



# **An Owner's Guide To Construction Management**

**Assuring Project Success Under Any Delivery Method**

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# Preface

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Construction management evolved as a professional practice distinct from design and construction in the early 1960's in response to increasing complexities in the construction industry. Highly sophisticated construction systems led to the specialization of both design and construction professionals. Additionally, increasing regulatory mandates, litigation and other risks created a need for a new professional to be an advocate for the Owner and bridge the gap between the Owner, the Designer and the Contractor. Today, construction management is well established, and recognized around the world as an indispensable profession.

A Construction Manager (CM) provides the Owner with specialized knowledge, experience and resources to navigate through the complexities of a construction program or project. Construction management services may be tailored to satisfy the needs of the novice or sophisticated Owner. The CM adds value by providing the resources and expertise needed to manage quality, cost, schedule, scope and risks associated with design and construction to help the Owner achieve its objectives.

A major construction effort is a complex and risk-laden venture. It involves the expenditure of a large sum of capital as well as the application of technologies of which many are aware, some are conversant, but few are expert. It requires the Owner to do business with several groups of people whose interests are not its own and to venture into a field with its own set of rules, some of which are not written down anywhere. It is an intensive process demanding constant attention in order to achieve success.

The federal government has a construction budget that is measured in billions of dollars and a plan for accomplishment that is measured in decades. Many state governments have construction efforts of hundreds of millions of dollars and multiple years. Although the federal and state governments have standing staffs to manage their typical construction program, they often need specialized expertise or supplemental staff to help manage certain projects.

Smaller government organizations are like smaller businesses, having the same organizational needs for construction expertise matched against an equal need to reduce expenses. Moreover, many times the smaller private Owner cannot afford to build a staff and fully develop sufficient expertise to embark upon a construction program.

The use of professional construction management services to oversee all or parts of the planning, design and construction process is recognized in both the public and private sectors as an effective and efficient means of achieving successful delivery of constructed projects under any contract format.

The Construction Management Association of America (CMAA) presents this document as a guide to public and private Owners in selecting a critical component of the construction project: the CM.

This guide will benefit those Owners who will embark on a construction project and who will seek expertise in the planning, design and construction process. It introduces the construction management practice and describes how it can enhance the success of a project.

# Executive Summary

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Professional CMs can be instrumental in achieving successful construction projects and may be used in a variety of contracting and project delivery systems.

There are many issues an Owner must consider in undertaking a project, such as time and cost constraints, the need for flexibility, pre-construction service needs, design process interaction, and financial constraints. The project team should enhance and reinforce the strengths of the Owner to provide a comprehensive set of resources and skills to accomplish the project.

While a wide and somewhat bewildering variety of ways to organize a project have been developed to satisfy the needs of Owners and projects, all share the same basic set of players: the Owner, the CM, the Designer, other consultants, Contractors, and Subcontractors. Regardless of resources, Owners must choose a particular organization, contract and award, and combine them into a desired and appropriate contracting format for each project.

Construction management is a professional services discipline applied to the planning, design and construction process of capital improvement projects. Professional CMs address the needs of projects and Owners by providing management services and expertise tailored to project needs and independent of the chosen contract format or project delivery method. It is this management approach that makes construction management unique. CMs apply and integrate comprehensive project controls to manage the critical issues of time, cost, scope, quality and safety.

As an Owner, it is necessary to choose a project delivery method and contracting format that efficiently delivers the project. A contracting format is an arrangement for the distribution or allocation of construction project risk (most frequently cost or performance risk) between the parties to a contract. A project delivery method is designed to achieve the satisfactory completion of a construction project from conception to occupancy. Construction management has been used successfully in all contracting and delivery systems by Owners who do not continuously maintain the staff expertise or numbers necessary to deal with the complex responsibilities involved in the management of major projects. In addition, the CM usually helps the Owner identify which delivery system is best for the project.

A number of contracting formats exist including fixed price, guaranteed maximum price, cost plus fixed or variable fee, and unit price contracts.

Construction projects in the United States have traditionally been delivered through the design-bid-build project delivery method. Because of financial, organizational and time constraints, alternative project delivery methods have evolved to fit particular projects and client needs. These include multiple primes; developer manager; design-build; and design, build, operate and transfer.

Construction management comes in two general forms. In agency construction management, the Owner utilizes a CM as its principal agent to advise on or manage the process over the life of the project regardless of the project delivery method used. In construction management at risk, the Owner utilizes a CM to consult in the Pre-Design and Design Phases of a project. However, the CM's role also includes a construction performance role during the Construction Phase. At that time, the CM converts to the legal equivalent of a Contractor once a price is established for the completion of the construction work.

Typically, professional construction management services are procured on the basis of an objective evaluation of the qualifications of competing firms. As is the case with any professional service contract, the issue of price does not enter into the ranking of construction management firms based on their qualifications. The Owner and the selected CM then jointly, through negotiation, develop a final scope of services to support the timely delivery of the project. Development of a construction management budget grows out of this scope and is the first step in the detailed planning of the project. Among the methods recognized and commonly used in the compensation of firms for professional construction management services are salary times multiplier plus direct expenses, billing rates, and cost plus fixed fee.

# 1.0 Defining Construction Management

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There are several issues an Owner must consider in the selection of a method of accomplishing a project:

- » *Time needs of the project:* Does it have to be done quickly? Will the schedule be affected by outside influences? Will the schedule be lengthened by cash flow considerations?
- » *Needs of the project for flexibility:* How much change will be required during the construction? How much of the project will be fully defined by the Owner and Designer prior to its being constructed? If other than the Owner, how much influence will the user have over the design and construction?
- » *Preconstruction service needs:* How much assistance will the Owner need in the definition and planning of the project with respect to quality and safety, and with respect to cost versus scope versus time?
- » *Design process interaction:* How well does the Owner understand the design process and the cost impacts of decisions made in the course of design development? How complex is the design process for the project?
- » *Financial constraints:* How is the project financed? How does the financing influence the schedule, type of contract, risk and other requirements of the project?

## The Project Participants

While a wide and somewhat bewildering variety of project organizations have evolved over time to satisfy the needs of Owners and projects, all share the same basic set of players:

- » *The Owner:* The private or public organization ultimately responsible for the proper execution of the project.
- » *The Construction Manager (CM):* A provider of professional services to the Owner, the CM organizes the effort, develops the management plan, monitors the participants' progress against the plan and identifies actions to be taken in the event of deviance from the plan. The CM also provides expert advice in support of the Owner's decisions in the implementation of the project. The CM can be a firm, a team of firms, or an individual.
- » *The Designer(s):* Employed by the Owner to provide design services in support of the project. While Designers can be contractually responsible to the Owner, they report progress to the CM and are monitored by the CM for compliance with the scope statement and both the design and construction budgets.

- » *Other Consultants:* Providers of specialized services, such as real estate acquisition firms, geotechnical engineering firms, environmental engineers, permitting consultants, etc., employed by the Owner in support of the project. Their efforts are coordinated and monitored by the CM.
- » *The Contractor:* The organization or individual who undertakes responsibility for the performance of the work, in accordance with plans, specifications and contract documents, providing and controlling the labor, material, equipment, and subcontractors to accomplish the work.

## Needs of the Project

Several forms of project organization have been developed that are designed to meet the needs of specific projects and Owners. The integration and coordination of the complex interrelationships occurring in a typical construction process require substantial expertise. Some Owners may have extensive operational organizations with vast knowledge of the business of the Owner or of a particular facet of the construction industry such as finance or building maintenance. Other Owners may not have the organizational resources or expertise on board to meet the needs of a particular project. Whatever level of expertise the Owner may have, the organization of a project can be designed to enhance and reinforce the strengths of the Owner's existing staff to provide a comprehensive set of skills to accomplish the project.

Expertise applicable to virtually any project includes:

- » Project scope development
- » Land acquisition
- » Permitting
- » Financing
- » Cash flow management
- » Design acquisition and management
- » Cost estimating
- » Cost and schedule control
- » Contract administration
- » Document control
- » Construction inspection
- » Quality control
- » Value engineering
- » Risk management
- » Constructibility review
- » Contracting and project delivery systems
- » Dispute avoidance and resolution
- » Commissioning
- » Activation

Construction management is a professional services discipline applied to the planning, design and construction process. CMs provide a program of management techniques and expertise tailored to Owner and project needs and independent of the chosen contract form or project delivery method. It is this management approach that makes construction management unique. CMs apply and integrate comprehensive project controls to manage the critical issues of time, cost, scope and quality. It is the matching of services to project/Owner needs that makes construction management a cost effective approach to managing project delivery.

A significant advantage of using a CM is that the organizational structure is not dependent on a single model or set of models. Generally, CMs fall within two categories, “agency” or “at risk.”

In “agency construction management” the CM assumes the position of professional advisor or extension of staff to the Owner. The Owner lets most of the contracts, and certain cost and performance risk is placed on the Contractors. In these cases, the CM is in a position to offer advice unencumbered by any interests other than those of the Owner and the project. The term agency infers, as is intended, a delegation of function to the CM by the Owner. As a consequence, it is possible that certain tasks and responsibilities place the CM in a legal agent relationship with the Owner. The necessity for openness and candor between the CM and Owner is paramount.

