December 10, 2015
TO: The Honorable Mayor and Members of the City Council
FROM: David Brandt, City Manager

Civic Center Master Plan Follow-up

At the November 17th Council study session on Civic Center Master Plan Financing Alternatives and Affordability Analysis, Council asked staff to look at creative ways that could be employed to build the approved master plan with $40 million. The professional cost estimation firm, and the peer review cost estimation firm arrived at a fully inclusive cost estimate of approximately $70 million based on the assumption of a standard design bid-build project delivery method, which is by far the most predominantly used method for public construction in California. It is also important to remember that these estimates include much more than construction costs; they are all-inclusive of demolition and construction; site work; design consultants; direct and indirect City staff costs; construction management; financing costs; relocation and temporary leasing for City staff; furniture, fixtures and equipment ("FFE'"); design contingency (15% of direct costs); hard cost contingency (10% of direct costs); and escalation (3 years to project midpoint). These estimates are based on standard industry practice, professional experience and knowledge of the local construction markets.

Public Works staff has many years of experience with delivering public projects, and doing so creatively within the rigid public contract code legal framework to achieve the best value and quality for the public's tax dollars. Through affiliations and networks such as the League of California Cities' Public Works Department, the American Public Works Association, and the California Multi-Agency CIP Benchmarking Study, we stay aware of new approaches being piloted or implemented to achieve potential cost savings. The most unique and creative delivery method that we have found deployed is the San Ramon City Hall that is currently under construction by Sunset Development. This is a very unique situation where San Ramon was able to enter into a very complex agreement with Sunset, and make supporting amendments to their municipal code under their charter city powers.

Attached, you will find several attachments. The first attachment is a memorandum from an attorney that we have retained to advise us on construction related matters. This provides some background on the most common project delivery methods and some alternative delivery methods, and their potential applicability to a Cupertino City Hall project within the constraints of the public contract code and Cupertino being a general law city. Other attachments are provided only as an additional resource if you are interested in gaining more depth on alternative project delivery methods. One of these white papers is prepared by a California construction law firm, another by a joint committee of the American Institute of Architects and the Association of General Contractors, and a third by the Construction Management Association of America.

Because we were not successful in our attempts to discover a project delivery process that could develop a $70 million estimated cost project for less than the maximum $40 million authorized by Council, we will not be bringing the project for further consideration unless so directed by City Council.

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DATE: December 1, 2015

TO: Colleen Winchester, Assistant City Attorney
City of Cupertino

FROM: Clare M. Gibson, Special Counsel

RE: Alternative Project Delivery Methods

This memorandum discusses alternative project delivery methods with reference to the planned City Hall project. Private parties have asserted that the project could be delivered at a lower cost if the contract is awarded without competitive public bidding. Whether or not that is correct, the threshold inquiry is whether and under what circumstances the City could contract for a new City Hall without competitive bidding. This memorandum begins with relevant legal context, summarizes the "default" public bidding requirements applicable to cities under the Public Contract Code, then examines and compares some alternative delivery methods.

A. Legal Context

Legal context is important for understanding the scope of and limitations on the City's ability to use alternative project delivery methods, and for understanding why an alternative delivery method used by other agencies might not be an option for the City. As a general law city, the project delivery methods available to the City of Cupertino are limited to what is expressly authorized under state law, primarily as stated in the Public Contract Code.

The Public Contract Code contains three main categories of laws:

1) laws that apply to all public agencies,
2) laws that apply only to the state and state agencies, and
3) laws that apply only to local agencies, including cities, counties and various types of districts.

Within the local agency category, there are provisions that apply to all local agencies and provisions that only apply to specific types of agencies, e.g., provisions that only apply to counties, provisions that only apply to school districts, and provisions that only apply to

cities, namely Public Contract Code sections 20160 through 20174 ("Section 20160 et seq.").[1]

Therefore, the City's project delivery options are largely limited to Section 20160 et seq., and laws that apply to all local agencies. As such, an alternative delivery method that is available to a state agency, a county, or a school district, is not necessarily available for a general law city. Likewise, an alternative delivery method that is available to a charter city based on authority under its charter will not be an option for a general law city.

B. Design-Bid-Build (Section 20160 et seq.)

Under section 20162, municipal contracts for public projects over $5,000[2] must be "contracted for and let to the lowest responsible bidder after notice." Section 20164 specifies the particular requirements for giving notice. There are limited statutory exceptions to these competitive bidding requirements, e.g., the emergency exception under section 20168, none of which would apply to the planned City Hall project. These statutory requirements are reflected in Chapter 3.23 of the City's municipal code.

The bidding requirements under section 20160 et seq. are structured for conventional design-bid-build project delivery. Under this procurement method, an architect or engineer retained separately by the city prepares plans and specifications for the project. The city advertises and solicits bids for the project using those plans and specifications. The successful low bidder is then required to construct the project as designed for the amount of its bid.

C. Design-Build

Design-bid-build has been and remains the standard project delivery method for all public agencies in California. However, beginning in 1957, the legislature enacted laws on a piecemeal basis, providing limited authority for certain public agencies to use design-build as an alternative project delivery method. Section 20175.2 was enacted in 2008, permitting general law cities to use design-build, subject to the limitations in that statute. Effective January 1, 2015, SB 785 repealed previous design-build statutes, including section 20175.2, and replaced them with new sets of statutory requirements, one set for the state and state agencies, and another set—section 22160 et seq. ("Section 22160 et seq.")—for local agencies, including cities. Therefore, the City may award a public works contract using the design-build method under SB 785 as an alternative to design-bid-build under Section 20160 et seq.

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[1] All section references are to the Public Contract Code unless otherwise specified.
[2] Since the City is subject to the higher bid limits under section 22032, the dollar threshold for "formal" public bidding is currently $175,000.

To comply with the statutory requirements for design-build delivery, a city must take steps including the following:

1. Develop a conflict of interest policy to bar the architect or engineer who prepares the initial design documents (called the "bridging documents") from subsequently submitting a proposal as a design-build entity or from participating in such a proposal.

2. Retain an architect or engineer to prepare the bridging documents, which may include performance specifications and plans that describe the general project requirements, including size, type, design character, building layout, etc.

3. Undertake a request for qualifications ("RFQ") process to either pre-qualify or develop a short-list of eligible design-build entities.

4. Undertake a request for proposals ("RFP") process, to elicit proposals from the pre-qualified or short-listed design-build entities, based on the bridging documents.

5. Select a design-build entity based on either the lowest bid or the "best value," depending on the terms of the RFP. For "best value" selections, the evaluation process must include certain required criteria (price, technical design, construction expertise, and life-cycle costs).

6. After the city selects a design-build entity, it may then engage in further negotiations with the selected design-build entity before the design-build agreement is finalized and executed.

The major advantage of design-build procurement is that a single entity is responsible for both design and construction, thereby eliminating the potential for conflict between an architect and contractor where each blames the other for problems that arise during construction. Design and construction are coordinated by the design-build entity, and it is solely responsible for both design and construction problems.

In theory, design-build procurement can provide for efficiencies between the design and construction phases. For example, site work can begin before all of the interior design details have been worked out. As a practical matter, design-build projects are subject to many of the same problems that arise under design-bid-build, e.g., claims over differing site conditions, delay claims, etc. Using design-build will not necessarily result in cost savings or in faster completion of a project.

The obvious disadvantage to using design-build is that it requires a procurement process that is much more complex and time-consuming than the conventional design-bid-build method, as indicated by the steps summarized above. The upfront transactional costs are generally higher, including the costs to develop the bridging documents, the RFQ, the RFP, and the design-build agreement, all of which must conform to the detailed requirements in Section 22160 et seq.

D. Construction Manager At Risk/Multi-Prime Delivery

Construction manager at risk ("CMAR") is a delivery method under which the owner hires a construction manager (or construction management firm) to construct a project for a guaranteed maximum price. The construction manager is then solely responsible for selecting, entering into subcontracts with, and overseeing the trade subcontractors that perform the actual work. The construction manager at risk is likewise responsible for any costs that exceed the guaranteed maximum price, hence the "at risk." If the project is completed for less than the guaranteed maximum price, the owner benefits from the cost savings.

The CMAR delivery method is not available for general law cities; there is no statutory authorization and it does not comply with the bidding requirements under Section 20160 et seq. However, it is possible for a general law city to structure a design-bid-build project in a manner that bears some similarity to CMAR delivery by using multi-prime delivery and separately retaining a construction manager to oversee the trade contractors performing the work.

Under a multi-prime delivery, instead of having a single prime contractor who subcontracts out portions of the work to multiple trade subcontractors, the work for a project is divided by trade, e.g., site work, framing, plumbing, etc., and a prime contract is awarded for each trade division through a conventional public bidding and award process. As long as a general law city complies with statutory bidding requirements, it may award contracts for a project using multi-prime delivery.[3]

A general law city may select and hire a qualified construction manager through a "fair, competitive process" under Government Code section 4529.10 et seq., e.g., by using an RFQ or RFP process. That construction manager may then be required to 1) assist in preparing and bidding out the separate prime contracts for each trade division, and 2) manage and coordinate all work performed under the separate prime contracts. This approach bears similarity to the CMAR model in that the city's selected construction manager is responsible for coordination and oversight of the work of the various trades.

[3] This differs from bid-splitting, which involves splitting the work of a project into small components for the purpose of avoiding public bidding requirements. Bid-splitting is unlawful under section 20163.)

However, instead of the construction manager contracting directly with trade subcontractor, the city bids out and awards each of the trade division contracts in compliance with public bidding requirements. Even though the construction manager has primary responsibility for coordinating the trade contracts, the city still has the direct contractual relationship with the trade contractors, with the same general legal obligations it would have under any design-bid-build construction contract.

While this hybrid method differs from true CMAR delivery, it does afford the opportunity for a city to separately select a specific construction manager through an RFQ or RFP process (which can involve exercise of discretion) to oversee the work instead of being limited to the low prime bidder for coordination of the trade subcontracts under a conventional design-bid-build delivery. Because public bidding is still required for each trade, the bidding costs would be similar to those for design-bid-build delivery.

E. Lease-Leaseback

School districts have special authorization under Education Code section 17406 to use an alternative delivery method known as "lease-leaseback." The primary purpose of this method is to provide a financing mechanism. Under a lease-leaseback procurement, a school district may lease property it owns to a contractor for a nominal amount, and the contractor agrees to construct school facilities on the property. Upon completion, the contractor then leases the improved property back to the school district, and once the construction (and financing) costs are recovered through the lease payments, the lease terminates and the property and facilities vest with the district.

There is no comparable law authorizing a general law city to use lease-leaseback project delivery. In the absence of such express authorization, lease-leaseback delivery is not an option for the City because it is inconsistent with the competitive bidding requirements of Section 20160 et seq. Moreover, the law limits the lease-leaseback delivery method for "a building or buildings for the use of the school district during the term of the lease." (Education Code §17406(a)(1).) As such, a school district could not use this project delivery method for the purposes of a constructing a city hall on behalf of a city.

F. Public-Private Partnerships

Public-private partnership agreements ("P3s") vary considerably, and are most frequently used as a financing mechanism, not unlike lease-leasebacks. While the Government Code provides two statutory schemes which permit a public agency, including general law city, to enter into a P3 agreement to fund certain public projects, neither of these statutory

authorizations would apply to construction of a city hall.[4] Without such express statutory authorization, the City's available options for partnering with a private party depend on the particular terms and circumstances.

If a P3 was structured to provide a substantial and quantifiable advantage over statutory procurement options, it could potentially be exempted from statutory bidding requirements under the common law exception to public bidding, as articulated in *Graydon v. Pasadena Redevelopment Agency* (1980) 104 Cal.App.3d 631. Under this case law exception, a project may be exempt from public bidding requirements if bidding would produce no competitive advantage or would even result in a substantial financial disadvantage. Application of this common law exception is necessarily fact-specific. As noted above, courts strictly apply exceptions to competitive bidding requirements.

For example, if a P3 agreement provided that a private party substantially paid for the costs of constructing the new City Hall, such that the project would clearly cost less for the City than it would under statutory procurement, there may indeed be defensible grounds for invocation of the common law exception. It would be important for the City to demonstrate that competitive bidding would be a clear disadvantage. This could potentially be determined by soliciting market rate quotes from qualified contractors or by obtaining an engineer's estimate of the construction cost under current market conditions.

Depending on the specific terms and circumstances, it is possible that construction could proceed under a P3 agreement, without competitive bidding, provided the facts unequivocally support reliance on the *Graydon* exception.

G. Development Agreement

A development agreement ("DA") between a public agency and a private developer is not a project delivery method as such, but public improvements are often constructed pursuant to the terms of a DA, e.g., infrastructure improvements that are required as a condition of approval. Parties to a DA have considerable discretion in terms of the contents of the DA, so in theory the City could negotiate a DA that included requirements relating to construction of a new City Hall.

Of course a DA is necessarily limited by what the other party—the private developer—will agree to. However, a DA could potentially provide a vehicle for more cost-effective construction of a new City Hall.

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[4] Government Code § 4217.10 et seq. applies to certain energy-related contracts; and Government Code § 5956 et seq. applies solely to specified "fee-producing infrastructure projects," e.g., utilities, airports or sports arenas.

Conclusion

In sum, despite the limitations that apply to general law cities, the City has several potential options for construction of a new City Hall: 1) conventional design-bid-build delivery under Section 20160 et seq.; 2) design-build delivery under Section 22160 et seq.; 3) multi-prime delivery coordinated by a construction manager; 4) potentially, a thoughtfully crafted P3 agreement: or 5) a development agreement. I remain available for further discussion of the City's options in this regard.

Primer on
PROJECT DELIVERY

Second Edition

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Primer on Project Delivery

Second Edition

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Introduction

To help architects and contractors achieve quality projects that fulfill owner expectations and are delivered on time and on budget, The American Institute of Architects (AIA) and The Associated General Contractors of America (AGC) formed a task force to produce this second edition of the *Primer on Project Delivery*. Intended to improve understanding for the mutual benefit of owners and the design and construction community, it is primarily addressed to owners who are unfamiliar with the various ways of procuring design and construction services. The AIA and AGC recognize that many viable project delivery methods are available, so the primer is not meant to endorse any one delivery method over another.

