

CM as Advisor/Agent	CM At-Risk	Design-Build
	<p>CM acts as a general contractor during construction. That is, the CM holds the risk of subletting the construction work to trade subcontractors and guaranteeing completion of the project for a fixed, negotiated price following completion of the design. However, in this scenario, the CM also provides advisory professional management assistance to the owner prior to construction, offering schedule, budget and constructibility advice during the project planning phase. Thus, instead of a traditional general contractor, the owner deals with a hybrid construction manager/general contractor.</p> <p>In addition to providing the owner with the benefit of pre-construction services which may result in advantageous changes to the project, the CM-At-Risk scenario offers the opportunity to begin construction prior to completion of the design. The CM can bid and subcontract portions of the work at any time, often while design of unrelated portions is still not complete. In this circumstance, the CM and owner negotiate a guaranteed maximum price (GMP) based on a partially completed design, which includes the CM's estimate of the cost for the remaining design features. Furthermore, CM may allow performance specifications or reduced specifications to be used, since the CM's input can lead to early agreement on preferred materials, equipment types and other project features.</p> <p>The primary disadvantages cited in the CM-At-Risk system involve the contractual relationship among designer, CM and owner once construction begins. Once construction is underway, the CM converts from a professional advisory role of the construction manager to the contractual role of the general contractor. At that time, tensions over construction quality, the completeness of the design, and impacts to schedule and budget can arise. Interests and stake holding can become similar to the traditional design-bid-build system, and adversarial relationships may result. While the fixed GMP is supposed to address the remaining unfinished aspects of the design, this can in fact increase disputes over assumptions of what remaining design features could have</p>	

been anticipated at the time of the negotiated bid.

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

At-Risk Construction Management

This delivery system is similar in many ways to the traditional Design-Bid-Build system, in that the C

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

Multiple-Prime Contracting

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

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

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

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

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

Design-Build

The design-build (D-B) project delivery system has grown in popularity, and is seen by some in the industry as the perfect solution in addressing the limitations of other methods. For an Owner, the primary benefit is the simplicity of having one party responsible for the development of the project. While the other systems often give rise to disputes among various project participants—with the Owner acting as referee (or party ultimately to blame)—in D-B many of these disputes become internal D-B team issues which do not affect the Owner. Under this system, the Owner contracts with a D-B team, which is often a joint venture of a general contractor and a designer. Since GC's are comfortable in the role of risking corporate capital in performing projects, they usually are the lead members of this sort of team. One variation of the typical D-B team structure, known as fee-paid developer, involves the Owner engaging a developer, which then selects its own designer and contractor partners. However formulated, the D-B team performs the complete design of the facility, usually based on a preliminary scope or design presented by the Owner.

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

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

consultants to help it develop its scope or preliminary design, in the role of a traditional design firm.

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

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

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

Agency Construction Management Services

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

A CM working as an agent to the Owner primarily provides the benefit of independent, professional services provided on the Owner's behalf throughout the project. In contrast to some other project participants, the ACM has no vested financial interest in the project — in either its design or construction — and maintains a responsibility to act on the Owner's behalf and provide to provide impartial advice concerning the construction project. As such, ACM firms should be selected based on qualifications, and not on a cost or low-bid basis.

Services offered by an ACM include the following:

Pre-Design and Design: As discussed earlier, there are often advantages to obtaining construction expertise during the early planning stages of a project. Some services typically offered

by ACM firms during planning stages include the following:

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

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

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

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

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

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

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