When the CM’s role includes a construction performance function, it is known as the “CM-at-risk” approach. In this approach, which can often occur under a guaranteed maximum price (GMP) contract format, the CM will assume additional obligations and will undertake construction responsibilities during the Construction Phase. At that time, the CM is typically placed in a legal position similar to that of a Contractor entering into a traditional construction agreement which provides for the completion of the construction work for an established price.

Regardless of the form of contract agreement, the CM is performing professional tasks throughout all the phases of program project implementation. A contract agreement will establish the scope of services and will also define the relationship of the parties.

## 2.0 Contracting and Project Delivery Systems

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As an Owner, it is necessary to choose an overall project delivery and contracting strategy which efficiently delivers the project. An understanding of the difference between a project delivery method and a contracting format is important because it impacts these decisions.

### Contracting Formats

A contracting format is an arrangement for the distribution of construction project risk--most frequently cost or performance risk--between the parties to a contract. Cost risk is the risk of being able to do something within a given budget limit. This risk distribution is accomplished through methods of arriving at or limiting the amount of money to be paid. Performance risk is the risk of being able to complete the project on time and at the level of quality as agreed. This is distributed through the technical terms of the contract, either by describing requirements for the finished product only, or by describing specific methods by which a task is to be performed. Contracting formats require some form of specific scope statement in order for the parties to make an accurate economic judgment as to cost or price.

A number of contracting formats have evolved as a result of the desire of Owners or Contractors to either shift or share the risk (usually cost) of a project through contractual provisions or to increase the speed of delivery of construction.

Public, and quite frequently private, works are usually procured through a sealed bid, fixed price contract or the equivalent. In these contract arrangements, most of the price risk is intended to shift to the Contractor. In order to provide a reasonable and enforceable scope definition to the Contractor so that bids can be developed, fixed price contracts are almost always based on a completed design. The need to have a completed design in hand prior to the commencement of construction requires a longer lead time for the construction process and requires a linear approach to project delivery that reduces flexibility.

Seeking more flexible alternatives, the private sector developed a host of risk-shifting and risk-sharing contract variations, including negotiated fixed price, guaranteed maximum price (GMP), cost plus fixed or variable fee, time and material, unit price, prepurchasing, and others. These contracts run the spectrum from the lump sum, where all of the cost and schedule risk is placed on the Contractor, to cost reimbursable situations, where the Owner agrees to pay all costs. Most of these methods are now also being implemented, to some extent, by public sector Owners.

Performance risk shifts are accomplished by the writing of end-product or performance contracts. When applied to a complete project, these are typically known as design-build contracts. If this form is coupled with a GMP, theoretically

the Owner has little risk either in cost or satisfaction beyond the GMP. Since a substantial part of the desired outcome from these projects is subjective, the risk of misunderstanding is large and can easily result in either disputes over what is included in the GMP or in disappointment on the part of the Owner in the final project as delivered.

## Project Delivery Methods

A project delivery method is a system designed to achieve the satisfactory completion of a construction project from conception to occupancy. A project delivery method may employ any one or a number of contracting formats to achieve the delivery. Project delivery methods define scope as part of their process.

Construction projects in the United States have traditionally been delivered through the design-bid-build sequence, securing the services of a Designer who will design the project, aid in the procurement of a Contractor, and often inspect the work of the Contractor for compliance with the specification. This sequence usually leads to the sealed bid, fixed price contract believed by many to offer the least capital cost to the Owner as well as the one generally required by public procurement regulations to assure fairness in the procurement process. However, this “traditional” project delivery system allows the use of many contracting formats, since there is no inherent constraint on the allocation of price risk.

Because of financial, organizational and time constraints, other project delivery methods have evolved to fit particular projects and client needs. These include:

- » *Multiple Primes:* The Owner uses separate contracts for various construction disciplines such as general construction, structural, mechanical, electrical, etc.
- » *Developer Manager:* The Contractor will acquire (or have constructed) a facility to suit the needs of the Owner who in turn commits to lease the facility.
- » *Design, Build, Operate and Transfer:* The Contractor will design, build, operate and maintain a facility for a fixed period before transferring it over to the Owner.
- » *Design-Build:* The Owner utilizes a single contract to acquire the services of both Designer and Contractor to construct a facility.

These delivery methods all share the characteristic of placing the Owner in what is a potentially unequal relationship with the Contractor. These systems may at times require the Owner to place the fate of the project in the hands of an organization or organizations whose interests may be in conflict with those of the project or of the Owner, due to contractually assigned risks.

In addition, these delivery methods all share the same disadvantages in that the Owner is required to have sufficient staff resources to fully define the project or be willing to allow another entity to define it. The Contractor or Designer or Developer has clear risks that it has assumed in its arrangement with Owner and has developed the expertise to manage these risks.

Parties who bear the risk in an endeavor are due their rights to control their destiny. The greater the risk profile, the greater the need to control. Loss or perceived loss of control leads to fear of a negative outcome. This fear leads to an assertion of the right to control, resulting in frequent disputes. Therefore, the key to successful management of the construction process is the placement of risk in the hands of those who are best equipped to manage it.

## 3.0 Why Construction Management?

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Construction management has been used successfully in all delivery methods for Owners who do not continuously maintain the staff expertise or numbers necessary to deal with the complex responsibilities involved in the delivery of major capital projects. The CM frequently helps the Owner identify which delivery method is best for the project.

The construction management approach utilizes a firm (or team of firms) with construction, design and management expertise to temporarily expand the Owner's capabilities so that the Owner can successfully accomplish its program or project.

A CM frequently has a role in both traditional and alternative project delivery methods as a trusted advisor to the Owner in oversight of the party at risk in the arrangements. In such cases, the CM may have a reduced scope of work, but participates in the decision-making process on behalf of and in concert with the Owner. This can be particularly helpful in design-build where substantial scope definition responsibility and project control have been assigned to the design-builder, and there exists no natural check on the design-builder.

### CM as Agent or At Risk

As previously mentioned, construction management comes in two general forms:

- » *Agency CM*: The CM acts as the Owner's principal agent to advise on or manage the process from project conception to completion.
- » *CM at risk*: The CM provides professional management assistance to the Owner prior to construction and advice on constructibility, budget and schedule considerations. The CM later converts to the equivalent of a Contractor during construction.

The key difference between these two forms is that the CM at risk is in fact a distinct delivery method due to its responsibility for construction performance. Agency construction management, on the other hand, is a distinct set of services that can be applied to any delivery method.

## Role of the CM

Use of a professional consultant in construction management improves the Owner's confidence in the success of the project. This enhanced confidence grows out of the ability of a professional CM to make expert recommendations regarding:

- » Most effective use of available funds
- » Enhanced control of the scope of the work
- » Optimal project/program scheduling options
- » Best use of individual project team members' expertise
- » Maximum avoidance of delays, changes and claims
- » Enhanced design and construction quality
- » Optimum flexibility in contracting/procurement options

Construction management includes a significant component often missing from the project delivery systems--a comprehensive management and control effort applied to the project for the Owner, beginning in the early program planning stages and continuing through project completion. It involves the application and integration of comprehensive project controls to the design and construction process and generally includes the following:

- » Development of a written scope understood by all of the participants
- » Development of thorough design criteria for issue to the Designer
- » Design quality assurance throughout the design process
- » Consideration of material, systems and process alternatives
- » Constructibility review
- » Code compliance review
- » Milestone cost estimating--to ensure design complies with the budget
- » Matching construction spending to funds availability
- » Construction specification enforcement
- » Continuous schedule enforcement

The implementation of these management activities turns the planning, design and construction process into one which maximizes the Owner's control over the project's scope, quality, time, and cost, and adds predictability of the outcome of the project from start of programming to completion of construction.

Early development of the scope of the project provides information for the establishment of a baseline budget and schedule. Because of the continuous

monitoring of the schedule and project cost during the progress of the project, the impact of changes and new information on this baseline can be evaluated and corrective action taken when most effective. Well formulated and priced construction bid packages, developed during the planning and design process, are the key to minimizing changes and avoiding disputes and delays during construction. This is the Owner's most powerful tool in assuring a positive outcome for the project.

The addition of a CM does not lessen the Owner's control over the project, but enhances it through the Owner's acquiring as adjunct staff an organization of experts in the design and construction process that will enable the Owner to make informed and timely decisions during the evolution of the project.

When an Owner implements a program or project using a consultant CM, it allows the Owner to make use of the expert advice available, advice that is unaffected by any potential conflict of interest. The Owner is still able to obtain the advantages of the many procurement methods, but with much greater control over and confidence in the outcome.

## 4.0 Selecting the CM

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CMAA recommends the selection and use of a CM for projects which are complex by virtue of their nature or size, or for which the Owner does not have an adequate capacity to manage the project effectively.

Typically, professional services of this sort are procured on the basis of an objective evaluation of the qualifications of competing firms. There are accepted practices that are used by both private entities and public bodies to select the best qualified CM for the project.

### **Preliminary Decisions and Information**

At the outset of the CM selection process, certain information should be documented and certain decisions should be made regarding the concept of the project and the needs of the Owner in realizing project objectives.

A brief, detailed description of the project, including size, purposes, goals and objective parameters, must be developed in order to convey to the CM proposer the activities and approximate level and type of skills that will be necessary. If any studies or other documents are available, they should be called to the attention of the proposers.

The Owner's needs and expectations with respect to scope, schedule and budget should be included in the description. Finalization of schedule should not take place until the selected CM has advised the Owner regarding the achievability of the proposed schedule and associated project cost.