At present, there are no industry-wide accepted definitions of project delivery methods and many groups, organizations, and individuals have developed their own. In so doing, they have often used different characteristics to define the delivery methods. The result has been a multiplicity of definitions, none of which is entirely right or entirely wrong. This primer offers basic definitions to help owners better understand their options.

The main criteria for measuring the success of any project delivery method are cost, quality, time, safety and how the project ultimately meets its intended purpose. However, responsibilities for meeting these criteria vary by method. Each delivery method offers a different level of risk to the owner.

The goals of this publication are:

1. *To develop a set of definitions for the four primary delivery methods—Design-Bid-Build, Design-Build, Construction Management at-Risk, and Integrated Project Delivery.*

2. *To create definitions broad enough that all hybrids fall within the four primary delivery methods mentioned above.*

3. *To encourage consensus on a set of defining characteristics for each delivery method.* Defining characteristics define a delivery method. Typical characteristics may be common to a delivery method, but are not required to define it.

4. *To provide the industry with a set of definitions that others can use as a baseline.* The design and construction industry has lacked standard definitions for so long that industry-wide consensus will not be reached quickly. Therefore, the goal of this primer is to provide a baseline against which people can reconcile their own set of definitions.

Note: Some states have laws that establish delivery methods and associated responsibilities. Check with your architect or contractor for assistance in reconciling differences within your state. AGC's Construction State Law Matrix™ (www.agc.org/slm) and AIA's Project Delivery Statute Matrix (http://www.aia.org/aiaucmp/groups/aia/documents/pdf/aias078880.pdf) are also useful resources for locating information on state laws affecting public or private construction projects.

Risk Tolerance and the Project Delivery Decision

Risk Tolerance regarding the choice of project delivery methods can be defined as the extent to which an organization chooses to risk experiencing a less favorable outcome in the pursuit of a more favorable outcome (*adapted from the International Standards Organization (ISO)).*

All things being equal, most organizations prefer paths where risk is consistent with their tolerance. This idea of risk is completely applicable to the decision regarding project delivery methods and can be seen as one of the factors why there is reluctance to implement certain project delivery models.

New project delivery methods have a structure focused on collaboration, while at the same time eliminating the adversarial nature of traditional models. This is appealing to some owners. There are several ways these collaborative models can be structured from mergers, to hires, to partnerships on a project by project basis.

Whether the various disciplines of design and construction management are provided in-house or whether there is some sort of partnering relationship established; collaborative project teams must provide the necessary leadership to deliver on an owner's expectations of cost and quality, while taking on the risk inherent in all design and construction projects.

This task force worked to reach consensus on how projects are delivered and to ensure that the language used is method-neutral. There was considerable discussion of the terms used to describe the four primary delivery methods discussed in this primer. The task force recognized that delivery and management terms such as "CM-adviser," "CM-agent," "program management" and "turnkey" are appropriate in some situations, as are terms that describe variations of some delivery methods, such as "bridging" as a variation of Design-Build. However, use of these terms is not in keeping with the goal of creating definitions broad enough to include all hybrids of the four primary project delivery methods.

The task force participants learned from this experience, and hope that others will also benefit from the information contained in this document.

Key Considerations

Delivery vs. Management

Before defining the project delivery methods, it is important to distinguish between the delivery and management aspects of project delivery. "Delivery" refers to the method for assigning responsibility to an organization or an individual for providing design and construction services. "Management" refers to the means for coordinating the process of design and construction (planning, staffing, organizing, budgeting, scheduling, and monitoring).

For example, CM at-Risk is a project delivery method and CM-adviser is a form of project management. While this difference in leadership may appear subtle, it is nonetheless important to the understanding of the different delivery methods. Assignment of contractual responsibility is a key concept for differentiating project delivery methods. Considering outsourcing of such responsibility and administration is an option that owners may want to address in any project.

Technology

Building Information Modeling (BIM) is a software tool that can be used with any of the project delivery methods discussed in this document. Because it is relatively new in the marketplace, there has been confusion that BIM is reserved exclusively for use with IPD projects. This is not the case. BIM is a technological choice that allows the IPD process to work most effectively, but is not a defining characteristic of that delivery method. BIM is a technology tool that is well suited for IPD projects because a collaborative delivery process paired with a technological catalyst creates a shared database of information available to all members of the team at the same time. This early access to information is the fuel that drives the successful outcome of a project. All team members utilize their specific area of expertise to inform the project design, make value-added decisions, and thereby advance the outcome. Still, BIM can be used with any of the delivery methods described in this primer.

Selection Procedures

How the owner selects the primary service providers has a significant effect on the project delivery method and resulting contractual relationships.

The selection is usually based on price, qualifications, or a combination of the two. When qualifications or qualifications *and* price serve as the basis for selection, it is common to use a Request for Qualifications (RFQ), a Request for Proposals (RFP), and interviews to review bidders. Each of these methods of gathering information reveals important aspects of the bidders' qualifications. Typically, more than one provider is contacted to supply information to encourage the opportunity for comparison and optimum selection.

The following are commonly used approaches for selecting a design and construction team:

Contractor Procurement Options:

Direct Negotiation – The contractor is selected based on reputation, experience and/or past performance. The fee and/or total cost is negotiated between the contractor and the owner.

Qualifications Based Selection (QBS) – The contractor is selected on the basis of demonstrated competence and qualifications only. The owner shall not request or consider fees, price, man-hours or any other cost information as part of the selection process.

Best Value: Fees – The contractor's final selection is based on some weighting of a combination of qualifications and fees (possibly including general conditions).

Best Value: Total Cost – The contractor's final selection is based on some weighting of the total cost and other criteria such as qualifications.

Low Bid – The contractor's final selection is based solely on lowest total cost.

Architect Procurement Options:

Direct Negotiation – The architect is selected based on reputation, experience, and/or past performance. The fee is negotiated between the architect and the owner.

Qualifications Based Selection (QBS) – The architect is selected on the basis of demonstrated competence and qualifications only. The owner shall not request or consider fees, price, man-hours or any other cost information as part of the selection process.

Best Value: Fees – The architect final selection is based on some weighting of a combination of qualifications and fees.

Low Fee – The architect final selection is based solely on lowest fee.

Accelerated Delivery

In some projects, owners may have an additional requirement to occupy the building or space as soon as possible. In these instances, architects and contractors will agree to terms which require an accelerated project delivery process or "fast-track". Fast-track projects can appear in any of the delivery methods discussed in this document but are most likely to be seen in CM at-Risk, Design-Build, and IPD. The schedule will require the architect to issue portions of the drawing set (e.g., foundation plans, structural steel, etc.) to the contractor for bid/pricing and construction before the project's design is fully complete. The benefit to the owner is a shorter schedule; however, the downside is that some design elements are locked in early making changes in scope later in the design phases difficult and costly.

Delivery Method Definitions

Introduction

In recent years, various delivery methods have been created or gained renewed popularity to address owners' concerns with finger pointing, cost overruns, and increasing project complexity. These delivery methods include Design-Build, Construction Management at-Risk, and Integrated Project Delivery. The sections below provide an overview of each of these project delivery methods with defining and typical characteristics for each. Owners should be aware that each project delivery method should include the development of carefully crafted contracts defining the roles of the players appropriate to that methodology.

Design-Bid-Build (DBB)

This method involves three roles in the project delivery process—owner, architect, and contractor—in traditionally separate contracts. "Traditional" is frequently used to describe the Design-Bid-Build method, which typically involves competitively bid, lump sum construction contracts that are based on complete and prescriptive contract documents prepared by architects. These documents generally include drawings, specifications, and supporting information. The phases of work are usually conducted in linear sequence. The owner contracts with an architect for design, uses the design documents produced by the architect to secure competitive bids from contractors; and, based on an accepted bid, contracts with a contractor for construction of the building.

For most of the 20th century, public work was routinely built using the Design-Bid-Build delivery method. This has included competitive bidding among general contractors, performance bonds, and employment of various other statutory requirements to protect taxpayer investments. Much private work has also been performed for a lump sum figure, in the belief that the marketplace ensures economic discipline and yields the lowest cost. It should be noted that this may not be the lowest cost for the project, but it represents the lowest cost associated with the design documents prepared for the project before actual construction begins.

In many instances private organizations with large constituencies, such as churches and schools, use project delivery methods with sealed bids and formal procedures similar to procedures for public projects.

The following *defining characteristics* identify Design-Bid-Build:

- Three prime players—owner, designer, contractor
- Two separate contracts—owner-designer, owner-contractor
- Final contractor selection is based on Low Bid or Best Value: Total Cost

Typical characteristics of the Design-Bid-Build approach include the following:

- Three phases—design, bid, build. These phases may be linear or overlapping if a project is fast-tracked or bid-out to multiple prime contractors.
- Well-established and broadly documented roles
- Contract documents that are typically completed in a single package before construction begins, requiring construction-related decisions in advance of actual execution
- Construction planning based on completed documents
- Complete specifications that produce clear quality standards
- Configuration and details of finished product agreed to by all parties before construction begins

Construction Management at-Risk (CM at-Risk)

Construction Management at-Risk (CM at-Risk) approaches involve a construction manager who takes on the risk of building a project. The architect is hired under a separate contract. The construction manager oversees project management and building technology issues, in which they typically have particular background and expertise. Such management services may include preparation of cost models, advice on the time and cost consequences of design and construction decisions, scheduling, cost control, coordination of construction contract negotiations and awards, timely purchasing of critical materials and long-lead-time items, and coordination of construction activities.

In CM at-Risk, the construction entity, after providing preconstruction services during the design phase, takes on the financial obligation for construction under a specified cost agreement. The construction manager frequently provides a Guaranteed Maximum Price (GMP). CM at-Risk is sometimes referred to as CM/GC because the construction entity becomes a general contractor (GC) through the at-risk agreement.

The term “at-risk” is often a source of confusion. Sometimes it refers to the fact that the contractor holds the trade contracts and takes the performance risk for construction. In other contexts, the term is tied to the existence of a cost guarantee or GMP. Because the term “at-risk” has two distinct meanings, it is important to understand how it is being used in a particular situation. The definition used for CM at-Risk in this document is based primarily on the fact that the construction manager holds the trade contracts and takes the performance risk. The eventual establishment of a guaranteed maximum price is typical of CM at-Risk project delivery, but it is not a defining characteristic of the delivery method in this case.

When a GMP is used, the CM at-Risk approach is flexible as to when the construction price becomes fixed. As a result, the timing for agreeing to a GMP varies by project. Considerations of risk should include an evaluation of the amount of design information available, the amount of contingency included, and the owner’s willingness to share in the risk of cost overruns.

The CM at-Risk contracts with trade contractors who perform their portion of the construction. These entities are contractually bound only to the CM at-Risk. It should be noted that there is no contractual relationship between the designer and the CM at-Risk.

The following *defining characteristics* identify CM at-Risk:

- Three prime players—owner, architect, CM at-Risk
- Two separate contracts—owner to architect, owner to CM at-Risk
- Final provider selection based on Qualifications Based Selection or Best Value: Fees

Typical characteristics of the CM at-Risk approach include the following:

- Hiring of the CM at-Risk during the design phase
- Clear quality standards produced by the contract's prescriptive specifications
- Establishment of a guaranteed maximum price

Other characteristics that may be seen in the CM at-Risk approach include the following:

- Overlapping phases—design and build
- Preconstruction services offered by the architect, CM or contractor (such as constructability review, bid climate, and bid management)

Construction Management at-Risk is also known by the designations CM at-Risk, CMAR, CM@R, CMc, CM/GC and GC/CM.

Design-Build (DB)

Design-Build has gained popularity in recent years in both the private and public sectors. The primary reason for this interest in Design-Build as a viable project delivery option is the owner's desire for a single source of responsibility for design and construction. In the Design-Build approach to project delivery, the owner contracts with a single entity, the design-build entity, for both design and construction. The design-build entity can be led by an architect or a contractor and can consist of any number of people. As with CM at-Risk, the timing of agreement on a GMP varies with each project.

The following *defining characteristics* identify Design-Build:

- Two prime players—owner, design-build entity
- One contract—owner to design-build entity

Typical characteristics of the Design-Build approach include the following:

- Final design-builder selection may be based on any of the following: Direct Negotiation, Qualifications Based Selection, Best Value: Fees or Total Project Cost, or Low Bid.
- Project-by-project basis for establishing and documenting roles
- Continuous execution of design and construction
- Overlapping phases—design and build
- Some construction-related decisions after the start of the project
- Overall project planning and scheduling by the design-build entity prior to mobilization (made possible by the single point of responsibility)

Other characteristics that may be seen in the Design-Build approach include the following:

- Preconstruction services offered by the architect, CM or contractor (such as constructability review, bid climate, and bid management)

Integrated Project Delivery (IPD)

In today's project atmosphere one could argue the delivery of traditional design and construction services has devolved into an adversarial process resulting in inefficiency, mistrust, and commoditization of services among owners, architects, contractors, subcontractors, and suppliers, each with their agendas, silos, and preferred outcomes built into the project delivery process. However, today's buildings are complex machines requiring the expertise of many professionals to complete. As a response to this unintentional paradox, the industry has begun to look to more collaborative, non-traditional delivery systems to facilitate better communication, reduce/share risk, increase profits, and provide a positive experience for project owners. Integrated Project Delivery (IPD) is one of these collaborative systems.

IPD is conceptually based on a collaborative arrangement of the major project stakeholders early in the process, implemented in an environment of "best-for-project thinking" and shared risk and reward. This collaboration of stakeholders works to define project issues at the outset, helping to identify conflicts, establish performance criteria, minimize waste, increase efficiency, and maximize the scope achieved for limited project budgets. The ultimate goal is to create a project environment that produces a positive outcome for all stakeholders. Although not exclusive to the IPD delivery method, multi-party agreements can include incentive clauses based on the idea of shared savings among the project team.

Both the AIA and AGC define Integrated Project Delivery as a delivery method based on the idea of collaboration.

