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Construction project delivery methods: Which is best for you?

By Mark C. Friedlander

Unless an owner performs or commissions a great deal of construction, he probably isn't aware that there are many different ways to structure a construction project. Even if an owner or developer is involved with construction frequently, he may not realize that his usual approach to construction is not the only way that it can be done, and he probably isn't familiar with the myriad of variations in structuring construction projects.

The choice of project delivery method is very important. It occurs at the beginning of a project, when the owner is in the best position to affect its outcome. Most experienced construction professionals recognize that the owner's ability to intervene to affect the outcome of the construction project is greatest at the beginning of the project and gradually reduces to nearly zero by project completion.

There is no one *right* or *best* form of construction project delivery. Each approach has corresponding advantages and disadvantages. The project owner or sponsor should select a method whose advantages maximizes his goals for the project and whose disadvantages are least important to him.

This article will identify the most common types of construction project delivery methods, including the newest methods that have received significant acclaim. It will describe the major advantages and disadvantages of each method, particularly from a practical standpoint, to assist owners in selecting the method that best fits their project. A caveat, however: because of space limitations, it is not possible to be comprehensive and highly detailed in the summaries and descriptions below. I invite any project owners who need additional information to contact me at the telephone number or e-mail address that I have provided below and to download materials from my Web site (URL below).

Traditional Tri-Partite Construction

"Tri-Partite" construction is the most common delivery method in the United States today. Its distinguishing feature is that the owner hires an architect and subsequently hires a general contractor under separate contracts, with no direct agreement between the architect and contractor. Traditionally, the architect prepares preliminary designs followed by construction documents, and the owner either competitively bids the construction documents to multiple general contractors or else uses them to negotiate a price directly with a select general contractor. The architect then administers the construction while acting as the owner's consultant and endeavoring to enforce the contractor's compliance with the plans.

There are several advantages to this approach. The architect is independent of the contractor and owes its loyalty to the owner. There is enhanced accuracy during the bidding process because the construction documents are fully or nearly complete. The most significant advantage of this approach is that it is common and familiar, so that lenders, insurers and other financial markets are comfortable with the approach, and there is a great deal of well-understood precedent in the courts and arbitrations for resolving disputes.

It is less well understood that tri-partite construction has many disadvantages as well. The architectural plans are usually prepared with little or no input from the construction team, so they may include products and construction requirements that are not cost-effective. The process is relatively slow since construction cannot begin until the plans are complete and a contractor has been selected. The process encourages the architect and contractor to become adversarial, with the contractor seeking extra compensation as a consequence of any flaws in the construction documents and the architect endeavoring to protect the owner from construction defects or shortcuts—which can leads to claims and litigation. Many owners find that a significant disadvantage of tri-partite construction is that there is no single party who will take responsibility for the outcome of the project: if something doesn't function properly, the architect may blame the construction team and vice versa.

Pricing Variations in Tri-Partite Construction. The contractor's performance in a tri-partite construction project often depends on his financial incentives, which change depending on how the compensation portion of the construction contract is drafted. At one end of the spectrum is "lump sum" pricing, sometimes also known as fixed price contracting. The other end of the spectrum is "cost-plus" pricing, also known as time and materials (T&M) work. Cost-plus contracts are best suited for projects where the scope cannot be fully defined until after construction has begun, such as the rehabilitation of industrial blast furnaces where the magnitude of the work cannot be ascertained until after the furnace is taken off-line and cooled, but specifications for the work must be completed before then to minimize the time that the furnace is off-line.

In any lump sum project, the contractor agrees to build the structure for a defined sum of money, no more and no less. The contractor bears all risk of cost overruns on the

work within its scope, although the contractor may be entitled to change orders increasing the lump sum if circumstances compel him to perform work that he can demonstrate to be out-of-scope. This approach tends to make the owner and contractor adversaries because they have competing interests. To maximize its profits, the contractor wants to minimize the quantity and quality of the work, whereas the owner wants to maximize quantity and quality because he pays the same amount either way. Lump sum contracts have a reputation for being the most litigation-prone in the industry.

Cost-plus or T&M contracts function almost exactly opposite. The contractor has no incentive to reduce quantity or quality of the project because it is paid all of its costs plus a fee (representing overhead and profit) for any work performed. If anything, the contractor is often incentivized to maximize the cost of the work because its fee is usually a percentage of the cost of the work. Instead of being worried about quantity or quality, an owner in a cost-plus project must focus on budget and costs, which are often difficult to cap or otherwise control.

