PROJECT DELIVERY SYSTEMS FOR CONSTRUCTION

3rd Edition







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PREFACE

A FOUNDATION FOR THE DISCUSSION

The subject of project delivery continues to evolve. When the second edition of this book was published in 2004, the industry lacked a common vocabulary when it came to the subject of capital project delivery. In 2004, only a segment of the construction market was addressing this varied terminology—mostly participants from the public sector working in vertical construction. In 2011, the discussion on project delivery now includes more participants; the private sector as well as those from the horizontal markets including highways, tunnels, and bridges are also now engaged. Though there is closer consensus on some terminology, such as CM at-Risk, new terminology, such as IPD, has emerged that continues to add to the confusion within the industry.

Going into a topic that confuses even the "experts" within an industry, what can the reader hope to gain from this book? One studying the subject of project delivery will do well to come away with enough understanding for a meaningful discussion on the subject. Upon completion of this book, the reader should expect to have gained a basic understanding of the most common project delivery methods.

The construction industry, like numerous other industries, has evolved in so many different directions simultaneously that the meanings of industry terms have become quite diverse. Without the benefit of established, widely accepted definitions of terms, individuals and groups continue to independently decide on their own meanings.

Over a period spanning several decades, each group or individual has independently selected the characteristics they feel best define each delivery method. Because many were starting with the same basic "raw materials," they often chose similar words. What has resulted? We now have an industry vocabulary full of similar words with different meanings and different words with similar meanings. Sometimes the meanings vary only slightly, but other times, as with the term "IPD," for example, the meanings vary considerably.

This book does not try to convince everyone to use one vocabulary but rather to promote the next best thing—understanding one another's vocabulary. Specifically, this book hopes to give readers the ability to listen to others' definitions of delivery methods, management approaches, procurement options, and basis of reimbursement and then relate these to their own definitions. Without trying to label any terminology as right or wrong, this textbook offers a framework of definitions and templates with which to understand the subject of project delivery. We don't expect everyone to agree with the definitions put forth here, but they provide us with a starting point as we begin to understand one another's vocabulary.

Just what terms are put forth here? This textbook limits the list of delivery methods to the four most common: Design-Bid-Build (DBB), Construction Management at-Risk (CMAR), Design-Build (DB), and Integrated Project Delivery (IPD). Our challenge has been to make every hybrid fall into one of these four categories. We, therefore, needed to establish definitions that were as broad as possible; otherwise we would end up with hybrids that do not fit into any of the four delivery methods. We tried our best to avoid giving these hybrids new names, as that would have forced us to expand the list beyond these four methods.

The biggest vocabulary challenge with respect to delivery methods continues to be how to distinguish between Design-Bid-Build and CM at-Risk. The most common and current definitions leave gaps between these two delivery methods. The result has been more confusion and the creation of yet more delivery method names. Our goal in meeting this challenge has been to choose definitions that close the gap between Design-Bid-Build and CM at-Risk in the absence of industry definitions that work.

The definitions proposed in this book are not any one individual's, but rather they are definitions that appear to be the most consistent with those currently being used by most in the industry. The definitions in this 2011 third edition are updated from the 2004 edition to reflect the evolution of the terminology and the slight shifts in industry consensus.

Recognizing the continued lack of an industry standard, it is understood that no matter which definitions we select, there will be those who disagree. But if we don't select definitions (or even worse, if we create new terms), then we are no further along in eliminating the confusion. In fact, we would be adding to it!

Has the industry existed for so long without consistent definitions—a situation that has compelled everyone to develop their own definitions—that any effort to straighten out all this mixed up vocabulary is now futile? There are two schools of thought on this. The first is, "Yes, any effort to create a common vocabulary is an exercise in futility." The second view, and the one offered by this textbook, is that it is never too late to establish a framework for discussion.

This is the essence of this textbook—to establish a context for the discussion on project delivery. Perhaps one day, if everyone is able to reconcile to the same templates, the industry can debate the names we use in the template itself. If this can occur, we will have standard industry terminology. For now, being more realistic, we are not expecting to have a common vocabulary in which everyone uses the same words, but instead to reach the point at which we all understand one another's vocabulary.

WHAT'S NEW IN THE 3RD EDITION?

