcontractor shall require of the Subcontractor's Sub-subcontractors, agents and employees, by appropriate agreements, written where legally required for validity, similar waivers in favor of the parties enumerated herein. The policies shall provide such waivers of subrogation by endorsement or otherwise. A waiver of subrogation shall be effective as to a person or entity even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, did not pay the insurance premium directly or indirectly, and whether or not the person or entity had an insurable interest in the property damaged.

## ARTICLE 14

**ARTICLE 14 TEMPORARY FACILITIES AND WORKING CONDITIONS**

**§ 14.1** The Contractor shall furnish and make available at no cost to the Subcontractor the Contractor's temporary facilities, equipment and services, except as noted below:

| Temporary Facility, Equipment or Service | Cost, if any ($0.00) |
|---|---|

**§ 14.2** Specific working conditions:
*(Insert any applicable arrangements concerning working conditions and labor matters for the Project.)*

## ARTICLE 15

**ARTICLE 15 MISCELLANEOUS PROVISIONS**

**§ 15.1** Where reference is made in this Subcontract to a provision of another Subcontract Document, the reference refers to that provision as amended or supplemented by other provisions of the Subcontract Documents.

**§ 15.2** Payments due and unpaid under this Subcontract shall bear interest from the date payment is due at such rate as the parties may agree upon in writing or, in the absence thereof, at the legal rate prevailing from time to time at the place where the Project is located.
*(Insert rate of interest agreed upon, if any.)*

**§ 15.3** Retainage and any reduction thereto are as follows:

**§ 15.4** The Contractor and Subcontractor waive claims against each other for consequential damages arising out of or relating to this Subcontract, including without limitation, any consequential damages due to either party's termination in accordance with Article 7.

## ARTICLE 16

**ARTICLE 16 ENUMERATION OF SUBCONTRACT DOCUMENTS**

**§ 16.1** The Subcontract Documents, except for Modifications issued after execution of this Subcontract, are enumerated in the sections below.

**§ 16.1.1** This executed AIA Document ~~A401–2007~~A401–2007 SP, Standard Form of Agreement Between Contractor and Subcontractor, for use on a Sustainable Project.

**§ 16.1.2** The Prime Contract, consisting of the Agreement between the Owner and Contractor dated as first entered above and the other Contract Documents enumerated in the Owner-Contractor Agreement.

**§ 16.1.3** The following Modifications to the Prime Contract, if any, issued subsequent to the execution of the Owner-Contractor Agreement but prior to the execution of this Agreement:

| Modification | Date |
|---|---|

**§ 16.1.4** Additional Documents, if any, forming part of the Subcontract Documents:

**.1** AIA Document E201™–2007, Digital Data Protocol Exhibit, if completed by the parties, or the following:

**.2** Other documents:
*(List here any additional documents that are intended to form part of the Subcontract Documents. Requests for proposal and the Subcontractor's bid or proposal should be listed here only if intended to be made part of the Subcontract Documents.)*

This Agreement entered into as of the day and year first written above.

| | |
|---|---|
| **CONTRACTOR** *(Signature)* | **SUBCONTRACTOR** *(Signature)* |
| *(Printed name and title)* | *(Printed name and title)* |

# Appendix N

# Construction Industry Arbitration Rules and Mediation Procedures of the American Arbitration Association

CONSTRUCTION

# Construction

## Arbitration Rules & Mediation Procedures

**Including Procedures for Large, Complex Construction Disputes**

AMERICAN ARBITRATION ASSOCIATION®

Available online at **adr.org/construction**

Rules Amended and Effective October 1, 2009
Fee Schedule Amended and Effective June 1, 2010

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# Construction Arbitration
## Rules and Mediation Procedures

(Including Procedures for Large, Complex Construction Disputes)

### National Construction Dispute Resolution Committee

Representatives of the organizations listed below constitute the National Construction Dispute Resolution Committee (NCDRC). This Committee serves as an advisory body to the American Arbitration Association® concerning construction dispute resolution services.

**American Association of Airport Executives**
**American Bar Association – Forum on the Construction Industry**
**American Bar Association – Construction Litigation Committee**
**American Bar Association – Public Contract Law Section**
**American College of Construction Lawyers**
**American College of Real Estate Lawyers**
**American Council of Engineering Companies**
**American Institute of Architects**
**American Road and Transportation Builders Association**
**American Society of Civil Engineers**
**American Subcontractors Association**
**Associated Builders & Contractors, Inc.**
**Associated General Contractors of America**
**American Specialty Contractors, Inc.**
**Construction Financial Management Association**
**Construction Management Association of America**
**Construction Owners Association of America**
**Construction Specifications Institute**
**Design Build Institute of America**
**Dispute Review Board Foundation**
**Engineers Joint Contract Documents Committee**
**National Association of Home Builders**
**National Association of Minority Contractors**
**National Association of State Facilities Administrators**
**National Association of Surety Bond Producers**
**National Society of Professional Engineers**
**National Utility Contractors Association**
**Surety Association of America**
**Victor O. Schinnerer**
**Women Construction Owners & Executives, USA**

## Important Notice

These Rules and any amendment of them shall apply in the form in effect at the time the administrative filing requirements are met for a demand for arbitration or submission agreement received by the American Arbitration Association. To insure that you have the most current information, visit **www.adr.org**. If an agreement for mediation or arbitration specifies that rules in effect at the time the agreement was executed be used, then absent the parties' agreement otherwise,the AAA shall apply the Rules as required by the agreement. We encourage parties to use the most current, state of the art, AAA rules available.

## Introduction

Each year, many thousands of construction-related transactions take place. Occasionally, disagreements in connection with these transactions develop. Often, these disputes are resolved by arbitration, the voluntary submission of a dispute to a disinterested person or persons for final and binding determination. Arbitration has been proven to be an effective way to resolve disputes fairly, privately, promptly, and economically.

The American Arbitration Association (AAA) is a public-service, not-for-profit organization offering a broad range of dispute resolution services to business executives, attorneys, individuals, trade associations, unions, management, consumers, families, communities, and all levels of government. The AAA is headquarted in New York and has offices located in many major cities throughout the United States and around the world, including Dublin, Mexico City and Singapore. Parties may hold hearings at local AAA offices or at other locations convenient for them. The AAA also provides education and training, publications, and conducts research on all forms of out-of-court dispute resolution.

Generally, the AAA's services are concluded with the transmittal of the award. Although there is voluntary compliance with the majority of awards, judgment on the award can be entered in a court having appropriate jurisdiction if necessary.

## Mediation

By agreement, the parties may submit their dispute to mediation before arbitration under the mediation procedures herein. Mediation involves the services of one or more individuals, to assist parties in settling a controversy or claim by direct negotiations between or among themselves. The mediator or mediators

participate(s) impartially in the negotiations, guiding and consulting the various parties involved. The result of the mediation should be an agreement that the parties find acceptable. The mediator cannot impose a settlement and can only guide the parties toward achieving their own settlement.

The AAA will administer the mediation process to achieve orderly, economical, and expeditious mediation, utilizing to the greatest possible extent the competence and acceptability of the mediators on the AAA's Construction Mediation Panel. Depending on the expertise needed for a given dispute, the parties can obtain the services of one or more individuals who are willing to serve as mediators and who are trained in mediation skills. In identifying those persons most qualified to mediate, the AAA is assisted by the National Construction Dispute Resolution Committee.

The AAA itself does not act as mediator. Its function is to administer the mediation process in accordance with the agreement of the parties, to teach mediation skills to members of the construction industry, and to maintain the National Panel from which mediators can be chosen.

Procedures for mediation cases are described in Sections M-1 through M-18.

## Arbitration

The arbitration rules contain four procedural tracks: the Regular Track Procedures (Section R), the Procedures for the Resolution of Disputes through Document Submission (Section D), the Fast Track Procedures (Section F) and the Procedures for Large, Complex Construction Disputes (Section L). The Regular Track Procedures are applied to the administration of all arbitration cases, unless they conflict with any portion of Section D, Section F or Section L whenever these Sections apply. In the event of a conflict, the Fast Track Procedures, Procedures for the Resolution of Disputes through Document Submission, or the Procedures for Large, Complex Construction Disputes apply.

### Regular Track Procedures

The highlights of the Regular Track Procedures are that they enable:

- opportunities for an administrative conference to help structure the dispute resolution process from the starting point;
- party input into the AAA's preparation of lists of proposed arbitrators;
- checklists for parties and arbitrators to organize the management hearing to address the needs associated with each dispute;
- express arbitrator authority to control the discovery process;
- broad arbitrator authority to control the hearing;
- award format choices;
- a Demand Form and an Answer Form, both of which seek information that will help the AAA to better serve the parties.

### Procedures for the Resolution of Disputes through Document Submission

The highlights of the Procedures for the Resolution of Disputes through Document Submissions are that they provide:

- a simple process for resolution of disputes where a face-to-face hearing is not necessary;
- flexibility to take advantage of technology options;
- the ability to be applied to any size dispute by party agreement.

## Fast Track Procedures

The Fast Track Procedures are designed for cases involving claims between two parties where no party's disclosed claim or counterclaim exceeds $75,000, exclusive of claimed interest, attorneys' fees, arbitration fees and costs. The highlights of these Procedures are:

- a 45-day "time standard" for hearing process completion;
- the establishment of a special pool of arbitrators who are pre-qualified to serve on an expedited basis;
- an expedited arbitrator appointment process, with party input;
- conference call with the arbitrator within 10 days of confirmation of the arbitrator;
- the presumption that cases involving $10,000 or less will be decided on a documents only basis;
- a single day of hearing in most cases;
- an award in no more than 14 calendar days after completion of the hearing.

## Procedures for Large, Complex Construction Disputes

Unless the parties agree otherwise, the Procedures for Large, Complex Construction Disputes will be applied to all cases administered by the AAA under the Construction Arbitration Rules in which the disclosed claim or counterclaim of any party is at least $1,000,000 exclusive of claimed interest, attorneys' fees, arbitration fees and costs.

The key features of these Procedures include:

- a highly qualified, trained Panel of Neutrals, compensated at their customary rates;
- a mandatory preliminary hearing with the arbitrators, which may be conducted by telephone;
- broad arbitrator authority to order and control discovery, including depositions;
- the presumption that hearings will proceed on a consecutive or block basis;
- a reasoned award unless the parties agree otherwise.

## The National Construction Panel

The AAA maintains a National Panel of individuals competent to hear and decide disputes administered under the Construction Industry Arbitration Rules. The AAA considers for appointment to the Construction Industry Panel persons recommended by the National Construction Dispute Resolution Committee, regional advisory committees and customers. These individuals are qualified to serve by virtue of their experience in the construction field. The majority of these neutrals are actively engaged in the construction industry with attorney neutrals generally devoting at least half of their practice to construction matters. Neutrals serving on the Panel and under these Rules must also attend periodic training.

## Administrative Fees

The AAA charges a filing fee based on the amount of claim or counterclaim. This fee information, which is contained with these Rules, allows the parties to exercise control over their administrative fees and costs.

The fees cover AAA administrative services; they do not cover arbitrator compensation or expenses, if any, nor do the fees cover reporting services, hearing room rental or any post-award charges incurred by the parties in enforcing the award.