**Owner's Internal Delegation and Management.** On all projects, the ability to react to changing circumstances is critically important. The project decision-making process must be designed to deliver informed decisions in the most timely manner possible. It has been said that the most frequent cause of project disruption is delayed decisive action.

It is very important that contractual authority—authority to obligate the Owner to pay money—be delegated to a qualified individual or small group of people so that decisions can be rendered in a timely manner and by those who are most familiar with the project. These decisions may concern change orders, contracts, dispute settlements, minor purchases and contracts in support of the project.

Some Owners' governing bodies may establish budget guidance for parts of a project, with specific decision authority within those budgets delegated to a part of the permanent staff, subject to review. These practices are highly recommended so that the Owner will gain credibility with the Contractor and consultant community.

Decisions with regard to the project organization, as envisioned by the Owner, including the reporting relationships among the Owner and all other parties to the design and construction effort, should be made and summarized for reference in the selection process.

**The Selection Committee.** A CM selection committee should be formed from the Owner's staff early in the selection process so that the committee can learn as much as possible about the project and the Owner's expectations of the CM.

The committee is responsible for one of the most critical decisions in the project—the selection of the CM. The committee will be comparing the approaches offered by several firms, their skill levels and the experience of their personnel, with the expectations and needs of the project and the Owner's organization. Each individual on the committee should understand how the selection process will be structured. The committee should include the individual on the Owner's staff who will be responsible for the project.

While it is not necessary that all members of the committee be familiar with the design and construction process, at least one member should. If the Owner does not have an individual on its staff who can provide this expertise, it may be appropriate to retain a consultant for the selection process. Individuals such as senior members of the engineering or architectural community can be used for this purpose. It is also important that the committee be free from any conflict of interest in the selection of a CM.

## **Qualifications Based Selection of the CM**

Laws and regulations generally govern the process of selection for public work, and practices will vary among the states. The process, however, generally follows three steps: a statement of qualifications; a technical proposal; and a price proposal and fee negotiation.

**Statement of Qualifications.** A request for qualifications (RFQ) should be advertised in national and local publications which will reach the CM community. The requested statement of qualifications is usually a document which describes in general the qualifications of a firm (or team of firms) to perform the work. It will often include the following types of information:

- » Firm name and address
- » Types of services usually offered
- » Names of principals
- » Numbers of staff, organized by discipline
- » Description of similar work completed including date, size and Owner contact

- » Description of similar work in progress, including date, size and Owner contact
- » Annual volume, backlog and capacity
- » Record of performance; i.e., cost control, quality, schedule, and safety

Federal Standard Form (SF) 254 contains substantially this same type of information and is maintained by most firms. A related form, SF 255, contains similar data and is designed to specifically address a particular project. The more recent SF 330 combines all of this into a single document.

The selection committee should evaluate the firms' submissions and make a judgement as to which firms appear qualified to perform the work. This will have the effect of reducing the number of competing firms to what is commonly known as a "short list."

**Technical Proposal.** Those that are judged to be qualified are requested to submit a technical proposal. This solicitation, issued as a request for proposal (RFP), is a request for information about a firm's qualifications and intentions to perform the services desired. The technical proposals are usually written for a specific project.

The RFP should provide prospective respondents with a description of the project and information regarding the method of compensation. Additionally, the RFP should contain information about the project such as the project budget, major constraints, unusual services that may be required, and particular goals of the Owner.

If the Owner has sufficient understanding of the expected scope of services, it may be advantageous to organize the RFP on that basis. The RFP may also be organized as a series of questions to be answered by the respondents.

The RFP should seek the following information from the proposers:

- » The respondent's approach to the project in terms of organization, process, tools and techniques, staff and quality assurance/quality control, etc.
- » The respondent's experience with projects of similar nature, including Owner references
- » Resumes of key staff to be assigned full time and those to be available as resources

Owners should keep in mind that proposals are often a CM's largest non-project expense. CMs appreciate an RFP that allows them to efficiently present their qualifications. It is appropriate for the RFP to include the criteria for the evaluation of the proposals as well as the weighting to be used.

It is desirable for the selection committee to be involved in the development and organization of the RFP. The RFP should be drafted with the understanding that the selection committee will have to evaluate a number of technical proposals and that the more consistent the presentations by the respondents the easier the evaluation will be. A mandatory outline of the technical proposal is useful in organizing the data for comparison by the selection committee. Additionally, a page limitation is suggested to keep the presentations to a manageable size. The page limitation should not include data such as resumes and brochures. The RFP should be examined by an experienced person for clarity and internal consistency.

**Evaluation Process.** The evaluation process may be time consuming and difficult. The selection committee should proceed with a logical and methodical evaluation of each proposal and grade each against the evaluation criteria stated in the RFP. The final ranking of CMs should be determined by averaging ranks assigned by each panelist rather than averaging the panelists' scores. This serves to reduce the influence of any one member of the panel and to ensure that the relative best of the proposals are identified. The CM proposal with the best average numerical ranking should be selected as the finalist to proceed to the next steps of submitting a cost proposal and negotiating the work effort.

In some cases, more than one respondent may appear qualified, and interviews or oral presentations may be the only appropriate method to differentiate between the top respondents. Interviews should be scheduled to provide the respondents with the best opportunity to show their capabilities. Questions should be formulated in advance by the selection committee to clarify points in the RFP response and to stimulate contrasting views among the respondents. Since the Owner will be placing the fate of the project into the hands of the CM, the compatibility between the goals and culture of the CM and those of the Owner is a critical consideration. On large or complex projects, where the competition is close, two or more rounds of interviews may be necessary (keeping in mind, however, that preparing for interviews can be extremely costly for a consultant).

**Price as a Part of the Proposal.** As is the case with any professional service contract, the issue of price should not enter into the ranking of CM firms based on their qualifications. The selection committee should keep in mind that the CM will be a trusted part of the Owner's project team and that the most important factors are the capabilities of the selected CM.

Some Owners will request a cost proposal as a part of the RFP. This can be useful in evaluating the thought given to the approach to the project and the proposer's organization for it. Price proposals included as part of the RFP response may also save time in the negotiation of the agreement.

Unless the RFP is extremely detailed and specific on the issues of cost, the total costs of two proposals will probably not be comparable. Scopes of work as envisioned

by each proposer may not be the same, particularly in assumptions about staffing levels. Qualifications of personnel may be sufficiently different to cause significant difference in price as well as level of service. Costs or multipliers (of cost) may be structured so as to appear lower than they effectively are. One proposer's direct cost may be included in the multiplier or assumed to be furnished by others. In essence, costs in the proposal stage are very soft numbers and should be analyzed in detail and with great care before comparisons are made.

When price proposals are solicited with the RFP, they may be required to be submitted in a separate, sealed and labeled envelope to be opened only when the qualifications-based selection phase has been completed.

**Negotiation and Development of Scope of Services and Cost.** Upon evaluation of the responses to the RFP, the firm judged most qualified is requested to provide a proposed scope of services. After thorough discussions designed to assure that both parties are in agreement on the desired level of service, the selected CM prepares a written scope of services proposal.

Decisions made and approaches discussed at this time will ultimately affect the success or failure of the project. Definition of necessary tasks and the application of estimated labor and expense to each task is an efficient way to develop a budget. To be addressed in the scope of services are:

- » Development of a specific project scope statement
- » Development of procurement strategy
- » Development of a project schedule and budget
- » Acquisition of special consultants
- » Acquisition of Designers
- » Acquisition of Contractors and Suppliers
- » Quality, cost and schedule control
- » Testing, startup and turnover

The scope of services should include deliverables or other tangible methods for measuring performance. Where applicable, physical examples of reports or other expected outcomes should be included or referenced. CMAA's Construction Management Standards of Practice is not intended to be a scope statement in support of a contract, but it provides information about the functions typically provided by a CM.

The Owner and the selected CM should jointly, through negotiation, agree on a final scope of services based on the selected CM's scope proposal and designed to support the timely delivery of the project. Development of a CM budget grows out of this scope and is the first step in the detailed planning of the project.

If the Owner and the most qualified CM are not able to reach agreement on price and scope, negotiations are commenced with the next qualified firm.

## Methods of Paying for Services

Several methods are recognized and commonly used in the compensation of firms for professional construction management services. All result from a negotiation between the Owner and the CM as to the proper level of staffing for particular tasks that constitute the CM's scope of services.

**Salary Times Multiplier Plus Direct Expenses.** A typical approach is based on a CM's direct salaries times a multiplier. The multiplier is a number that is derived from the sum of the CM's indirect salary costs (such as FICA and unemployment insurance and salary benefits) and overhead costs (general and administrative office and other indirect costs) divided by the total salaries paid. This ratio is used by the CM to recover these costs. An agreed profit rate is then applied to the product of the direct salary times the multiplier. Direct project expenses are paid separately. Frequently, an administrative or handling charge may be made on the direct expense.

Salaries are the actual salaries of the individuals working on the project. Direct expenses are the necessary and ordinary expenses associated with the CM's performance. These may include items ranging from paper and pens, to automobiles, travel, separate offices, furniture, computers, software, etc. Some Owners may provide office space or buy some equipment for the use of the CM during the project to avoid lease payments. Some direct expenses may be avoided by use of Owner assets.