There are a number of additions and updates to this third edition. The updates reflect the continuous evolution that the subject of project delivery continues to go through. Highlights of the updates to the third edition include:

- The addition of Integrated Project Delivery—In recognition of the growing use of Integrated Project Delivery (IPD) with a multi-party contract, IPD has been added as the "fourth" delivery method. Along with this new delivery method, a new basis of reimbursement, Target Price, has been added as well.
- Updated definitions—Project delivery and procurement definitions have been updated to be closer to where the industry consensus has evolved. One key update is the expansion of Best Value procurement into two procurement types: 1) Total Cost and 2) Fees. Closely related, the previous edition of this textbook referred to Best Value competitions where price was based on the total cost (now referred to as Best Value: Total Cost) as a type of CM at-Risk; in this edition, the definition of Design-Bid-Build has been broadened to include the Best Value: Total Cost procurement option.
- The addition of BIM, lean construction, and sustainability—These terms have been added and are discussed relative to each delivery method.
- Expanded discussion on procurement—In addition to separating Best Value into two types of procurement, the discussion on procurement options that previously spanned across separate chapters has now been consolidated into one chapter (Chapter 2) and expanded.
- The addition of basis of reimbursement—We have also consolidated and expanded the discussion on this subject into a new chapter (Chapter 3) due to the growing importance of the basis of reimbursement on successful implementation. This chapter includes expanded discussion on Guaranteed Maximum Price (GMP) and an introduction to the Target Price basis of reimbursement.
- Updated Appendix and Glossary—The Appendix, which lists the contracts specifically related to the implementation of the different project delivery methods, and the Glossary of Terms have both been updated.

CHAPTER ONE

AN INTRODUCTION

Establishing a Context for Discussion

- What Is a Project Delivery Method?
- No "Perfect" Project Delivery Method
- Evolution of Project Delivery Methods
- The Four Stops on the Road to Implementing a Project Delivery Method
- Responding to the Industry's "Need for Speed"
- Fundamental Relationships Among the Parties
- "Defining" Characteristics
- "Typical" Characteristics and Hybrids
- Procurement Method and Its Importance
- Having a List—The Delivery Method Options Matrix
- Using the Delivery Method Options Matrix to Compare Different Lists
- Related Areas
- Management Methods vs. Delivery Methods

How the Book Is Organized

- Section 1: Introduction
- Section 2: Procurement Options & Basis of Reimbursement
- Section 3: Management Methods
- Section 4: Project Delivery Methods
- Section 5: Reference

Thoughts for the Reader to Consider

- Selecting an Appropriate Delivery Method
- Accelerated Procurement Approaches: IDIQ, On-Call Contracting, Term Contracting, and JOC
- Multiple Prime Contracting and Direct Subcontracting
- Agreements—Making Them Work for You
- Standard Forms of Agreement

Self Test

ESTABLISHING A CONTEXT FOR DISCUSSION

What Is a Project Delivery Method?

A project delivery method is the comprehensive process of assigning the contractual responsibilities for designing and constructing a project. A delivery method identifies the primary parties taking contractual responsibility for the performance of the work. The delivery method process includes:

- Definition of scope and requirements of a project
- Contractual requirements, obligations, and responsibilities of the parties
- Procedures, actions, and sequences of events
- Interrelationships among the participants
- Mechanisms for managing time, cost, safety, and quality
- Forms of agreement and documentation of activity

It is crucial to the success of a project that all participants understand the goals and objectives of the delivery method being used and how all parties are related to each other contractually. The essential elements of any project delivery method are cost, quality, time, and safety. Responsibilities for implementing these elements vary from method to method.

A project delivery method is fundamentally a people method because people remain the most valuable construction resource. The success or failure of any delivery method depends upon the performance, trust, and cooperation among the parties.

There are numerous hybrids and variations of the delivery methods discussed in this book. The result has been a confusing landscape of terms and definitions. To help establish a context for a project delivery discussion, this book introduces "defining" characteristics. Defining characteristics distinguish one delivery method from all other delivery methods. This book offers defining characteristics broad enough to cover almost any known hybrid.

Most common delivery methods, regardless of the name applied, should align with one of the delivery methods defined in this book. Using this simple set of definitions, readers should be able to align their list of methods with the methods used in this book.

Readers are encouraged to use this book to facilitate an intelligent discussion on the subject. The goal is to help everyone establish his or her own list and then compare them. Everyone can travel down the road of using various project delivery methods and develop the experience necessary to implement all the delivery methods successfully. The ability to compare lists increases the ability for best practices to be shared more easily across the industry even though individuals may still be using different terminology to describe their methods.

It is not the intention of this book to argue in favor of any one delivery method over another. Rather, this book strives to provide readers with a meaningful way to discuss project delivery methods.

No "Perfect" Project Delivery Method

Most groups agree that there is no perfect project delivery method. Every project is unique and has its own unique set of challenges. Therefore, industry consensus is that every project should be considered on a case-by-case basis to determine the most appropriate project delivery method.

Evolution of Project Delivery Methods

Delivery methods respond to changing circumstances. The Design-Bid-Build method is frequently described as "traditional." It involves competitively bid construction contracts that are based on complete and prescriptive contract documents prepared by architects and engineers. The documents include drawings, specifications, and supporting information.