> **Integrated Project Delivery (IPD):**
> IPD is a method of project delivery distinguished by a contractual arrangement among a minimum of the owner, constructor and design professional that aligns business interests of all parties. IPD motivates collaboration throughout the design and construction process, tying stakeholder success to project success, and embodies the following contractual and behavioral principles:
>
> **Contractual Principles**
> Key Participants Bound Together as Equals
> Shared Financial Risk and Reward Based on Project Outcome
> Liability Waivers between Key Participants
> Fiscal Transparency between Key Participants
> Early Involvement of Key Participants
> Jointly Developed Project Target Criteria
> Collaborative Decision Making
>
> **Behavioral Principles**
> Mutual Respect and Trust
> Willingness to Collaborate
> Open Communication

It is important to note that some projects are being delivered in a hybrid approach when integrated practices or philosophies are applied to more traditional delivery approaches such as CM at-Risk, Design-Build or Design-Bid-Build (where the owner is not party to a multi-party contract). In addition to not having a multi-party contract, this IPD hybrid is characterized by "traditional" transactional CM at-Risk or Design-Build contracts, some limited risk-sharing , and some application of IPD principles.

The following *defining characteristic* identifies IPD:

- A contractual arrangement among multiple parties including, at a minimum, the owner, the architect and the contractor

Typical characteristics of the IPD approach include the following:

- Shared risk and reward
- Continuous execution of design and construction
- A minimum of three prime players—owner, architect, contractor
- Some construction-related decisions after the start of the project
- Overall project planning and scheduling collaboratively by the entire team
- Selection of the architect and contractor team is typically accomplished through Direct Negotiation, Qualifications Based Selection or Best Value: Fees.

Other characteristics that may be seen in the IPD approach include the following:

- Overlapping phases—design and build
- Preconstruction services offered by the architect, CM or contractor (such as constructability review, bid climate, and bid management)

Conclusion

There are a myriad of choices for both project delivery methods and professional services selection types. The downside of this myriad of choices is that confusion is inevitable. The good news is these alternatives offer the parties involved more flexibility to select the best process for a particular project. The decision about which delivery method to choose has become increasingly complex as different methods of project delivery have been developed.

This primer attempts to address the lack of standard industry definitions for project delivery by sharing a baseline set of definitions. For example, the rise of IPD in the industry, including the many different ways it is defined, adds to the list of project delivery options without a standard definition. As the industry moves forward, it will be increasingly more important to have common definitions of project delivery options.

The definitions proposed in this primer do not represent any one individual opinion but rather are definitions that appear to be most consistent with those currently being used in the industry and reflect the evolution of the terminology and the slight shifts in industry consensus. Perhaps one day, if everyone is able to reconcile to the same templates, we will be one step closer to having 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.

Resources

General

AGC Project Delivery Website. The Associated General Contractors of America.

Best Practices for Use of Best Value Selections. The Associated General Contractors of America and The National Association of State Facilities Administrators. 2008.

Project Delivery Systems for Construction-3rd Edition. Michael E. Kenig. The Associated General Contractors of America. 2011.

Qualifications Based Selection of Contractors. The Associated General Contractors of America. 2009.

The Architect's Handbook of Professional Practice-14th Edition. The American Institute of Architects. Joseph A. Demkin, AIA, ed. New York: John Wiley & Sons Inc. 2008.

Construction Management at-Risk (CM at-Risk)

CM At-Risk State-by-State Map. The Associated General Contractors of America. 2010.

CM/GC Guidelines for Public Owners-2nd Edition. The Associated General Contractors of America and The National Association of State Facilities Administrators. 2007.

Design-Build (DB)

AIA/AGC Design-Build Teaming Checklist. The American Institute of Architects and The Associated General Contractors of America. 1999.

AIA/AGC Recommended Guidelines for Procurement of Design-Build Projects in the Public Sector. The American Institute of Architects and The Associated General Contractors of America. 1995.

The Architect's Guide to Design-Build Services. The American Institute of Architects. G. William Quatman, FAIA, and Ranjit (Randy) Dhar, FRAIC, eds. Hoboken, N.J. John Wiley & Sons Inc. 2003.

Integrated Project Delivery (IPD)

3xPT - Integrated Project Delivery: First Principles for Owners and Teams. The American Institute of Architects, The Associated General Contractors of America and The Construction Users Roundtable. 2008.

Experiences in Collaboration: On the Path to IPD. The American Institute of Architects and The American Institute of Architects California Council. 2009.

Integrated Project Delivery: 2010 Case Studies. The American Institute of Architects and The American Institute of Architects California Council. 2010.

Integrated Project Delivery: A Guide. The American Institute of Architects. 2008.

Integrated Project Delivery for Public and Private Owners. National Association of State Facilities Administrators, Construction Owners Association of America, APPA: The Association of Higher Education Facilities Officers, Associated General Contractors of America and American Institute of Architects (AIA). 2010.

IPD Case Studies. The American Institute of Architects, AIA Minnesota and the University of Minnesota, School of Architecture. 2011

List of Industry Contracts

The following chart lists the key contracts and forms for the delivery models discussed in this document. Please refer to the following websites for a complete list of contracts and related documents as well as current updates: www.consensusdocs.org and www.aia.org/contractdocs. *Note that AIA-developed contracts begin with either A, B or C, and AGC-endorsed contracts begin with ConsensusDOCS®.*

Design-Bid-Build (DBB)

A101™–2007, Standard Form of Agreement Between Owner and Contractor where the basis of payment is a Stipulated Sum

A102™–2007, Standard Form of Agreement Between Owner and Contractor where the basis of payment is the Cost of the Work Plus a Fee with a Guaranteed Maximum Price

A103™–2007, Standard Form of Agreement Between Owner and Contractor where the basis of payment is the Cost of the Work Plus a Fee without a Guaranteed Maximum Price

A105™–2007, Standard Form of Agreement Between Owner and Contractor for a Residential or Small Commercial Project (including general conditions)

A107™–2007, Standard Form of Agreement Between Owner and Contractor for a Project of Limited Scope (including general conditions)

A201™–2007, General Conditions of the Contract for Construction

B101™–2007, Standard Form of Agreement Between Owner and Architect

B103™–2007, Standard Form of Agreement Between Owner and Architect for a Large or Complex Project

B104™–2007, Standard Form of Agreement Between Owner and Architect for a Project of Limited Scope

B105™–2007, Standard Form of Agreement Between Owner and Architect for a Residential or Small Commercial Project

ConsensusDOCS 200 Owner-Contractor Agreement & General Conditions—Lump Sum

ConsensusDOCS 205 Short Form Owner-Contractor Agreement & General Conditions—Lump Sum

ConsensusDOCS 235 Short Form Owner-Contractor Agreement & General Conditions—Cost of Work

ConsensusDOCS 240 Owner-Architect/Engineer Agreement

ConsensusDOCS 245 Short Form Owner-Architect/Engineer Agreement

Construction Management at-Risk (CM at-Risk)
A133™–2009, Standard Form of Agreement Between Owner and Construction Manager as Constructor where the basis of payment is the Cost of the Work Plus a Fee with a Guaranteed Maximum Price

A134™–2009, Standard Form of Agreement Between Owner and Construction Manager as Constructor where the basis of payment is the Cost of the Work Plus a Fee without a Guarantee Maximum Price

B103™–2007, Standard Form of Agreement Between Owner and Architect for a Large or Complex Project

A201™–2007, General Conditions of the Contract for Construction

ConsensusDOCS 500 Owner-Construction Manager Agreement & General Conditions—GMP with option for Preconstruction Services

ConsensusDOCS 510 Owner-Construction Manager Agreement & General Conditions—Cost of Work with option for Preconstruction Services

Design-Build (DB)
A141™–2004, Agreement Between Owner and Design-Builder

A142™–2004, Agreement Between Design-Builder and Contractor

B142™–2004, Agreement Between Owner and Consultant where the Owner contemplates using the design-build method of project delivery

B143™–2004, Standard Form of Agreement Between Design-Builder and Architect

ConsensusDOCS 400 Preliminary Owner-Design-Builder Agreement

ConsensusDOCS 410 Owner-Design-Builder Agreement & General Conditions—Cost Plus with GMP

ConsensusDOCS 415 Owner-Design-Builder Agreement & General Conditions—Lump Sum

Integrated Project Delivery (IPD)
C191™–2009, Standard Form Multi-Party Agreement for Integrated Project Delivery

A195™–2008, Standard Form of Agreement Between Owner and Contractor for Integrated Project Delivery

A295™–2008, General Conditions of the Contract for Integrated Project Delivery + B195™–2008, Standard Form of Agreement Between Owner and Architect for Integrated Project Delivery

B195™-2008, Standard Form of Agreement Between Owner and Architect for Integrated Project Delivery

C195™–2008, Standard Form Single Purpose Entity Agreement for Integrated Project Delivery

C196™-2008, Standard Form of Agreement Between Single Purpose Entity and Owner for Integrated Project Delivery

C197™-2008, Standard Form of Agreement Between Single Purpose Entity and Non-Owner Member for Integrated Project Delivery

C198™2010, Standard Form of Agreement Between Single Purpose Entity and Consultant for Integrated Project Delivery

C199™2010, Standard Form of Agreement Between Single Purpose Entity and Contractor for Integrated Project Delivery

ConsensusDOCS 300 Collaborative Agreement (Multi-Party Agreement)

Qualification Forms

A305™–1986, Contractor's Qualification Statement

B305™–1993, Architect's Qualification Statement

ConsensusDOCS 221 Contractor's Statement of Qualifications for a Specific Project

ConsensusDOCS 222 Architect/Engineer's Statement of Qualifications for a Specific Project

ConsensusDOCS 721 Subcontractor's Statement of Qualifications for a Specific Project

Alternative Project Delivery Methods for Public Works Projects in California

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I. Introduction

Public agencies in California have long been restricted in the manner they can award public works construction projects. As a general rule, public agencies are obligated by competitive bidding statutes to award construction contracts to the lowest responsive, responsible bidder. This traditional project delivery method places primary importance on cost, and restricts agencies from utilizing most of the alternative project delivery methods available to the private sector (design-build, job-order contracting, construction manager at risk, public-private partnerships, integrated project delivery, all discussed below in more detail). However, an increasing number of statutes are being enacted authorizing designated public agencies to use alternative project delivery methods under certain circumstances. While this is a welcome trend for most people involved with public works contracting, the scope of this authority is both limited and confusing. This paper will summarize the current statutory authority for alternative project delivery methods for public works projects, and explain why it is vitally important for public agencies to understand the limits of these statutes so as to avoid awarding public works contracts illegally.

Determining the statutory constraints that apply to a particular public works project is only the first step in selecting the best project delivery method. Where more than one project delivery method is available, careful thought should be given to which method is most advantageous for that particular project. The answer will vary depending on the size of the project, how quickly it must be delivered, the complexity of the work, how much risk the public agency is willing to assume, and other variables. As discussed in more detail below, even those agencies that are subject to competitive bidding requirements can tailor their approach to particular projects with creativity to maximize their opportunity for a successful outcome. For instance, awarding a project on a multi-prime basis (modified CM at risk) allows a public agency to use a qualifications-based selection process for the construction management firm while still awarding the construction work to the lowest bidder for various individual trade contracts. It also allows for the inclusion of integrated project delivery principles (early involvement of trade contractors in the design process, and structuring of compensation based on successful project outcome). For large, complex projects, this approach offers real benefits in terms of the quality of construction, efficient delivery and cost.

II. The Base-line: Lowest Responsive, Responsible Bidder

Until recently, most public agencies in California have been required to award all public works construction projects to the lowest responsive, responsible bidder. This contract award method is commonly referred to as the “design-bid-build” project delivery method, because the design contract is awarded separately from the construction contract. After the design work is complete, the construction contract documents are advertised, contractors submit bids, the work is awarded to the lowest bidder, and the structure or public improvement is built. Thus, in order, the project goes through the design, bid and build phases.

There are several defining features of a design-bid-build contract award. First, the award must be made on the basis of cost (lowest bid submitted). The agency cannot award the contract based on the qualitative factors of the contractors bidding for the work such as experience, financial capacity, references, safety record etc. Second, the low-bidder must submit a bid which is responsive to all of the requirements set forth in the contract documents. Third, the agency must confirm that the lowest bidder meets the requisite "responsibility" standard. "Responsible bidder" is defined as "a bidder who has demonstrated the attribute of trustworthiness, as well as quality, fitness, capacity, and experience to satisfactorily perform the public works contract." (See Public Contract Code Section 1103.) Finally, the scope of services provided under the contract can't include any professional services (such as construction management, engineering or architectural services). This is because California Government Code 4526 (known as the "Little Brooks Act") requires that contracts for professional services for architectural, engineering, environmental, land surveying, or construction project management be awarded "on the basis of demonstrated competence and on the professional qualifications necessary for the satisfactory performance of the services required." In other words, it can't be awarded on the basis of cost. Thus, without specific statutory authority to combine professional services and construction work, a single contract awarded by a public agency can't include both construction and professional services because two different contract award methods must be implemented.

It is important to note that there can be significant variations among competitive bidding statutes requiring an award to the lowest bidder. For instance, different agencies have different dollar thresholds for competitive bidding. Some agencies must competitively bid all contracts over $10,000 while others do not need to use competitive bidding for contracts below $100,000. In addition, the type of contracts which require competitive bidding can be defined differently in different statutes. One statute may require competitive bidding for "maintenance" or "repair" contracts while another may not. Thus, the first step for any public agency embarking on a public works project is to have a firm understanding of the requirements and limitations of the specific competitive bidding statute to which it is subject. Depending on the type of agency, competitive bidding statutes can be found in the Public Contract Code, Health and Safety Code and the Streets and Highways Code. There are some public agencies which are not subject to any competitive bidding requirements, but they are rare. Other entities, like the University of California at San Francisco, have special legislative authority for a pilot program which allows the university to award contracts on a "best value" basis and avoid strict low bid awards.

III. Design-Build

A design-build contract involves the award of a single contract for both the design and construction of a structure or public improvement. The primary advantage of awarding a project on a design-build basis is that the project will likely be completed sooner than if two separate contracts are awarded for design work and construction work, although it may not necessarily be cheaper. By combining the design and construction, the design-build contractor has greater control over the schedule, quality of the work and ultimately the efficiency of the project as conflicts between design and construction are significantly reduced. Another advantage of awarding a project on a design-build basis for the public agency owner is that the responsibility for a successful outcome rests with a single entity rather than being split between two firms who are frequently motivated to take a defensive and adversarial posture when claims arise. Of course, the possibility for conflicts between the design-build contractor and public agency owner still exists, for instance with regard to the quality of the initial 30% design which the owner usually furnishes prior to bidding.

While design-build contracts have been prevalent in the private sector for 15-20 years, they can not be used in the public sector in the absence of specific statutory authority. As discussed above, professional design services must be awarded on the basis of "demonstrated competence and on the professional qualifications" and construction work must generally be awarded to the lowest bidder. Thus, award of a single contract for design-build services would violate one of these requirements.