Consequently, many cost-plus contracts contain a price cap known as a "guaranteed maximum price" or GMP. The contractor is reimbursed for all of its costs, plus its fee, up to but not surpassing the GMP. Thus, if the project has little danger of the total compensation exceeding the GMP, it resembles a T&M contract. However, if the project exceeds, or seems in the future likely to exceed, the GMP, then it more nearly resembles a lump sum contract with the owner always paying the guaranteed maximum price but no more. In order to incentivize the contractor to minimize cost and complete the project for less than the GMP, the contracts often include a savings sharing clause in which the contractor is paid at final completion a bonus equal to a designated percent of the savings achieved (or some other method of calculation).

Even experienced construction professionals often confuse lump sum contracts with cost-plus contracts to a GMP. Progress payments for lump sum contracts are made based on percentage of completion, whereas similar payments for cost-plus contracts are based on actual costs incurred. This changes, however, if a cost-plus contract with a GMP appears to be in danger of having the guaranteed maximum price overrun; in such case, progress payments should be based on the GMP multiplied by the percentage of completion, in an attempt to avoid a situation in which the contractor has no money left to earn, but has not yet completed the project (which is a recipe for contractor abandonment). Another little known difference between lump sum and GMP contracting is that, at least in theory, the GMP should be higher than the lump sum because while the risk of cost overrun is the same, the contractor has a superior opportunity for reward (excess profits) for bringing a lump sum job in under budget.

Fast-Tracking. For most owners, "time is money," and the ability to complete a construction project more quickly translates into savings and profits. In order to improve the slow pace of the tri-partite approach—completion of drawings, followed by pricing, then award—some owners have organized their projects to begin preliminary construction before the final details of the drawings are completed. This process is called fast-tracking and tends to be used most frequently in entrepreneurial projects with knowledgeable owners/developers.

Fast-tracking involves a tradeoff: saving time in exchange for loss of cost control. Construction commences on site work, excavation, foundation and structure before the finishing details are added to the plans. The earlier start of construction usually translates to an equivalently early finish, but the contractor ordinarily will not commit to a final price until after the plans are complete, which means that the owner will be in the middle of the project before the contractor can quote a firm price. This gives the contractor strong bargaining leverage and the ability to increase the price at the last minute by claiming that its earlier estimate assumed less expensive details than in the completed plans. The owner needs significant expertise in construction pricing to control costs in fast-track projects, and there have been numerous examples of owners paying spectacularly exorbitant claims.

Negotiated Pricing. In recent years it has become more popular for an owner to select a contractor shortly after retaining a design professional and involve the contractor in the project from the design phase onward. Providing construction information to the architect during design can improve the drawings and specifications by ensuring that all details are constructable and all specified products are readily available. But the primary reason owners cite for early contractor involvement is to obtain pricing information before the plans are completed so that the plans can be gradually adjusted to conform to the budget as they are being prepared, rather than the inferior approach of completing them, and then "value engineering" (reducing the quality or quantity of the project) after they have been completed.

At least to some extent, however, this advantage is illusory. When the contractor is pricing the project, it knows that it ultimately will be building it as well, so a savvy contractor will overestimate or include extra contingencies to minimize its risk of overrunning what will ultimately be the lump sum price or GMP. There is no competitive bidding from other general contractors to keep the chosen contractor honest. Even if a contractor uses "open book" pricing, in which several subcontractors from each trade (i.e., carpentry, roofing, etc.) competitively bid their portion of the work, the general contractor can ensure that no "cheap" subcontractors participate in the competitive bidding, and can work out "side deals" with the subcontractors to quote "higher numbers" and to "rebate" to the general contractor some of the excess in those numbers. Negotiating with a general contractor, rather than competitively bidding the project, works best when the owner has significant expertise in construction pricing.

Multiple Prime Contractors. There is no legal requirement that owners hire a general contractor. A project owner may hire each trade separately under a series of independent contracts and then administer the project by sequencing the trades so that they work in the correct order and without disrupting each other. But there are significant risks in administering the trades. Bringing a subcontractor to the site before the predecessor trade has completed necessary work can result in multiple stops and starts for the contractor and in claims for extra compensation. Similarly, sequencing the trades too closely together so that they interfere with each other's work is inefficient and can result in similar claims. An owner needs to have construction management expertise to take advantage of hiring multiple trades directly.