For most of the 20th century, public work routinely has been built under the Design-Bid-Build delivery method. The basis of reimbursement for these projects is typically Fixed Price/Lump Sum, which uses competitive bidding among general contractors. Performance bonds, liquidated damages, and various other statutory requirements are employed to protect taxpayers' investments. These agreements are also called "Hard Money" contracts. All states and the federal government have detailed statutes on public advertisement of projects, bid submission procedures, and constructor selection.

Much private work also has been performed under the Design-Bid-Build method, in the belief that the marketplace ensures economic discipline and yields the best value. Particularly those private organizations with large constituencies, such as religious institutions and schools, use public-like project delivery methods, with sealed bids and formal procedures. In addition, many private corporations still employ the Design-Bid-Build method, but many now also use other delivery methods.

The Four Stops on the Road to Implementing a Project Delivery Method

As the adoption of multiple project delivery methods becomes more common for more owners, the process for deciding which project delivery method to implement has four stops:



These stops are based on the premise that someone has (or eventually will have) the ability to choose from a list of project delivery methods and that there is no perfect delivery method.

There are many products, papers, and guidelines to help us understand each of these four steps. For example, AGC offers guidelines, documents, and assistance with implementing all project delivery methods (Stop 4). This book's primary purpose is to provide a list of delivery methods and definitions for the reader to use as a framework for discussion (Stop 2).

Groups all over the country, if not the world, that get to the first stop and gain the ability to use multiple delivery methods often skip to the third stop and attempt to select the appropriate method. Eventually, most realize they need a set of definitions and return to the second stop.

This is where much of the confusion begins. As associations, individuals, and firms return to the second stop, they find that there are no industry standards, so they create their own set of definitions. This results in numerous differing lists and definitions.

Recognizing that there is not any one list of detailed definitions with which all would agree, this book puts forth broad definitions that the reader can use as a starting point. When everyone can establish his or her own list and compare those lists, the result will raise the bar for everyone and promote continuous improvement throughout the industry.

Responding to the Industry's "Need for Speed"

Why did these various project delivery methods evolve, anyway? In large part they were an industry response to demand for faster completion of construction projects. The concept of "speed to market" is a result of intense global competition, which has made it more critical than ever to move new products and services to market ahead of competitors. To be late in the marketplace can be devastating to profitability.

Many organizations have dramatically compressed their product development time by improving technology and better integrating processes. A stumbling block, though, has been the comparatively slow pace of delivering the facilities needed to house production.

The construction industry has responded to this trend with new methods of project delivery. The construction industry accelerated the processes of design and construction while striving to maintain controls on cost, safety, and quality. Construction Management (CM) at-Risk, Design-Build and Integrated Project Delivery (IPD) are being used effectively to shorten project schedules.

Public and private owners, seeing the success of accelerated projects in other settings, are now looking for similar results on their building projects. Overall schedule compression is now expected of constructors. This is one of the main reasons many owners are looking at the various delivery methods.

Fundamental Relationships Among the Parties

The classic triangle of construction is made up of owner, designer, and constructor. These three parties are participants in all project delivery methods, but their relationships and alignments vary according to the method being used.

It is the owner's duty to decide on the delivery method, scope, program, budget, and funding source for a project prior to design. During design and construction, the owner monitors project progress and quality and makes periodic payments to design and construction practitioners. After construction, the owner—whether private or public—should protect and enhance the built investment by providing maintenance for the completed building.

It is the designer's duty to translate the owner's needs and requirements into plans and specifications to be used during construction. During that phase, the architect may assist the owner in monitoring the progress of the work by verifying that the specified level of quality is achieved and certifying payment applications. The architect should provide interpretations of the construction documents and give additional instructions as needed.

The constructor's duty is to build the project according to the designer's plans and specifications, within the time and budget specified in the contract. This should be done without sacrificing either the quality of the work or the safety of the workers. The constructor has complete responsibility for achieving the quality level required in the documents, and for doing so safely. The constructor also may be involved in training the owner's personnel in the operation of the building systems and may provide some maintenance after construction is complete.

"Defining" Characteristics

Because industry-wide accepted definitions of project delivery methods do not exist, it is of little surprise that many groups have chosen different characteristics to define their lists of delivery methods. There is no right or wrong set of definitions, but there is a need for consistency among definitions to facilitate communication. The following definitions of delivery methods are as broad as possible, using terms that are generally accepted in the industry. This allows the definitions to work with as many hybrids as possible. The definitions are based on what we shall refer to as "defining" characteristics. *Defining* characteristics distinguish one delivery method from the others. The following are the *defining* characteristics of project delivery methods used in this textbook:

- 1. What is the contractual agreement between the core team of the owner, designer, and contractor? Are the design and construction:
 - a. Under separate contracts directly with the owner?
 - b. Combined under one contract?
 - c. Separate but contractually bound by a single multi-party contract with the owner?
- 2. Is total construction cost part of the criteria in the final selection of the constructor?