Fortunately, the California Legislature has gradually adopted a handful of statutes over the last 10 years that authorize design-build contracts for particular public agencies under specified circumstances. While some argue that design-build authority should be made available to all public agencies, the Legislature has been deliberate in their expansion of this authority. Only the following public agencies may currently utilize design-build contracts: 1) "transit operators"; 2) cities; 3) Sonoma County Health Care District; 4) school districts; 5) community college districts; 6) counties; 7) Director of General Services for the State of California; 8) Los Angeles County Metropolitan Transportation Authority; 9) select public agencies pursuing wastewater or solid waste facilities; and most recently 10) "local transportation agencies." For more details regarding these statutes, see the table attached to this paper.

These design-build statutes can vary significantly. For instance, cities have a dollar threshold of $1 million, while transit operators have a threshold of $25 million for capital maintenance or capital enhancing rail projects. Some statutes require that design-build contracts be awarded to the lowest bidder, while others allow for a "best value" approach to determine the successful proposer. A "best value" award generally allows the public agency to select from among a variety of qualitative factors as well as cost. For instance, under the design-build statute for transit operators, "best value" is defined as "a value determined by objective criteria and may include, but is not limited to, price features, functions, life-cycle costs, and other criteria deemed appropriate by the transit district." Payment bond and subcontractor listing requirements generally apply under the design-build statutes, although the requirements are modified slightly from the low bid setting.

IV. Construction Manager at Risk

The construction manager at risk ("CM at risk") project delivery method is also common in the private sector, although it is generally not available for public works construction projects. In its truest form, a CM at risk contract involves hiring a construction management firm after the design has been completed to take responsibility for the construction of the project. The contract award to the CM is usually made on a qualitative basis, and not strictly on price. Generally, the CM agrees to deliver the completed project to the public agency for no more than a guaranteed maximum price. The CM will then award contracts to individual trade contractors to perform specific portions of the construction work. The CM can select trade contractors on whatever basis it prefers (lowest bidder, qualifications, familiarity, etc). The CM manages the construction work performed by the trade contractors, and may also choose to perform some of the actual construction work, in which case the entity would function as a combined construction manager and general contractor (CM/GC).

As with design-build contracting authority, utilizing a true CM at risk project delivery method is not possible for most public agencies without specific statutory authority, for several reasons. First, unless each trade contract is competitively bid and awarded by the public agency, a CM at risk contract does not satisfy the requirement to award contracts for construction work to the lowest responsible bidder. Second, if the CM decides to perform some

of the construction work itself and act in part as a general contractor, the CM's contract would also need to be awarded to the lowest responsible bidder. Finally, awarding a contract to a CM prior to knowing which trade contractors will perform the work poses potential issues with the subcontractor listing law, which requires that a general contractor identify all subcontractors at the time it submits a bid. (See Public Contract Code Section 4100 et. seq.) As a result, most public agencies require specific statutory authority to award a contract on a true CM at risk basis.

Currently, only the University of California has express statutory authority to award contracts on a CM at risk basis. However, there are ways to structure a modified CM at risk contract which satisfy competitive bidding requirements even without specific statutory authority, such as a "multi-prime" approach. The multi-prime approach to CM at risk requires a public agency to award each trade contract required for a project to the lowest bidder, and to award a contract to a CM on a qualitative basis strictly to manage the various trade contractors. This "multi-prime" approach allows for the inclusion of other collaborative contracting principles, as discussed further below in Section VII.

V. Job-Order Contracting

Many public agencies have recurring but relatively minor construction work, the scope and timing of which is difficult to know in advance. This work often involves repair, remodeling or other repetitive work. In California, the project delivery method known as job-order contracting ("JOC") is well suited to address such work. JOC has been defined as follows:

> "[A] competitively bid, firm fixed price, indefinite quantity contract for the performance of minor construction, … [or] the renovation, alteration, painting, and repair of existing public facilities. A JOC, generally a multi-year contract including a base year and multiple option years, is bid and awarded prior to the identification of any specific projects to be performed. Thus, a typical JOC involves a variety of tasks such as the remodeling, renovation, and repair, including roofing, electrical, plumbing, and painting, of all a public agency's buildings for a period of years." (See 76 Op. Atty Gen. Cal. 126, pg 2 (1993).)

The pricing for JOC is frequently based on a unit price book, to which the contractor applies a percentage mark-up.[1]

Again, as with design-build and CM at risk, JOC is not available to most public agencies without specific statutory authority. According to two advisory opinions issued by the California Attorney General, this is primarily because the open-ended nature of the scope of services does not comply with competitive bidding principles and because the Legislature has adopted express JOC authority where it intended to allow JOC. The first of these opinions addressed a general law city's ability to award work on a JOC basis, and held that "a public works project

[1] According to an opinion issued by the California Attorney General's office, "A JOC is a fixed price agreement in the sense that it is based upon specified charges contained in a unit price book (prepared by the public agency or by independent commercial sources) setting forth detailed repair and construction tasks, including task descriptions, specifications, unites of measurement, and unit prices for each task. A contractor's bid is expressed in terms of a percentage of the specified book charges such as 115 percent or 125 percent. The book is then used to determine the costs of each proposed project during the term of the contract, which is normally one or more years. The total JOC value may be specified as a range with a certain guaranteed minimum, typically from $50,000 to $250,000, and a maximum which may extend beyond $10 million." (See 76 Op. Atty Gen. Cal. 126 (1993).)

does not encompass a combination of projects which are essentially unspecified at the time of bidding, except as may be otherwise expressly provided by law." (*Id*. at 5.) Similarly, a subsequent opinion addressing a school district's authority to award a project on a JOC basis held that: "No authority is granted for school districts to execute a JOC similar in terms to what the Legislature has granted to counties. Indeed, the unique features of a JOC, including the lack of information regarding specific projects at the time of submitting the competitive bids, is entirely inconsistent with the" applicable low bid statute for school districts. (See 84 Op. Atty Gen. Cal. 5 (2001.) Thus, while JOC is a practical and efficient way to award certain kinds of ongoing work, a public agency should not award work on a JOC basis without specific authority.

Currently, only three public agencies have specified statutory authority for JOC: 1) counties; 2) California State Universities; and 3) the Los Angeles Unified School District. For more details regarding these statutes, see the table attached to this paper.

VI. Public-Private Partnerships

"Public-private partnerships" have probably been the most discussed, and most misunderstood, project delivery method over the last several years. This is likely due in part to the fact that public private partnerships have achieved successful results on a variety of projects outside the United States. More importantly, the current financial difficulties many public agencies are experiencing limit the public funds available for infrastructure projects, making public private partnerships a more enticing option. However, before attempting to undertake a public works construction project pursuant to a public-private partnership, it is important that a public agency understand the applicable legislative authority and how it applies to a particular project.

The term "public-private partnership" covers a wide variety of arrangements between a public agency and the private sector, with the common feature among them being some form of private sector financing. In a sense, public-private partnerships are not really an alternative project delivery method, as much as an alternative project funding mechanism for public works projects. Technically, even garden-variety redevelopment agreements can be considered public-private partnerships.

Perhaps the most common public-private partnership structure involves the private entity financing and constructing a fee-generating facility (such as a toll road), and operating it for a set number of years in exchange for a percentage of the revenues generated. At the end of the agreement, the possession and operation of the facility is transferred back to the public agency. This approach to public-private partnership allows an agency to construct a project it might not otherwise have the funding for, allows the contractor to profit from the revenues generated, and creates valuable infrastructure for use by the public. Public-private partnerships can be structured in a variety of ways, including as a design-build project and on a design-build-operate-maintain basis.

There are currently three statutes that we are aware of that could be characterized as specifically authorizing public-private partnerships: 1) authority for the Administrative Office of the Courts; 2) the Infrastructure Financing Act applicable to "local government agencies; and 3) authority for Energy Conservation Contracts. In addition, recently approved legislation (SBX2 4; Ch.2, Stats. 2009) will allow the state and regional transit agencies broad authority to undertake public-private partnerships. For more details regarding these statutes, see the table attached to this paper.

VII. Lease/Lease-Back

The lease/lease-back project delivery method resembles a public-private partnership in some ways. The most common form of lease/lease-back involves a public agency leasing real property to a contractor for a nominal sum, who then agrees to construct facilities and lease them back to the public agency. The lease payments made by the public agency to the contractor under the facilities lease generally amount to the cost of construction and the contractor's overhead and profit. At the conclusion of the facilities lease (which may be terminated shortly after construction is complete), ownership of the real property and newly constructed facilities revert to the public agency.

Currently, only school districts and community college districts have specific statutory authority to award construction projects on a lease/lease-back basis. (See Education Code Sections 17406 and 81335.) These statutes have remarkably few restrictions on how the construction work must be awarded. In fact, the public agency is free to select its contractor in essentially any manner it chooses (low bid, RFP, direct negotiation, etc.). Needless to say, agencies that don't fall within this lease/lease-back statutory authority can not legally pursue a lease/lease-back project of this variety. There are, however, other versions of lease/lease-back agreements used by transit districts which do not involve public works construction.

VIII. Integrated Project Delivery

Integrated Project Delivery ("IPD") is perhaps the most progressive alternative project delivery method. IPD strives for a maximum level of collaboration between all parties working on the project, and has been defined as follows:

> Integrated Project Delivery (IPD) is a project delivery approach that integrates people, systems, business structures and practices into a process that collaboratively harnesses the talents and insights of all participants to optimize project results, increase value to the owner, reduce waste, and maximize efficiency through all phases of design, fabrication, and construction. ("Integrated Project Delivery: A Guide," published jointly by the American Institute of Architects California Council and the American Institute of Architects.)

Contractually, the key elements of a pure IPD project are as follows: 1) a single agreement between the owner, designer (architect/engineer), general contractor, and trade contractors; 2) a waiver of the right to sue any of the other project team members; 3) involvement of the trade contractors from the outset of the project so that they can provide input during the design stage; 4) extensive reliance on Building Information Modeling ("BIM")[2] for the design, construction, operation and maintenance of the structure; and 5) compensation and incentives structured to require a successful project outcome regardless of any individual firm's performance.

Without specific statutory authority, however, public agencies can't award a project on a pure IPD basis. This is due to the fact that a pure IPD project involves negotiated contracts with the designer, the general contractor and trade contractors. Selection of each of these parties is ideally based in large part on the firm's comfort and flexibility with performing work on a

[2] Building Information Modeling utilizes three dimensional computer imaging to represent building structures, and combines previously separate sets of documents (drawings, specifications, take-offs, construction details) into a single comprehensive database. BIM greatly reduces issues of drawing coordination and conflict resolution.

collaborative IPD project. Of course, competitive bidding laws do not allow selection of contractors on an informal basis.

In fact, even design-build contracting authority is not sufficient by itself to support the award of a pure IPD project. Design-build authority does not allow a public agency to informally select trade contractors to become part of the project team (it only contemplates a single award to design-build entity). Moreover, design-build projects traditionally require a 30% design before the project is advertised to interested design-build contractors. Due to public contracting principles that prohibit organizational conflicts of interest, the designer that creates the initial 30% design is precluded from competing for the design-build contract. This is contrary to IPD principles that require the earliest possible involvement of all members of the project team in the design process. Finally, a design-build contractor has the right to file a claim against a public agency owner under Public Contract Code Section 20104 et. seq. This right is not consistent with the IPD approach of having all project team members waive the right to pursue claims against the agency and/or to sue the agency.

There is currently no statutory authority authorizing IPD for any public agencies in California. Recent efforts were made to introduce IPD legislation for state and local agencies, but the effort was not successful. Colorado has adopted an IPD statute which appears to apply to virtually all public agencies, although it contemplates a contract between the public agency and a single entity rather than a single contract between the agency and multiple parties which form the project team. Nonetheless, Colorado is demonstrating that a form of IPD can be brought to the public sector.

Hopefully, California will follow Colorado's lead and IPD authority will soon be made available to at least some public agencies. The benefits of using IPD as the project delivery method are significant. First, IPD can result in cost benefits between 10-20% on a typical project. These saving arise as a result of considerably greater efficiencies throughout the design and construction stages of the project. IPD projects are also generally completed faster than a traditional design-bid-build approach. Effectively, IPD offers the benefits of design-build with fewer drawbacks.

IX. Creative Approaches within Design-Bid-Build Limitations

For those agencies which are restricted to awarding public works construction projects on a design-bid-build basis, there are some creative approaches which can provide greater flexibility. Two of the most effective approaches include awarding a project on a multi-prime basis, and pre-qualifying bidders. Both are summarized below.

A. Multi-prime Approach

The multi-prime project delivery method is a modified version of CM at risk, and provides a public agency with greater flexibility in selecting the firm which is ultimately responsible for delivering the project. After the design is completed for the project, the public agency awards a contract to a construction management firm (CM) on a qualitative basis to satisfy Government Code Section 4526. In other words, the CM is selected pursuant to an RFP process which considers the interested CM firms' experience, competence, project approach etc., but not costs. Ideally, the public agency hires a CM with a high degree of trustworthiness and reliability. The CM will not perform any construction work, but will manage this work. The public agency then awards individual contracts to specific trade contractors (mechanical, electrical, plumbing etc.) on a low bid basis to satisfy the competitive bidding statute. This is where the term "multi-

prime" arises, since the trade contractors are each awarded a separate contract by the public agency and are not subcontractors to a general contractor. These trade contracts are then managed by the CM, which performs its professional services for a fee. Note that while a traditional CM at risk contract would be performed pursuant to a Guaranteed Maximum Price, that should be avoided since it arguably turns the CM into a general contractor, which would then require a contract award pursuant to competitive bidding. (See *City of Inglewood v. Superior Court* (1972) 7 Ca Cal.3d 861.)

The "multi-prime" approach described can be enhanced with the addition of certain IPD principles. For instance, compensation on the project can be structured to include incentive bonuses for a successful project outcome. By making such bonuses contingent upon a successful outcome for the entire project, the incentive for collaboration among project team members will increase. Trade contracts can even be structured to only guarantee direct costs and make profit and bonus amounts contingent upon a successful project outcome. The trade contracts can also be awarded prior to the completion of the design in order to allow trade contractors to consult during the design process. Under this approach, trade contractors would be asked to bid a combination of their hourly rate for consultation work, as well as their general conditions and fee during construction. Finally, Building Information Modeling can be used on a "multi-prime" project (or any project for that matter), which will greatly improve the resolution of design conflicts, and will improve communications between project team members.