## Alternative Dispute Resolution (ADR) Clauses

### Mediation

If the parties elect to adopt mediation as a part of their contractual dispute settlement procedure, the following mediation clause can be inserted into the contract in conjunction with a standard arbitration provision:

> *If a dispute arises out of or relates to this contract, or the breach thereof, and if the dispute cannot be settled through negotiation, the parties agree first to try in good faith to settle the dispute by mediation administered by the American Arbitration Association under its Construction Industry Mediation Procedures before resorting to arbitration, litigation, or some other dispute resolution procedure.*

If the parties choose to use a mediator to resolve an existing dispute, the following language may accompany the submission:

> *The parties hereby submit the following dispute to mediation administered by the American Arbitration Association under its Construction Industry Mediation Procedures. (The clause may also provide for the qualifications of the mediator(s), method of payment, locale of meetings, and any other item of concern to the parties.)*

### Arbitration

Parties can provide for arbitration of future disputes by inserting the following clause into their contracts:

> *Any controversy or claim arising out of or relating to this contract, or the breach thereof, shall be settled by arbitration administered by the American Arbitration Association under its Construction Industry Arbitration Rules, and judgment on the award rendered by the arbitrator(s) may be entered in any court having jurisdiction thereof.*

Arbitration of existing disputes may be accomplished by use of the following:

> *We, the undersigned parties, hereby agree to submit to arbitration administered by the American Arbitration Association under its Construction Industry Arbitration Rules the following controversy: (cite briefly). We further*

*agree that the above controversy be submitted to (one)(three) arbitrator(s). We further agree that we will faithfully observe this agreement and the rules, that we will abide by and perform any award rendered by the arbitrator(s), and that a judgment of the court having jurisdiction may be entered on the award.*

The AAA's *Guide to Drafting Dispute Resolution Clauses for Construction Contracts* offers additional information about dispute resolution options available for construction disputes. For more information about the AAA's Construction Dispute Avoidance and Resolution Services, as well as the full range of other AAA services, contact the nearest AAA office or visit **www.adr.org**.

## Construction Industry Mediation Procedures

### M-1. Agreement of Parties

Whenever, by stipulation or in their contract, the parties have provided for mediation or conciliation of existing or future disputes under the auspices of the American Arbitration Association (AAA) or under these procedures, the parties and their representatives, unless agreed otherwise in writing, shall be deemed to have made these procedures, as amended and in effect as of the date of filing of a request for mediation, a part of their agreement and designate the AAA as the administrator of their mediation.

The parties by mutual agreement may vary any part of these procedures including, but not limited to, agreeing to conduct the mediation via telephone or other electronic or technical means.

### M-2. Initiation of Mediation

Any party or parties to a dispute may initiate mediation under the AAA's auspices by making a request for mediation to any of the AAA's regional offices or case management centers via telephone, email, regular mail or fax. Requests for mediation may also be filed online via AAA WebFile at **www.adr.org**.

The party initiating the mediation shall simultaneously notify the other party or parties of the request. The initiating party shall provide the following information to the AAA and the other party or parties as applicable:

**(i)** A copy of the mediation provision of the parties' contract or the parties' stipulation to mediate.

**(ii)** The names, regular mail addresses, email addresses (if available), and telephone numbers of all parties to the dispute and representatives, if any, in the mediation.

**(iii)** A brief statement of the nature of the dispute and the relief requested.

**(iv)** Any specific qualifications the mediator should possess.

Where there is no preexisting stipulation or contract by which the parties have provided for mediation of existing or future disputes under the auspices of the AAA, a party may request the AAA to invite another party to participate in "mediation by voluntary submission". Upon receipt of such a request, the AAA will contact the other party or parties involved in the dispute and attempt to obtain a submission to mediation.

### M-3. Fixing of Locale (the city, county, state, territory and, if applicable, country of the mediation)

**(a)** When the parties' agreement to mediate is silent with respect to locale and the parties are unable to agree upon a locale, the locale shall be the city nearest to the site of the project in construction disputes as determined by the AAA.

**(b)** When the parties' agreement to mediate requires a specific locale, absent the parties' agreement to change it, the locale shall be that specified in the agreement to mediate.

**(c)** If the reference to a locale in the agreement to mediate is ambiguous, the AAA shall have the authority to consider the parties' arguments and determine the locale.

### M-4. Representation

Any party may participate without representation (pro-se), or by any representative of that party's choosing, or by counsel, unless such choice is prohibited by applicable law. A party intending to have representation shall notify the other party and the AAA of the name, telephone number and address, and email address if available of the representative.

### M-5. Appointment of the Mediator

Parties may search the online profiles of the AAA's Panel of Mediators at **www.aaamediation.com** in an effort to agree on a mediator. If the parties have not agreed to the appointment of a mediator and have not provided any other method of appointment, the mediator shall be appointed in the following manner:

**(i)** Upon receipt of a request for mediation, the AAA will send to each party a list of mediators from the AAA's Panel of Mediators. The parties are encouraged to agree to a mediator from the submitted list and to advise the AAA of their agreement.

**(ii)** If the parties are unable to agree upon a mediator, each party shall strike unacceptable names from the list, number the remaining names in order of preference, and return the list to the AAA. If a party does not return the list within the time specified, all mediators on the list shall be deemed acceptable to that party. From among the mediators who have been mutually approved by the parties, and in accordance with the designated order of mutual preference, the AAA shall invite a mediator to serve.

**(iii)** If the parties fail to agree on any of the mediators listed, or if acceptable mediators are unable to serve, or if for any other reason the appointment cannot be made from the submitted list, the AAA shall have the authority to make the appointment from among other members of the Panel of Mediators without the submission of additional lists.

### M-6. Mediator's Impartiality and Duty to Disclose

AAA mediators are required to abide by the Model Standards of Conduct for Mediators in effect at the time a mediator is appointed to a case. Where there is a conflict between the Model Standards and any provision of these Mediation Procedures, these Mediation Procedures shall govern. The Standards require mediators to (i) decline a mediation if the mediator cannot conduct it in an impartial manner, and (ii) disclose, as soon as practicable, all actual and potential conflicts of interest that are reasonably known to the mediator and could reasonably be seen as raising a question about the mediator's impartiality.

Prior to accepting an appointment, AAA mediators are required to make a reasonable inquiry to determine whether there are any facts that a reasonable individual would consider likely to create a potential or actual conflict of interest for the mediator. AAA mediators are required to disclose any circumstance likely to create a presumption of bias or prevent a resolution of the parties' dispute within the time-frame desired by the parties. Upon receipt of such disclosures, the AAA shall immediately communicate the disclosures to the parties for their comments.

The parties may, upon receiving disclosure of actual or potential conflicts of interest of the mediator, waive such conflicts and proceed with the mediation. In the event that a party disagrees as to whether the mediator shall serve, or in the event that the mediator's conflict of interest might reasonably be viewed as undermining the integrity of the mediation, the mediator shall be replaced.

### M-7. Vacancies

If any mediator shall become unwilling or unable to serve, the AAA will appoint another mediator, unless the parties agree otherwise, in accordance with section M-5.

### M-8. Duties and Responsibilities of the Mediator

**(i)** The mediator shall conduct the mediation based on the principle of party self-determination. Self-determination is the act of coming to a voluntary, uncoerced decision in which each party makes free and informed choices as to process and outcome.

**(ii)** The mediator is authorized to conduct separate or *ex parte* meetings and other communications with the parties and/or their representatives, before, during, and after any scheduled mediation conference. Such communications may be conducted via telephone, in writing, via email, online, in person or otherwise.

**(iii)** The parties are encouraged to exchange all documents pertinent to the relief requested. The mediator may request the exchange of memoranda on issues, including the underlying interests and the history of the parties' negotiations. Information that a party wishes to keep confidential may be sent to the mediator, as necessary, in a separate communication with the mediator.

**(iv)** The mediator does not have the authority to impose a settlement on the parties but will attempt to help them reach a satisfactory resolution of their dispute. Subject to the discretion of the mediator, the mediator may make oral or written recommendations for settlement to a party privately or, if the parties agree, to all parties jointly.

**(v)** In the event a complete settlement of all or some issues in dispute is not achieved within the scheduled mediation session(s), the mediator may continue to communicate with the parties, for a period of time, in an ongoing effort to facilitate a complete settlement.

**(vi)** The mediator is not a legal representative of any party and has no fiduciary duty to any party.

**(vii)** The mediator shall set the date, time, and place for each session of the mediation conference. The parties shall respond to requests for conference dates in a timely manner, be cooperative in scheduling the earliest practicable date, and adhere to the established conference schedule. The AAA shall provide notice of the conference to the parties in advance of the conference date, when timing permits.

### M-9. Responsibilities of the Parties

The parties shall ensure that appropriate representatives of each party, having authority to consummate a settlement, attend the mediation conference.

Prior to and during the scheduled mediation conference session(s) the parties and their representatives shall, as appropriate to each party's circumstances, exercise their best efforts to prepare for and engage in a meaningful and productive mediation.

### M-10. Privacy

Mediation sessions and related mediation communications are private proceedings. The parties and their representatives may attend mediation sessions. Other persons may attend only with the permission of the parties and with the consent of the mediator.

### M-11. Confidentiality

Subject to applicable law or the parties' agreement, confidential information disclosed to a mediator by the parties or by other participants (witnesses) in the course of the mediation shall not be divulged by the mediator. The mediator shall maintain the confidentiality of all information obtained in the mediation, and all records, reports, or other documents received by a mediator while serving in that capacity shall be confidential.

The mediator shall not be compelled to divulge such records or to testify in regard to the mediation in any adversary proceeding or judicial forum.

The parties shall maintain the confidentiality of the mediation and shall not rely on, or introduce as evidence in any arbitral, judicial, or other proceeding the following, unless agreed to by the parties or required by applicable law:

**(i)** Views expressed or suggestions made by a party or other participant with respect to a possible settlement of the dispute;

**(ii)** Admissions made by a party or other participant in the course of the mediation proceedings;

**(iii)** Proposals made or views expressed by the mediator; or

**(iv)** The fact that a party had or had not indicated willingness to accept a proposal for settlement made by the mediator.

### M-12. No Stenographic Record

There shall be no stenographic record of the mediation process.

### M-13. Termination of Mediation

The mediation shall be terminated:

**(i)** By the execution of a settlement agreement by the parties; or

**(ii)** By a written or verbal declaration of the mediator to the effect that further efforts at mediation would not contribute to a resolution of the parties' dispute; or

**(iii)** By a written or verbal declaration of all parties to the effect that the mediation proceedings are terminated; or

**(iv)** When there has been no communication between the mediator and any party or party's representative for 21 days following the conclusion of the mediation conference.

### M-14. Exclusion of Liability

Neither the AAA nor any mediator is a necessary party in judicial proceedings relating to the mediation. Neither the AAA nor any mediator shall be liable to any party for any error, act or omission in connection with any mediation conducted under these procedures. Parties to a mediation under these procedures may not call the mediator, the AAA or AAA employees as a witness in litigation or any other proceeding relating to the mediation. The mediator, the AAA and AAA employees are not competent to testify as witnesses in any such proceeding.

### M-15. Interpretation and Application of Procedures

The mediator shall interpret and apply these procedures insofar as they relate to the mediator's duties and responsibilities. All other procedures shall be interpreted and applied by the AAA.

### M-16. Deposits

Unless otherwise directed by the mediator, the AAA will require the parties to deposit in advance of the mediation conference such sums of money as it, in consultation with the mediator, deems necessary to cover the costs and expenses of the mediation and shall render an accounting to the parties and return any unexpended balance at the conclusion of the mediation.

### M-17. Expenses

All expenses of the mediation, including required traveling and other expenses or charges of the mediator, shall be borne equally by the parties unless they agree otherwise. The expenses of participants for either side shall be paid by the party requesting the attendance of such participants.

### M-18. Cost of the Mediation

There is no filing fee to initiate a mediation or a fee to request the AAA to invite parties to mediate.

The cost of mediation is based on the hourly or daily mediation rate published on the mediator's AAA profile. This rate covers both mediator compensation and an allocated portion for the AAA's services. There is a four-hour or one half-day minimum charge for a mediation conference. Expenses referenced in Section M-17 may also apply.