Using these two simple defining characteristics creates the following uniquely defined delivery methods:

Design-Bid-Build

- 1. Design and construction are separate contracts (versus Design-Build, where the contracts are combined).
- 2. Total construction cost is a factor in the final selection of the constructor (versus CM at-Risk).
- CM at-Risk
 - 1. Design and construction are separate contracts (versus Design-Build, where the contracts are combined).
 - 2. Total construction cost is not a factor in final selection of the constructor (versus Design-Bid-Build).

Note: The eventual establishment of a Guaranteed Maximum Price is typical with CM at-Risk.

Design-Build

1. Design and construction responsibilities are contractually combined into a single contract with the owner (versus both Design-Bid-Build and CM at-Risk, where contracts are separate).

Integrated Project Delivery (IPD)

1. The designer, the contractor, and the owner (and possibly other key members of the project team) sign one multi-party contract (versus Design-Bid-Build, CM at-Risk, and Design-Build).

"Typical" Characteristics and Hybrids

There are many characteristics typical of each type of method, but these characteristics are not required to define the delivery method. The following scenario highlights an example of a "typical" characteristic—in this case, preconstruction services.

What would you call a constructor based on the following scenario?

If the constructor is...

- Under a contract directly to the owner (separate from the design firm),
- Selected on the basis of qualifications and other non-price criteria,
- Contracting directly with the trade contractors, and
- Brought on board after the design is complete.

What would you call this? Construction Management? General Construction? Do you refer to this as CM at-Risk? Or some other term? Are you without a name for it?

Applying the *defining* characteristics, the constructor described here is contracting with the owner directly (separate from the designer) and is holding the trade contracts (warranting the performance of the work). As the constructor was selected for something other than the lowest bid on the total construction cost, this method would still be defined as CM at-Risk. This is true even though the constructor was not providing preconstruction services during the design phase.

Being brought on board during the design process is an example of a "typical" characteristic. It is *typical* for the CM at-Risk to join the team during the design phase and provide preconstruction services before design completion. However, based on this definition, a provider of preconstruction services during the design is not a defined *requirement* of CM at-Risk; it is a *typical* characteristic of CM at-Risk.

The same logic applies to the schedule guarantee. Though it is *typical* to have the CM at-Risk provide one, it is not required by definition. Therefore, a schedule guarantee is a typical characteristic, not a defining characteristic, of CM at-Risk.

There is much debate in the industry over the meaning of "at-risk" in the phrase "CM at-Risk" if there is no cost guarantee. The answer assumes that "risk" refers to a cost guarantee versus the performance risk (i.e., holding the trade contracts). If the phrase "at-risk" refers to the performance risk (vs. agency CM), then the term "CM at-Risk" works even if there is no cost guarantee. It works because the word "risk" refers to the performance risk that the CM takes by holding the trade contracts. Many choose to avoid this debate over the phrase "at-risk" and instead use the terms "CM/GC" or "CMC" (CM as constructor) instead of CM at-Risk.

When someone labels a "typical" characteristic as a "defining" characteristic, a hybrid is created. People may (and often do) give their hybrid a new name. There's nothing inherently wrong with this, but the key is to recognize that with all hybrids, these "typical" characteristics can be stripped away. Using the above two defining characteristic questions, the reader can align any method with one of the four delivery methods defined in this book.

Procurement Method and Its Importance

Many people look at how projects are delivered separately from how the services are procured. This separation is fine, but there is a general belief that how a project is procured has such an impact on the delivery method that you should consider

both aspects together. In other words, how a project is procured has such an impact on the delivery method, the process, and the ultimate outcome of the project that when one is considering the delivery method, one must also look at the procurement option.

The procurement method is also referred to as the "selection" method. Just as with project delivery methods, numerous terms exist for the different procurement methods. The following (described in detail in Chapter 2: Procurement Options) are the four procurement methods defined in this book:

- Low Bid—Total construction cost is the sole criterion for final selection (total construction cost = 100% of final selection criteria).
- **Best Value: Total Cost**—Both total construction cost and other factors are criteria for the final selection (total construction cost = between 0–100% of the final selection criteria).
- **Best Value: Fees**—Both fees and qualifications are factors in the final selection (total construction cost = 0% of the final selection criteria; fees are a criteria in the final selection).
- Qualifications Based Selection—Cost is *not* a criterion for the final selection; qualifications are the only factor used in the final selection (cost = 0% of final selection criteria).

When using the term "price" or "cost" when discussing how a project is going to be procured, it is critical to define what is meant by the term "price." When using some version of the often used phase, "price has to be part of the competition," parties should be certain to clarify which aspect of the price is being referenced. This topic is discussed in more detail in Chapter 2.