B. Pre-Qualification of Bidders (two step process)

For complex projects, or those which require particular expertise, implementing a bidder pre-qualification process can be very valuable. Most public agencies have the authority to pre-qualify pursuant to Public Contract Code Section 20101(c) and (d). In essence, a pre-qualification process separates the bidder "responsibility" determination from the bid award, and allows a public agency to tailor more specific experience requirements for a particular project. When the experience requirements are drafted thoughtfully, the agency benefits from narrowing the pool of contractors to only those that can truly perform the work. Of course, pre-qualification requires additional time and effort. Nonetheless, for complex projects there can be significant benefits in terms of the quality and level of experience in the pool of contractors bidding on a project. In turn, this can lead to better performance and fewer disputes between the public agency and the contractor on the project.

X. Consequences for Awarding Contract in Contravention of Applicable Statute

While the patchwork of statutory authority for alternative project delivery methods in California can be confusing, there are real legal risks to public agencies for awarding public works projects without complying with applicable competitive bidding statutes. Stated simply, an illegally awarded contract is void, leaving the contractor with no legal right to complete the project. In such an instance, a public agency is subject to a lawsuit from a disgruntled bidder or taxpayer which can compel the agency to rescind the contract award, causing considerable delay. Under these circumstances, the agency may owe the contractor "the reasonable costs, excluding profit, of the labor, equipment, materials, and services furnished by the contractor prior to the date of the determination that the contract is invalid." (Public Contract Code Section 5110.) In the event that the project has progressed too far for a court to rescind the contract award, the court could allow the contract to stand and award damages to the bidder that should have won the contract. These damages have been limited to bid preparation costs and do not include lost profit or loss of added value to a contractor's reputation. (See *Kajima v. LACMTA* (2000) 23 Cal.4th 305.) Thus, if an illegal contract award is challenged, the public agency will be

faced with either: 1) rescission of the contract, delays related to re-awarding, and damages to the first contractor; or 2) completion of the original contract but payment of damages to the wrongfully denied bidder. Obviously, both of these scenarios can be avoided through careful review of applicable public works contracting authority.

XI. Conclusion

While there is an increasing consensus among those involved with public works construction projects that public agencies need a wider array of alternative project delivery methods, the statutory authority still lags behind. Accordingly, it is incumbent upon public agency leaders to carefully review the statutory authority applicable to them. Even within the framework of limited statutory authority, public agencies can tailor their approach to particular projects with creativity in order to maximize their opportunity for a successful outcome. Ultimately, the public as a whole benefits when our infrastructure is built more quickly, with greater quality and at a reasonable cost.

STATUTORY AUTHORITY FOR ALTERNATIVE
PROJECT DELIVERY METHODS FOR PUBLIC WORKS PROJECTS IN CALIFORNIA

Project Delivery Method	Public Agencies Covered	Statute	Notes
Design/Build	Transit Operators	Public Contract Code (hereinafter "P.C.C.") §20209.5	does not apply to highway projects
Design/Build	All cities	P.C.C.§20175.2 AB 642	applies to projects over $1 million
Design/Build	Sonoma County Health Care District	H&S Code §32132.5	
Design/Build	Calif. State University	P.C.C.§10708	
Design/Build	School Districts	Education Code §17250.10-§17250.50	
Design/Build	Community College Districts	Education Code §81700-81708	
Design/Build	Counties	P.C.C. §20133	
Design/Build	State of California Director of General Services	Gov. Code §14661	
Design/Build	State of California Director of General Services	Gov. Code §8169.5	Applies to contracts for Capital Area Plan
Design/Build	Los Angeles County Metropolitan Transportation Authority	P.C.C. §20209.22-.44	for HOV lanes
Design/Build	"Qualified Entity" = cities, counties, city and counties, and special districts	P.C.C.§20193	limited to 20 projects in these categories: 1. regional and local wastewater treatment facilities 2. regional and local solid waste facilities 3. regional and local water recycling facilities
Design/Build	"Local transportation entity"; Department of Transportation	P.C.C.§6801	SBX2 4, Cogdill (effective Jan. 1, 2010)
Public Private Partnership	Administrative office of the Courts	Gov. Code § 70391.5	
Public Private Partnership	"Public Agency" = the state, a county, city and county, city district, community college district, school district, joint powers authority etc.	Gov. Code §4217.10 - §4117.18 "Energy Conservation Contracts"	allows agencies to enter into ground lease with private contractor who constructs energy conservation facility and sells discounted energy to the agency for a period of years (20-30), before the agency takes possession of the facility.

Public Private Partnership	"Local Government Agencies" = city, county , city and county, including a chartered city or county, school district, community college district, public district, county board of education, joint powers authority, transportation commission or authority, or any other public or municipal corporation.	Gov. Code §5956-§5956.10 "Infrastructure Financing Act"	authorizes any combination of: study, plan, design, construct, develop, finance, maintain, rebuild, improve, repair or operate - used by BART for Oakland Airport connector project - only applies to revenue generating projects
Public Private Partnership	"Regional transportation agency"	P.C.C. §143	SBX2 4, Cogdill (effective Jan. 1, 2010)
CM at Risk	University of California	P.C.C. §10503(c)	requires prequalification of bidders
CM at Risk	Port of Oakland		
CM at Risk	California State University		
Job Order Contracting	Los Angeles Unified School District	P.C.C. §20919-§20919.15	
Job Order Contracting	Cal. State University	PCC §10710	
Job Order Contracting	Counties	P.C.C.§20128.5	contract can't exceed $3 million
Informal Bidding	"Public Agency" = city, county, city and county, chartered cities, chartered counties, special districts etc.	P.C.C. §22000 et. seq. "Uniform Public Construction Cost Accounting Act."	still requires low bid award
Lease Lease-back	Community College Districts	Education Code §81335	
Lease Lease-back	School Districts K-12	Education Code §17406 can also be used as a revenue generating mechanism for existing assets	
Best Value	UCSF	P.C.C.. §10506.4	this is a pilot project
Infrastructure Privatization	"Local Agency" = city, county, city and county, special district or county service area	Gov. Code §54250-54256	Local Government Privatization Act; applies to wastewater and sewer project
Energy Conservation	"Public agency" = state, county, city and county, city, district, community college district, school district, joint powers authority etc.	Gov. Code §4217.10-4217.18	authorizes "energy conservation contracts" and related ground leases

AN OWNER'S GUIDE TO PROJECT DELIVERY METHODS

Advancing Professional Construction and Program Management Worldwide

ACKNOWLEDGMENTS

CMAA gratefully acknowledges the time and efforts of those who served as contributing editors in developing this *Owner's Guide to Project Delivery Methods*. Without the collective efforts of these individuals, this document would not have been possible.

Preface

This document is an introductory guide for owners who face the choice of delivery methods for their projects, and for the construction and program managers whose role it is to advise owners and to manage the design and construction process utilizing the most appropriate method.

While not intended to be an exhaustive analysis of each delivery method, this guide provides a comparison among the various available methods, an outline of the pros and cons of each, and an overview of the role of a program manager or agency construction manager in each delivery method.

There are many delivery methods in use today, but virtually all of them are variations of the four most common methods that are the subject of this document. Closely related to project delivery methods are procurement strategies, contractual arrangements, and compensation methods. While not the focus of this document, there is a brief discussion that touches on how these contract strategies align with the various delivery methods.

Project delivery methods will continue to evolve. This guide is thus a reflection of today's construction market, and will be periodically updated to reflect future developments. The characteristics of each delivery method are objectively presented in keeping with CMAA's policy of remaining delivery method neutral.

Contents

Executive Summary

How the project will be designed and constructed, or the project delivery method, is one of the most important decisions made by every owner embarking on a construction project. With a variety of delivery methods in use today across the design and construction industry, it is possible to tailor a delivery method that best meets the unique needs of each owner and each project.

Several fundamental project considerations are directly impacted by the delivery method selected. These considerations include the need to adhere to a realistic budget, a schedule that accurately presents the performance period, a responsive and efficient design process that leads to a quality set of documents, a thorough risk assessment followed by the proper allocation of risk by the owner, and a recognition of the level of expertise within the owner's organization or available to it.

There is a wealth of information in the public domain regarding alternative delivery methods. Most treatments divide the various options into three basic categories: Design-Bid-Build, Construction Management At Risk, and Design-Build. Recent discussions, including the discussion in this guide, add a fourth method, Integrated Project Delivery. Other delivery methods are variations of these four, and are treated as such for our purposes.

The project delivery methods examined are:

Design-Bid-Build (DBB) – The traditional U.S. project delivery method, which customarily involves three sequential project phases: design, procurement, and construction.

Construction Management At Risk (CMAR) – A project delivery method in which the Construction Manager acts as a consultant to the owner in the development and design phases, but assumes the risk for construction performance as the equivalent of a general contractor holding all trade subcontracts during the construction phase. This delivery method is also known as CM/GC.

Design-Build (DB) – A project delivery method that combines architectural and engineering design services with construction performance under one contract.

Integrated Project Delivery (IPD) – A project delivery method that contractually requires collaboration among the primary parties – owner, designer, and builder – so that the risk, responsibility and liability for project delivery are collectively managed and appropriately shared.

Each of these project delivery methods carries a different level of risk for the owner. Generally, the level of control retained by the owner correlates with the level of risk, and those levels typically have an inverse relationship to the risk and control levels of the contractor.

None of these delivery methods is right for every project. For each situation, there will be advantages and disadvantages in the use of any specific method. The owner needs to carefully assess its particular project requirements, goals, and potential challenges and find the delivery

method that offers the best opportunity for success.

Construction Management is a discipline uniquely tailored to the planning, design, and construction process of capital projects. *Agency Construction Management* is a management process whereby the owner utilizes a construction manager (CM) as its principal agent to advise on or manage the process over the life of the project, or during specific phases of the project. The use of agency construction management, whether through an in-house resource to the owner or from a third-party firm, has proven effective regardless of the chosen contract form or project delivery method. The role of the CM on each project delivery method is discussed in this document.

Whether provided through owner staffing or a third-party firm, the CM should be engaged as early in the project as possible to guide and assist the owner through all phases of delivering the project. In fact, the CM can be an invaluable source of advice and counsel to the owner when choosing the optimum delivery method for a project. The CM may also act as the owner's representative to the rest of the project team, being the point of contact for the designer, contractor, and other specialty consultants engaged in the project by the owner.

Contracting and compensation methods for professional services and construction services will generally fall into one of three categories: Lump Sum/Fixed Price (LS), Guaranteed Maximum Price (GMP), or Reimbursable. These methods are not specific to any particular delivery method, and may be applied to contracting for professional services, such as design, engineering, and construction management, as well as contracting for construction services.

Procurement of professional and construction services will generally be accomplished in one of three methods: price-based, qualifications-based, or a combination of both. Procurement may also involve a single project award or multiple project award. Like contracting methods, these procurement methods are not specific to any particular delivery method.

Every construction project or program is unique, and for each, there is an optimum project delivery method. It requires expertise and experience to select the right delivery method for a particular situation.

1.0 Introduction

Every owner responsible for the implementation of a construction project must make an early and important decision regarding the method by which the project will be 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 potential weaknesses in the traditional design-bid-build scenario. Methods that have gained in popularity include construction management at-risk, multiple prime contracting, design-build, and the latest, Integrated Project Delivery. Proponents of particular alternative methods advocate or promise improvements over the traditional system in terms of project schedule and cost control, and the number of disputes.

For the owner, with a wealth of choices available, the ultimate decision 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 another, confusion is 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 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, owners have utilized construction management successfully in all contracting methods and delivery systems, using either internal staffing or third-party firms. It is particularly helpful for owners who do not continuously maintain a CM staff in numbers or qualifications necessary to deal with the complex responsibilities involved in the management of major projects.

A companion CMAA document, *An Owner's Guide to Construction and Program Management* defines CM and PM as follows:

> **Construction Management** is a professional management practice applied to construction projects from project inception to completion for the purpose of controlling time, cost, scope and quality.
>
> **Program Management** is 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 commissioning—for the purpose of providing standardized technical and management expertise on each project.

Construction management comes in two general, but very different forms, agency construction management (CMA) and construction management-at-risk (CMAR or CM@R). Outside of this

document, the abbreviation "CM" can be used to mean many things. For clarity, the following abbreviations will be used for the remainder of the discussion to distinguish between various uses of the CM abbreviation:

CMA	Agency Construction Management– a management process.
CMAR	Construction Management at Risk – a delivery method.
CM	Construction Manager – a person or firm acting in an agency role.
CMR	Construction Manager at Risk – a person or firm acting in an at-risk role.

Agency Construction Management, a management process, can be implemented regardless of the project delivery method. In CMA, the owner utilizes a CM as its principal agent to advise on or manage the process over the life of the project, or specific phases of the project.

Program Management (PM), also a management process, is the practice of professional Construction Management applied to a capital improvement program of one or more projects. For the purposes of this document, only CMA will be discussed since the CMA discussion also can be applied to program management.

Construction management at risk, a delivery system, is similar in many ways to the Design-Bid-Build system, in that the CMR acts as a general contractor during construction. The CMR holds the risk of subletting the construction work to trade contractors and typically guaranteeing completion of the project for a fixed, negotiated price following completion of the design. However, in this arrangement, the CMR also provides advisory management assistance to the owner prior to construction, offering schedule, budget and constructibility advice during the project planning and design phases. Thus, instead of a traditional general contractor, the owner deals with a hybrid CM/general contractor.

2.0 Considerations in Selecting a Delivery Method

2.1 Owner's Requirements and Risk Considerations

An owner has several areas of concern when embarking on a construction program or project. It is necessary to choose an overall project delivery and contracting strategy that effectively and efficiently delivers the project. The following are some of the key considerations that will influence the selection of the project delivery method for a project:

Budget

Determining a realistic budget before design to evaluate project feasibility, to secure financing, to evaluate risk, and as a tool to choose from among alternative designs or site locations is a primary need. Once the budget is determined, the owner requires that the project be completed at or near the established budget figure. Owners must decide how quickly they need to establish final project costs and with what risk level of exceeding this cost.

