



## CONSTRUCTION DELIVERY METHODS

One of the most important decisions when embarking on a construction project is also one of the most overlooked: which method of design and construction delivery will meet your organizations' needs and objectives? Our goal is to provide a comprehensive understanding of each option thereby enabling your organization to make the most informed and effective planning decisions.

### THE GENERAL CONTRACTOR MODEL

Known as the "traditional" approach to construction it can also be referred to as "lump sum", "design-bid-build" and "plan & spec bid". The owner hires an architect first, to start defining the scope of work and produce schematic designs. Bid requests, with the project scope and architect's drawings, are sent to selected general contractors for pricing. The owner pays the architect for the plans and chooses a general contractor based on cost, schedule, qualifications, etc.

#### Advantages:

- **Direct Price Competition:** If the project is cost driven, general contracting can work best for the owner.
- **Owner Involvement:** This approach may be most appealing to owners who wish to be closely involved with the coordination of the project scope and design, thereby providing the owner with a comprehensive understanding of the project budget.

#### Disadvantages:

- **Scope:** Problems arise when the project scope is not clearly defined from the outset, resulting in a lack of direction for the design team. This in turn leads to insufficient information being included in the bid package sent to general contractors for pricing. This results in a less accurate and ineffective pricing effort. There is little wiggle room for scope changes after design and pricing is complete.
- **Separate Contract Structure:** Design and construction operate under separate contracts; thereby utilizing different metrics for profit generation. Any ambiguity or misinterpretation on the part of the design and/or construction teams can result in change orders, which will increase costs.

### THE CONSTRUCTION MANAGER AT RISK MODEL (CMAR)

The construction manager (CM) is hired at any point during the planning and design stages. The CM's role is to collaborate on finding the best design and construction solutions for the project, to review the architect's plans for constructability and to provide cost estimating at various intervals for budgeting purposes. Once the design development process is completed, the CM will proceed with cost estimating resulting in a Guaranteed Maximum Price (GMP) for construction of the project for review by the owner. The CM proceeds to hire the subcontractors and is responsible for guaranteeing their work moving forward.



**Advantages:**

- **Pricing Stability:** The GMP provides the owner with pricing stability, knowing that the project will not cost more than anticipated. The CM is considered “**at risk**” because once the GMP contract is approved, the risk of cost overruns is shifted to the CM. If the project cost exceeds the GMP, the construction manager, not the owner, is financially responsible for the overage.
- **Owner Input:** The owner has maximum control over the architect and CM, by establishing separate contracts for each. The owner has significant agency in directing both the architect and CM. This structure is very advantageous when it comes to controlling both cost and schedule.
- **Budget:** The design phase includes a more detailed look at budgetary options enabling the owner to use cost information provided by the CM early on, to make critical decisions about program elements, construction type, building systems, subcontractor selection and finishes within the context of the overall project goals and design intent. Costs can also be controlled if the project team starts with a loosely defined scope and the opportunity for savings exists (ex. a split savings agreement) if the CM’s cost of completion is less than the GMP.

**Disadvantages:**

- **Owner’s Time Commitment:** A high degree of involvement is required to ensure that the design and construction teams are effectively collaborating during the design and preconstruction phases. Coordination on the part of the owner is essential for meeting the construction completion date. This can either be an advantage or disadvantage, depending on the time commitment the owner plans to have.
- **Contract Structure & Schedule:** Since the architect and CM are under separate contracts, neither one has complete control over decisions that need to be made. This contract structure is not suitable for projects on an accelerated/fast-track schedule. Fast-tracking (the overlapping of design and construction activities) requires very clear communication and decision making between the architect and CM. The owner must have a hands-on role facilitating communications and decision making to maintain the schedule.

**THE DESIGN-BUILD MODEL**

Design-build is the fastest growing construction method in the United States. The owner hires a design-builder who serves as the design and construction manager. The design-builder oversees every aspect of the project, this includes hiring subcontractors, engineers, consultants, and an architect. This allows the owner to have only one contract for the project, with the design-builder. The design-builder develops a preliminary scope with the owner, which the architect then uses as the basis for schematic design. The design-builder starts developing a GMP for construction of the project. The design phase continues as the construction phase begins.