If a matter submitted for mediation is withdrawn or cancelled or results in a settlement after the request to initiate mediation is filed but prior to the mediation conference the cost is $200 plus any mediator time and charges incurred. These costs shall be borne by the initiating party unless the parties agree otherwise.

If you have questions about mediation costs or services visit **www.aaamediation.com** or contact your local AAA office.

## Construction Industry Arbitration Rules

## Regular Track Procedures

### R-1. Agreement of Parties and Designation of Applicable AAA Rules

**(a)** The parties shall be deemed to have made these Rules a part of their arbitration agreement whenever they have provided for arbitration by the American Arbitration Association (hereinafter AAA) under its Construction Industry Arbitration Rules or whenever they have provided for arbitration of a construction dispute pursuant to the Rules of the AAA without designating particular AAA Rules.

**(b)** Unless the parties or the AAA determines otherwise, the Fast Track Procedures shall apply in any case involving no more than two parties in which no disclosed claim or counterclaim exceeds $75,000, exclusive of claimed interest, attorneys' fees and arbitration fees and costs. Parties may also agree to use these procedures in larger cases. The Fast Track Procedures shall be applied as described in Section F of these Rules, in addition to any other portion of these Rules that is not in conflict with the Fast Track Procedures.

**(c)** Unless the parties agree otherwise, the Procedures for Large, Complex Construction Disputes shall apply to all cases in which the disclosed claim or counterclaim of any party is $1,000,000 or more, exclusive of claimed interest, attorneys' fees, and arbitration fees and costs. The Procedures for Large, Complex Construction Disputes shall be applied as described in Section L of these Rules, in addition to any other portion of these Rules that is not in conflict with the Procedures for Large, Complex Construction Disputes.

**(d)** Parties may, by agreement, apply the Fast Track Procedures, the Procedures for Large, Complex Construction Disputes or Procedures for the Resolution of Disputes through Document Submission (Section D of these Rules) to any dispute.

**(e)** All other cases shall be administered in accordance with Regular Track Procedures of these Rules.

### R-2. AAA and Delegation of Duties

When parties agree to arbitrate under these Rules, or when they provide for arbitration by the AAA and an arbitration is initiated under these Rules, they thereby authorize the AAA to administer the arbitration. The authority and duties of the AAA are prescribed in the agreement of the parties and in these Rules, and may be carried out through such of the AAA's representatives as it may direct. The AAA may, in its discretion, assign the administration of an arbitration to any of its offices. Arbitrations administered under these rules shall only be administered by the AAA or by an individual or organization authorized by the AAA to do so.

### R-3. National Panel of Construction Neutrals

The AAA shall establish and maintain a National Panel of Construction Arbitrators ("National Panel") and shall appoint arbitrators as provided in these Rules. The term "arbitrator" in these Rules refers to the arbitration panel, constituted for a particular case, whether composed of one or more arbitrators, or to an individual arbitrator, as the context requires.

### R-4. Filing Requirements Under an Arbitration Agreement in a Contract

**(a)** Filing of a Demand: Arbitration under an arbitration provision in a contract shall be initiated in the following manner:

**(i)** The initiating party ("the claimant") shall, within the time period, if any, specified in the contract(s), file with the AAA a demand for arbitration, the administrative filing fee, and a copy of the applicable arbitration agreement from the parties' contract which provides for arbitration. Filing may be accomplished through use of AAA WebFile, located at **www.adr.org**, or by filing the demand with any AAA office.

**(ii)** The claimant shall simultaneously provide a copy of the demand and the applicable arbitration agreement to the opposing party ("the respondent").

**(iii)** The demand shall include:

**(a)** The name of each party;

**(b)** The address for each party, including, if known, telephone and fax numbers and email addresses;

**(c)** If applicable, the names, addresses, telephone and fax numbers and, if known, email address of the known representative for each party;

**(d)** A statement setting forth the nature of the claim including the relief sought and the amount involved;

**(e)** The locale requested, if the arbitration agreement does not specify one.

**(b)** The AAA shall provide notice to the parties (or their representatives if so named) of the receipt of a demand when the administrative filing requirements have been satisfied. The date on which the filing requirements are satisfied shall establish the date of filing the dispute for administration however, any disputes in connection with the AAA's determination may be decided by the arbitrator.

If a filing does not satisfy the Filing Requirements set forth above, the AAA shall acknowledge to all named parties receipt of the incomplete filing and inform the parties of the filing deficiencies. If the deficiencies are not cured by the due date specified by the AAA, the filing may be returned to the filing party.

**(c)** Answers and Counterclaims

**(i)** Answering Statement: A respondent may file an answering statement with the AAA within 14 calendar days after notice of the filing of the demand is sent by the AAA. The respondent shall, at the time of any such filing, send a copy of the answering statement to the claimant and to all other parties to the arbitration. If no answering statement is filed within the stated time, respondent will be deemed to deny the claim. Failure to file an answering statement shall not operate to delay the arbitration.

**(ii)** Counterclaim: A respondent may file a counterclaim within 14 calendar days after notice of the filing of the demand is sent by the AAA. The Respondent shall, at the time of any such filing, send a copy of the counterclaim to the claimant and to all other parties to the arbitration. If a counterclaim is asserted, it shall include a statement setting forth the nature of the counterclaim including the relief sought and the amount involved. The filing fee as specified in the applicable AAA Fee Schedule must be paid at the time of the filing of any counterclaim.

If the counterclaim filing is deficient, and not cured by the date specified by the AAA, it may be returned to the filing party.

**(d)** Parties are encouraged to provide descriptions of their claims, in any document filed pursuant to this section, in sufficient detail to make the circumstances of the dispute clear to the arbitrator.

### R-5. Filing Requirements Under a Submission Agreement

Parties to any existing dispute, who have not previously agreed to use these Rules, may commence arbitration under these Rules by either filing online through AAA WebFile or by filing at any office of the AAA a written submission to arbitrate under these Rules, signed by the parties. The submission shall contain:

**(a)** The names and addresses for each party and their representatives, including, if known, telephone and fax numbers and email addresses;

**(b)** A statement setting forth the nature of the dispute including the relief sought, the amount involved and the claims and counterclaims asserted by the parties. Unless the parties state otherwise in the submission, all claims and counterclaims will be deemed to be denied by the other party;

**(c)** The hearing locale, if agreed upon by the parties;

**(d)** The appropriate filing fee for each claim or counterclaim as provided in the AAA Fee Schedule applicable at the time of filing.

Parties are encouraged to provide descriptions of their claims in sufficient detail to make the circumstances of their dispute clear to the arbitrator.

## R-6. Changes of Claim or Counterclaim

**(a)** A party may at any time prior to the close of the hearing or by the date established by the arbitrator increase or decrease the amount of its claim or counterclaim. Written notice of the change of claim amount must be provided to the AAA and all parties.

**(b)** Any new or different claim or counterclaim, as opposed to an increase or decrease in the amount of a pending claim or counterclaim, shall be made in writing and filed with the AAA, and a copy shall be provided to the other party, who shall have a period of 14 calendar days from the date of such transmittal within which to file an answer to the proposed change of claim or counterclaim with the AAA. After the arbitrator is appointed no new or different claim or counterclaim may be submitted without the arbitrator's consent.

## R-7. Consolidation or Joinder

**(a)** If the parties are unable to agree to consolidate related arbitrations or to the joinder of parties to an ongoing arbitration, the AAA shall directly appoint a single arbitrator (hereinafter referred to as the R-7 arbitrator) for the limited purpose of deciding whether related arbitrations should be consolidated or parties joined.

**(i)** To request consolidation of arbitrations, the requesting party must have filed a demand for arbitration, including the applicable arbitration provision(s) from the parties' contract(s) and must provide a written request for consolidation which outlines the reasons for such request. It is the requesting party's responsibility to provide a copy of the request to all parties.

**(ii)** To request joinder of parties, the requesting party must file a written request to join parties to an existing arbitration which provides the names and contact information for such parties, names and contact information for the parties' representatives, if known and the reasons for such request. It is the requesting party's responsibility to provide a copy of the request to all parties.

**(b)** Absent agreement of all parties, the R-7 arbitrator appointed under this Rule shall not be an arbitrator who is appointed to any pending case involved in the consolidation request at issue.

**(c)** If the R-7 arbitrator determines that separate arbitrations shall be consolidated or that the joinder of additional parties is permissible, that arbitrator may also establish a process for selecting arbitrators for any ongoing or newly constituted case and, unless agreed otherwise by the parties, the allocation of responsibility for arbitrator compensation among the parties, subject to reapportionment by the arbitrator(s) appointed to the newly constituted case in the final arbitration award.

**(d)** The AAA may take reasonable administrative action to accomplish the consolidation or joinder as directed by the arbitrator.

**(e)** The AAA shall maintain a panel of construction attorneys who have experience with consolidation or joinder issues. All arbitrators appointed to hear requests under this Rule shall be appointed from that panel, unless the parties agree otherwise.

## R-8. Interpretation and Application of Rules

The arbitrator shall interpret and apply these Rules insofar as they relate to the arbitrator's powers and duties. When there is more than one arbitrator and a difference arises among them concerning the meaning or application of these Rules, it shall be decided by a majority vote. If that is not possible, either an arbitrator or a party may refer the question to the AAA for final decision. All other rules shall be interpreted and applied by the AAA.

## R-9. Jurisdiction

**(a)** The arbitrator shall have the power to rule on his or her own jurisdiction, including any objections with respect to the existence, scope or validity of the arbitration agreement.

**(b)** The arbitrator shall have the power to determine the existence or validity of a contract of which an arbitration clause forms a part. Such an arbitration clause shall be treated as an agreement independent of the other terms of the contract. A decision by the arbitrator that the contract is null and void shall not for that reason alone render invalid the arbitration clause.

**(c)** A party must object to the jurisdiction of the arbitrator or to the arbitrability of a claim or counterclaim no later than the filing of the answering statement to the claim or counterclaim that gives rise to the objection. The arbitrator may rule on such objections as a preliminary matter or as part of the final award.

## R-10. Mediation

**(a)** At any stage of the proceedings, the parties may agree to conduct a mediation conference under the AAA Construction Industry Mediation Procedures in order to facilitate settlement. Unless requested by all parties, the mediator shall not be an arbitrator appointed to the case. Should the parties jointly request that the arbitrator serve as a mediator, the arbitrator's consent to do so is also required.

**(b)** If the case is initially filed for arbitration and the parties subsequently agree to mediate, unless the parties agree otherwise, or in the absence of party agreement, by the decision of the arbitrator, the arbitration process shall not be stayed while the mediation is pending.

## R-11. Administrative Conference

**(a)** Before the appointment of the arbitrator, any party may request, or the AAA, in its discretion, may schedule an administrative conference with a representative of the AAA and the parties and/or their representatives.

**(b)** The purpose of the administrative conference is to organize and expedite the arbitration, explore administrative details, establish an efficient means of selecting an arbitrator, ascertain the parties' preferred arbitrator qualifications and to consider

mediation as a dispute resolution option and to address other appropriate concerns of the parties, including but not limited to joinder of parties, consolidation of related cases, changes to claims and the possibility of proceeding through the submission of documents only as set out in optional Section D of the Rules, may also be explored.

**(c)** Administrative conferences may be convened, at the AAA's discretion or at the request of any party, at other times during the case to address case management matters that do not require the arbitrator's involvement.