Design

Of foremost importance to the owner is that the desired facility function as envisioned while successfully fulfilling the needs of the owner and users. Therefore, the design team should be well qualified in the type of facility being designed. In addition, the owner must ensure that the program needs are clearly conveyed to the design team. Since the design of the facility must be buildable and design intent must be properly communicated, the owner requires that the design documents are constructible, complete, clear and coordinated. The documents should properly incorporate unique features of the site to include subsurface conditions, interfaces with adjoining properties, access, and other characteristics. Owners must decide how much control they need to have over the design elements of a project.

Schedule

The owner has similar needs in the area of scheduling. The dates of design commencement, construction completion and ultimately the operation 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 must then be monitored and updated throughout the design, construction and pre-occupancy phases to achieve the desired goal. An owner must decide how critical it is to minimize schedule duration for a project.

Risk Assessment

In construction, issues of risk are closely tied to the status of the local construction market, on-site

safety, the schedule and the budget. 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 can best exercise control over those aspects. For example, it would typically be problematic to require that the contractor correct problems due to design errors or changes at no extra cost since a contractor generally has little control over the cause or magnitude of such errors or changes. An owner must decide how much project risk they are comfortable in assuming.

Owner's Level of Expertise:

The owner's familiarity with the construction process and level of in-house management capability has a large influence over the amount of outside assistance required during the process, and may guide the owner in determining the appropriate project delivery method. An owner must make an assessment of its ability to properly perform under the various delivery methods.

2.2 Project Delivery Methods Available to Owners

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 more contracting formats to achieve the delivery.

Because of financial, organizational and time constraints, various project delivery methods have evolved to fit particular project and owner needs. Most delivery methods used today are variations of three methods: Design-Bid-Build, Construction Management At Risk, and Design-Build. A fourth method, Integrated Project Delivery, although to date only used on a negligible number of projects, is included here due to the attention is it getting and the interest in understanding the concept. The four methods and the primary variations are:

Design-Bid-Build (DBB) – The traditional U.S. project delivery method, which typically involves three sequential project phases: The design phase, which requires the services of a designer who will design the project; the bid phase, when a contractor is procured; and a build or construction phase, when the project is built by the contractor. This sequence usually leads to the sealed bid, fixed price contract. A common variation is:

- *Multiple Primes* – An owner contracts directly with separate trade contractors for specific and designated elements of the work, rather than with a single general or prime contractor.

Construction Management At Risk (CMAR) (also called CM at Risk and CM/GC) – A delivery method that entails a commitment by the CMR for construction performance to deliver the project within a defined schedule and price, either fixed or a Guaranteed Maximum Price (GMP). The CMR acts as consultant to the owner in the development and design phases, but as the legal

equivalent of a general contractor during the construction phase.

Design-Build (DB) – A project delivery method which combines architectural and engineering design services with construction performance under one contract. Variations include:

- *Bridging* – A designer is retained by the owner to develop the design documents to a specific point (usually schematic level) prior to engaging the Design-Build contractor, who then finishes the design and constructs the project.

- *Public Private Partnership (P3)* – A private entity or consortium of investors provides some or all of the required capital with a commitment to deliver a completed project for a public sector owner in exchange for revenue that the completed facility is anticipated to generate.

Integrated Project Delivery (IPD) – A project delivery method that attempts to spread the risk, responsibility and liability for project delivery equally among the primary parties—the owner, the designer, and the builder, whether through partnership agreements or multi-party contracts.

Each of these project delivery methods carries a different level of risk for the owner. Generally, the level of control provided to the owner correlates with the level of risk, as illustrated in the following chart.

Integrated Project Delivery does not fit cleanly on the above chart because the basis of IPD is shared risk among all parties, or an aligned relationship rather than an inverse relationship of risk between the owner and contractor.

In today's U.S. construction market, the prevalence of each of the methods described in this guide varies between the vertical construction market and the horizontal construction market. In the

vertical construction market, the breakdown is approximately as follows:

- Design-Bid-Build (DBB) 60%
- Construction Management at Risk (CMAR) 25%
- Design-Build (DB) 15%
- Integrated Project Delivery (IPD) <1%

The recent trend has been an increasing use of CMAR and Design-Build, with a corresponding decline in the use of the Design-Bid-Build method. There has been a great deal of recent attention to IPD. However, the formalization of IPD as a distinct delivery method is still relatively new and still lacks an overall industry consensus. There are only a limited number of projects that have actually employed the multi-party contractual arrangements that IPD proponents use to define IPD as a delivery method as opposed to a collaborative management approach or philosophy.

In the horizontal infrastructure market, DBB is still most prevalent. DB is also used, particularly in large public-private partnership infrastructure projects. One noticeable difference in horizontal construction is that CMAR is seldom utilized in this market.

CMAA promotes a policy of project advocacy that requires being delivery method neutral. Owners who are unfamiliar with alternate delivery methods should consult with a professional CM/PM to determine what specific delivery method is best for them and their project.

2.3 The Role of the CM

There are benefits and trade-offs that come with various delivery methods, and it can be invaluable for the owner to have professional CM advice to determine what makes the most sense for any given project or program. For example, one owner may value the speed to completion and the potential for design innovation that Design-Build promises while another owner may not wish to accept the reduction in owner control of final design that accompanies Design-Build delivery. In addition, many alternate delivery methods require the owner to have sufficiently experienced staff resources to fully define the project or be willing to allow another entity to define it. The owner must also be able to make decisions, handle inquiries, and manage other processes quickly enough to take full advantage of the accelerations offered by some alternate delivery methods.

Regardless of the delivery method utilized, the professional CM can play a pivotal role throughout all phases of project implementation. In each section of this document describing a delivery method, the role of the CM is discussed.

2.4 Contracting Alternatives

Contracting and compensation methods for professional services and construction services will generally fall into one of three categories:

1. Fixed Price or Lump Sum (LS)
2. Guaranteed Maximum Price (GMP)
3. Reimbursable

These methods are not specific to any particular delivery method, and may be applied to contracting for professional services, such as design, engineering, and construction management, as well as contracting for construction services.

Lump Sum contracting, also called Fixed Price, is when an owner contracts with an entity to perform a fixed scope of work in exchange for an agreed lump sum payment for the specified services. This method is one of the most commonly used.

Guaranteed Maximum Price contracting is an arrangement in which an owner contracts with an entity to perform a fixed scope of work in exchange for a price that is guaranteed to not exceed a stated maximum price. The GMP will typically include a base cost along with several allowances and contingencies that, depending on their ultimate use, may result in a final cost below the stated GMP. These "savings" may fall to the owner or may be shared with the entity providing the GMP.

Reimbursable contracts come in a variety of forms, and are sometimes coupled with a not-to-exceed maximum price. With a reimbursable contract, an owner contracts with an entity to perform a fixed or variable scope of work in exchange for a payment based on some agreed calculation method. The forms of reimbursable contracts include:

- Unit Price – payment is based on actual quantities at set unit prices.
- Cost Plus Fixed Fee – payment is based on actual cost plus a fixed fee.
- Cost Plus Incentive Fee – payment is based on actual cost plus an incentive based fee.
- Cost Plus Award Fee – payment is based on actual cost plus a performance based fee.
- Time Spent – payment is based on actual hours spent at set billing rates.
- Time and Materials – payment is based on actual costs with a fixed markup on costs.

Project Delivery Method	Design-Bid-Build (DBB)	Construction Management at Risk (CMAR)	Design Build (DB)	Integrated Project Delivery (IPD)
Contracting Methods				
Lump Sum	Common	Common	Common	Rare
Guaranteed Maximum Price	Rare	Common	Common	Rare
Reimbursable	Rare	Rare - Common	Rare	Common

2.5 Procurement Alternatives

Procurement of professional services and construction services will generally be accomplished in one of three ways:

1. Priced based
2. Qualifications based
3. Best value (combination of 1 and 2)

Procurements may also involve a one-step process, in which there is just a single round of submittals that determine the selection, or a two-step process, which may include a qualifications submittal as the first step and then a price proposal as the second step.

For the procurement of construction services, the chart below illustrates the use of the various options.

Selection Criteria	Low Bidder	Best Value	Best Qualifications
Project Delivery Method	Selection is based solely on Price	Selection is based on a weighted combination of Price and Qualifications	Selection is based solely on Qualifications
Design-Bid-Build	Most Common	Common; Price evaluation based on Construction Cost	Rare
Construction Management at Risk	Rare	Most Common; Price evaluation based on CMAR Fees and General Conditions	Common
Design/Build	Common	Most Common; Price evaluation based on fees and GCs; may or may not include Construction Cost	Common
Integrated Project Delivery	Rare	Common	Most Common

Services will be procured for a single project or for multiple projects within a single procurement. By far, the most common procurement method is the single project award. In this method, an owner has a specific project and they procure services specifically for, and only for, that project.

The other procurement option is the multiple project award method, of which there are several variations. This method can be utilized to procure both professional services and construction services. With this method, an owner procures the services of one or more firms to perform a series of projects, also sometimes referred to as tasks. Each project is priced separately, but a

single contract vehicle is used for all projects.

The various types of multiple project (task) awards include:

- Indefinite Delivery / Indefinite Quantity (IDIQ)
- Multiple Award Task Order Contract (MATOC)
- Single Award Task Order Contract (SATOC)
- Job Order Contracts (JOC)

The IDIQ award is commonly used with professional services. With an IDIQ, an owner will select one or more firms and award an IDIQ contract to these firms. Billing rates are generally pre-established in the IDIQ contract, and as subsequent projects or tasks are identified, the IDIQ firm(s) will submit a proposal to the owner based on the requirements and prices set forth in the master IDIQ agreement. When multiple firms hold the same IDIQ contract, they will generally be competing for subsequent projects and tasks. IDIQ contracts are typically awarded for a 3-5 year period of time, often with renewal options.

A MATOC is very similar to the IDIQ contract and actually is a form of IDIQ contract. It will always involve multiple firms and typically be used for design-build or construction related work. The MATOC contract is very common in government contracting. Similar to a MATOC, the SATOC operates in the same manner but will only be awarded to a single firm.

Job Order Contracting (JOC) is another form of an IDIQ contract and is typically used to complete large numbers of smaller projects or tasks. A single JOC contractor is selected and a contract is executed based on a pricing guide (e.g. RS Means) which is used as the basis for payment. As tasks are assigned to the contractor, pricing proposals are generated based on the rates in the pricing guide multiplied by a fixed pricing factor, which is established with the contractor in the contract.

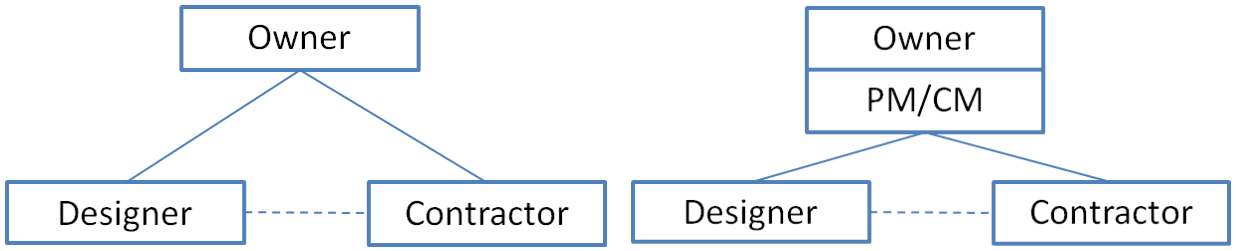
3.0 Project Delivery Methods

3.1 Design-Bid-Build (DBB)

Description

The Design-Bid-Build system remains the most frequently used delivery method for construction projects. Using this method, the owner engages a designer to prepare the design of the project, including construction drawings, and specifications. The designer may also provide additional services including environmental investigation, permitting, right-of-way purchase documents, hearings for public approval, and submissions for project funding.

Once completed, the bid package, including the design and bidder's information packet, is presented to interested contractors, who prepare and submit their bids for the work. The owner will select a contractor, usually based on the lowest responsive and responsible bid (for most all public work), or some hybrid of price and technical merit. The selected general contractor will then execute contracts with subcontractors to construct various specialty items. The contractor is responsible for constructing the facility in accordance with the contract documents. The designer typically maintains limited oversight of the work and responds to questions about the design on behalf of the owner. If a CM is not involved in the process, the designer may also assist the owner in administering the construction contract, including determination of project progress, for validation of interim payments made to the general contractor.



Design-Bid-Build

Design-Bid-Build
With PM/CM

Risk Analysis

The DBB delivery method has been the standard delivery method for many years. This method gives the owner reliable price information for the project before construction starts. With proper design oversight and budgeting of the total project, costs are somewhat predictable for the owner once the bids are received. In DBB, the owner has more control over the design content, relative to other delivery methods.

However, this method typically involves a longer time period to execute, in that construction may not begin until the design and procurement phases are complete. DBB is prone to creating

more adversarial relationships between all parties when issues develop, as there is no contractual relationship between the contractor and the designer and no opportunity for collaboration during the design phase.

Advantages:

- This method is widely applicable, well understood, and has well-established and clearly defined roles for the parties involved.
- This method is the most common approach for public owners having to comply with local, state or federal procurement statutes.
- The owner has 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.

Disadvantages:

- The process may have a longer duration when compared to other delivery methods 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 change orders and claims over design and constructibility issues since the owner accepts liability for design in its contract with the contractor.
- This traditional approach, in some cases, may promote more adversarial relationships rather than cooperation or coordination among the contractor, the designer and the owner.
- If the owner uses the fixed price bidding and compensation method, the contractor may pursue a least-cost approach to completing the project and the owner may receive less scope or lesser quality than expected for the price, requiring increased oversight and quality review by the owner. If the owner uses the unit price bidding and compensation method, the contractor may pursue an increased-scope approach to maximize revenue from the contract, while providing the owner more scope than expected.
- The absence of construction 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 and methods of construction may be made without full consideration from a construction perspective.
- Technological and programmatic obsolescence can be a problem for very large, long lasting project. The owner may be at a disadvantage negotiating programmatic and technological changes in a DBB vehicle.

The disadvantages listed above assume that the owner does not have experienced Certified Construction Managers (CCM) on staff, and has not retained the services of a CCM during the design phase of the project.

Contracting and Procurement Methods

Numerous variations in procurement exist when using the DBB method. The most common approach to bidding a project in vertical construction – a building or treatment facility – is for general contractors to submit a sealed lump-sum or fixed price bid. In most horizontal projects such as transportation, the most common approach to bidding is unit price, line item bids, where quantities are easily measured during construction and the owner pays only for what is installed.