As previously discussed, to determine the most appropriate delivery approach, it is highly recommended to consider both the procurement method and the delivery method. When considering the procurement and delivery methods together, the following matrix is created:

Delivery Methods by Procurement Option					
DELIVERY METHOD Common Nicknames	Low Bid	Best Value: Total Cost	Best Value: Fees	Qualifications Based Selection (QBS)	
Design-Bid-Build Competitive Sealed Bid; Low Bid; Inv. to Bid (IFB)			N/A	N/A	
CM at-Risk cm/gc; gc/cm; cmc; ECI	N/A	N/A			
Design-Build Engineer-Procure- Construct (EPC)					
IPD Multi-party; Alliancing	Not Typical	Not Typical			

Note: There is no agreed upon definition of Best Value: Total Cost when used with separate contracts for design and construction. The previous edition of this textbook referred to Best Value: Total Cost as a type of CM at-Risk, but in this edition, the definition of Design-Bid-Build has been broadened to include this selection type.

If the CM at-risk is procured by Low Bid (total construction cost being the sole criterion) or Best Value: Total Cost, you have, by definition, Design-Bid-Build Low Bid or Design-Bid-Build Best Value.

Taking the approaches created by combining the delivery methods and procurement options, owners can use this matrix to determine the delivery methods and selection types they use in their own organizations.

Having a List—The Delivery Method Options Matrix

When the definitions used here for the delivery methods are combined with the definitions used for the selection types, the result by selection type is the "Delivery Method/Selection Approaches" options matrix, shown with commonly used industry terms:

Delivery Method / Selection Approaches					
SELECTION TYPES	"Price" Definition	Designer & Contractor 2 separate contracts	Design- Builder 1 combined contract	Designer- Contractor- Owner 1 Multi-Party contract	
Low Bid 1. "Price" only criteria for final selection	Total Construction Cost (TCC)	Design-Bid-Build Low Bid	Design-Build Low Bid	Not Typical	
2A. Best Value: Total Cost "Price" and other criteria in the final selection; Price = TCC	Total Construction Cost (TCC)	Design-Bid-Build BestValue: Total Cost	Design-Build Best Value: Total Cost	Not Typical	
2B. Best Value: Fees "Price" and other criteria in the final selection; "Price" = Fees	Fees, General Conditions, Etc.	CM at-Risk Best Value: Fees	Design-Build Best Value: Fees	IPD BestValue: Fees	
Qualifications Based Selection (QBS) "Price" is <u>not</u> a factor in the final selection criteria	None	CM at-Risk QBS	Design-Build QBS	IPD QBS	

This matrix is particularly useful for organizations that do not currently have a list of options. Using this along with the blank matrix in the next section, organizations can fill in a name for the approaches they use with the name provided if the organization does not already have a name.

Using the Delivery Method Options Matrix to Compare Different Lists

Because the industry has gone for so long without standard definitions, some readers may not entirely agree with these definitions. This is not unusual and highlights the purpose of this textbook: to provide a framework for these discussions. Because the "Delivery Method/Selection Approaches" matrix works with nearly every known method of delivering design and construction, readers are encouraged to insert into the following blank matrix the names YOU use to describe each approach:

Delivery Method / Selection Approaches					
SE	LECTION TYPES	"Price" Definition	Designer & Contractor 2 separate contracts	Design- Builder 1 combined contract	Designer- Contractor- Owner 1 Multi-Party contract
1.	Low Bid "Price" only criteria for final selection	Total Construction Cost (TCC)			
2A.	Best Value: Total Cost "Price" and other criteria in the final selection Price=TCC	Total Construction Cost (TCC)			
2B.	Best Value: Fees "Price" = Fees / General Conditions, etc. (no TCC)	Fees, General Conditions, Etc.			
3.	Qualifications Based Selection (QBS) "Price" is <u>not</u> a factor in the final selection criteria	None			

If any of the approaches are not used within your organization, just write "N/A" to indicate that either the organization does not have that option available or does not consider that option one of its available options.

There are no right or wrong names. Organizations can use whatever names they would like, but they should try to avoid adding to the list within this matrix (try, rather, to ensure that all options are just hybrids of one of the ten listed). Even if an organization does not normally use all ten options, or does not agree with the use of all them, members should at least be aware that all ten options exist and that one or more options may not be included on the organization's list of "available" options.

Many institutions have already found this matrix to be an excellent tool for establishing its own list. In addition, if separate groups have used this matrix to articulate their list of delivery options and names, everyone can easily compare those different names.

Related Areas

In Chapter 6, you will be introduced to the concept of "related areas." These are topics closely related to the subject of project delivery. In fact, they are so closely related that they are often used by others as defining characteristics of delivery methods.

"Related areas" are defined as characteristics not unique to any one delivery method. Any topic characterized as a "related area" is one that can actually be

applied to more than one project delivery method. Prequalification is one example of a related area. One could prequalify with *any* project delivery method.