The advantage of hiring the trades directly is that there is no need to pay the markup plus overhead and profit of a general contractor. In theory, these savings can be

substantial, but in fact they are often illusory. Because of the general contractor's greater pricing expertise and business relationships, construction trades may quote an owner a higher price than they would charge the general contractor. Also, some of the savings are eaten up by the owner's expenditure of time or need to pay someone to administer the project. Owners who typically make best use of multiple prime contracting are institutional/industrial entities with full-time construction staffs, or else single-family residential owners doing uncomplicated projects at a leisurely pace where the sequence of trades is simple and obvious.

Construction Management

Construction management is a term that means different things to different people. It should be thought of as a spectrum of different approaches to construction utilizing a company hired by the owner to provide certain construction services. At one end of the spectrum is what is commonly called "agency" construction management, in which the owner hires a company to act as a consultant for the construction project, but the company merely provides advice and does not guarantee the construction price or completion date, does not contract with the trade contractors, and does not perform any actual construction. At the opposite end of the spectrum is what is commonly called "at risk" construction management, in which the consulting company hires the subcontractors and guarantees the construction price and completion date, much like a general contractor. There are as many different varieties of construction management inhabiting the middle of the spectrum as there are possible combinations of construction-related services for the construction manager to provide.

The advantages claimed for construction management are controversial. The construction manager (CM) is typically involved in the design phase and provides information and feedback regarding cost, constructability, schedule and product availability. But if the CM is not actually providing the construction, the reliability of this information is debatable. There have been many instances in which the construction manager estimates a construction cost from the plans, but the actual contractors bidding on the project quote a higher price. And if the CM knows that it is going to be ultimately "at risk" for the project price and completion date, then it has the same incentive to pad its estimates and include contingencies as in tri-partite construction with negotiated pricing (discussed above).

A construction manager can be a source of construction knowledge, expertise and administrative personnel for an owner who lacks them. The CM can break the construction documents down into bidding packages for each trade, which can facilitate competitive pricing and fast-tracking the project. Many construction managers claim that they perform all of the services of a general contractor (although frequently without price or schedule guarantees) for less than the mark-up that a general contractor would take for overhead and profit, but there is conflicting data on whether and the extent to which these savings are real, and results differ by industry, project complexity, and many other variables.

Design-Build

The fastest growing method of construction project delivery is also the oldest: design-build, in which the design professional and contractor are the same entity or are on the same team. Throughout the history of the world, almost everything, from the pyramids to the Eiffel Tower, were constructed via design-build. It was only in the early twentieth century that the tri-partite method became dominant—and only in America, not Europe. Also known as EPC (Engineer/Procure/Construct) in industrial construction, where it is already the majority project delivery method, design-build is making a rapid resurgence in the United States because owners perceive that it offers numerous important advantages over other methods.

The following is a truncated list of the major advantages claimed for design-build. (For more detailed explanations, see my Web site at http://www.schiffhardin.com/design-build).

- **Speed of Completion**. Design-build facilitates fast-tracking the construction project, but without any loss of cost control. The design-builder cannot sensibly claim that he didn't know how the plans would be completed when he quoted a price because he himself is (or is on the same team with) the design professional.
- **Single Point Responsibility**. If some aspect of the building fails to function properly, such as a leaky roof, the design-builder is automatically responsible to the owner because he controlled the design, procurement and construction of everything relating to the roof. There is no finger-pointing, and the owner need not adjudicate who is at fault.
- **Greater and Earlier Cost Certainty**. Using conceptual estimating techniques, a good design-builder can quote a firm price relatively early in the design process, provided that the owner's program is well understood, because the construction team can ensure that the design professional completes the plans consistent with the quoted cost.
- **Better Communication**. The architect and contractor communicate cooperatively as a team rather than adversarially through RFI's (Requests for Information) and formal letters, leading to a greater likelihood that the owner's program will be successfully translated into the completed structure.
- **Fewer Disputes and Litigation**. The major source of tension on a construction project disappears when the architect and general contractor are on the same team rather than being adversaries. Observational evidence (not statistically validated) indicates that there are fewer than half as many claims on design-build compared to traditional tri-partite projects.