**Billing Rates.** An alternative to the use of salary times multiplier is the use of classified billing rates. These rates are typically based on average salaries for a specified range of employee skills, experience and education. An amount of money is added based on the CM's overhead and profit multiplier and the resultant sum is used for all individuals in that classification. The classifications have to be carefully defined to avoid confusion.

**Cost Plus Fixed Fee.** Some payment arrangements fix the amount of fee (profit) that the CM will be paid to a lump sum. These arrangements also spell out how and in what increments the fee will be paid. The CM is paid actual salaries times a multiplier to cover all overhead costs and a separate lump sum as profit. The Owner should recognize that payment of the fee should be related to time, progress or other factors.

**Fee as a Percent of Construction Cost.** This form of compensation is not recommended as it is arbitrary and not related to the effort that may be required.

For example, a greater effort may be required for a smaller dollar value project due to technical complexity or schedule compression.

## Standard Contract Forms

A number of organizations publish contract forms related to the design and construction industry. CMAA provides a number of model forms of agreement specific to the implementation of construction management services for use by CMs and Owners:

- » *CMAA Document A-1*: Standard Form of Agreement Between Owner and Construction Manager (for Agency); or
- » *CMAA Document CMAR-1*: Standard Form of Agreement Between Owner and Construction Manager (Construction Management-at-Risk).

Other published standard forms compatible with these CM agreements are:

- » *CMAA Document A-2*: Standard Form of Contract Between Owner and Contractor
- » *CMAA Document A-3*: General Conditions of the Construction Contract; Owner-Contractor Contract
- » *CMAA Document A-4*: Standard Form of Agreement Between Owner and Designer
- » *CMAA Document CMAR-2*: Standard Form of Contract Between Construction Manager and Contractor
- » *CMAA Document CMAR-3*: General Conditions of the Construction Contract; Construction Manager-Contractor Contract
- » *CMAA Document CMAR-4*: Standard Form of Agreement Between Owner and Designer

The advantages of CMAA standard forms of agreement are:

- » They provide the most detailed specification of the duties of the CM.
- » The Owner-CM agreement is fully integrated with the Owner-Designer, General Conditions and Owner/CM-Contractor agreements.

Use of standard forms increases the predictability of project outcomes, increases the consistency of pricing, and simplifies management. The forms are regularly updated and maintained consistent with the industry practice. Standard forms may be modified as required by the project or the Owner's needs, but such modifications should be undertaken only with the advice of an attorney knowledgeable of the forms and the implications of changes to them.

# 5.0 CMAA Publications

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Additional information on construction management such as services provided, definitions, and procedures may be obtained from the CMAA. Following is a list of pertinent available publications:

- » Construction Management Standards of Practice
- » Contract Administration Procedures
- » Time Management Procedures
- » Quality Management Guidelines
- » Cost Management Procedures
- » Capstone: The History of Construction Management Practice and Procedures
- » Construction Management Professionals Salary and Benefits Survey 2007
- » CMAA 2007 Comparison of Construction and Program Management Costs

# 6.0 Choosing the Best Delivery Method for Your Project

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An Owner embarking on a construction project must make an important decision regarding the method by which the project is designed and constructed—the project delivery method. This decision has become more difficult in recent years as several “alternative delivery methods” have been developed to address weaknesses in the traditional design-bid-build scenario. Methods that have gained in popularity include at-risk construction management, fast-track construction, multiple prime contractors, and design-build. Proponents of particular alternative methods promise improvements over the traditional system in terms of cost, project control and reduction in disputes.

For the Owner, the wealth of choices can be both good and bad. The downside is that with the variety of delivery systems—along with the accompanying assurances of the superiority of one method over others—confusion can be inevitable. The good news is the increased number of alternatives offers the Owner or developer more flexibility to choose an appropriate and effective system for its particular project.

Construction management (CM) is a discipline uniquely tailored to the planning, design and construction process of capital projects. It has proven effective regardless of the chosen contract form or project delivery method. Indeed, CM has been used successfully in all contracting methods and delivery systems by Owners who do not continuously maintain the staff expertise or numbers necessary to deal with the complex responsibilities involved in the management of major projects. The following is a brief review of project delivery systems, along with a discussion of some of the important points an Owner should consider in choosing a delivery method.

**Owner’s Requirements.** An Owner has several areas of concern when embarking on a construction program. The following highlights some of the key considerations in developing a construction program:

**Budget.** The Owner has an obvious need to determine a realistic budget before design to evaluate project feasibility, to secure financing, and as a tool to choose from among alternative designs or site locations. Once the budget is determined, the Owner requires that the project be completed at or near the established figure without excessive overruns.

**Design.** Of foremost importance to the Owner is that the desired facility function as envisioned, that the design program successfully fulfill the needs of the Owner and users. Therefore, an Owner requires that its design team be well qualified in the type of facility being designed. In addition, the Owner must ensure that the Owner's and users' program needs are clearly conveyed to the design team. Since the design of the facility actually must be buildable and properly communicated in order to be useful, the Owner requires that the design documents are constructible, complete, and coordinated. The documents should properly incorporate unique features of the site to include subsurface conditions, interface with adjoining properties, access, and other characteristics.

**Schedule.** The Owner has similar needs in the area of scheduling. The date of completion of a new facility can be critical, either in terms of generating revenue from the facility, or in terms of providing needed functional space by a particular deadline. Therefore, a realistic assessment of project duration and sequencing needs to be performed early in the planning process. The schedule should then be monitored throughout design and construction.

**Risk Assessment.** The development of any facility involves many risks. In construction, issues of risk are closely tied to schedule and budget issues. The Owner requires an understanding of the risks involved in construction, and should make a conscientious decision regarding allocation of these risks among project participants, so that all areas of exposure are properly understood. In considering risk allocation, the Owner should strive to assign risks to those parties that exercise control over those aspects. For example, it would typically be problematic to require that the contractor correct problems due to design errors at no extra cost since a contractor generally has little control over the cause or magnitude of such errors.

**Owner's Level of Expertise.** The Owner's familiarity with the building process and level of in-house management capability will have a large influence over the amount of outside assistance required during the process and may guide the Owner in determining the appropriate project delivery system.

## Review of Project Delivery Methods

**Traditional Design-Bid-Build.** The traditional design-bid-build system remains the most popular delivery method for construction projects. The Owner engages a designer to prepare the design of the complete facility, including construction drawings, specifications and contract packages.

Once completed, the design package is presented to interested general contractors (GC), who prepare bids for the work, and execute contracts with subcontractors to construct various specialty items. In many cases, the contractor submitting the lowest responsive bid is selected to perform the construction. This contractor is then responsible for constructing the facility in accordance with the design. The designer typically maintains limited oversight of the work and responds to questions about the design on behalf of the Owner. The designer may also assist the Owner in administering the construction contract, including determination of project progress, for interim payments made to the contractor.

This contracting system offers the advantage of being widely applicable, well understood, and with well-established and clearly defined roles for the parties involved. It is the most common approach for public Owners having to comply with state procurement statutes. Furthermore, it offers the Owner a significant amount of control over the end product, particularly since the facility's features are fully determined and specified prior to selection of the contractor. However, many construction Owners have experienced a variety of frustrations using this system, leading to the development of other methods.

Among the chief disadvantages of the traditional system are:

- » The process is time-consuming since all design work must be completed prior to solicitation of the construction contract.

The designer may have limited ability to assess scheduling and cost ramifications as the design is developed which can lead to a more costly final product.

The Owner generally faces exposure to contractor claims over design and constructibility issues since the Owner accepts liability for design in its contract with the contractor.

- » The traditional approach tends to promote more adversarial relationships rather than cooperation or coordination among the contractor, the designer and the Owner.
- » The contractor pursues a least-cost approach to completing the project, requiring increased oversight and quality review by the Owner.
- » The absence of a contractor's input into the project design may limit the effectiveness and constructibility of the design. Important design decisions affecting both the types of materials specified and the means of construction may be made without full consideration of a construction perspective.

While the most common approach to bidding a project in building construction is for general contractors to submit a sealed lump-sum bid, many variations in contractor procurement exist in the traditional system.

Other methods include unit-price contracting, which is generally limited to projects that can be easily divided into small work units and quantified prior to construction. This is commonly found in heavy construction projects. At the other end of the spectrum is cost-plus contracting, generally used in circumstances where there is such high risk or variability in the work that preparing a responsible bid is impossible.

When allowed, many Owners make some effort to pre-qualify contractors, either through invitation, or through an objective set of criteria considering construction experience and financial capability. Doing so helps assure the Owner that the contractor is capable of providing a high-quality product. Once the field of bidders is established, an Owner bidding a lump-sum project may choose to require sealed bids, wherein the lowest responsible bidder will earn the right to perform the work.

However, many private colleges and universities prefer to negotiate bids with pre-selected GC's. This can be an especially powerful technique if the Owner considers qualifications, history of claims and experience in related work along with price in its evaluation. What the Owner should really be seeking is the best value for its money, not necessarily the lowest initial cost. Through a careful negotiation or contractor evaluation, the Owner can maintain the maximum amount of control over the resulting construction portion of the project.

**At-Risk Construction Management.** This delivery system is similar in many ways to the traditional Design-Bid-Build system, in that the CM acts as a general contractor during construction. That is, the CM holds the risk of subletting the construction work to trade subcontractors and guaranteeing completion of the project for a fixed, negotiated price following completion of the design. However, in this scenario, the CM also provides advisory professional management assistance to the owner prior to construction, offering schedule, budget and constructibility advice during the project planning phase. Thus, instead of a traditional general contractor, the owner deals with a hybrid construction manager/general contractor.