When allowed by governing procurement policy, many owners take some effort to pre-qualify contractors, either through invitation or an objective set of criteria considering construction experience and financial capability. Pre-qualification helps assure the owner that the contractor is capable of performing the scope of work specific to the project at hand. Once the field of bidders is established, an owner will require sealed bids, wherein the lowest responsive and responsible bidder will earn the right to perform the work.

Public owners, where public funds mandate open competition by statute, are unable to develop an invited bidders' list, and are only allowed to eliminate contractors from bidding if the contractor has not qualified for or has been removed from the agency's approved bidder's list.

Some private owners prefer to negotiate bids with pre-selected GCs. 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 and contractor evaluation, the owner can maintain the maximum amount of control over the resulting construction portion of the project.

Role of the CM

In the past, most owners relied on the experience of the designer to provide a complete and responsible set of contract documents. Recently, more and more owners have found the value in utilizing the advice and expertise of those with overall process, program and construction management knowledge during the design phase.

Whether provided through owner staffing or a third-party firm, the CM should be engaged as early in the project as possible to guide and assist the owner through all phases of delivering the project. The CM may also act as the owner's representative with the other members of the project team, being the point of contact for the designer, contractor, and any other specialty consultants engaged in the project by the owner.

In a Design-Bid-Build delivery, in addition to overall management expertise, the CM must also provide construction expertise and advice to the project team during all pre-construction phases since the contractor will not be involved on the project until the construction phase.

In the pre-design phase, the CM's role may include development and evaluation of the project, defining the overall program and scope of work, development of project budgets and schedules, evaluation of project delivery methods, procurement of the design consultant, and development of project procedures and standards. The CM may also develop contract language for use during later procurement phases.

During the design phase, the CM's role will continue to include tasks started in the pre-design phase, and may include oversight of the designer, review of design documents, generation of cost estimates, value engineering, budget and schedule management, and development of overall phasing and contracting approaches.

In the procurement phase, the CM's role may include generation of bidder interest, pre-qualification of bidders (if used), management of bid document and addenda distribution, conducting the pre-bid meeting and bid opening, and production of executed contracts.

As a project shifts into construction phase, the CM's role may include representing the owner's interests through a system of project controls that include conducting periodic progress meetings, document control, cost tracking and management, evaluation of payment requests, change order management, quality management, schedule control, monitoring of contractor's safety efforts, commissioning and generation of the punchlist.

During the post-construction phase, the CM's role may include commissioning, coordination of occupancy procedures, the assembly and review of record documents and manuals, warranty management, and final project close-out.

3.1.1 Multiple-Prime Contracting

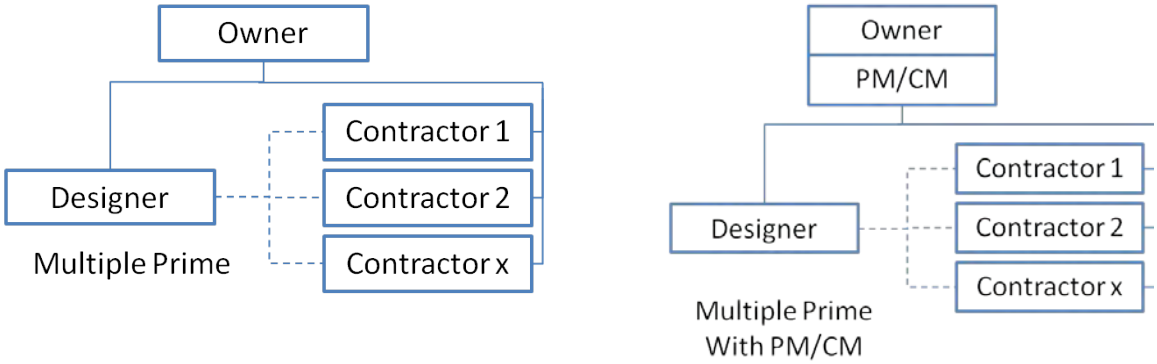
Description

An important variation of Design-Bid-Build is multiple prime contracting, in which the owner holds separate contracts with contractors of various construction work disciplines, such as general construction, earthwork, structural, mechanical, and electrical. In this system, the owner, or its CM, manages the overall schedule and budget

This system, which some 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 can be a highly desirable feature of this method of procurement when time of performance is critical.

Furthermore, the delivery system allows the owner to have more control over the project schedule, since the owner sets the timeline 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 has the potential to realize savings by directly procuring major material items, such as structural steel or major mechanical equipment, and avoiding contractor mark-ups.



Risk Analysis

The very nature of this delivery system causes its primary disadvantages. To work properly, there is a need for increased coordination in the development of the separate bidding and contract packages for each separate prime, leading to the potential that work scope will be omitted or duplicated. Additionally, the final cost of the project is not known until the final prime contract is procured. In addition, there have been numerous cases when this method did not work well due to the absence of overall authority and coordination among the prime contractors once construction was 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 generally lacks the direct contractual authority to dictate the schedule of another prime contractor.

Advantages:

- The ability to "fast-track" early components of construction prior to full completion of design.

Disadvantages:

- No central point of contractor coordination and responsibility for all trades. By default, the owner assumes this responsibility.
- Potential for numerous claims between various contractors.

Role of the CM

The role of the CM in a multiple prime contracting delivery system is very similar to the role of the CM in a design-bid-build delivery. Whether provided through owner staffing or a third-

party, the CM is engaged as early in the project as possible and guides and assists the owner through all phases of delivering a project. The CM also acts as the owner's representative with the rest of the project team, acting as the point of contact for the designer, contractors, and other specialty consultants engaged in the project by the owner.

The primary difference involves the fact that in most instances there is not a single prime general contractor involved to oversee and manage the activities of all of the various trades. Instead, in a multiple prime environment, all trades are contracted directly with the owner. The CM, acting as the owner's representative, may be required to actively coordinate and manage all trade contractors on the project.

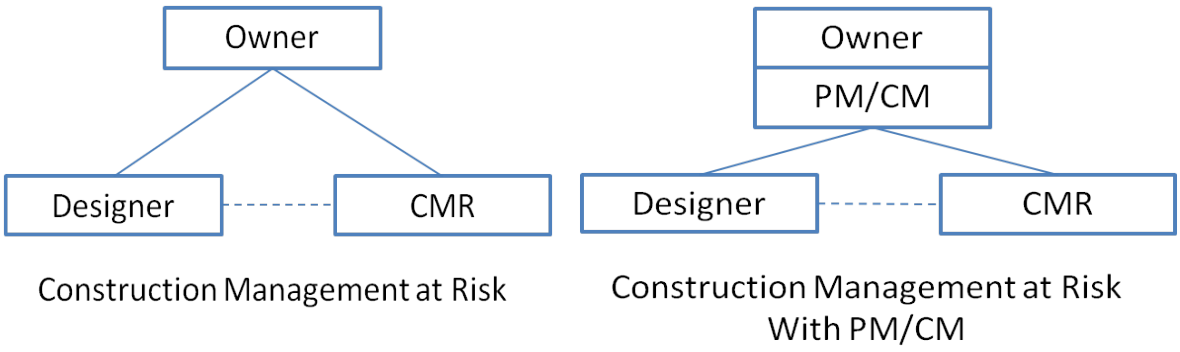
This effort involves increased levels of scheduling, since the CM role changes from managing a single schedule from the general contractor to consolidating and managing the schedules of multiple firms. Any schedule slip or design issue will potentially need to be addressed with multiple trades simultaneously, so the level of effort can increase significantly for the CM.

3.2 Construction Management at Risk (CMAR)

Description

This delivery system is similar in many ways to the Design-Bid-Build system, in that the Construction Manager at Risk (CMR) acts as a general contractor during construction. That is, the CMR holds the risk of construction performance and guarantees completion of the project for a negotiated price which is usually established when the design is somewhere between 50 percent and 90 percent developed. However, in this scenario, the CMR also provides advisory professional management assistance to the owner prior to construction, offering schedule, budget and constructibility advice during the project planning and design phases. 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 Construction Management at Risk scenario offers the opportunity to begin construction prior to completion of the design. The CMR can bid and subcontract portions of the work with an approved design at any time, often while design of unrelated portions is still not complete. In this circumstance, the CMR and owner often negotiate a guaranteed maximum price (GMP) based on a partially completed design, which includes the CMR's estimate of the cost for the remaining design features. Furthermore, CMR may allow performance specifications or reduced specifications to be used, since the CMR's input can lead to early agreement on preferred materials, equipment types and other project features.



Construction Management at Risk

Construction Management at Risk With PM/CM

Risk Analysis

The primary disadvantages cited in the CMAR system involve the contractual relationship among designer, CMR and owner once the price is fixed. The CMR then 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 design-bid-build system, and adversarial relationships may result. While the established

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 CMR to open its books and share with the owner its subcontractor bids, ensuring transparency in the process. The CMR 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.

Advantages:

- The owner gains the benefit of having the opportunity to incorporate a contractor's perspective and input to planning and design decisions.
- The ability to "fast-track" early components of construction prior to full completion of design

Disadvantages:

- A premium is placed on the proper selection of the CMR, based on the CMR's particular skills and experience, to provide the best value to the owner.
- While the CMR provides the owner with professional advisory management assistance during design, this same assistance is not present during the construction phase, as the CMR is in an "at-risk" position during construction.

Contracting and Procurement Methods

A common contracting approach in the Construction Management at Risk delivery method is to enter initially into an agreement with the CMR for a fixed-fee contract for pre-construction and General Conditions costs, along with an agreed contractor's markup fee as a percentage of construction costs.

Once the design has progressed to a point where a GMP can be established, the contract is converted to a GMP contract, with all remaining fixed costs rolled into the GMP.

On the procurement side, the selection process is either a one-step or two-step process. In a one-step process, an RFP is issued and proposals are received that will include qualifications of the team, along with price proposals for the pre-construction costs, General Conditions costs, and construction fee as a percentage. The owner will make their evaluations based on the submitted information.

In a two-step process, step one will involve a Request for Qualifications (RFQ) and firms will only submit their qualifications. The owner will then establish a short list of firms and a Request for Proposals (RFP) will be issued to these firms, requesting the same cost information submitted in the one-step process. The owner will then make a selection based on a combination of qualifications and pricing.

As with Design-Bid-Build, private owners may choose to negotiate directly with pre-selected CMRs.

Role of the CM

The role of the CM in a CMAR delivery system is sometimes considered redundant. However, there is still a vital role for the CM to play, whether the CM is from within the owner's staffing or from a third-party CM.

As in other delivery methods, it is important to engage the CM as early in the project as possible to guide and assist the owner through all phases of project delivery. The CM will still act as the owner's representative with the rest of the project team, acting as the point of contact for the designer, CMR, and any other specialty consultants engaged in the project by the owner.

The CM's role in a CMAR delivery method is similar to the CM's role in a Design-Bid-Build delivery with one major difference: the CM may not be the primary provider of construction expertise and advice to the project team during the pre-construction phases once the CMR firm is engaged by the owner, and as such may not be called upon to perform as many tasks. An example of this would be that the CM might not provide estimating or constructibility reviews during design phases if the owner relies on the CMR to perform these tasks.

Tasks that will remain with the CM include verification of schedule, overall project cost tracking, quality control, administration of all contracts, and coordination with all owner stakeholders.

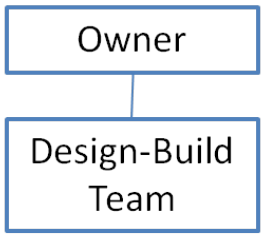
3.3 Design-Build (DB)

Description

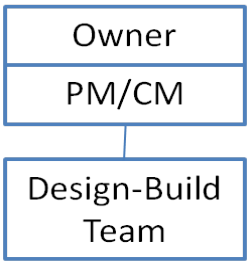
The design-build (DB) project delivery system has grown in popularity, and is seen by some in the industry as a solution for addressing the limitations of other methods. For an owner, the primary benefit is the simplicity of having one party responsible for the design and construction of the project.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

Under this system, the owner contracts with a DB team, which can be a joint venture of a contractor and a designer, a contractor with a designer as a subconsultant, a designer-led team with a contractor as a subcontracted entity, or a single firm capable of performing both design and construction. Since contractors are most 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 DB 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 DB 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, through a prescribed process, the DB team will establish a fixed price to complete the design and construction of the facility. Once underway, the DB team is then responsible for construction of the project, and for all coordination between design and construction.



Design-Build



Design-Build With PM/CM

Risk Analysis

Since the design-build team is working together from the outset, DB 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 other stakeholders. Accordingly, it is difficult for the owner to verify that it is receiving the best value for its money without having a great deal of transparency in the DB team.

The primary caution for an owner considering DB is that the owner should carefully consider 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 additional consultants to help it develop the scope or preliminary design, in the role of a traditional design firm.

Owners with highly specialized program needs may not find it advantageous to turn over responsibility to an outside DB 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 the DB delivery method. During project development, the DB team made several key design and equipment selection decisions without full involvement of the owner, resulting in an unsatisfactory facility that required costly changes before the facility could be used as intended.

With this lesson in mind, DB 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 DB. 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 DB.

Another primary consideration of the owner is proper selection of the DB 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 DB team roles. In particular, the owner should strongly favor DB teams with a successful track record working together on previous similar projects in the same DB roles. More so than in any other delivery system, the success of a DB project may hinge on the initial selection process.

Advantages:

- DB can produce a project more quickly than a conventional DBB.
- There is a single point of accountability for design and construction.
- Cost efficiencies can be achieved since the contractor and designer are working together throughout the entire process.
- Change orders would typically arise primarily from owner changes.

Disadvantages:

- Less design control and involvement by the owner and stakeholders.
- Owner must be highly responsive in its decision making to take full advantage of the speed of DB.
- The owner does not receive the benefit of the checks and balances that exist when it contracts separately with a designer and a general contractor.
- May be problematic when there is a requirement for multiple agency design approvals.

- May be inappropriate if the owner is looking for an unusual or iconic design.

Contracting and Procurement Methods

One common contracting method in the Design-Build delivery method is to initially enter into an agreement with the DB team for a fixed-fee contract for design and pre-construction costs and an agreed General Conditions costs and construction fee given as a percentage of total construction costs.