Other examples include fast-tracking, bridging, and program management methods. These related areas are typical characteristics—common but not required to define a particular delivery method.

Management Methods vs. Delivery Methods

Is agency construction management a project delivery method? Based on our delivery method definition in the beginning of this chapter, for the delivery of design and construction services, the answer is, "No, agency CM is not a delivery method." Instead, agency CM is a project management method, a method of managing design and construction services.

Therefore, agency CM could be used in conjunction with any project delivery method, including Design-Bid-Build, Design-Build, or even CM at-Risk. For the purpose of this textbook, we offer the following definitions:

A construction manager is either:

- 1. A construction manager agent [an "agent CM" or "CMa" (CM as advisor)], or
- 2. A construction manager (CM) at-risk.

The CM is either holding the trade contracts and at risk for the delivery of the project (the performance of the work) or not. (All other variations of CM are just slight modifications of the responsibilities and expectations of the CM and do not change this fundamental separation into these two categories. For example, a CM/ GC is essentially the same as a CM at-risk.)

Management methods include:

- 1. Owner's in-house options (within the user's group or operations unit or by the real estate/facilities or procurement groups), or
- 2. Third party options (including development managers, agent CMs, and program managers).

These methods are discussed further in Chapter 4: Program Management and Chapter 5: Agency Construction Management.

HOW THE BOOK IS ORGANIZED

This book is divided into five sections: Section 1: Introduction, Section 2: Procurement Options & Basis of Reimbursement, Section 3: Management Methods, Section 4: Project Delivery Methods (including a chapter on considerations when the constructor is involved in the financing or operation of the project), and Section 5: Reference.

Section 1: Introduction

This section includes the Preface and Chapter 1. It discusses the basic principles to be covered in the text and "sets the stage" for the rest of the discussion.

Section 2: Procurement Options & Basis of Reimbursement

Chapter 2: Procurement Options and Chapter 3: Basis of Reimbursement highlights two areas that are often separated from the discussion of project delivery. Since both have such an important impact on the discussion of project delivery, it is recommended that they be reviewed in conjunction with project delivery methods.

Section 3: Management Methods

Chapter 4: Program Management and Chapter 5: Agency Construction Management discuss the most common project management methods. The goal is to help the reader appreciate that any project delivery method can be used with any project management method.

Section 4: Project Delivery Methods

Chapter 6 expands on the concept of "Related Areas" and provides a brief explanation of each. Related areas are topics that are closely related to the subject of project delivery. Each of the delivery method chapters (Chapters 7–10) includes a section addressing each of the related area topics and how each may be affected when used with that chapter's delivery method. Chapter 7: Design-Bid-Build, Chapter 8: Construction Management At-Risk, Chapter 9: Design-Build and Chapter 10: Integrated Project Delivery are discussed as the project delivery methods. Chapter 11 discusses variations of the typical delivery methods that incorporate aspects of financing and real estate as well as operations and maintenance.

Section 5: Reference

Following the main chapters of the book are the Glossary, the answers to the Self-Tests found at the end of each chapter, a listing of related industry contracts sorted by project delivery method, and the Index.

THOUGHTS FOR THE READER TO CONSIDER

Selecting an Appropriate Delivery Method

Many factors might be considered when trying to determine which delivery method is most appropriate for a particular project. However, many find that only

a handful of "major" factors need to be evaluated before it is reasonably apparent which method is most appropriate.

The major factors are typically derived from the owner's project-specific requirements. The most common major factors affecting the delivery method decision are:

- **Schedule**—Is there a need to overlap phases of the project?
- Project complexity—Is constructor input necessary during design?
- Level of desired collaboration—What level of collaboration is desired?
- Changes—Is there any potential for changes during construction?
- Owner's in-house capability—Are the appropriate skills available?
- Quality definition and verification—Will the designer handle this?
- **Experience with the desired method**—Has the owner used this delivery method before?
- Timing/availability of funding—Are design and construction funded?

The overall schedule constraints frequently become the key criteria for selecting a project delivery method. Traditionally, the design/construction process has been linear—that is, each party performs its duties and then passes relevant information and responsibilities on to the next participant. This deliberate process has certain advantages in regard to boundaries of responsibility—including careful design decisions, material selection, and project administration—and typically utilizes Lump Sum contracts.

But while this linear process may be valid for many projects, it takes a lot of time and reduces the integration of expert knowledge from the various parties. In a complex project, the design process alone may take more than a year, and construction may take two or three years more. Integrated or clustered decision making and fast-tracking can shorten the process, but they require project delivery methods different from the traditional Low Bid Design-Bid-Build/Lump Sum process.