In addition to providing the owner with the benefit of pre-construction services which may result in advantageous changes to the project, the CM-At-Risk scenario offers the opportunity to begin construction prior to completion of the design. The CM can bid and subcontract portions of the work at any time, often while design of unrelated portions is still not complete. In this circumstance, the CM and owner negotiate a guaranteed maximum price (GMP) based on a partially completed design, which includes the CM's estimate of the cost for the remaining design features. Furthermore, CM may allow performance specifications or reduced specifications to be used, since the CM's input can lead to early agreement on preferred materials, equipment types and other project features.

The primary disadvantages cited in the CM-At-Risk system involve the contractual relationship among designer, CM and owner once construction begins. Once construction is underway, the CM converts from a professional advisory role of the construction manager to the contractual role of the general contractor. At that time, tensions over construction quality, the completeness of the design, and impacts to schedule and budget can arise. Interests and stake holding can become similar to the traditional design-bid-build system, and adversarial relationships may result. While the fixed GMP is supposed to address the remaining unfinished aspects of the design, this can in fact increase disputes over assumptions of what remaining design features could have been anticipated at the time of the negotiated bid.

One mitigating approach to this problem is for the CM to share with the owner its subcontractor bids, to ensure openness in the process. The CM may further assume risk by taking some responsibility for design errors discovered during construction, if it was involved in the review of the design prior to establishing the GMP. In addition, arrangements can be made regarding risk sharing and profit sharing if there are over-runs or under-runs in the GMP.

An owner wishing to use the construction management at-risk approach can realize many benefits. Chief among them are the opportunity to incorporate a contractor's perspective and input to planning and design decisions and the ability to "fast-track" early components of construction prior to full completion of design. However, since a commitment is made to a contractor earlier in the process, a premium is placed on the proper selection of the CM to provide the best value to the owner.

**Multiple-Prime Contracting.** Another alternative procurement system is multiple prime contracting, in which the Owner holds separate contracts with contractors of various disciplines, such as general construction, structural, mechanical, and electrical. In this system, the Owner, or its CM, manages the overall schedule and budget during the entire construction phase.

This system, which many Owners are required to use, gained favor in part as another method of "fast-tracking" construction. Work in each construction discipline is bid separately, allowing the flexibility of awarding construction contracts on the first portions of the project as soon as the respective aspect of design is completed. This fast-track approach appears to be a highly desirable feature of this method of procurement in cases where time of performance is a critical element.

Furthermore, the system allows the Owner to have more control over the project schedule, since the Owner sets the schedule for bidding individual portions of the work. For example, if an initial phase of construction (such as foundation construction) is delayed, the Owner may reduce liability for delays by postponing the bidding of follow-on work. Another advantage of this system is that the Owner can realize savings by directly procuring major material items, such as structural steel or major mechanical equipment, avoiding contractor mark-ups.

However, the very nature of this system causes its primary disadvantages. First, the final cost of the project is not known until the final prime contract is procured. In addition, there have been numerous cases where this method did not work well due to the absence of overall authority and coordination once construction is underway. The problems primarily arise from lack of coordination and contractor delay issues. While the general construction prime contractor is often given contractual responsibility to coordinate the work among trades, including schedule, this contractor lacks the contractual authority to dictate the schedule of another contractor.

For example, during the construction of a university laboratory/classroom facility, delays arose due to coordination issues involving installation of laboratory equipment. The general contractor sought damages from the Owner for delays by the mechanical contractor, while the mechanical contractor blamed the general contractor for its delays. This type of dispute is far from unique in this form of contracting, even in cases where the Owner has used an independent CM to coordinate schedule issues.

**Design-Build.** The design-build (D-B) project delivery system has grown in popularity, and is seen by some in the industry as the perfect solution in addressing the limitations of other methods. For an Owner, the primary benefit is the simplicity of having one party responsible for the development of the project. While the other systems often give rise to disputes among various project participants—with the Owner acting as referee (or party ultimately to blame)—in D-B many of these disputes become internal D-B team issues which do not affect the Owner.

Under this system, the Owner contracts with a D-B team, which is often a joint venture of a general contractor and a designer. Since GC's are comfortable in the role of risking corporate capital in performing projects, they usually are the lead members of this sort of team. One variation of the typical D-B team structure, known as fee-paid developer, involves the Owner engaging a developer, which then selects its own designer and contractor partners. However formulated, the D-B team performs the complete design of the facility, usually based on a preliminary scope or design presented by the Owner.

At some point early in the process, the D-B team will usually negotiate a fixed price to complete the design and construction of the facility. Once underway, the D-B team is then responsible for construction of the project, and for all coordination between design and construction. Since the construction team is working together from the outset, D-B offers the opportunity to save time and money. However, the advantages of the system are offset by a significant loss of control and involvement by the Owner and stakeholders. Accordingly, it is difficult for the Owner to verify that it is receiving the best value for its money, without a great deal of confidence in the D-B team.

The primary caution for an Owner considering D-B is that it considers the level of involvement it requires for a successful project. First, the Owner needs to recognize the effort and completeness that must be behind its initial scope/preliminary design which forms the basis of its contract with the design-builder. Often, the Owner will require needs additional consultants to help it develop its scope or preliminary design, in the role of a traditional design firm.

Owners with highly specialized program needs or desires may not find it advantageous to turn over responsibility to an outside team, without ensuring adequate levels of oversight and communication. For example, a government Owner constructed a high-technology research facility involving highly specialized equipment using D-B. During project development, the D-B team made several key design and equipment selection decisions without full involvement of the Owner, resulting in an unsatisfactory facility that required costly changes.

With this lesson in mind, it appears that D-B is best suited to conventional projects for which project requirements can be clearly defined and for which expertise is widely available. For example, an office facility might be a project ideally suited for D-B. In a project of this type, the Owner is not assuming undue risk in conceding control over the project, and may benefit from the advantages of D-B.

Another primary consideration for the Owner is proper selection of the D-B team. Since the Owner selects a team that has been created prior to selection, it may be difficult for the Owner to maintain the proper balance of design expertise, financial capability, construction experience, and experience in D-B team roles. In particular, the Owner should strongly favor D-B teams with a successful track record working together on previous projects in the same D-B roles. More so than in any other delivery system, the success of a D-B project may hinge on the initial selection process.

**Agency Construction Management Services.** Agency construction management (ACM), or construction management-for-fee, encompasses a range of services provided by a CM on behalf of an Owner. It is a common misconception that CM-for-fee represents a distinct project delivery system. In fact, agency construction management consists of a distinct set of services that are applicable to any project delivery system. These services can be used by the Owner as necessary to extend or supplement the Owner's own expertise, its own staff, and to manage the construction process to help address some of the shortfalls of the project delivery system chosen.

A CM working as an agent to the Owner primarily provides the benefit of independent, professional services provided on the Owner's behalf throughout the project. In contrast to some other project participants, the ACM has no vested financial interest in the project—in either its design or construction—and maintains a responsibility to act on the Owner's behalf and provide to provide impartial advice

concerning the construction project. As such, ACM firms should be selected based on qualifications, and not on a cost or low-bid basis.

Services offered by an ACM include the following:

- » *Pre-Design and Design:* As discussed earlier, there are often advantages to obtaining construction expertise during the early planning stages of a project. Some services typically offered by ACM firms during planning stages include the following:
- » *Selection of a design team:* An ACM firm, based on historical experience in the market, can assist the Owner in selecting the most qualified design team to develop project plans and specifications. Similarly, an ACM firm can also assist the Owner in evaluating various potential construction sites.
- » *Budget and Cost Estimating:* Preliminary budgets, based on historical data for similar projects, will assist the Owner in determining the feasibility of initial scope. More refined estimates are developed during the design process to pinpoint the necessary construction budget, and provide a basis of comparison to contractor bids.
- » *Constructibility Review:* A review of design plans and specifications will help the Owner verify that the design as presented is clear to the contractor, poses no construction conflicts, and is economically feasible to build.
- » *Value Engineering:* A multi-disciplined team reviews project features to ensure that the Owner's necessary functions are provided in the most cost-effective way, both in terms of initial and life-cycle costs.
- » *Contract Bidding:* An ACM firm can assist the Owner in pre-selection of contractors and development of the bid package to ensure that the contractor selection process is fair and provides the best value to the Owner.

In fact, an ACM is often most cost effective during the planning stages of the project, since the ACM firms can provide the careful planning and organization skills that can help prevent costly problems during construction. Properly executed services such as constructibility reviews and preliminary scheduling can result in significant risk reduction and cost savings many times initial cost in terms of limiting change orders, delays, and contractor claims. Here the Owners can maximize the benefits of CM in a professional advisory role throughout the design and construction process because the CM has no stake in the construction contracting.