The major disadvantage of design-build is the loss of the architect's role as "policeman" for the owner on the project. The architect has an incentive to cooperate with the contractor to maximize the design-build team's profit for the project. There have been situations in which the design-build team has inflated cost estimates so that it earned a windfall via a percentage of the savings when the project was completed far under the target price. There is also some anecdotal evidence that some design-build teams may diminish project quality without informing otherwise unsuspecting owners and have permitted construction defects that do not manifest themselves until much later.

However, empirical evidence does not support the proposition that modern design-build projects are of inferior quality. Design-build teams' reputations for future work depend on their clients' satisfaction with previously-performed work. And there are other ways that owners can "police" their projects, such as by hiring a third-party consultant or using knowledgeable in-house staff. An emerging practice is for owners to hire a "cri-

teria professional," usually a design professional who works with the owner to establish the owner's program for the project, including comprehensive performance criteria for all aspects of the project, which are then incorporated into the design-build contract so that the design-build team is guaranteeing to meet the owner's standards—after which the criteria professional becomes the owner's "project policeman". Although a criteria professional would seem to add an additional layer of expense, experience seems to indicate that the costs are not significantly greater than fees typically expended on programming and are more than outweighed by the time savings and other efficiencies of the design-build process.

Another criticism of design-build is that it does not permit competitive bidding of the completed plans, and therefore is not designed to achieve the lowest possible price. There is some truth to this criticism, but experience has shown that the time savings and other efficiencies of design-build methods tend to result in lower costs than the traditional tri-partite approach. Most construction owners and developers are motivated primarily by budget, rather than achieving the lowest possible price, so it is more valuable for them to avoid spending a dollar over budget than to save a dollar under budget, and the greater and earlier cost certainties of design-build facilitate adherence to budget.

Variations in the Design-Build Team. Although all design-build teams include at least a design professional and a contractor, the manner in which the team chooses to structure itself can have a significant effect on project outcome. The majority of design-build teams consist of a prime contractor with the architect (or engineer) as a subcontractor. To some extent, this is an accident of history. For many years, the American Institute of Architects forbid its members from being design-builders, and contractors, who are more entrepreneurial and risk-accepting, dominated the design-build marketplace. Their superior financial capacity, compared to most design professionals, can provide an owner with bonding capacity or other financial assurances securing performance of the project.

But there has been considerable criticism of design quality in contractor-led design-build teams. When the architect is hired by the contractor, its concerns about design quality can be overruled, and the architect does not have direct access to communicate its concerns to the owner. Many design-build contractors have been criticized for over-valuing issues of cost and constructability and under-valuing issues of design quality. For many years, contractor-led design-build had a reputation for being appropriate only for "cookie-cutter" facilities where design quality plays a minimal role. Of course, this is not true of all contractors, particularly those with long-standing relationships with their clients or those whose marketing is based in significant part on its reputation for design quality.

Sometimes the design-build "team" is a single company that has both design and construction capacity in-house. Proponents of such companies cite greater efficiencies and superior communication among the design and construction employees, who work more or less exclusively with each other. But detractors of such "integrated companies," as they are called, argue that their design and construction skills tend toward complacency and mediocrity and are not cutting edge, lacking the "sharpening" that comes from being exposed to and needing to accommodate other company's approaches. Critics of integrated companies also argue that the very ease of internal communication tends to exclude the owner from the information flow, allowing the design-builder to make decisions or conceal problems and other issues to the owner's detriment.

Much more common than integrated firms in the design-build marketplace is some kind of joint business venture comprised of an architect and a contractor. It is difficult to classify and analyze these joint business ventures because their operations depend on the specifics of their joint venture agreement or other governing documentation. If the governing documents give most of the power to the contractor, then such ventures tend to resemble contractor-led design-build teams, with the corresponding advantages and disadvantages. It is rare for the governing documents to give the majority of the power to the architect, but if they do, then the venture tends to resemble architect-led design-build, discussed below. When the power is shared more or less equally, it may be difficult to predict how the design-build team will tend to function, and it is often prudent for an owner to review how the design-build venture has performed on other projects in the past.