### R-12. Fixing of Locale (the city, county, state, territory and, if applicable, country of the arbitration)

The parties may mutually agree to the locale where the arbitration is to be held. Any disputes regarding the locale must be submitted to the AAA and all other parties within 14 calendar days from the date of the AAA's initiation of the case or the date established by the AAA. Disputes regarding locale shall be determined in the following manner:

**(a)** When the parties' arbitration agreement is silent with respect to locale and the parties are unable to agree upon a locale, the locale shall be the city nearest to the site of the project in dispute, as determined by the AAA, subject to the power of the arbitrator to finally determine the locale within 14 calendar days after the date of the preliminary hearing.

**(b)** When the parties' arbitration agreement requires a specific locale, absent the parties' agreement to change it, the locale shall be that specified in the arbitration agreement.

**(c)** If the reference to a locale in the arbitration agreement is ambiguous and the parties are unable to agree to a specific locale, the AAA shall determine the locale, subject to the power of the arbitrator to finally determine the locale within 14 calendar days after the date of the preliminary hearing.

The arbitrator, at the arbitrator's sole discretion, shall have the authority to conduct special hearings for document production purposes or otherwise at other locations if reasonably necessary and beneficial to the process.

### R-13. Date, Time and Place of Hearing

The arbitrator shall set the date, time, and place for each hearing and/or conference. The parties shall respond to requests for hearing dates in a timely manner, be cooperative in scheduling the earliest practicable date, and adhere to the established hearing schedule. The AAA shall provide notice of hearing to the parties at least 7 calendar days in advance of the hearing date, unless otherwise agreed by the parties or so directed by the arbitrator.

## R-14. Arbitrator Appointment from National Construction Panel

If the parties have not appointed an arbitrator and have not provided any other method of appointment, the arbitrator shall be appointed in the following manner:

**(a)** Immediately after the filing of the submission or the answering statement or the expiration of the time within which the answering statement is to be filed, the AAA shall send simultaneously to each party to the dispute an identical list of 10 (unless the AAA decides that a different number is appropriate) names of persons chosen from the National Construction Panel. The parties are encouraged to agree on an arbitrator from the submitted list and to advise the AAA of their agreement.

**(b)** If the parties are unable to agree upon an arbitrator, each party to the dispute shall have 14 calendar days from the transmittal date in which to strike names objected to, number the remaining names in order of preference, and return the list to the AAA.

The parties shall not exchange arbitrator selection lists. If a party does not return the list within the time specified by the AAA, all persons named therein shall be deemed acceptable by that party. From among the persons who have been approved on both lists, and in accordance with the designated order of mutual preference, the AAA shall invite the acceptance of an arbitrator to serve.

**(c)** If the parties fail to agree on any of the persons named, or if acceptable arbitrators are unable to act, or if for any other reason the appointment cannot be made from the submitted lists, the AAA shall have the authority to make the appointment from among other members of the National Construction Panel without the submission of additional lists.

**(d)** Unless the parties agree otherwise, when there are two or more claimants or two or more respondents, the AAA may appoint all the arbitrators without the submission of lists.

**(e)** In a three-arbitrator case, the parties shall first attempt to agree on the professional backgrounds of the composition of the arbitration panel. If the parties are unable to agree, then the AAA shall determine the professional composition of the panel, taking into account any preferences expressed by the parties.

The AAA may provide the parties with lists, separated by industry, in order for the parties to select arbitrators from different professional backgrounds. If separate lists are used, the total number of names will be no less than 15, unless the AAA determines otherwise.

## R-15. Direct Appointment by a Party

**(a)** If the agreement of the parties names an arbitrator or specifies a method of appointing an arbitrator, that designation or method shall be followed. The notice of appointment, with the name, address and telephone number and fax number and email, if known, of the arbitrator, shall be filed with the AAA by the appointing party. Upon the request of any appointing party, the AAA shall submit a list of members of the National Construction Panel from which the party may, if it so desires, make the appointment.

**(b)** Where the parties have agreed that each party is to name one arbitrator, the arbitrators so named must meet the standards of R-20 with respect to impartiality and independence unless the parties have specifically agreed pursuant to R-20(a) that the party-appointed arbitrators are to be non-neutral and need not meet those standards.

**(c)** If the agreement specifies a period of time within which an arbitrator shall be appointed and any party fails to make the appointment within that period, the AAA shall make the appointment.

**(d)** If no period of time is specified in the agreement, the AAA shall notify the party to make the appointment. If within 14 calendar days after such notice has been sent, an arbitrator has not been appointed by a party, the AAA shall make the appointment.

### R-16. Appointment of Chairperson by Party-Appointed Arbitrators or Parties

**(a)** If, pursuant to Section R-15, either the parties have directly appointed arbitrators, or the arbitrators have been appointed by AAA and the parties have authorized those arbitrators to appoint a chairperson within a specified time and no appointment is made within that time or any agreed extension, the AAA may appoint the chairperson.

**(b)** If no period of time is specified for appointment of the chairperson and the party-appointed arbitrators or the parties do not make the appointment within 14 calendar days from the date of the appointment of the last party-appointed arbitrator, the AAA may appoint the chairperson.

**(c)** If the parties have agreed that their party-appointed arbitrators shall appoint the chairperson from the National Construction Panel, the AAA shall furnish to the party-appointed arbitrators, in the manner provided in Section R-14, a list selected from the National Construction Panel, and the appointment of the chairperson shall be made as provided in that Section.

### R-17. Nationality of Arbitrator in International Arbitration

Where the parties are nationals of different countries, the AAA, at the request of any party or on its own initiative, may appoint as arbitrator a national of a country other than that of any of the parties. The request must be made before the time set for the appointment of the arbitrator as agreed by the parties or set by these rules.

### R-18. Number of Arbitrators

**(a)** If the parties have not agreed on the number of arbitrators, the dispute shall be heard and determined by one arbitrator, unless the AAA, in its discretion, directs that three arbitrators be appointed. A party may request three arbitrators in the demand or answer, which request the AAA will consider in exercising its discretion regarding the number of arbitrators appointed to the dispute.

**(b)** Any request for a change in the number of arbitrators as a result of an increase or decrease in the amount of a claim must be made to the AAA and the other parties to the arbitration no later than 7 calendar days after receipt of the R-6 required notice of change of claim amount. If the parties are unable to agree with respect to the request for a change in the number of arbitrators, the AAA shall make that determination.

## R-19. Disclosure

**(a)** Any person appointed or to be appointed as an arbitrator as well as the parties and their representatives shall disclose to the AAA, as promptly as practicable, any circumstance likely to give rise to justifiable doubt as to the arbitrator's impartiality or independence, including any bias or any financial or personal interest in the result of the arbitration or any past or present relationship with the parties or their representatives. Such obligation shall remain in effect throughout the arbitration.

**(b)** Upon receipt of such information from the arbitrator or another source, the AAA shall communicate the information to the parties and, if it deems it appropriate to do so, to the arbitrator and others.

**(c)** In order to encourage disclosure by arbitrators, disclosure of information pursuant to this Section R-19 is not to be construed as an indication that the arbitrator considers that the disclosed circumstances is likely to affect impartiality or independence.

## R-20. Disqualification of Arbitrator

**(a)** Any arbitrator shall be impartial and independent and shall perform his or her duties with diligence and in good faith, and may be subject to disqualification for

**(i)** Partiality or lack of independence,

**(ii)** Inability or refusal to perform his or her duties with diligence and in good faith, and

**(iii)** Any grounds for disqualification provided by applicable law.

The parties may agree in writing, however, that arbitrators directly appointed by a party pursuant to Section R-15 shall be non-neutral, in which case such arbitrators need not be impartial or independent and shall not be subject to is disqualification for partiality or lack of independence.

**(b)** Upon objection of a party to the continued service of an arbitrator, or on its own initiative, the AAA shall determine whether the arbitrator should be disqualified under the grounds set out above, and shall inform the parties of its decision, which decision shall be conclusive.

## R-21. Communication with Arbitrator and the AAA

**(a)** No party and no one acting on behalf of any party shall communicate *ex-parte* with an arbitrator except as follows: A party or anyone acting on behalf of a party may

communicate *ex-parte* with a candidate for direct appointment pursuant to Section R-15 in order to advise the candidate of the general nature of the controversy, and of the anticipated proceedings and to discuss the candidate's qualifications, availability, or independence in relation to the parties or to discuss the suitability of candidates for selection as a third arbitrator where the parties or party-designated arbitrators are to participate in that selection.

**(b)** R-21(a) does not apply to arbitrators directly appointed by the parties who, pursuant to R-20(a), the parties have agreed in writing are non-neutral. Where the parties have so agreed under R-20(a), the AAA shall as an administrative practice suggest to the parties that they agree further that R-21(a) should nonetheless apply prospectively.

**(c)** In the course of administering an arbitration, the AAA and the parties or anyone acting on behalf of any of the parties may communicate with each other either jointly or individually.

**(d)** As set forth in R-41, unless otherwise instructed by the AAA or by the arbitrator, any documents submitted by any party to the AAA or to the arbitrator shall simultaneously be provided to the other party or parties to the arbitration.

### R-22. Vacancies

**(a)** If for any reason an arbitrator is unable to perform the duties of the office, the AAA may, on proof satisfactory to it, declare the office vacant. Vacancies shall be filled in accordance with the applicable provisions of these Rules.

**(b)** In the event of a vacancy in a panel of neutral arbitrators after the hearings have commenced, the remaining arbitrator or arbitrators may continue with the hearing and determination of the controversy, unless the parties agree otherwise.

**(c)** In the event of the appointment of a substitute arbitrator, the panel of arbitrators shall determine in its sole discretion whether it is necessary to repeat all or part of any prior hearings.

### R-23. Preliminary Management Hearing

As promptly as practicable after the selection of the arbitrator(s), a preliminary management hearing shall be held among the parties and/or their attorneys or other authorized representatives and the arbitrator(s). Unless the parties agree otherwise or the arbitrator specifically directs otherwise, the preliminary management hearing will be conducted by telephone rather than in person.

At the Preliminary Management Hearing the matters to be discussed may include:

**(a)** The issues to be arbitrated, including:

**(i)** review of claims as set forth in the parties' claims and counterclaims;

**(ii)** the schedule for specification of any undisclosed claims or counterclaims;

**(iii)** deadlines for amending claims, if the arbitrator deems appropriate;

**(iv)** whether claims for attorneys' fees, costs, interest or any other similar claims exist;

**(v)** if any limitations exist on the arbitrator's authority to award any of the remedies sought.

**(b)** The identification of any ongoing, related litigation or other dispute resolution.

**(c)** The procedures for maintaining an efficient and cost effective dispute resolution process, including:

**(i)** the extent to which testimony may be admitted at the hearing telephonically, over the internet, by affidavit, or by any other means;

**(ii)** the overall cost of the dispute resolution process as structured through this management hearing;

**(iii)** exhibit management;

**(iv)** a review of possible cost- and time-saving steps.

**(d)** The date, time, place, and estimated duration of the hearings.

**(e)** The scope and timing of exchange of information.

**(f)** The need for pre- or post- hearing submissions and schedules for the same if applicable.

**(g)** The schedule for submission of witness lists.

**(h)** The form of award.

**(i)** Any other matters the arbitrator deems appropriate.

The arbitrator shall promptly issue written orders reflecting his or her decisions on the above matters and may conduct additional conferences when the need arises.

## R-24. Exchange of Information

**(a)** At the request of any party or at the discretion of the arbitrator, consistent with the expedited nature of arbitration, the arbitrator may direct

**(i)** the production of documents and other information, and

**(ii)** the identification of any witnesses to be called.

**(b)** At least 7 calendar days prior to the hearing, or by the date established by the arbitrator, the parties shall exchange copies of all exhibits they intend to submit at the hearing.

**(c)** The arbitrator is authorized to resolve any disputes concerning the exchange of information.

**(d)** There shall be no other discovery, except as indicated herein, unless so ordered by the arbitrator in exceptional cases.