**Construction Phase:** ACM firms provide a variety of services during construction, including the following:

- » *Construction Inspection and Surveillance:* Virtually all Owners desire some type of examination of project performance on a continuous or periodic basis to review progress, ensure compliance with specifications and plans, and to review housekeeping and safety issues.
- » *Project Controls:* These services are provided to ensure that the project is efficiently and effectively managed. They include maintenance of project correspondence, conducting progress meetings, handling submittals and requests for information, documentation of progress, review of pay requests, schedule reviews and schedule updates.
- » *Change Order Review:* These services include negotiation of change orders with the contractor, coordination with the designer over design changes, determination of responsibility for changed conditions or coordination conflict, and review of price and schedule changes.
- » *Project Closeout:* Review of the project to ensure orderly and timely completion, including development of punchlists; monitoring of implementation, training and warranty periods; resolution of outstanding issues; review and analysis of claims or disputed issues.

The most frequently cited criticism of ACM services is that the CM adds a level of bureaucracy to a project, resulting in added cost. While it can be argued that such costs may actually reduce overall project costs, it should be noted that an Owner can realize the benefit of the ACM services without necessarily committing to large increases in expense by supplementing its own project management as necessary and selecting ACM on a service-specific basis.

The Owner has the option of tailoring its use of ACM services to its needs in order to provide the best combination of project control and cost. For example, many Owners have a large contingent of inspection personnel, but may lack sufficient management experience to enact effective project cost controls. Or, an Owner may wish to have more construction knowledge built into the design process by engaging an ACM firm to perform a value engineering or constructibility review. An Owner may also desire enhanced scheduling expertise in coordinating its various designers and contractors for a multiple-phase effort.

Other Owners may be very comfortable with their design team, but may need assistance in finding qualified contractors to perform the work. Many Owners use an ACM's construction closeout services to resolve intractable problems on projects which degenerate due to disputes with a contractor over schedule and delay issues.

## Recommendations and Conclusion

Clearly, there is no one right project delivery method for a given project. All of the methods discussed have been used successfully, and have weaknesses which can limit their success. The following considerations should guide the Owner in selecting the proper delivery method:

- » *Type of Project:* The Owner should gauge the level of complexity and uniqueness of the project, and maintain an appropriate level of control.
- » *Size of Project:* The amount of outside assistance and number of project participants should match the significance of the project. Obviously, the more complex and costly a project, the greater the need for professional management and advice.
- » *Owner Capabilities:* The Owner should realistically assess its own in-house capabilities in evaluating project procurement methods.
- » *Time Considerations:* If the project needs to be constructed in a severely compressed time limit, methods adaptable to fast-track construction should be considered. However, the Owner must weigh the need for the compressed time limit against the increased cost and risk of fast tracking.
- » *Likelihood of Changes:* If the Owner is aware that its requirements may change considerably during the project, this should be evaluated against the potential cost of such changes. For example, a D-B team may present the most fluid method of incorporating changes during construction, but those changes may come at a higher cost than through other methods.

Professional construction management can help Owners in constructing the best project possible, on-time and on-budget. Construction management services are highly desirable, if not essential, to a successful project especially for Owners lacking this expertise in-house. These services are adaptable to any project delivery system, and are scalable to meet the specific needs of the project. An Owner should thoroughly explore available options for construction procurement, and consider the benefits of professional management services regardless of the contractual approach used to deliver the project.

# 7.0 Code of Professional Ethics for the Construction Manager

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Since 1982, the Construction Management Association of America (CMAA) has taken a leadership role in regard to critical issues impacting the construction and program management industry, including the setting of ethical standards of practice for the Professional Construction Manager.

The Board of Directors of CMAA has adopted the following Code of Professional Ethics of the Construction Manager (CODE) which applies to CMAA members in performance of their services as Construction and Program Managers. This Code applies to the individuals and to organizations who are members of CMAA.

All members of the Construction Management Association of America commit to conduct themselves and their practice of Construction and Program Management in accordance with the Code of Professional Ethics of the Construction Manager.

As a professional engaged in the business of providing construction and program management services, and as a member of CMAA, I agree to conduct myself and my business in accordance with the following:

1. **Client Service.** I will serve my clients with honesty, integrity, candor, and objectivity. I will provide my services with competence, using reasonable care, skill and diligence consistent with the interests of my client and the applicable standard of care.
2. **Representation of Qualifications and Availability.** I will only accept assignments for which I am qualified by my education, training, professional experience and technical competence, and I will assign staff to projects in accordance with their qualifications and commensurate with the services to be provided, and I will only make representations concerning my qualifications and availability which are truthful and accurate.
3. **Standards of Practice.** I will furnish my services in a manner consistent with the established and accepted standards of the profession and with the laws and regulations which govern its practice.
4. **Fair Competition.** I will represent my project experience accurately to my prospective clients and offer services and staff that I am capable of delivering. I will develop my professional reputation on the basis of my direct experience and service provided, and I will only engage in fair competition for assignments.
5. **Conflicts of Interest.** I will endeavor to avoid conflicts of interest; and will disclose conflicts which in my opinion may impair my objectivity or integrity.

6. **Fair Compensation.** I will negotiate fairly and openly with my clients in establishing a basis for compensation, and I will charge fees and expenses that are reasonable and commensurate with the services to be provided and the responsibilities and risks to be assumed.
7. **Release of Information.** I will only make statements that are truthful, and I will keep information and records confidential when appropriate and protect the proprietary interests of my clients and professional colleagues.
8. **Public Welfare.** I will not discriminate in the performance of my services on the basis of race, religion, national origin, age, disability, or sexual orientation. I will not knowingly violate any law, statute, or regulation in the performance of my professional services.
9. **Professional Development.** I will continue to develop my professional knowledge and competency as Construction Manager, and I will contribute to the advancement of the construction and program management practice as a profession by fostering research and education and through the encouragement of fellow practitioners.
10. **Integrity of the Profession.** I will avoid actions which promote my own self-interest at the expense of the profession, and I will uphold the standards of the construction management profession with honor and dignity.

# 8.0 How To Select a Construction Manager

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CMAA recommends a systematic approach to selecting a construction manager, based on an objective evaluation of the qualifications of competing firms, coupled with a clear expression of the owner's expectations and desires. An effective selection process should include the following steps. (State and local laws may govern parts of the selection process, so this outline is intended only as a general guide.)

1. **Create a clear statement of the project, including size, purposes, goals, and other parameters.** This statement will enable prospective CM firms to understand the level of effort required, types of skills they are expected to provide, and other factors important to the owner.
2. **State your expectations regarding schedule and budget.** Bear in mind, however, that once selected, your construction manager will advise you on the achievability of your desired schedule and budget. So don't consider these elements final just yet.
3. **Define your own internal procedures.** Clearly identify who in your organization will have authority over purchasing, contracting, design issues, changes, and both overall and day-to-day decisions.
4. **Form a selection committee.** At least one member of the committee should be familiar with the design and construction process. The committee should also include the individual on the owner's staff who will be responsible for the project. Form this committee early enough so that all members can learn as much as possible about the project before launching the evaluation of potential CMs.
5. **Statement of Qualifications.** Publish a Request for a Statement of Qualifications (RFQ). You can place this request right here at CMAA's website, by following the link "Find a Construction Manager" in the left frame. Bear in mind, also, that certification under CMAA's Certification Program is a reliable indicator of professional competence and accomplishment. The CCM designation--Certified Construction Manager--applies to individuals, not to firms, but the availability of CCMs on a prospective bidder's staff should be a favorable factor in your evaluation. You can also advertise your RFQ in publications reaching the CM community. Most firms will be able to respond with a standardized form such as Federal Standard Form 254, which describes in general the qualifications of a firm or group of firms to do the work.
6. **Compile a "short list."** The selection committee will use the submissions to reduce the number of competing firms to a manageable level. These firms will then be asked to submit proposals.

7. **Proposals.** Firms judged to be qualified should be invited to submit a Technical Proposal. Your Request for Proposals (RFP) should provide enough project detail to enable bidders to offer specific information about their approach, experience, and resources. You may opt to include a mandatory proposal outline to which bidders must adhere, or to place a maximum length limit on proposals. Many selection committees also find it appropriate to ask bidders for separate financial proposals, which are not opened and compared until bidders have already been ranked based on their technical proposals.
8. **Evaluate bidders.** Compare and judge technical proposals with the goal of ranking bidders in numerical order. Several bidders may appear qualified for the work, and you may wish to interview the top candidates. When a final numerical ranking of bidders has been compiled, open and compare the financial proposals. Bear in mind, however, that budget and cost numbers at this stage are very “soft,” subject to detailed negotiation as part of a final contract process.
9. **Finalize scope of services and cost.** CMAA’s CM Standards of Practice can be used as a general guide to the functions typically provided by a CM. The owner and CM should, through negotiation, agree on a final scope of services based on a scope proposal submitted by the selected CM. This document should include deliverables or other tangible methods for measuring performance. The Scope of Services will also serve as the basis for development of a project CM budget.

**CONTRACT FORMS.** CMAA provides a number of model forms of agreement you can use or adapt to your own circumstances. To explore this forms library, go to the CMAA Bookstore, [www.cmaanet.org](http://www.cmaanet.org).

# Glossary of CM Terms

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## A

**ADDENDUM:** A supplement to documents, issued prior to taking receipt of bids, for the purpose of clarifying, correcting, or otherwise changing bid documents previously issued.

**ADDITIONAL SERVICES:** Services provided in addition to those specifically designated as basic services in the agreement between the owner and CM. Also known as Supplemental Services.

**AGENCY:** A legal relationship by which one party is empowered and obligated to act on behalf of another party.

**AGENCY CM:** A professional service that can be applied to all delivery systems where the CM acts as the owner's principal agent in the management of a construction project or program, where the CM is responsible to the owner for managing the planning, design, construction and post construction phases, or portions thereof. The CM represents the interests of the owner in its dealings with other construction professionals, and with other private and public entities.