## Advantages:

- **Schedule:** Budgeting, pricing, design, and early construction work happen simultaneously, making this the best option for schedule driven projects, especially ones on an accelerated/fast track timeline. The design-builder works with the architect as they progress through the design phase. This gives them the ability to order long-lead items early and avoid unexpected schedule delays. Another benefit is the option to use “**phased**” scheduling. Design for each phase can be completed just prior to construction, rather than delaying construction until the architect completes construction drawings for the entire project. The project team is able to avoid/minimize interruptions or shut downs to business operations in occupied facilities.
- **Cost Savings:** The design-builder develops a GMP and the owner retains the possibility of savings if the project is completed below the GMP.
- **Cost Control & Flexibility:** The inherent flexibility within the design-build approach allows the project team to identify possible savings and divert those funds into scope changes, especially early on, when design choices can significantly add to project cost. Effective planning leads to optimal cost control. Likewise, changes that need to be made have little to no effect on the schedule.
- **Coordination & Collaboration:** The design-builder is solely accountable for driving the project. There is a greater degree of coordination and collaboration between the design-builder and the subcontractors, enabling them to identify any discrepancies in the scope documents or specifications right away. Efficient problem solving in the field is also possible, helping to avoid schedule delays and cost increases.
- **Architectural/Design Resources:** The design-builder will either team with an external architect or utilize its own in-house architects; whichever one is the best fit for the project. Depending on how they approach the design-build model, they may also have other resources to offer such as VDC (Virtual Design and Construction) or BIM (Building Information Modeling). These resources provide another layer of coordination that helps prevent errors in the field.

## Disadvantages:

- **Complex Projects:** Since the design-builder has control over the project team, competing aspects of complex projects and issues that arise between the subcontractors in the field are the design-builder’s responsibility to address. It’s critical for the design-builder to have an operations team (project manager, asst. project manager, site supervisor, etc.) that is experienced and well versed in the design-build methodology. An inexperienced team won’t be able to effectively find and execute solutions to problems that arise in the field.
- **Trust:** Since the design-builder has a great deal of latitude in making decisions, it’s vital that the owner selects a qualified firm they can trust. Therefore, proper due diligence on the part of the owner, is critical prior to selecting a builder. Without proper vetting, the design-builder may not have qualifications that match the size and scope of the project, and/or the right operations people to dedicate to your project.



## PROJECT COST FRAMEWORK

Refer to chart 1 in the Construction Delivery Methods Guide.

All project delivery models offer opportunities for competitive pricing.

In the **General Contracting** model:

- Architectural proposals and design fees are compared first.
- Competitive pricing amongst subcontractors takes place at the bid stage.
- The GC assembles a lump-sum bid after receiving pricing from subcontractors. This is based on documents the architect has completed at this stage. Therefore, it's important to note, that any changes to design or scope thereafter are negotiated as change orders and added to the overall cost of the project.

In the **CMAR** model:

- Architectural proposals are (generally) compared first and CM proposals shortly thereafter.
- Fees and "general conditions" (the costs involved in running work that is not part of the budget or a subcontract) can be compared at this stage. The owner should be very specific as to what should or should not be included in the general conditions. Otherwise, it will be difficult to comparatively assess the proposals and select a CM.

In the **Design-Build** model:

- Fee comparisons are similar to the CMAR model, with the difference being that an owner will obtain both design and construction proposals from one source -the design-builder.
- Price competition for the construction phase takes place at the subcontractor level. The design-builder solicits competitive proposals from subcontractors. The owner and design- builder make subcontractor selections based on the criteria that is appropriate for the job (price, qualifications, capacity to meet the schedule, safety record, etc.).

## PROJECT CONTROL PROFILE

Refer to chart 2 in the Construction Delivery Methods Guide.

The owner has the greatest control over a project in the early stages of design before funds have been allocated. As the project progresses and choices are made, that control is gradually diminished. Therefore, the more information made available in these early design phases helps the owner make decisions that save money and time. In selecting a method of project delivery, the owner should carefully consider what they hope to accomplish, the scope of the project and any budgetary constraints. While there is no "one-size-fits-all" option, understanding the strengths and weaknesses of each model will help align your organization's priorities for the construction project with the approach that maximizes the results and success of the project.