Once the design has progressed to a point where a Guaranteed Maximum Price (GMP) can be established, the contract is converted to a GMP contract, with all fixed costs rolled into the GMP.

Another method used is to enter into a fixed price sum agreement for the entire DB effort.

On the procurement side, the selection process is typically a two-step process. In a two-step process, step one will involve an RFQ and teams will only submit their qualifications. The owner will then establish a short list of teams and an RFP will be issued to these teams, requesting cost information and a technical proposal which defines the project scope along with the firms' innovations, schedule and details that define the quality of the delivered project. The owner will then make a selection based on a combination of qualifications, approach and pricing.

As with other delivery methods, private owners may choose to negotiate directly with pre-selected DB teams at any point in the process above.

Role of the CM

The role of the Construction Manager in a Design-Build delivery system is different than in the CMAR delivery method during the design phase, primarily due to the differing relationships. In DB, the designer is part of the builder's team, rather than under direct contract with the owner. There continues to be an important role for the CM, whether provided through the owner's staffing or through a third-party firm. This role is particularly critical if the owner does not have experience with the DB delivery method.

Owners with deliberate and time-consuming decision-making processes may find themselves particularly pressured in DB, since the speed of execution offered by this delivery method relies on the owner's promptness and responsiveness.

As in all delivery methods, it is important to engage the CM as early in the project as possible to guide and assist the owner through all phases of project delivery. It is particularly important in Design-Build because the program of requirements must be thoroughly analyzed and tightly documented. The contractor will ultimately be held to delivering the requirements of these program documents that are the basis for the DB proposal.

In a DB environment, the CM will act as the owner's representative with the rest of the project team, acting as the point of contact for the DB team and any other specialty consultants engaged in the project by the owner.

The CM's role in a Design-Build delivery method begins early in the project, assisting with the development of the owner's project requirements and the important selection of the DB team. The role then becomes similar to the CM's role in a CMAR delivery method with a few differences: since the owner's control over design is not as tight as in other delivery methods, the CM's reviews of the design will need to focus on compliance with the owner's project requirements and overall cost compliance.

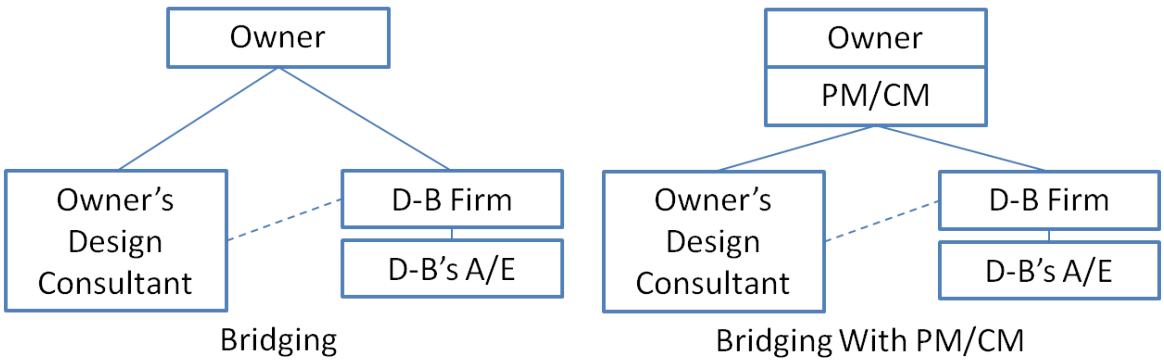
3.3.1 Bridging

Description

Bridging is not Design-Build in the typical sense but makes use of a design-build form of agreement between the owner and the contractor. In Bridging, the owner has its own "bridging architect" (also referred to as the "owner's design consultant" or "ODC"). The ODC and its consulting engineers, working with the owner, prepare preliminary design documents along with bid documents for a "Design-Build" form of agreement.

The ODC, and/or the owner's CM, will assist the owner in obtaining proposals and award of the Design-Build contract, later review the construction documents prepared by the contractor's designer for payment recommendation, and represent the owner throughout the construction with full typical construction phase services as design consultants normally provide except for the detailed checking of shop drawings.

The Design-Build contractor, along with a design subconsultant or an in-house design division, prepares the final construction documents. The construction documents may be thought of as an enormous set of shop drawings and should not be confused with the bridging contract documents.



Risk Analysis

The Bridging approach provides a good alternate for owners who like the benefits that the DB approach can bring to a project, but who would like more control over the ultimate design of the project.

Significant advantages of Bridging arise from the method's focus on communicating the owner's intentions for the project. Other potential advantages are that the owner obtains a firm price for the construction in less time and less design cost as compared with typical Design-Bid-Build pricing, and reduced exposure for the owner to contractor initiated change orders and claims. With bridging the owner has an opportunity to retain the desired level of control of the design, design details, quality of engineering and quality of construction.

Role of the CM

The role of the Construction Manager in a Bridging delivery system will fall somewhere between the CM's role in a CMAR delivery system and in a Design-Build delivery system. This role can be filled either through owner's staffing or through a third-party firm.

Tasks that will remain with the CM include verification of schedule, overall project cost tracking, quality control, administration of all contracts, and coordination with all owner stakeholders.

3.3.2 Public Private Partnership (P3 or PPP)

Description

Public Private Partnership is a delivery method whereby a public entity partners with a private entity for the purpose of delivering public infrastructure. The National Council for Public-Private Partnerships identifies 18 variations of P3s. In the most typical of these variations, the private entity will be comprised of a design-build team, a maintenance firm, and a lending firm. This entity will design, build, finance, maintain and/or operate the facility for a set number of years, agreeing to meet specified performance criteria in exchange for lease payments or some other compensation. At the end of the specified period, the facility is returned to the public entity.

Various forms of P3 compensation include a fee contract, in which the P3 firm receives its compensation through a fee charged to the owner, and a concession contract, in which the P3 firm receives its compensation directly from the consumers rather than the owner.

Risk Analysis

P3 has gained much attention due to its ability to provide a funding option for public entities that may be struggling to identify adequate sources of capital. While this approach is a good option as a means of bringing a project to reality, it is also a very complicated and deliberate process that needs to be carefully considered.

P3 can benefit public projects in the following ways:

- Targets alternative revenue and funding sources to close a funding gap
- Allows use of low cost tax-exempt or taxable financing

- Transfers risk to the private sector
- Not subject to capital budget allocations or voter referendums
  - Accelerates construction starts
  - Reduces construction cost and interest rate risks
- Takes advantage of private-sector efficiencies and innovations in construction, scheduling, and financing
- Provides efficiencies in long-term operations and maintenance
- Presents an opportunity to combine public and private uses in mixed-use developments to leverage economic development

Disadvantages of P3 include:

- The owner may experience higher total life cycle costs.
- The proposal process can be very expensive for all involved.
- A high level of expertise is required to execute a P3 project.

Role of the CM

The role of the CM in a P3 delivery system will be very similar to the CM's role in any other Design-Build delivery system, although often there is much more of a program management focus. It would be important for the CM to have experience specific to PPP projects since there are many unique characteristics related to this process.

As always, this role can be filled with qualified personnel either through owner's staffing or through a third-party firm. The CM tasks will include verification of schedule, overall project cost tracking, quality assurance, administration of all contracts, and coordination with all owner stakeholders.

3.3.3 Other Variations

There are numerous other variations of Design–Build and/or P3 delivery systems. The National Council for Public-Private Partnerships publishes a list that includes:

- Operations and Maintenance (O&M) – A public entity contracts with a private entity to provide operations and maintenance of a public asset.

- Operations, Maintenance, Management (OMM) - A public entity contracts with a private entity to operate, maintain and manage a public asset.

- Design-Build-Maintain (DBM) – Similar to a design–build contract on a public project, but the private entity is also contracted to maintain the public asset for some defined period.

- Design-Build-Operate (DBO) - A public entity contracts with a private entity to design, build and operate a public asset.

- Design-Build-Operate-Maintain (DBOM) - A public entity contracts with a private entity to design, build, operate, and maintain a public asset.

- Design-Build-Finance-Operate-Maintain (DBFOM) - A public entity contracts with a private entity to design, build, operate, and maintain a public asset. Additionally, the private entity will also finance the project in exchange for either user fees, lease payments or some other revenue stream.

3.4 Integrated project delivery (IPD)

Description

Integrated Project Delivery contracts are a relatively new entry into the U.S. marketplace and very few projects have been carried out using these contracts; however, the concepts of IPD have been around for many years. Pure IPD, in its contractual sense, requires a multiparty agreement among the prime players in the design and construction process – at least the owner, the designer and the builder – but this agreement can include many of the important subconsultants and subcontractors as well. The intention of the multiparty contract – or the closely integrated family of contracts – is a team-based approach that, according *to* Integrated Project Delivery, A Working Definition, Version 2*, AIA California Council and McGraw Hill Construction, 6/13/2007*:

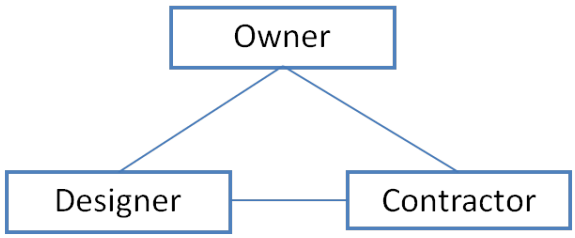
> *… integrates people, systems, business structures and practices into a process that collaboratively harnesses the talents and insights of all participants to reduce waste and optimize efficiency through all phases of design, fabrication and construction.*

IPD is an attempt to properly reflect, in contract, the working relationships and efforts that are possible when a team is working in an integrated fashion to complete a design and construction project.

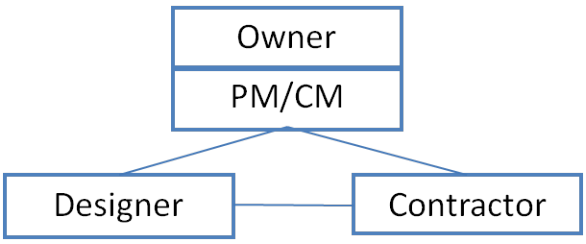
Compensation for parties in the IPD delivery method, other than the owner, is typically comprised of three components: *Cost reimbursement* to cover costs, *incentive* for achieving or bettering agreed project cost targets, and *rewards* for accomplishing set project goals. Ideally all costs, bases of costs, and cost inputs from all parties to the contract(s) are fully open-book in nature; and all incentive and goal achievement compensation will be agreed to by the team and incorporated in the contracts in advance.

As the entire project team is equally (or similarly) incentivized to achieve the same set of goals, which they have been party to setting or agreeing to, IPD requires the owner to assemble the major players into a contracted team at the very earliest opportunity, ideally as early as project inception and feasibility.

This early creation and agreement of project goals results in earlier engagement of the project team than in other delivery methods. During the pre-design phase, the IPD team designates all of the criteria it will be bound under contract to deliver.



Integrated Project Delivery



Integrated Project Delivery
With PM/CM

Risk Analysis

All of the advantages of the CMAR and DB project delivery approaches would apply under an IPD approach. At the same time, the IPD approach addresses the issues discussed related to tensions created by the completion of design, the setting of the GMP and the execution of the construction phase of a CMAR project.

IPD creates a different set of tensions and issues for the owner, not present in the CMAR approach. These tensions include making a team selection that can be based as much on behavioral characteristics as on ability and on belief in total cost more than initial costs.

Advantages:

- The owner gains all the advantages of DB or CMAR
- The entire team's interests are aligned with the project goals making the chance of success, once underway, extremely high.

Disadvantages:

- Actual agreement on the criteria and the final IPD contract can be very difficult and can take an inordinate amount of time and effort, for which the owner may be paying, if not in money then in time.
- Industry inexperience with working in non-adversarial team relationships makes the chance of failure most dependent on the behavior of individuals within the team. Damaging behavior is very difficult to control or to correct and can cause the breakdown of collaborative processes that are critical to success.
- Objective selection of the team is very difficult to achieve and can rely on little more than instinct for an owner who does not already have a team or teams that it knows and works with well.
- While team members are paid at cost for the work they do, prediction of and control of the effort comprising "cost" is difficult at the time the team is selected and even after the contract with fully agreed criteria is executed.

- IPD contracts have not yet been tested in law, so the result of a failure within the team is unpredictable.

Contracting and Procurement Methods

The most common contracting method in an Integrated Project Delivery approach is a joint agreement that includes the design firm, the construction firm, and the owner. The typical contract is a cost-plus-incentive-based contract built around target costs for all elements of the project and on the achievement of non-cost-related project goals.

On the procurement side, the selection process is generally a qualifications-based selection, consistent with the objective of making sure all team members make good team partners to enhance the likelihood of the success of this approach.

The selected team enters into a pre-design phase and together creates and agrees on the project's target cost, program and definition, achievement goals, schedule, other critical players to bring into the team (and the timing of entry) and other contract basics. At this point, the contract is fully executed and the project process proceeds.

Role of the CM

The role of the Construction Manager in an IPD delivery system will be very similar to the CM's role in the CMAR and DB delivery approach in providing the industry and management expertise to represent the owner within the IPD team, whether the CM comes from within the owner's staff or from a third party.

In addition to the owner representation, successful IPD teams require an integrator and leader to keep the team on track, focused on project goals, and to facilitate the IPD behaviors necessary to carry the team to success. This role would encompass initial leadership of the IPD project management team, developing protocols to perform and then managing everyday tasks, such as making recommendations on payment of invoices, managing disputes, resolving issues and the like.

The CM, as owner's representative, may or may not be party to the IPD agreement. The CM, if playing the role of integrator, would typically be a party to the agreement and would share in the common risk and reward of the contract to an appropriate extent.

4.0 Conclusion

One of the most important decisions made by any owner embarking on a construction project is the choice of the project delivery method – how the project will be designed and constructed. There are many options for delivery methods and many variations within those options.

An owner faced with choosing a project delivery method should consider several factors in making the decision, including:

- Project size
- Type of project
- Legislative and regulatory requirements
- Tolerance for risk
- Schedule
- Local market knowledge
- Desired level of involvement
- Owner's resources and capabilities

When these factors are properly evaluated, a good decision can be made on the selection of a project delivery method that best fits the goals and requirements of the owner and the project.

The use of a *qualified* Construction Manager can greatly help in developing a project and in making the decision on project delivery methods, regardless of whether this expertise comes from internal staff or from a third-party provider.