**AGREEMENT:** A document setting forth the relationships and obligations between two parties, as the CM and owner or contractor and owner. It may incorporate other documents by reference.

**APPARENT LOW BIDDER:** The bidder who has submitted the lowest bid for a division of work described in bid documents, a proposal form, or proposed contract.

**APPROVED BIDDERS LIST:** The list of contractors that have been prequalified for the purpose of submitting responsible, competitive bids.

**APPROVED CHANGES:** Changes in the contract documents that have been subjected to an agreed upon change approval process and have been approved by the party empowered to approve such changes. See Also: Change Order

**AS-BUILT DRAWINGS:** Drawings (plans) that show the work, as actually installed. Also known as Record Drawings.

**AT-RISK CM:** A delivery method which entails a commitment by the CM for construction performance to deliver the project within a defined budget and schedule. The CM acts as a consultant to the owner in the Pre-Design and Design phases, but as the legal equivalent of a general contractor during the Construction Phase. When a CM is bound to a price, either fixed or a Guaranteed Maximum Price (GMP), the most fundamental character of the relationship is changed. In addition to acting in the owner's interest, the CM also protects its own interests.

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# B

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**BASIC SERVICES:** Scope of service as defined in the original agreement between owner and CM as basic services.

**BENEFICIAL OCCUPANCY:** The use of the constructed facility by the owner prior to final completion or acceptance of the construction.

**BID:** An offer to perform the work described in contract documents at a specified cost.

**BID BOND:** A pledge from a surety to pay the bond amount to the owner in the event the Bidder defaults on its commitment to enter into a contract to perform the Work described in the Bid Documents for the bid price.

**BID DOCUMENTS:** The documents issued to the contractor(s) by the owner which describe the proposed Work and contract terms. Bid documents typically include: drawings, specifications, contract forms, general and supplementary general conditions, proposal or bid forms, and other information.

**BIDDABILITY:** The degree to which a set of Bid Documents could be reasonably expected to permit a bidder to establish a competitive price to perform the Work as defined in the Bid Documents.

**BIDDABILITY REVIEW:** A formal review of the contract documents, addendum, and reference documents to eliminate ambiguities, errors, omissions, and contradictions, to be accomplished with respect to the local construction marketplace and the bid packaging strategy; for the purpose of minimizing bid prices in the procurement phase and disputes during construction.

**BOND:** A pledge from a surety to pay the bond amount to the Obligee (owner or contractor) in the event of a default, or non-payment by a principal (contractor or subcontractor), as with Bid, Performance and Labor and Material Bonds.

**BONUS:** Additional compensation paid or to be paid to a contractor by the owner as a reward for accomplishing predetermined objectives that are over and above the basic requirements of the contract between the owner and contractor.

**BUDGET:** The dollar and time amount allocated by the owner for a project.

**BUDGET ESTIMATE:** An estimate of the cost of work based on preliminary information, with a qualified degree of accuracy.

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# C

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**CHANGE ORDER:** A written agreement or directive between contracted parties which represents an addition, deletion, or revision to the contract documents, identifies the change in price and time and describes the nature (scope) of the work involved. Also known as Contract Modifications.

**CHANGED CONDITIONS:** Conditions or circumstances, physical or otherwise, which alter the conditions or circumstances on which the contract documents were based.

**CLAIM:** A formal demand for compensation, filed by a contractor or the owner with the other party, in accordance with provisions of the contract documents.

**CM FEE:** A form of contractual payment for services, where the CM is paid a fee for services performed.

**COMMISSIONING:** A quality-oriented, systematic process for achieving, verifying, and documenting that the performance of facility systems and assemblies meets defined Owner objectives and criteria.

**CONSTRUCTIBILITY:** The ease with which a project can be built, based upon the clarity, consistency, and completeness of the contract documents for bidding, administration, and interpretation to achieve overall project objectives.

**CONSTRUCTIBILITY REVIEWS:** The process of evaluating the construction documents for clarity, consistency, completeness, and ease of construction to achieve overall project objectives.

**CONSTRUCTION BUDGET:** The sum established, normally during the planning or design phase, as available for construction of the project.

**CONSTRUCTION COST:** All costs attributed to the construction of the project, including the cost of contracts with the contractor(s), construction support items, general condition items, all purchased labor, material and fixed equipment. See Also: Cost of Construction

**CONSTRUCTION MANAGEMENT:** A professional management practice consisting of an array of services applied to construction projects and programs through the planning, design, construction and post construction phases for the purpose of achieving project objectives including the management of quality, cost, time and scope.

**CONSTRUCTION MANAGER:** A provider of professional construction management services, the Construction Manager (CM) acts as an extension of staff to the Owner and manages the entire project with pre-planning, design, construction, engineering and management expertise that can assure the best possible project outcome no matter what type of project delivery method used.

**CONTINGENCY:** An amount of money reserved by the owner to pay for unforeseen changes in the work.

**CONTRACT MODIFICATIONS:** A written agreement or directive between contracted parties which represents an addition, deletion, or revision to the contract documents, identifies the change in price and time and describes the nature (scope) of the work involved.

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**C**

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**CRITICAL DATE SCHEDULE:** A schedule representing important events along the path to project completion. All milestones may not be equally significant. The most significant are termed “major milestones” and usually represent the completion of a group of activities. See Also: Milestone Schedule

**CRITICAL PATH METHOD (CPM):** A management technique used to plan and control a project which combines all relevant information into a single plan defining the sequence and duration of operations, and depicting the interrelationship of the Work elements required to complete the project. The critical path is defined as the longest sequence of activities in a network which establishes the minimum length of time for accomplishment of the end event of the project. Arrow Diagramming Method (ADM) and Precedence Diagramming Method (PDM) are both common techniques used in CPM scheduling.

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**DEFECTIVE WORK:** Work conforming to the plans, specifications, and applicable standards yet is incomplete, insufficient, or lacking in workmanship. See “Non-conforming Work.”

**DELIVERY SYSTEM:** The process selected to execute a construction project for the purpose of assigning responsibilities and risk to the project team. Common delivery systems include: design-bid-build, design-build, multiple prime, and construction management-at-risk.

**DESIGN PHASE - SCHEMATIC:** Traditionally this is the first phase of a designer’s basic services. In the schematic phase, the designer ascertains the requirements of the project and prepares schematic design studies consisting of drawings and other documents illustrating the scale and relationships of the project.

**DESIGN PHASE - PRELIMINARY:** The term used on projects to describe the transition from the schematic phase to the completion of the design development phase. During this phase ancillary space is developed and dimensions are finalized. Outline specifications are developed into technical specifications; sections are delineated and elevations are defined. Also known as Design Development.

**DESIGN PHASE - FINAL:** The phase of the design process on a project when drawings and specifications are completed for construction bid purposes. The designation used by designers for the last part of the design process prior to procurement. Also known as Construction or Working Drawings.

**DESIGN-BUILD:** Design-Build is a project delivery method which combines architectural and engineering design services with construction performance under one contract agreement.

**DESIGNER:** The individual or organization that performs the design and prepares plans and specifications for the work to be performed. The designer can be an architect, an engineer, or an organization which combines professional services.

**DIRECT COSTS:** The field costs directly attributed to the construction of a project, including labor, material, equipment, subcontracts and their associated costs.

**DRAWINGS:** Graphic representations showing the relationships, geometry and dimensions of the elements of the Work.

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## E

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**ESTIMATED COST TO COMPLETE:** The current estimate of the remaining costs to be incurred on a project at a specific point in time.

**ESTIMATED FINAL COST:** The anticipated cost of a project or project element when it is complete. The sum of the cost to date and the estimated cost to complete.

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## F

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**FAST TRACK:** The process of dividing the design of a project into increments in such a manner as to permit construction to start before the entire design phase is complete. The overlapping of the construction phase with the design phase.

**FIELD ORDER:** An order issued at the site by the owner or CM to clarify and/or require the contractor(s) to perform work not included in the contract documents. A field order normally represents a minor change not involving a change in contract price or time and may or may not be the basis of a change order.

**FINAL COMPLETION:** The date on which the terms of all construction contracts have been satisfied.

**FLOAT:** Contingency time that exists on a schedule of activities. It is measured by comparing the early and late dates on a start and finish basis.

**FORCE ACCOUNT:** Directed work accomplished by the contractor outside of the contract agreement.

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## G

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**GENERAL CONDITIONS:** A section of general clauses in the Contract Specifications that establish how the project is to be administered. Included are obligations such as providing temporary work, insurance, field offices, etc.

**GUARANTEE:** A legally enforceable assurance by a third party of satisfactory performance, quality or quantity of products or work during a specific period of time stated and included in the contract in the event the product or work fails to perform properly.

**GUARANTEED MAXIMUM PRICE:** A contracting format wherein a maximum price for the cost of the Work is established based on an agreed-to scope.

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## K

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# L

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**LIEN:** A claim, encumbrance, or charge against or an interest in property to secure payment of a debt or performance of an obligation.

**LIFE CYCLE COST:** Life cycle costs include all costs incident to the planning, design, construction, operation, maintenance and demolition of a facility, or system, for a given life expectancy, all in terms of present value.