Accelerated Procurement Approaches

Many owners find it appropriate for some projects to use a process that allows accelerated procurements. These include smaller projects, time-sensitive projects, projects with difficult-to-define scopes, or projects with indefinite timeframes. Owners are also implementing alternate delivery approaches to address the myriad of repair, renovation, and remodeling projects that occur on an ongoing basis.

These approaches allow industry participants to deliver projects more efficiently than they might through a traditional advertisement/procurement/contracting process.

- Indefinite Duration, Indefinite Quantity (IDIQ)
- On-Call Contracting
- Term Contracting
- Job Order Contracting (JOC)

The first three approaches (IDIQ, On-Call, and Term) are generally used to describe open-ended contractual relationships that are not tied to specific scope. They are often used by owners who want to have contracts in place quickly to accommodate certain project types such as small or emergency projects. These types of projects benefit from having contracts that have already met the required procurement rules and can move quickly into the execution stage. Job Order Contracting is a type of IDIQ contract that, similar to the other three, has an open-ended contractual relationship that is not tied to a specific project, but is typically tied to a specific scope.

An IDIQ contract is a long-term contract in which the precise scope and timing of construction delivery is not defined at contract procurement. The contract term is typically well-defined, and is often broken down into a base contract term (typically a year or two) with option years which must be accepted by both the owner and the contractor. IDIQ contracts will often have a guaranteed minimum value and/or a contractual maximum per term. Individual projects are delivered through the use of delivery orders, and can have dollar limitations at this level, as well.

IDIQ contracts have the advantage of providing owners with an on-call contractor who is familiar with the complexities of working in their specific facilities environment. By establishing an IDIQ contract to facilitate use of the same contractor for multiple projects, owners avoid the delays associated with the project team's learning curve, making project delivery faster. When multiple projects are being executed simultaneously, there is also an efficiency and economy of scale for owner and contractor alike in project supervision, facility security requirements, and ongoing communication.

In selecting an IDIQ contract structure, owners must consider laws governing procurement or procedures, typical project size and total volume, and preferred degree of collaboration. Selection of an IDIQ contractor can be based on Low Bid, Best Value: Total Cost, Best Value: Fees or Qualifications Based Selection. Since the contracts result in a multi-year relationship, some consideration of qualifications is often desired.

A Job Order Contract (JOC), a type of IDIQ contract, traditionally relies on unit prices, though some JOCs are appearing in the market with alternative pricing structures. A JOC is typically based on a Unit Price Book (UPB) which establishes pricing for tens of thousands of construction tasks. The unit prices are all-inclusive, capturing not only labor and materials but general conditions, overhead and profit as well as incidental costs such as bonds and permits. At the outset of a contract the contractor will propose or compete based on a coefficient which modifies this pricing. This coefficient, also sometimes called a multiplier or a factor, is applied to all unit prices in the UPB across the board. Construction inflation is addressed by updating either the UPB or the coefficient periodically (usually annually) over the life of the contract. For example, a coefficient of 1.12 would represent a 12% markup on all line items, and a coefficient of .88 would represent a 12% discount on all line items.

JOC projects are priced according to the contractual unit prices, prior to proceeding with work. The delivery order scoping process typically takes 1-3 weeks and results in a detailed scope of work that is tied to a proposal comprised of line items from the UPB with appropriate quantities applied. The unit pricing is typically prepared by the contractor and validated by the owner. This hybrid pricing approach typically resulting in a lump sum ensures that the owner knows the total project cost before proceeding and can incentivize contractor efficiency.

The JOC scoping process is often a collaborative one which explores various options for accomplishing the desired project result. The JOC contractor can manage the design process with a design professional as a subcontractor, as in a Design-Build, or they can be engaged to advise a design professional under contract to the owner, as in CMAR. There is seldom a separate fee for preconstruction services—they are included in the coefficient as are scoping and proposal services and there is no cost recovery for delivery orders that do not proceed to construction. The generation of line item proposals can commence before design is 100% complete, resulting in faster project delivery. Flexible contractual terms such as use of typical rates and unit costs for common scope items are negotiated only once. Terms of special or unique situations are also established in the contract. Once selected, the chosen team is then under contract and available when needed.

All of the accelerated procurement options allow owners to satisfy their procurement requirements and deliver projects more effectively. They can also be used by owners to retain design firms, program or construction managers, CM atrisks or design-builders. They all entail a distinct project development process and include relationship, responsibility, selection and pricing approaches similar to the project delivery systems for larger projects. Some of these accelerated procurement approaches are often characterized by some as separate project delivery methods. This is especially true for Job Order Contracting that is procured using a Unit Price Book with price competition through a coefficient. IDIQ qualifies under the Federal Acquisition Requirements for the use of Federal Funds and under most State procurement codes.

These accelerated procurement approaches are better characterized more as a procurement methodology than as a separate definable project delivery method. These approaches can be used in conjunction with any of the typical project delivery methods. What makes them different from delivery methods is not how the design and construction services are delivered, but rather how and when they are contracted.