### R-25. Attendance at Hearings

The arbitrator and the AAA shall maintain the privacy of the hearings unless the law provides to the contrary. Any person having a direct interest in the arbitration is entitled to attend hearings. The arbitrator shall otherwise have the power to require the exclusion of any witness, other than a party or other essential person, during the testimony of any other witness. It shall be discretionary with the arbitrator to determine the propriety of the attendance of any person other than a party and its representative.

### R-26. Representation

Any party may participate without representation (pro-se), or by counsel or any other representative of that party's choosing, unless such choice is prohibited by applicable law. A party intending to have representation shall notify the other party and the AAA of the name, telephone number and address, and email address if available of the representative at least 7 calendar days prior to the date set for the hearing at which that person is first to appear. When such a representative initiates an arbitration or responds for a party, notice is deemed to have been given.

### R-27. Oaths

Before proceeding with the first hearing, each arbitrator may take an oath of office and, if required by law, shall do so. The arbitrator may require witnesses to testify under oath administered by any duly qualified person and, if it is required by law or requested by any party, shall do so.

### R-28. Stenographic Record

**(a)** Any party desiring a stenographic record shall make arrangements directly with a stenographer and shall notify the other parties of these arrangements at least 7 calendar days in advance of the hearing. The requesting party or parties shall pay the cost of the record.

**(b)** No other means of recording the proceedings will be permitted absent the agreement of the parties or per the direction of the arbitrator.

**(c)** If the transcript or any other recording is agreed by the parties and determined by the arbitrator to be the official record of the proceeding, it must be provided to the arbitrator and made available to the other parties for inspection, at a date, time, and place determined by the arbitrator.

**(d)** The arbitrator may resolve any disputes with regard to apportionment of the costs of the stenographic record or other recording.

### R-29. Interpreters

Any party wishing an interpreter shall make all arrangements directly with the interpreter and shall assume the costs of the service.

### R-30. Postponements of Hearings

The arbitrator for good cause shown may postpone any hearing upon agreement of the parties, upon request of a party, or upon the arbitrator's own initiative.

### R-31. Arbitration in the Absence of a Party or Representative

Unless the law provides to the contrary, the arbitration may proceed in the absence of any party or representative who, after due notice, fails to be present or fails to obtain a postponement. An award shall not be made solely on the default of a party. The arbitrator shall require the party who is present to submit such evidence as the arbitrator may require for the making of an award.

### R-32. Conduct of Proceedings

**(a)** The claimant shall present evidence to support its claim. The respondent shall then present evidence supporting its defense. Witnesses for each party shall also submit to questions from the arbitrator and the adverse party. The arbitrator has the discretion to vary this procedure, provided that the parties are treated with equality and that each party has the right to be heard and is given a fair opportunity to present its case.

**(b)** The arbitrator, exercising his or her discretion, shall conduct the proceedings with a view toward expediting the resolution of the dispute and may direct the order of proof, bifurcate proceedings, and direct the parties to focus their presentations on issues the decision of which could dispose of all or part of the case.

When deemed appropriate, the arbitrator may also allow for the presentation of evidence by alternative means including video conferencing, internet communication, telephonic conferences and means other than an in-person presentation. Such alternative means must still afford a full opportunity for all parties to present any evidence that the arbitrator deems material and relevant to the resolution of the dispute and when involving witnesses, provide that such witness submit to examination.

**(c)** The arbitrator may entertain motions, including motions that dispose of all or part of a claim, or that may expedite the proceedings, and may also make preliminary rulings and enter interlocutory orders.

**(d)** The parties may agree to waive oral hearings in any case.

## R-33. Evidence

**(a)** The parties may offer such evidence as is relevant and material to the dispute and shall produce such evidence as the arbitrator may deem necessary to an understanding and determination of the dispute. Conformity to legal rules of evidence shall not be necessary.

**(b)** The arbitrator shall determine the admissibility, relevance, and materiality of the evidence offered. The arbitrator may request offers of proof and may reject evidence deemed by the arbitrator to be cumulative, unreliable, unnecessary, or of slight value compared to the time and expense involved. All evidence shall be taken in the presence of all of the arbitrators and all of the parties, except where: 1) any of the parties is absent, in default, or has waived the right to be present, or 2) the parties and the arbitrators agree otherwise.

**(c)** The arbitrator shall take into account applicable principles of legal privilege, such as those involving the confidentiality of communications between a lawyer and client.

**(d)** An arbitrator or other person authorized by law to subpoena witnesses or documents may do so upon the request of any party or independently. Parties who request that an arbitrator sign a subpoena shall provide a copy of the request and proposed subpoena to the other parties to the arbitration simultaneously upon making the request to the arbitrator.

## R-34. Evidence by Affidavit and Post-hearing Filing of Documents or Other Evidence

**(a)** The arbitrator may receive and consider the evidence of witnesses by declaration or affidavit, and shall give it such weight as the arbitrator deems it entitled to after consideration of any objection made to its admission.

**(b)** If the parties agree or the arbitrator directs that documents or other evidence be submitted to the arbitrator after the hearing, the documents or other evidence, unless otherwise agreed by the parties and the arbitrator, shall be filed with the AAA for transmission to the arbitrator. All parties shall be afforded an opportunity to examine and respond to such documents or other evidence.

## R-35. Inspection or Investigation

An arbitrator finding it necessary to make a site inspection or other investigation in connection with the arbitration shall set the date and time for such inspection or investigation and shall direct the AAA to so notify the parties. Any party who so desires may be present at such an inspection or investigation. Absent agreement of the parties, the arbitrator shall not undertake a site inspection unless all parties are present. In the event of a case proceeding in the absence of a party pursuant to Section R- 31 of these Rules, agreement of the parties for the arbitrator to proceed without all parties' present is not necessary so long as sufficient notice of the inspection or investigation is provided.

## R-36. Interim Measures

**(a)** The arbitrator may take whatever interim measures he or she deems necessary, including injunctive relief and measures for the protection or conservation of property and disposition of perishable goods.

**(b)** Such interim measures may be taken in the form of an interim award, and the arbitrator may require security for the costs of such measures. If it has been determined that an interim award is needed, the arbitrator shall establish a reasonable due date for issuing the interim award. In the event an arbitrator does not promptly establish such a due date, the AAA shall set the due date.

**(c)** A request for interim measures addressed by a party to a judicial authority shall not be deemed incompatible with the agreement to arbitrate or a waiver of the right to arbitrate.

**(d)** The arbitrator shall have the discretion to apportion costs associated with the application for any interim relief in the interim award or in the final award.

## R-37. Closing of Hearing

**(a)** The arbitrator shall specifically inquire of all parties whether they have any further proofs to offer or witnesses to be heard. Upon receiving negative replies or if satisfied that the record is complete, the arbitrator shall declare the hearing closed.

**(b)** If documents or responses are to be filed as provided in Section R-34 (b), or if briefs are to be filed, the hearing shall be declared closed as of the final due date set by the arbitrator for the receipt of documents, responses, or briefs. If no documents, responses or briefs are to be filed, the arbitrator shall declare the hearings closed as of the date of the last hearing (including telephonic hearings). If the case was heard without any oral hearings, the arbitrator shall close the hearings upon the due date established for receipt of the final submission.

**(c)** The time limit which the arbitrator is required to make the award shall commence, in the absence of other agreements by the parties, upon the closing of the hearing. The AAA may extend the time limit for the rendering of the award only in unusual and extreme circumstances.

## R-38. Reopening of Hearing

The hearing may be reopened on the arbitrator's initiative, or by direction of the arbitrator upon application of a party, at any time before the award is made. If reopening the hearing would prevent the making of the award within the specific time agreed to by the parties in the arbitration agreement, the matter may not be reopened unless the parties agree to an extension of time. When no specific date is fixed by agreement of the parties, the arbitrator shall have 30 calendar days from the closing of the reopened hearing within which to make an award (14 calendar days if the case is governed by the Fast Track Procedures).

### R-39. Waiver of Rules

Any party who proceeds with the arbitration after knowledge that any provision or requirement of these Rules has not been complied with and who fails to state an objection in writing shall be deemed to have waived the right to object.

### R-40. Extensions of Time

**(a)** The parties may modify any period of time by mutual agreement, provided that any such modification that adversely affects the efficient resolution of the dispute is subject to review and approval by the arbitrator. The AAA or the arbitrator may for good cause extend any period of time established by these rules, except as set forth in R-37 (c).

**(b)** The AAA shall notify the parties of any extension.

### R-41. Serving of Notice

**(a)** Any papers, notices, or process necessary or proper for the initiation or continuation of an arbitration under these rules; for any court action in connection therewith, or for the entry of judgment on any award made under these rules, may be served on a party by mail addressed to the party or its representative at the last known address or by personal service, in or outside the state where the arbitration is to be held, provided that reasonable opportunity to be heard with regard thereto has been granted to the party.

**(b)** The AAA, the arbitrator and the parties may also use overnight delivery, electronic fax transmission (fax) or electronic mail (email) to give the notices required by these rules. Where all parties and the arbitrator agree, notices may be transmitted by other methods of communication.

**(c)** Unless otherwise instructed by the AAA or by the arbitrator, any documents submitted by any party to the AAA or to the arbitrator shall simultaneously be provided to the other party or parties to the arbitration.

### R-42. Majority Decision

When the panel consists of more than one arbitrator, unless required by law or by the arbitration agreement, a majority of the arbitrators must make all decisions; however, in a multi-arbitrator case, if all parties and all arbitrators agree, the chair of the panel may make procedural decisions.

## R-43. Time of Award

The award shall be made promptly by the arbitrator and, unless otherwise agreed by the parties or specified by law, no later than 30 calendar days from the date of closing the hearing, or, if oral hearings have been waived, from the due date set for receipt of the parties' final statements and proofs.

## R-44. Form of Award

**(a)** Any award shall be in writing and signed by a majority of the arbitrators. It shall be executed in the form and manner required by law.

**(b)** In all cases, unless waived by agreement of the parties, the arbitrator shall provide a concise written financial breakdown of any monetary awards and, if there are non-monetary components of the claims or counterclaims, the arbitrator shall include a line item disposition of each non-monetary claim or counterclaim.

**(c)** The parties may request a specific form of award, including a reasoned opinion, an abbreviated opinion, findings of fact or conclusions of law no later than the conclusion of the first Preliminary Management Hearing. If the parties agree on a form of award other than that specified in R-44(b) of these Rules the arbitrator shall provide the form of award agreed upon. If the parties disagree with respect to the form of the award, the arbitrator shall determine the form of award. After the conclusion of the Preliminary Management Hearing, the parties may not change the form of the award without the arbitrator's express consent. In such event, the arbitrator shall confirm the nature of the change to the form of award.

## R-45. Scope of Award

**(a)** The arbitrator may grant any remedy or relief that the arbitrator deems just and equitable and within the scope of the agreement of the parties, including, but not limited to, equitable relief and specific performance of a contract.

**(b)** In addition to the final award, the arbitrator may make other decisions, including interim, interlocutory, or partial rulings, orders, and awards. In any interim, interlocutory, or partial award, the arbitrator may assess and apportion the fees, expenses, and compensation related to such award as the arbitrator determines is appropriate.

**(c)** In the final award, the arbitrator shall assess fees, expenses, and compensation as provided in Sections R-52, R-53, and R-54. The arbitrator may apportion such fees, expenses, and compensation among the parties in such amounts as the arbitrator determines is appropriate.

**(d)** The award of the arbitrator may include:

- **(i)** interest at such rate and from such date as the arbitrator may deem appropriate; and
- **(ii)** an award of attorneys' fees if all parties have requested such an award or it is authorized by law or their arbitration agreement.

