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Alternative Delivery Methods from the Engineer's Perspective

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Alternatives to the traditional design-bid-build (DBB) delivery method of construction have been evolving for decades in a continual effort to improve efficiencies and effectiveness. But with aging infrastructure, cost escalation, and increased limits on financial and human resources, facility owners are incentivized more than ever to look to alternative delivery methods (ADM) to meet their constituencies growing needs. While there is a plethora of information on the various forms of ADM and the distinct advantages and disadvantages to each, little has been written about the topic from the consulting engineer's perspective.

The three main ADM are design-build (DB), Construction Manager/General Contractor (CM/GC) [sometimes referred to as Construction Manager at-Risk (CMR)], and public-private partnerships (P3). Each presents a unique set of circumstances for the engineer and is quite different from the familiar DBB delivery system. One of the most important things to recognize when considering an ADM is that it is a project delivery method. Traditional contractual arrangements (with selection based on price, qualifications, or a percentage of both) and compensation methods (lump sum, guaranteed maximum, or reimbursable) are not dependent on or tied to a delivery method.

Design-Build

In DB, the owner has funding in place to move forward and a general idea of its project requirements. It's up to the design-build team to optimize resources to meet the owner's requirements of the project. Typically, the selection criteria are based on a formula that includes a technical score, a price component and the schedule. This selection method has become more popular with owners seeking to know costs up front and to take advantage of the DB team's strengths and problem solving abilities. As a result, more teams are pursuing these projects and engineering services are becoming more of a commodity. While the best technical score would win the job using the tradition DBB method, there's a little more complexity in this method introducing factors beyond the engineer's control.

To be competitive, the design-build team has to spend more time and effort on the pre-bid in order to introduce innovations that improve quality and/or decrease overall project costs. The cost to pursue this delivery method is expensive. The engineer has some influence in the selection process but he or she must be very strategic and calculating to win.

CM/GC

The CM/GC project delivery method begins at the conceptual stage. The owner engages the construction manager during the design process to provide constructability, cost estimates, scheduling and phasing input. This helps the

owner to review various options, make adjustments, and fine-tune their design. The Construction Manager is generally selected on the basis of qualifications, past experience or a best-value basis. Typically the owner and the construction manager negotiate at the 60% to 90% design completion stage a guaranteed maximum price for general contractor portion of the project based on the refined scope and schedule.

From the engineer's perspective, this procurement method involves early partnering between owner, designer, and contractor to jointly develop projects. The engineer's role becomes less of a commodity because the owner recognizes throughout the process the value of engineering, however, the engineer should be aware that the design development stage will be very interactive process.

P3

The P3 project delivery method is similar to design-build in many ways but it also has a funding and, sometimes, a long-term maintenance and operations component. The owner may select this delivery method for large infrastructure projects that are greatly needed but for which there is no immediate financing available. The investment company becomes the main proposing entity and, therefore, is positioned between the owner and the design-build team. The investor's goals are to complete construction as quickly as possible so they can begin to recoup their outlay and soon after initiate divestiture of their shares. If the design performs as planned during the first maintenance cycle in 6-8 years, the investor realizes a sizable profit and a higher re-sale value.

From the engineer's perspective, however, this method increases the complexity and cost of the pursuit and places the engineer in a third-tier relationship to the owner. There are additional factors beyond the engineer's control and there's a lengthy, costly pre-bid process to refine the pricing. In the long-term there could be additional risks if the design doesn't perform as planned.

Key Factors to Consider

Project owners select the best delivery method based on criteria pertinent to the goals and objectives for the project at hand and the current circumstances. Just as it takes expertise for an owner to choose the best delivery method for a particular project, savvy engineering firm leaders are wise to understand the implications of each option before pursuing a project of this nature. Here are some of the key factors to consider:

- a. Cost of the pursuit is higher which can impact your bottom line.

While stipends are sometimes offered to teams proposing on ADM projects, they are often inadequate to support the effort. In order to provide a reliable proposal estimate, engineering must be 20 percent complete. As an engineer, it may not be wise to pursue the project unless you have a strong chance of succeeding. It won't take too many lost pursuits to negatively affect even a sound firm's financial footing.

- b. Different chain of command.

Engineers historically have worked directly for the owner, the architects, or other engineers. In fact, engineers would oversee the contractor's work to ensure it meets the intended design. But with ADM, the engineer reports to the contractor in both DB and CM/GC projects and to the finance company in the case of P3. Other factors beyond the engineer's control can affect the outcome of the proposal. Engineers will best be served by working for investment companies and contractors who have experience with the project type, have better than average probability of winning the project, and understand the risks and complexities that are associated with it.

- c. Potential impact of warranties / guarantees.

Engineers need to carefully consider the potential impact of warranties and guarantees. While it's beyond the scope of this article to address these legal issues, the engineer should gain a clear understanding of the potential impacts to the project and develop a plan to mitigate these possibilities.

- d. Expanding liability to third parties.

The focus of investor-led P3 is the availability and cost of capital to finance the project. Quite simply, it represents the largest portion of the overall costs and, therefore, carries the largest risk associated with their involvement in the project. In addition, investors look at the costs associated with maintaining and operating a facility for 30 years or longer. With so many potentially competing facets and parties contributing to the project, the risk of liability can appear much broader.

Advantages for the Engineer

Even with these concerns, there is plenty of opportunity for rewards, which can make an engineer's involvement in ADM projects well worth it, such as:

- a. More flexibility and opportunity for innovation and cost savings to meet the owner's goals

The reward structure of ADM projects encourages innovation to reduce costs, speed construction, meet and exceed the owner expectations. By working together up front on a project, the dynamic collaboration between the contractor, other designers, subcontractors, operators, and financing parties can bring about tremendous originality, effecting huge savings in time, material and/or costs.

- b. Work on more interesting and larger projects.

Projects that benefit most from ADM often are very large, prominent in their communities and rewarding to problem-solver types. Engineers also benefit from the synergy and experience of team members that transfer and build through the team effort.

- c. Continuity between contractor and designer.

The very nature of ADM projects calls for the designer and contractor to work collaboratively, brainstorming, building on each other's strengths, all while minimizing any potential weaknesses. The give-and-take allows for increased innovation, as well as improved efficiencies in design and means and methods in construction.

- d. Expanding/building working relationship with contractors.

The process of working as team builds even stronger relationships and reputations, positioning the team for future successful joint efforts that can bring greater value to their clients.

- e. Qualifications based selection is a factor in selection.

While ADM projects often have a price component to the selection process, qualifications are critical as well. With so much at stake, clients rely on the quality and reputation of the team they will be entrusting to do the work.

- f. Shared risk / reward

As with any team effort, there is comfort in knowing that you're in it together. With the right owner, team members, and compensation, the overall experience can be very rewarding in terms of the project experience and financial outcome.

Strategies for Success

The engineer needs to recognize that each ADM has a different level of complexity and needs to consider where they can influence the process. Carefully weigh the investment, risks and likelihood of success.

Alternative delivery methods are here to stay. Owners will select the project delivery system that best meets the project goals. These could include having a guaranteed price possibly making DB the best option, requiring input and innovation to help address some unknowns such as in CM/GC, or needing a financing option calling for a P3 structure. Engineering firms can benefit from these new ADM but should be sure to complete their due diligence to make certain they are pursuing projects that meet their firm's goals and objectives, which includes adequate compensation for the risk involved.

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