**LIQUIDATED DAMAGES:** An amount of money usually set on a per-day basis, which the contractor agrees to pay the owner for delay in completing the Work in accordance with the contract documents.

**LONG-LEAD ITEMS:** The identification given to material and equipment having an extended delivery time and which may be considered for early procurement and purchase. Items which would be delivered too late for timely installation if their procurement or purchase were included as part of the procurement for the entire contract or project.

**LONG-LEAD TIME:** The time interval between purchase and delivery of long lead items.

**LOW BIDDER:** The bidder who has submitted the lowest bid, which is determined to be responsive and responsible for a division of work described in a bid document, proposal form or contract.

**LUMP SUM FEE:** A fixed amount that includes the cost of overhead and profit paid, in addition to all other direct and indirect costs of performing work.

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# M

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**MASTER SCHEDULE:** An executive level summary schedule identifying the major components of a project, their sequence and durations. The schedule can be in the form of a network, Milestone Schedule, or bar chart.

**MILESTONE SCHEDULE:** A schedule representing important events along the path to project completion. All milestones may not be equally significant. The most significant are termed “major milestones” and usually represent the completion of a group of activities.

**MULTIPLE PRIME CONTRACTS:** Separate contractors contracting directly with the owner for specific and designated elements of the work.

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# N

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**NON-CONFORMING WORK:** Work that does not meet the requirements of the contract documents.

**NOTICE OF AWARD:** A formal document informing an individual or organization of successfully securing a contract.

**NOTICE TO PROCEED:** A formal document and/or point in the project’s life cycle authorizing an individual or organization to commence work under its contract. The issuance of the notice to proceed typically marks the end of a procurement phase.

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## O

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**OWNER CONSTRUCTION MANAGEMENT:** A form of construction management that does not use an independent or outsourced construction management organization as a team member. The owner performs all required construction management services with in-house staff.

**OWNER'S REPRESENTATIVE:** The individual representing the owner on the project team.

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## P

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**PENALTY:** A punitive measure, usually associated with failure to fulfill a contractual obligation.

**PERFORMANCE BOND:** A pledge from a surety to pay the bond amount to the Obligee (owner or contractor) in the event of a default in performance of contractual obligations.

**PHASED CONSTRUCTION:** An incremental approach to construction or design and construction. Each overlapping or sequential phase or element to have a defined work scope and to be considered as a separate project.

**PLANS:** Also known as “Drawings”. See Also: Drawings

**POST-CONSTRUCTION PHASE:** The period following substantial completion.

**PRE-DESIGN PHASE:** The period before schematic design commences, during which the project is initiated and the program is developed; the planning and conceptual phase.

**PRIME CONTRACT:** A direct contract with an owner. It can be a single contract and/or include the work specified for several contracts depending upon division of work.

**PRIME CONTRACTOR:** A contractor who has a contract with an owner.

**PROFESSIONAL SERVICES:** Services provided by a professional or by an organization that has specific competence in a field of endeavor that requires professional (and technical) knowledge and capabilities and that meets recognized standards of performance.

**PROGRAM MANAGEMENT:** The practice of professional construction management applied to a capital improvement program of one or more projects from inception to completion. Comprehensive construction management services are used to integrate the different facets of the construction process—planning, design, procurement, construction and activation—for the purpose of providing standardized technical and management expertise on each project.

**PROGRESS MEETING:** meeting dedicated to the subject of progress during any phase of project delivery.

**PROGRESS PAYMENT:** Partial payment of the contract amount periodically paid by the owner, upon approval by the CM, verifying that portions of the Work have been accomplished.

**PROJECT:** The total effort required in all phases from conception through design and construction completion to accomplish the owner's objectives.

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**PROJECT BUDGET:** The sum or target figure established to cover all the owner's costs of the project. It includes the cost of construction and all other costs such as land, legal and professional fees, interest, and other project related costs.

**PROJECT COST:** The actual cost of the entire project.

**PROJECT MANAGEMENT:** As applied to a construction project, the use of integrated systems and procedures by the project team to accomplish design and construction. Project management is an integral function of construction management.

**PROJECT PROCEDURES MANUAL:** A detailed definition of the project team responsibilities and authority, project systems, and procedures.

**PROJECT TEAM:** Initially consists of the owner, designer, and CM. Thereafter, as prime construction contractors are engaged they are added to the team.

**PROJECT TEAM MEETING:** A meeting dedicated to all aspects of the project, involving the project team members (owner, designer, CM, contractor(s)).

**PUNCH LIST:** A list made near the completion of the construction work indicating items of work that remain unfinished, do not meet quality or quantity requirements as specified or are yet to be performed by the contractor prior to completing the terms of the contract.

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## Q

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**QUALIFICATIONS BASED SELECTION:** A process where qualifications such as competence, capability, relevant experience and past performance are given primary consideration in the evaluation and selection of a service provider.

**QUALITY:** The degree to which the project and its components meet the owner's expectations, objectives, standards, and intended purpose; determined by measuring conformity of the project to the plans, specifications, and applicable standards.

**QUALITY ASSURANCE (QA):** The application of planned and systematic methods to verify that quality control procedures are being effectively implemented.

**QUALITY CONTROL (QC):** The continuous review, certification, inspection, and testing of project components, including persons, systems, materials, documents, techniques, and workmanship to determine whether or not such components conform to the plans, specifications, and applicable standards.

**QUALITY MANAGEMENT:** The process of planning, organization, implementation, monitoring and documenting of a system of policies and procedures that coordinate and direct relevant project resources and activities in a manner that will achieve quality. See Also: Quality

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## R

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**RECORD DRAWINGS:** Drawings (plans), prepared after construction is complete that represent the work, accomplished under the contract.

**RECOVERY SCHEDULE:** The schedule that depicts action(s) and special effort(s) required to recover lost time in the original Master Schedule. It can depict activities of any member of the project Team.

**REQUEST FOR CHANGE PROPOSAL:** A delineation and/or narrative issued by the CM to the contractor that describes a proposed change to the contract documents for purposes of establishing cost and time impacts. May also be known as Bulletin, Request for Information, and Request for Quote.

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## S

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**SCHEDULE OF VALUES:** A list of basic contract segments in both labor and material, where each line item consists of a description of a portion of work and a related cost and the sum of the lines of the contract equals the total contract price. Generally used to determine progress payments to contractor.

**SCOPE:** Identification of all requirements of a project or contract.

**SCOPE CHANGES:** Changes that expand or reduce the requirements of the project during design or construction.

**SHOP DRAWINGS:** Drawings typically prepared by the contractor, based upon the contract documents and provided in sufficient detail that indicate to the designer that the contractor intends to construct the referenced work in a manner that is consistent with the design intent and the contract documents.

**SHORT TERM CONSTRUCTION ACTIVITY PLAN:** The planning and scheduling of prime contractor(s) activities on site, for the short duration or “foreseeable future” usually developed on a week-by-week basis using milestones for planning intervals and coordinated by Construction Management personnel. Also known as Rolling Schedule, Look Ahead Schedule, and Short Interval Schedule.

**SPECIAL CONDITIONS (OF THE CONTRACT FOR CONSTRUCTION):** Also known as “Supplementary General Conditions”. See Also: Supplementary General Conditions

**SPECIAL CONSULTANTS:** The designation for various professionals, including engineers, architects, designers and other experts, who provide expertise in specialized fields.

**SPECIFICATIONS:** The detailed written descriptions of materials, equipment, systems, and required workmanship and other qualitative information pertaining to the work.

**START-UP:** The period prior to occupancy when systems are activated and checked out, and the owner’s operating and maintenance staff assumes the control and operation of the systems.

**SUBCONTRACTOR:** A contractor who has a contract with a prime contractor to perform work.

**SUBMITTALS:** Transmittals of information as required by the contract documents.

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**SUBSTANTIAL COMPLETION:** The date, certified by the designer or CM or both, that a contractor has reached that stage of completion when the owner accepts use of the facility for its intended purposes, even though all work is not completed.

**SUPPLEMENTARY GENERAL CONDITIONS:** Additions and/or modifications to the General Conditions, which are part of the Bid Documents and/or contract documents.

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**T**

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**TESTING:** The application of specific procedures to determine if work has been completed in the prescribed manner and at the required levels of workmanship. See Also: Non-conforming Work

**TRADE CONTRACTORS:** Construction contractors who specialize in providing and/or installing specific elements of the overall construction requirements of a complete project.

**TRADE-OFF STUDY:** The study to define the comparative values and risks of a substitution or exchange of a design component. The trade-off can identify both monetary and functional values. Also known as Alternatives Analysis.

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**U**

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**V**

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**VALUE ANALYSIS:** Also known as “Value Engineering”.

**VALUE ENGINEERING:** A specialized cost control technique, which utilizes a systematic and creative analysis of the functions of a project or operation to determine how best to achieve the necessary function, performance, and reliability at the minimum life cycle cost.

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**W**

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**WARRANTY:** Assurance by a party that it will assume stipulated responsibility for its own work.

**WORK:** All construction-incorporating labor, material and equipment required by the contract documents.

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**Y**

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**Z**

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***“The most important driver of cost for capital construction programs is how the program is managed.”***

—CMAA/FMI 7th Annual Survey of Owners

The cost and complexity of a construction program can be a make-or-break proposition for its owner.

Every design and construction program will benefit from an experienced professional who identifies risks and leads collaborative teams to ensure program success.

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