### R-46. Award Upon Settlement

**(a)** If the parties settle their dispute during the course of the arbitration and if the parties so request, the arbitrator may set forth the terms of the settlement in a "consent award." A consent award must include an allocation of arbitration costs, including administrative fees and expenses as well as arbitrator fees and expenses.

**(b)** The consent award shall not be released to the parties until all administrative fees and all arbitrator compensation amounts have been paid in full.

### R-47. Delivery of Award to Parties

Parties shall accept as notice and delivery of the award the placing of the award or a true copy thereof in the mail addressed to the parties or their representatives at the last known address, personal or electronic service of the award, or the filing of the award in any other manner that is permitted by law.

### R-48. Modification of Award

**(a)** Within 20 calendar days after the transmittal of an award, the arbitrator on his or her initiative, or any party, upon notice to the other parties, may request that the arbitrator correct any clerical, typographical, technical or computational errors in the award. The arbitrator is not empowered to re-determine the merits of any claim already decided.

**(b)** If the modification request is made by a party, the other parties shall be given 10 calendar days to respond to the request. The arbitrator shall dispose of the request within 20 calendar days after transmittal by the AAA to the arbitrator of the request and any response thereto.

**(c)** If applicable law provides a different procedural time frame, that procedure shall be followed.

### R-49. Release of Documents

The AAA shall, upon the written request of a party to the arbitration, furnish to that party, at its expense, copies or certified copies of papers in the AAA's possession that are not determined by the AAA to be privileged or confidential.

### R-50. Withdrawal of Claims or Counterclaims

**(a)** Once the AAA has provided notice to the parties that the filing requirements for a claim or counterclaim have been met, no claim or counterclaim may be withdrawn unless the parties agree or the arbitrator consents.

**(b)** Disputes regarding whether a claim or counterclaim is withdrawn with or without prejudice may be decided by the arbitrator.

## R-51. Applications to Court and Exclusion of Liability

**(a)** No judicial proceeding by a party relating to the subject matter of the arbitration shall be deemed a waiver of the party's right to arbitrate.

**(b)** Neither the AAA nor any arbitrator in a proceeding under these Rules is a necessary or proper party in judicial proceedings relating to the arbitration.

**(c)** Parties to these Rules shall be deemed to have consented that judgment upon the arbitration award may be entered in any federal or state court having jurisdiction thereof.

**(d)** Parties to an arbitration under these Rules shall be deemed to have consented that neither the AAA nor any arbitrator shall be liable to any party in any action for damages, injunctive or declaratory relief for any act or omission in connection with any arbitration under these rules.

**(e)** Parties to an arbitration under these Rules may not call the arbitrator, the AAA or AAA employees as a witness in litigation or any other proceeding relating to the arbitration. The arbitrator, the AAA and AAA employees are not competent to testify as witnesses in any such proceeding.

## R-52. Administrative Fees

As a not-for-profit organization, the AAA shall prescribe filing and other administrative fees and service charges to compensate it for the cost of providing administrative services. The fees in effect when the fee or charge is incurred shall be applicable.

The filing fee shall be advanced by the party or parties, subject to final apportionment by the arbitrator in the award.

The AAA may, in the event of extreme hardship on the part of any party, defer or reduce the administrative fees.

## R-53. Expenses

The expenses of witnesses for either side shall be paid by the party producing such witnesses. All other expenses of the arbitration, including required travel and other expenses of the arbitrator, AAA representatives, and any witness and the cost of any proof produced at the direct request of the arbitrator, shall be borne equally by the parties, unless they agree otherwise or unless the arbitrator in the award assesses such expenses or any part thereof against any specified party or parties.

## R-54. Neutral Arbitrator's Compensation

**(a)** Arbitrators shall be compensated at rate consistent with the arbitrator's stated rate of compensation.

**(b)** Absent an agreement of the parties otherwise, or as determined by an arbitrator appointed under the auspices of Section R-7, each party shall share equally in the compensation of the arbitrator, subject to reapportionment in the final award. In the event that multiple parties are participating in the arbitration through a single representative, the AAA may consider them a single party for the purposes of allocating arbitrator compensation.

**(c)** If there is disagreement concerning the terms of compensation, an appropriate rate shall be established with the arbitrator by the Association and confirmed to the parties.

**(d)** Any arrangement for the compensation of a neutral arbitrator shall be made through the AAA and not directly between the parties and the arbitrator.

**(e)** The arbitrator's requests for payment shall be made available to the parties upon request.

## R-55. Deposits

**(a)** The AAA may require the parties to deposit in advance of any hearings such sums of money as it deems necessary to cover the expense of the arbitration, including the arbitrator's fee, if any, and shall render an accounting to the parties and return any unexpended balance at the conclusion of the case.

**(b)** Other than in cases where the arbitrator serves for a flat fee, deposit amounts requested will be based on estimates provided from the arbitrator. The arbitrator will determine the estimated amount of deposits using the information provided by the parties with respect to the complexity or length of each case.

**(c)** Upon the request of any party, the AAA shall request from the arbitrator an itemization or explanation of the arbitrator's request for deposits.

## R-56. Remedies for Nonpayment

**(a)** If arbitrator compensation or administrative charges have not been paid in full, the AAA may so inform the parties in order that one of them may advance the required payment.

**(b)** Upon receipt of information from the AAA that payment for administrative charges or deposits for arbitrator compensation have not been paid in full, to the extent the law allows, a party may request that the arbitrator issue an order directing what measures might be taken in light of a party's non-payment.

Such measures may include limiting a party's ability to assert or pursue their claim. In no event, however, shall a party be precluded from defending a claim or counterclaim. The arbitrator must provide the party opposing a request for such

measures with the opportunity to respond prior to making any such determination. In the event that the arbitrator grants any request for relief which limits any party's participation in the arbitration, the arbitrator shall require the party who is making a claim and who has made appropriate payments, to submit such evidence as the arbitrator may require for the making of an award.

**(c)** Upon receipt of information from the AAA that full payments have not been received, the arbitrator, on the arbitrator's own initiative, may order the suspension of the arbitration. If no arbitrator has yet been appointed, the AAA may suspend the proceedings.

**(d)** If arbitrator's compensation or administrative fees remain unpaid after a determination to suspend an arbitration due to non payment, the arbitrator has the authority to terminate the proceedings. Such an order shall be in writing and signed by the arbitrator.

## Procedures for the Resolution of Disputes through Document Submission

### D-1. Applicability

**(a)** In any case, regardless of claim size, the parties may agree to waive in-person hearings and resolve the dispute through submission of documents to one arbitrator. Such agreement should be confirmed in writing no later than the deadline for the filing of an answer.

**(b)** If one party makes a request to use the Procedures for the Resolution of Disputes through Document Submission (D-Procedures) and the opposing party is unresponsive, the arbitrator shall have the power to determine whether to proceed under the D-Procedures. If both parties seek to use the D- Procedures after the appointment of an arbitrator, the arbitrator must also consent to the process.

**(c)** When parties agree to the D-Procedures, the procedures in Sections D-1 through D-4 of these Rules shall supplement other portions of these rules which are not in conflict with the D-Procedures.

### D-2. Preliminary Management Hearing

Within 14 calendar days of confirmation of the arbitrator's appointment, the arbitrator shall convene a preliminary management hearing, via conference call, video conference or internet, to establish a fair and equitable procedure for the submission of documents, and, if the arbitrator deems appropriate, a schedule for one or more telephonic or electronic conferences.

### D-3. Removal from the D Procedures

**(a)** The arbitrator has the discretion to remove the case from the D-Procedures if the arbitrator determines that an in-person hearing is necessary.

**(b)** If the parties agree to in-person hearings after a previous agreement to proceed under the D-Procedures, the arbitrator shall conduct such hearings. If a party seeks to have in-person hearing after agreeing to the D-Procedures, but there is not agreement among the parties to proceed with in-person hearings, the arbitrator shall resolve the issue after the parties have been given the opportunity to provide their respective positions on the issue.

## D-4. Time of Award

**(a)** The arbitrator shall establish the date for either final written submissions or a final telephonic or electronic conference. Such date shall operate to close the hearing and the time for the rendering of the award shall commence.

**(b)** Unless the parties have agreed to a form of award other than that set forth in Rule R-44 (b), when the parties have agreed to resolve their dispute by the D-Procedures, the arbitrator shall render the award within 14 calendar days from the date the hearing is closed.

**(c)** If the parties agree to a form of award other than that described in Rule R-44 (b), the arbitrator shall have 30 calendar days from the date the hearing is declared closed in which to render the award.

**(d)** The award is subject to all other provisions of the Regular Track of these Rules which pertain to awards.

## Fast Track Procedures

### F-1. Fast Track Applicability

The Fast Track Procedures shall apply to all two party cases where no party's disclosed claim or counterclaim exceeds $75,000.

If a claim or counterclaim is amended to exceed $75,000, the case will be administered under the Regular Track Procedures (or Large Complex Case Procedures, if applicable) unless all parties agree that the case may continue to be processed under the Fast Track Procedures.

The AAA, in its discretion, may reassign a matter to the Regular Track Procedures or, if applicable, Large Complex Case Procedures, upon the occurrence of any of the following events:

**(a)** The case is to be decided by more than one arbitrator;

**(b)** The parties agree to any information exchange beyond that permitted by Section F-8;

**(c)** The timing of the case exceeds the Time Standards set forth in Section F-12; or

**(d)** Hearing time exceeds what is allowable under Section F-11.

Where no party's claim exceeds $10,000, exclusive of interest, attorneys' fees and arbitration costs, the dispute shall be resolved by submission of documents, unless any party requests an oral hearing, or the arbitrator determines that an oral hearing or conference call is necessary. The arbitrator shall establish a fair and equitable procedure for the submission of documents, as set forth in the D-Procedures of these Rules.

### F-2. Answers and Counterclaims

If an answer or counterclaim is to be filed, it shall be filed within 7 calendar days after notice of the filing of the demand is sent by the AAA. All other requirements of Section R-4 apply.

### F- 3. Limitation on Extensions

**(a)** In the absence of extraordinary circumstances, the AAA may grant no more than one 7 calendar day extension of the time in which to respond to a demand for arbitration or a counterclaim as provided in F-2.

**(b)** All other requests for extensions of time are subject to Sections F-12 and R-40 of these Rules, as applicable.

## F-4. Changes of Claim or Counterclaim

**(a)** A party may increase or decrease the amount of its claim or counterclaim up to 7 calendar days prior to the first scheduled hearing, subject to the provisions of F-1. Such changes must be made in writing and provided to the AAA and the opposing party.

**(b)** Any new or different claim or counterclaim, as opposed to an increase or decrease in the amount of a pending claim or counterclaim, shall be made in writing and filed with the AAA, and a copy shall be provided to the other party, who shall have a period of 7 calendar days from the date of such transmittal within which to file an answer to the proposed change of claim or counterclaim with the AAA. After the arbitrator is appointed no new or different claim or counterclaim may be submitted without with the arbitrator's consent.

## F-5. Appointment and Qualification of Arbitrator

**(a)** Immediately after the filing of the submission or the answering statement or the expiration of the time within which the answering statement is to be filed, the AAA shall simultaneously submit to each party an identical list of 5 names from the Construction Panel from which one arbitrator shall be appointed.

**(b)** The parties are encouraged to agree to an arbitrator from this list, and to advise the Association of their agreement.

**(c)** If the parties cannot agree upon an arbitrator, each party may strike up to two names from the list and rank the remaining names in order of preference. The list shall be returned to the AAA within 7 calendar days of the AAA's transmission of the list. If a party does not return the list by the due date, all names shall be deemed acceptable to that party.