A potentially dangerous kind of design-build joint business venture is the "shotgun marriage." This occurs when an owner persuades an architect and a contractor who have never been co-design-builders with each other to team up for the owner's project. One of the major reasons that design-build has been so successful is that the architect and contractor usually have a history of working together and expect to do so again in the future, which provides a strong counter-incentive for them to take action that would harm the other's interests when working as a design-build team. This incentive is missing when the owner "marries together" the two companies for a single project, in which case the procedural shortcuts and informal communications that are the hallmark of successful design-build projects can instead become a source of claims.

A small but growing form of design-build occurs when the architect leads the team, usually with the general contractor as its subcontractor. This structure allows the architect to weigh considerations of cost and constructability versus design quality, which is what architects are trained to do. An important advantage when the architect leads the design-build team is that the owner can postpone deciding whether to deliver the project via design-build or more traditional means by beginning to work with the architect on preliminary planning and design while preserving an option to convert the project to design-build at a later time. Although architect-led design-build is sometimes criticized because the architect typically lacks the financial capacity to secure construction of the project, this objection can be overcome by careful drafting of the project contracts and other documents, which can allow the general contractor's financial balance sheet to secure the construction obligations even though the general contractor isn't contracting directly with the owner.

Architect-led design-build is a very flexible approach because the architect is usually the owner's first consultant involved in the construction project. Some projects, especially smaller and simpler ones, do not require a general contractor, in which case the architect can hire and administer the trade contractors directly. One promising approach, pioneered by Peter Gluck in New York, involves the architect performing many of the functions typically performed by other parties—detailing and drafting for consult-

ing engineers, and material takeoffs and procurement for trade contractors—which has resulted in lower construction costs and greater efficiencies by removing most of the risk from the consultants and subcontractors.

Integrated Project Delivery. The hottest topic today in project delivery methods is "integrated project delivery," which, like construction management, means different things to different people. Even the American Institute of Architects has apparently conceded that there is a spectrum of meanings for the term, having published two different contract groups for integrated projects which bear virtually no resemblance to each other. At its core, integrated project delivery is a design-build structure in which the owner participates to some extent in the design-build team. At one end of the spectrum, that participation may be purely contractual, in which the owner shares in certain decision-making procedures and financial consequences. At the other end of the spectrum, the design-build team may form a single-purpose entity to deliver the project in which the owner has an ownership interest and considerable other involvement.

Integrated project delivery provides some advantages over other methods of design-build for an owner who desires and is able to participate in the design and construction decision-making process. The owner is involved in all relevant communication and is able to advocate its interests before decisions are finalized. The corresponding danger, however, is that an owner may have insufficient experience or resources to participate usefully, and may slow down the process or adversely affect the decisions made. Rather than simply establishing performance criteria and requiring the design-build team to achieve them, the owner's involvement in the process may provide a defense to the design-build team if the criteria are not met.

A more radical form of integrated project delivery, practiced primarily in Australia, is "alliance contracting." This approach involves sharing financial risks and rewards in lieu of attempting to establish legal responsibility for failure. All of the major parties to a construction project, including not only the owner, design professional and contractor, but also consulting engineers and major subcontractors and suppliers, bind themselves to a compensation formula that depends almost exclusively on mutually established criteria for project performance, which results in the entire team sharing bonuses for meeting or exceeding criteria and losses for failing to do so—regardless of the reasons for project success or failure. This structure is an attempt to distance project outcome from the finger-pointing that commonly results from typical Anglo-American rules for culpability and proximate cause, instead substituting teamwork and joint dedication to achieving the project criteria, regardless of attribution of fault or credit. Alliance contracting requires a great deal of trust among project participants, probably cemented by long-standing working relationships, and there is not yet sufficient data to predict its applicability to or likely success in the American construction market.

Conclusion

Once the need for a construction project is conceived or realized, the single most important decision that affects the outcome of the project is usually how to structure it. Most owners pay far too little attention to such an important decision, either using a structure with which they are familiar or else blindly following someone's recommendation that it is "always done this way." Once the project delivery decision is made and implemented, the owner has lost much of his ability to influence project outcome. Considerable extra expenses are often incurred delivering a construction project the "same old way" because the owner is too unsophisticated or lazy to analyze the alternatives. There are a greater number and variety of construction project delivery methods available today than ever in the history of the world, and savvy owners who take advantage of the most favorable delivery methods are more likely to achieve significant advantage in today's competitive construction marketplace. ■

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