Multiple Prime Contracting and Direct Subcontracting

Multiple Prime Contracting and Direct Subcontracting are contracting approaches that can be used with any of the delivery methods described in this book. As the names imply, instead of an owner contracting with a single general contractor, construction manager, or design-builder, the owner (or its representative) contracts directly with multiple trade contractors for the completion of the work and assumes the responsibility for its coordination.

Multiple Prime Contracting is generally applied when the project is awarded in a limited number of packages (typically fewer than ten). Packages are a combination of several trade contracts. Typical packages include sitework, structure, general construction, mechanical, and electrical. Each package is referred to as a "prime contract" and is contracted directly to the owner.

Direct Subcontracting applies when each trade contract and supplier is awarded individually and contracted directly to the owner. The number of direct contracts is typically greater than 10 and is often 50 or more.

Several states and local governments have laws requiring construction to be performed using Multiple Prime Contracts. Proponents of this contracting method point out that the owner gets the benefit of the lowest cost for each of the trades. The method also prevents bid shopping by the general contractor or construction manager. In addition, this contracting method can be used to fast-track a project without involving one of the other delivery methods in those jurisdictions where the other approaches are not available.

An owner using these approaches essentially becomes the general contractor. The owner holds the multiple contracts and assumes responsibility for coordinating them. Because there is a risk of poor coordination among the various trades, many owners do not wish to be burdened with this task. They might solve the problem by hiring an agent CM or by assigning one of the multiple prime contractors this responsibility. Even so, the ultimate responsibility for coordination remains with the owner.

Agreements—Making Them Work for You

What is the role of contracts? Simply stated, a contract is a written document describing the terms and conditions of an agreement, which in turn determine the legal rights and obligations of the parties to the contract.

Contracts are agreements that specify who does what when it comes to implementing the chosen delivery method. The terms and conditions of an agreement are set forth in legal documents. Ideally, the documents define many considerations beyond the fundamentals of cost, time, quality, and safety. It is important in modern management of construction to avoid having contracts become barriers to cooperation among the parties.

The industry-recognized best practice is to first select the management approach, project delivery method, procurement method, and desired relationship, and then use a contract to further specify the details of the relationship.

Standard Forms of Agreement

Contracts are either standard or specially prepared agreements. In the United States, standard forms of agreement, such as ConsensusDOCS, are promulgated by and are available from several construction industry associations, the federal government, and most state and local governments. The section at the end of this book, Related Contracts, provides a side-by-side comparison of the ConsensusDOCS to the American Institute of Architects (AIA) Contract Documents.

Self Test

- 1. Which of these is not a typical step on the Road to Implementing a Project Delivery Method?
 - a. Obtaining the funding for the project
 - b. Gaining the ability to use a project delivery method
 - c. Developing definitions and a list of delivery methods
 - d. Selecting the appropriate delivery method
 - e. Implementing the chosen delivery method
- 2. Fast-tracking is a defining characteristic of which of the following delivery methods?
 - a. Design-Bid-Build
 - b. Construction Management at-Risk
 - c. Design-Build
 - d. All of the above
 - e. None of the above
- 3. Which of the following are considered "defining" characteristics?
 - a. Are the design and the construction under separate contracts directly to the owner, or are they combined under one contract?
 - b. Is final selection of the constructor based on criteria other than just the lowest total construction costs?
 - c. The construction can be fast-tracked
 - d. Both a and b
 - e. All of the above
- 4. Which of the following are considered "typical" characteristics?
 - a. A Guaranteed Maximum Price (GMP) contract
 - b. A contractual schedule guarantee
 - c. Preconstruction services
 - d. The construction can be fast-tracked
 - e. All of the above
- 5. If an owner selects a contractor using a competition based on the total construction cost based on less than complete design and a final selection based on both the price and other non-price criteria, which procurement method is this?
 - a. Low Bid
 - b. Best Value: Total Cost
 - c. Best Value: Fees
 - d. Qualifications Based Selection
 - e. None of the above

- 6. Based on the definitions used in this chapter, in which procurement method are fees and the contractor's general conditions part of the final selection criteria but not the total construction cost?
 - a. Low Bid
 - b. Best Value: Total Cost
 - c. Best Value: Fees
 - d. Qualifications Based Selection
- 7. Third party options for program management include:
 - a. Development manager
 - b. Agent CMs
 - c. Program managers
 - d. All of the above
- 8. Based on the definitions used in this chapter, the difference between Multiple Prime Contracting and Direct Subcontracting is:
 - a. The type of contract being contracted
 - b. Whether the owner directly holds the contracts
 - c. The number of contracts
 - d. None of the above

This concludes the sample of this textbook. To purchase the full book please visit The AGC Store or Amazon.com