**(d)** The AAA will appoint the agreed-upon arbitrator, or in the event the parties cannot agree on an arbitrator, will designate the arbitrator from among those names not stricken. The parties will be given notice by the AAA of the appointment of the arbitrator, who shall be subject to disqualification for the reasons specified in R-20.

**(e)** Within the time period established by the AAA, the parties shall notify the AAA of any objection to the arbitrator appointed. Any objection by a party to the arbitrator shall be for cause and shall be confirmed in writing to the AAA with a copy to the other party or parties.

**(f)** Absent agreement of the parties, the arbitrator shall not have served as the mediator in the mediation phase of the instant proceeding.

**(g)** In the event the AAA is unable to appoint an arbitrator from the first list submitted, the AAA is empowered to appoint an arbitrator without the submission of additional lists.

## F-6. Serving of Notice for Hearing

In addition to notice being provided according to the means specified in R-41, parties shall accept notice of hearings, including preliminary hearings, by telephone, email, AAA WebFile, fax or mail.

### F-7. Preliminary Telephone Management Hearing

**(a)** A preliminary telephone conference shall be held among the parties or their representatives, and the arbitrator within 10 business days from the confirmation of the arbitrator's appointment.

**(b)** During this conference, the arbitrator shall direct the parties' preparations and presentations so that Fast Track F-12 Time Standard can be met. Arrangements made during the Preliminary Management Hearing shall be confirmed in writing to the parties.

### F-8. Exchange of Information

At least 5 business days prior to the hearing or no later than the date established by the arbitrator, the parties shall (a) exchange directly between themselves copies of all exhibits, affidavits and any other information they intend to submit at the hearing, and (b) identify all witnesses they intend to call at the hearing. The arbitrator is authorized to resolve any disputes concerning the exchange of information.

### F-9. Discovery

There shall be no discovery, except as provided in F-8 or as ordered by the arbitrator in exceptional cases.

### F-10. Date, Time and Place of Hearing

In cases in which a hearing is to be held, the arbitrator shall set the date, time, and place of the hearing. The hearing shall be set so that the time standards in F-12 will be satisfied. The AAA will notify the parties in advance of the hearing date.

### F-11. The Hearing

The hearing should not exceed one day. For good cause shown, the arbitrator may schedule additional time, which shall not exceed the equivalent of one day. The arbitrator shall schedule any additional time so as to comply with the F-12 Time Standards. At the discretion of the arbitrator, this additional time can take the form of an in-person meeting, a conference call, or some other means of taking testimony, provided that each party has the right to be heard and is given a fair opportunity to present its case.

### F-12. Time Standards

The hearing shall be closed no later than 45 calendar days after of the date of the preliminary telephone conference, unless all parties and the arbitrator agree otherwise and such agreement is memorialized by the arbitrator prior to the expiration of the initial 45 day period. Such report shall include the reason for the extension of the Time Standards. The AAA may extend the Time Standards in the event the parties agree to AAA mediation.

### F-13. Time of Award

The award shall be rendered not later than 14 calendar days from the date of the closing of the hearing or, if oral hearings have been waived, from the due date established for the receipt of the parties' final statements and proofs.

### F-14. Neutral Arbitrator's Compensation

Arbitrators serving on Fast Track cases will receive compensation at rates established by the AAA.

## Procedures for Large, Complex Construction Disputes

### L-1. Applicability

Unless the parties agree otherwise, the Procedures for Large, Complex Construction Disputes (hereinafter LCC) shall apply to all cases administered by the AAA under the Construction Industry Arbitration Rules in which the disclosed claim or counterclaim of any party is $1,000,000 or more, exclusive of claimed interest, attorneys' fees and arbitration fees and costs. Parties may agree to use these Procedures in cases involving claims or counterclaims under 1,000,000 or in cases involving non-monetary claims. The LCC Procedures are designed to complement the Regular Track of these Rules. To the extent there is any conflict between the Regular Track and the LCC procedures, the LCC Procedures shall control.

### L-2. Administrative Conference

Prior to the dissemination of a list of potential arbitrators, the AAA shall, unless the parties agree otherwise, conduct an administrative conference with the parties and/or their attorneys or other representatives by conference call. The conference call will take place within 14 calendar days after the notice that the administrative filing requirements have been satisfied. In the event the parties are unable to agree on a mutually acceptable time for the conference, the AAA may contact the parties individually to discuss the issues contemplated herein. Such administrative conference shall be conducted for the following purposes and for such additional purposed as the parties or the AAA may deem appropriate:

**(a)** to obtain additional information about the nature and magnitude of the dispute and the anticipated length of hearing and scheduling;

**(b)** to discuss the views of the parties about the technical and other qualifications of the arbitrator as well as an efficient method for selecting the arbitrator;

**(c)** to obtain conflicts statements from the parties;

**(d)** to consider, with the parties, whether mediation or other non-adjudicative methods of dispute resolution might be appropriate;

**(e)** to identify whether there are other related arbitrations or parties which may requested to consolidate or join the arbitration;

**(f)** to discuss means and methods for cost effective case management; and

**(g)** to discuss any other items which may facilitate the management of a complex arbitration.

### L-3. Arbitrators

**(a)** Large, Complex Construction Cases shall be heard and determined by either one or three arbitrators, as may be agreed upon by the parties. If the parties are unable to agree, three arbitrators shall hear the case.

**(b)** The parties are encouraged to agree upon a method for selection of the arbitrator(s). The AAA shall appoint arbitrator(s) by the method agreed upon by the parties.

**(c)** If the parties are unable to agree on a method of appointment, the AAA shall appoint arbitrator from the Large, Complex Construction Case Panel, in the manner provided in the Regular Construction Industry Arbitration Rules. The AAA shall determine the number of names on the list(s).

**(d)** Absent agreement of the parties, the arbitrator shall not have served as the mediator in the mediation phase of the instant proceeding.

### L-4. Preliminary Management Hearing

As promptly as practicable after the confirmation of the appointment of the arbitrator, a preliminary management hearing shall be held among the parties and/or their attorneys or other representatives and the arbitrator. Unless the parties agree otherwise, or unless the arbitrator determines that an in-person hearing is necessary, the preliminary hearing will be conducted by telephone conference call rather than in person.

In addition to the items enumerated in R-23, at the preliminary management hearing for LCC cases, the matters to be considered shall include, without limitation:

**(a)** service of a detailed statement of claims, damages and defenses, a statement of the issues asserted by each party and positions with respect thereto, and any legal authorities the parties may wish to bring to the attention of the arbitrator;

**(b)** stipulations to uncontested facts;

**(c)** the extent to which discovery shall be conducted;

**(d)** exchange and pre-marking of those documents which each party believes may be offered at the hearing;

**(e)** the identification and availability of witnesses, including experts, and such matters with respect to witnesses including their biographies and expected testimony as may be appropriate;

**(f)** whether, and the extent to which, any sworn statements and/or depositions may be introduced;

**(g)** the extent to which hearings will proceed on consecutive days;

**(h)** whether a stenographic or other official record of the proceedings shall be maintained;

**(i)** the possibility of utilizing mediation or other non-adjudicative methods of dispute resolution; and

**(j)** the procedure for the issuance of subpoenas; and

**(k)** such other items which may facilitate the efficient and cost effective management of the arbitration.

The arbitrator may issue an agenda in advance of the preliminary management hearing outlining the scope of the hearing in effort to efficiently manage the process and eliminate superfluous issues.

By agreement of the parties and/or order of the arbitrator, the pre-hearing activities and the hearing procedures that will govern the arbitration will be memorialized in a Scheduling and Procedure Order.

### L-5. Management of Proceedings

**(a)** The arbitrator shall take such steps as the arbitrator may deem necessary or desirable to avoid delay and to achieve a just, efficient and cost-effective resolution of Large, Complex Construction Cases.

**(b)** Parties shall cooperate in the exchange of documents, exhibits and information within such party's control if the arbitrator considers such production to be consistent with the goal of achieving a just, efficient and cost effective resolution of a Large, Complex Construction Case.

**(c)** The parties may conduct such discovery as may be agreed to by all the parties provided, however, that the arbitrator may place such limitations on the conduct of such discovery as the arbitrator shall deem appropriate. If the parties cannot agree on production of document and other information, the arbitrator, consistent with the expedited nature of arbitration, may establish the extent of the discovery.

**(d)** At the discretion of the arbitrator, upon good cause shown and consistent with the expedited nature of arbitration, the arbitrator may order depositions of, or the propounding of interrogatories to such persons who may possess information determined by the arbitrator to be necessary to a determination of the matter.

**(e)** The parties shall exchange copies of all exhibits they intend to submit at the hearing 10 calendar days prior to the hearing unless the arbitrator determines otherwise.

**(f)** The exchange of information pursuant to this Rule, as agreed by the parties and/or directed by the arbitrator, shall be included within the Scheduling and Procedure Order.

**(g)** The arbitrator is authorized to resolve any disputes concerning the exchange of information.

**(h)** Generally hearings will be scheduled on consecutive days or in blocks of consecutive days in order to maximize efficiency and minimize costs.

## L-6. Form of Award

In addition to the award requirements set forth in R-44 (a) and (b) unless the parties agree otherwise, the arbitrator shall issue a reasoned award.

## Administrative Fee Schedules (Standard And Flexible Fees)

The AAA has two administrative fee options for parties filing claims or counterclaims, the Standard Fee Schedule and Flexible Fee Schedule. The Standard Fee Schedule has a two payment schedule, and the Flexible Fee Schedule has a three payment schedule which offers lower initial filing fees, but potentially higher total administrative fees of approximately 12% to 19% for cases that proceed to a hearing. The administrative fees of the AAA are based on the amount of the claim or counterclaim. Arbitrator compensation is not included in this schedule. Unless the parties agree otherwise, arbitrator compensation and administrative fees are subject to allocation by the arbitrator in the award.

**Fees for incomplete or deficient filings:** Where the applicable arbitration agreement does not reference the AAA, the AAA will attempt to obtain the agreement of the other parties to the dispute to have the arbitration administered by the AAA. However, where the AAA is unable to obtain the agreement of the parties to have the AAA administer the arbitration, the AAA will administratively close the case and will not proceed with the administration of the arbitration. In these cases, the AAA will return the filing fees to the filing party, less the amount specified in the fee schedule below for deficient filings.

Parties that file demands for arbitration that are incomplete or otherwise do not meet the filing requirements contained in these Rules shall also be charged the amount specified below for deficient filings if they fail or are unable to respond to the AAA's request to correct the deficiency.

**Fees for additional services:** The AAA reserves the right to assess additional administrative fees for services performed by the AAA beyond those provided for in these Rules which may be required by the parties' agreement or stipulation.

### Standard Fee Schedule

An Initial Filing Fee is payable in full by a filing party when a claim, counterclaim, or additional claim is filed. A Final Fee will be incurred for all cases that proceed to their first hearing. This fee will be payable in advance at the time that the first hearing is scheduled. This fee will be refunded at the conclusion of the case if no hearings have occurred. However, if the Association is not notified at least 24 hours before the time of the scheduled hearing, the Final Fee will remain due and will not be refunded.