# CONSTRUCTION DELIVERY METHODS GUIDE

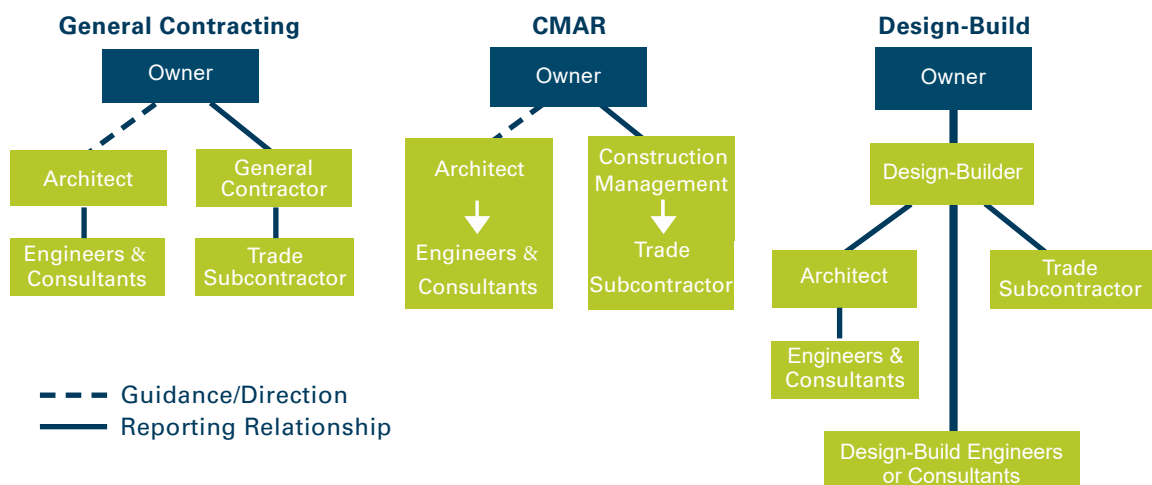
## 5 KEY QUESTIONS TO CONSIDER BEFORE CHOOSING A CONSTRUCTION DELIVERY METHOD

1. Has a consensus been reached regarding the project scope or is the design and construction team expected to provide direction as the project progresses?
2. To what extent is the project schedule driven? Has a target start and/or completion date been identified or is the expectation for the general contractor to propose the schedule?
3. To what degree is my organization willing to accept changes in pricing and budget, or is pricing certainty of paramount importance?
4. Is my organization able to dedicate time to interfacing with multiple contacts, or is it preferred to have a dedicated point of contact for management of the project?
5. How involved does my organization want or need to be throughout the design and construction phases?

## COMPARING CONSTRUCTION PROJECT DELIVERY MODELS IN CONTEXT

Each of these models has advantages and drawbacks. The construction project delivery method that works best for your organization depends on your specific needs and project goals. Illustrations 1 and 2 provide a quick reference for comparing the structures and schedules of all three project delivery methods.

### 1: STRUCTURAL COMPARISON OF CONSTRUCTION PROJECT DELIVERY MODELS



## 2: SCHEDULE AND PHASE COMPARISON FOR EACH CONSTRUCTION PROJECT DELIVERY MODEL

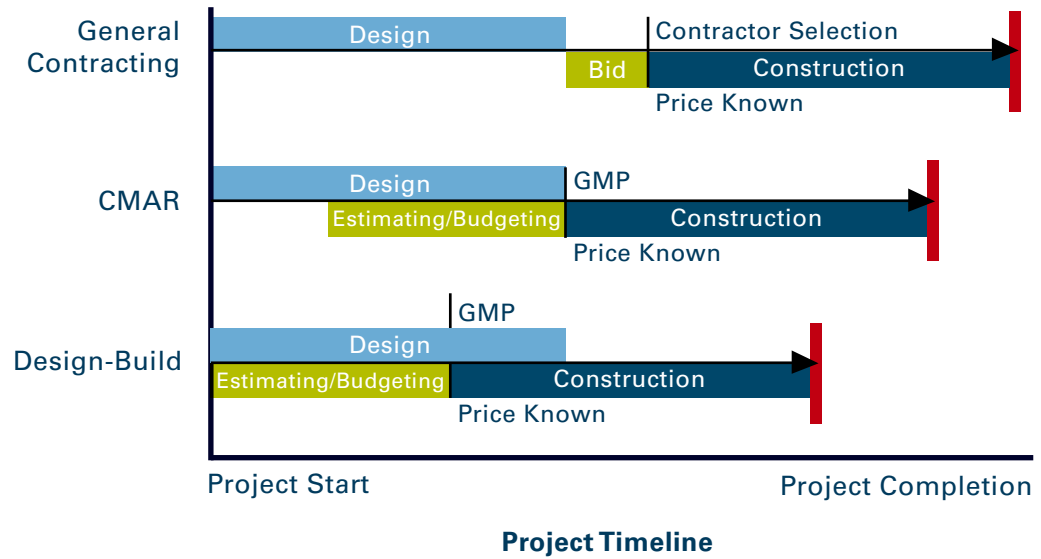


Chart 1A provides a basis for understanding how project costs can be divided and which ones are typically controlled by the owner or contractor. The percentages can change based on project scope.

### 1A: PROJECT COST ANALYSIS