These fees will be billed in accordance with the following schedule:

| AMOUNT OF CLAIM | INITIAL FILING FEE | FINAL FEE |
|---|---|---|
| Above $0 to $10,000 | $775 | $200 |
| Above $10,000 to $75,000 | $975 | $300 |
| Above $75,000 to $150,000 | $1,850 | $750 |
| Above $150,000 to $300,000 | $2,800 | $1,250 |
| Above to $300,000 to $500,000 | $4,350 | $1,750 |
| Above to $500,000 to $1,000,000 | $6,200 | $2,500 |
| Above $1,000,000 to $5,000,000 | $8,200 | $3,250 |
| Above $5,000,000 to $10,000,000 | $10,200 | $4,000 |
| Above $10,000,000 | Base fee of $12,800 plus .01% of the amount above $10,000,000 Fee Capped at $65,000 | $6,000 |
| Nonmonetary claims[1] | $3,350 | $1,250 |
| Deficient Claim Filing Fee[2] | $350 | |
| Additional Services[3] | | |

[1] *This fee is applicable when a claim or counterclaim is not for a monetary amount. Where a monetary claim amount is not known, parties will be required to state a range of claims or be subject to a filing fee of $10,200.*

[2] *The Deficient Claim Filing Fee shall not be charged in cases filed by a consumer in an arbitration governed by the Supplementary Procedures for the Resolution of Consumer-Related Disputes, or in cases filed by an Employee who is submitting their dispute to arbitration pursuant to an employer promulgated plan.*

[3] *The AAA may assess additional fees where procedures or services outside the Rules sections are required under the parties' agreement or by stipulation.*

Fees are subject to increase if the amount of a claim or counterclaim is modified after the initial filing date. Fees are subject to decrease if the amount of a claim or counterclaim is modified before the first hearing.

The minimum fees for any case having three or more arbitrators are $2,800 for the Initial Filing Fee, plus a $1,250 Final Fee. Fast Track Procedures are applied in any two-party case where no disclosed claim or counterclaim exceeds $75,000, exclusive of interest and arbitration costs.

Parties on cases filed under either the Flexible Fee Schedule or the Standard Fee Schedule that are held in abeyance for one year will be assessed an annual abeyance fee of $300. If a party refuses to pay the assessed fee, the other party or parties may pay the entire fee on behalf of all parties, otherwise the matter will be administratively closed.

For more information, please contact your local AAA office, case management center, or our Customer Service desk at 1-800-778-7879.

### Refund Schedule for Standard Fee Schedule

The AAA offers a refund schedule on filing fees connected with the Standard Fee Schedule. For cases with claims up to $75,000, a minimum filing fee of $350 will not be refunded. For all other cases, a minimum fee of $600 will not be refunded. Subject to the minimum fee requirements, refunds will be calculated as follows:

- 100% of the filing fee, above the minimum fee, will be refunded if the case is settled or withdrawn within five calendar days of filing.
- 50% of the filing fee, will be refunded if the case is settled or withdrawn between six and 30 calendar days of filing.
- 25% of the filing fee will be refunded if the case is settled or withdrawn between 31 and 60 calendar days of filing.

No refund will be made once an arbitrator has been appointed (this includes one arbitrator on a three-arbitrator panel). No refunds will be granted on awarded cases.

**Note:** The date of receipt of the demand for arbitration with the AAA will be used to calculate refunds of filing fees for both claims and counterclaims.

## Flexible Fee Schedule

A non-refundable Initial Filing Fee is payable in full by a filing party when a claim, counterclaim, or additional claim is filed. Upon receipt of the Demand for Arbitration, the AAA will promptly initiate the case and notify all parties as well as establish the due date for filing of an Answer, which may include a Counterclaim. In order to proceed with the further administration of the arbitration and appointment of the arbitrator(s), the appropriate, non-refundable Proceed Fee outlined below must be paid.

If a Proceed Fee is not submitted within ninety (90) days of the filing of the Claimant's Demand for Arbitration, the Association will administratively close the file and notify all parties.

***No refunds or refund schedule will apply to the Filing or Proceed Fees once received.***

The Flexible Fee Schedule below also may be utilized for the filing of counterclaims. However, as with the Claimant's claim, the counterclaim will not be presented to the arbitrator until the Proceed Fee is paid.

A Final Fee will be incurred for all claims and/or counterclaims that proceed to their first hearing. This fee will be payable in advance when the first hearing is scheduled, but will be refunded at the conclusion of the case if no hearings have occurred. However, if the Association is not notified of a cancellation at least 24 hours before the time of the scheduled hearing, the Final Fee will remain due and will not be refunded.

All fees will be billed in accordance with the following schedule:

| AMOUNT OF CLAIM | INITIAL FILING FEE | PROCEED FEE | FINAL FEE |
|---|---|---|---|
| Above $0 to $10,000 | $400 | $475 | $200 |
| Above $10,000 to $75,000 | $625 | $500 | $300 |
| Above $75,000 to $150,000 | $850 | $1,250 | $750 |
| Above $150,000 to $300,000 | $1,000 | $2,125 | $1,250 |
| Above to $300,000 to $500,000 | $1,500 | $3,400 | $1,750 |
| Above to $500,000 to $1,000,000 | $2,500 | $4,500 | $2,500 |
| Above $1,000,000 to $5,000,000 | $2,500 | $6,700 | $3,250 |
| Above $5,000,000 to $10,000,000 | $3,500 | $8,200 | $4,000 |
| Above $10,000,000 | $4,500 | $10,300 plus .01% of claim amount over $10,000,000 up to $65,000 | $6,000 |
| Nonmonetary[1] | $2,000 | $2,000 | $1,250 |
| Deficient Claim Filing Fee | $350 | | |
| Additional Services[2] | | | |

[1]*This fee is applicable when a claim or counterclaim is not for a monetary amount. Where a monetary claim amount is not known, parties will be required to state a range of claims or be subject to a filing fee of $3,500 and a proceed fee of $8,200.*

[2]*The AAA reserves the right to assess additional administrative fees for services performed by the AAA beyond those provided for in these Rules and which may be required by the parties' agreement or stipulation.*

For more information, please contact your local AAA office, case management center, or our Customer Service desk at 1-800-778-7879. All fees are subject to increase if the amount of a claim or counterclaim is modified after the initial filing date. Fees are subject to decrease if the amount of a claim or counterclaim is modified before the first hearing.

The minimum fees for any case having three or more arbitrators are $1,000 for the Initial Filing Fee; $2,125 for the Proceed Fee; and $1,250 for the Final Fee.

Under the Flexible Fee Schedule, a party's obligation to pay the Proceed Fee shall remain in effect regardless of any agreement of the parties to stay, postpone or otherwise modify the arbitration proceedings. Parties that, through mutual agreement, have held their case in abeyance for one year will be assessed an annual abeyance fee of $300. If a party refuses to pay the assessed fee, the other party or parties may pay the entire fee on behalf of all parties, otherwise the matter will be closed.

**Note:** The date of receipt by the AAA of the demand for arbitration will be used to calculate the ninety (90) day time limit for payment of the Proceed Fee.

There is no Refund Schedule in the Flexible Fee Schedule.

### Hearing Room Rental

The fees described above do not cover the cost of hearing rooms, which are available on a rental basis. Check with the AAA for availability and rates.

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# Appendix O

# Typical Construction Company General Ledger Accounts

**Assets**

| | |
|---|---|
| 10. | Petty Cash |
| 11. | Bank Deposits |
| .1 | General Bank Account |
| .2 | Payroll Bank Account |
| .3 | Project Bank Accounts |
| .4 | |
| 12. | Accounts Receivable |
| .1 | |
| .2 | Parent, Associated, or Affiliated Companies |
| .3 | Notes Receivable |
| .4 | Employees' Accounts |
| .5 | Sundry Debtors |
| .6 | |
| 13. | Deferred Receivables |
| | All construction contracts are charged to this account, being diminished by progress payments as received. This account is offset by Account 4X.0, Deferred Income. |
| 14. | Property, Plant, and Equipment |
| | *Property and General Plant* |
| .100 | Real Estate and Improvements |
| .200 | Leasehold Improvements |
| .300 | Shops and Yards |
| | *Mobile Equipment* |
| .400 | Motor Vehicles |
| .500 | Tractors |
| .01 | Repairs, parts, and labor |
| .05 | Outside service |
| .12 | Tire replacement |
| .15 | Tire repair |
| .20 | Fuel |

.25 Oil, lubricants, filters
.30 Licenses, permits
.35 Depreciation
.40 Insurance
.45 Taxes
.510 Power shovel s
.520 Bottom Dumps
.525

*Stationary Equipment*

.530 Concrete Mixing Plant
.540 Concrete Pavers
.550 Air Compressors
.560

*Small Power Tools and Portable Equipment*

.600 Welders
.610 Concrete Power Buggies
.620 Electric Drills
.630

*Marine Equipment*

.700

*Miscellaneous Construction Equipment*

.800 Scaffolding
.810 Concrete Forms
.820 Wheelbarrows
.830

*Office and Engineering Equipment*

.900 Office Equipment
.910 Office Furniture
.920 Engineering Instruments
.930

15. Reserve for Depreciation
16. Amortization for Leasehold
17. Inventory of Materials and Supplies
.1 Lumber
.2 Hand Shovels
.3 Spare Parts
.4

These accounts show the values of all expendable materials and supplies. Charges against these accounts are made by authenticated requisitions showing project where used.

18. Returnable Deposits
.1 Plan Deposits
.2 Utilities
.3

19. Prepaid Expenses
  .1 Insurance
  .2 Bonds
  .3

**Liabilities**

40. Accounts Payable
41. Subcontracts Payable
42. Notes Payable
43. Interest Payable
44. Contracts Payable
45. Taxes Payable
  .1 Old-Age, Survivors, and Disability Insurance (withheld from employees' pay)
  .2 Federal Income Taxes (withheld from employees' pay)
  .3 State Income Taxes (withheld from employees' pay)
  .4
46. Accrued Expenses
  .1 Wages and Salaries
  .2 Old-Age, Survivors, and Disability Insurance (employer's portion)
  .3 Federal Unemployment Tax
  .4 State Unemployment Tax
  .51 Payroll Insurance (public liability and property damage)
  .52 Payroll Insurance (workers' compensation)
  .6 Interest
  .7
47. Payrolls Payable
48. Deferred Income
49. Advances by Clients

**Net Worth**

50. Capital Stock
51. Earned Surplus
52. Paid-in-Surplus
53.

**Income**

70. Income Accounts
  .101 Project Income
  .102
  .2 Cash Discount Earned
  .3 Profit or Loss from Sale of Capital Assets
  .4 Equipment Rental Income
  .5 Interest Income
  .6 Other Income

**Expense**

| | |
|---|---|
| 80. | Project Expense (Expenses directly chargeable to the projects. See Figure 12.1.) |
| .100 | Project Work Accounts |
| .700 | Project Overhead Accounts |
| | These are control accounts for the detail project cost accounts that are |
| 81. | Office Expense |
| .10 | Office Salaries |
| .11 | Insurance on Property and Equipment |
| .20 | Donations |
| .21 | Utilities |
| .22 | Telephone and Telegraph |
| .23 | Postage |
| .30 | Repairs and Maintenance |
| 82. | Yard and Warehouse Expense (not assignable to a particular project) |
| .10 | Yard Salaries |
| .11 | Yard Supplies |
| 83. | Estimating Department Expense Accounts |
| .10 | Estimating Salaries |
| .11 | Estimating Supplies |
| .12 | Estimating Travel |
| 84. | Engineering Department Expense Accounts |
| .10 | |
| 85. | Cost of Equipment Ownership |
| .1 | Depreciation |
| .2 | Interest |
| .3 | Taxes and Licenses |
| .4 | Insurance |
| .5 | Storage |
| 86. | Loss on Bad Debts |
| 87. | Interest |
| 90. | Expense on Office Employees |
| .1 | Workers' Compensation Insurance |
| .2 | Old-Age, Survivors, and Disability Insurance |
| .3 | Employees' Insurance |
| .4 | Other Insurance |
| .5 | Federal and State Unemployment Taxes |
| .6 | |
| 91. | Taxes and Licenses |
| .1 | Sales Taxes |
| .2 | Compensating Taxes |
| .3 | State Income Taxes |
| .4 | Federal Income Taxes |

# Index

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