When The Design-Build Delivery Method Takes Hold: Will You Be Prepared?

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Infrastructure projects have traditionally been delivered through the design-bid-build delivery method, in which a design is either performed by the contracting agency in-house or procured through an outside design team and then put out for competitive bidding.

The History Of Design-Build For Infrastructure Projects.

Design-bid-build has been the chosen project delivery method for more than a half-century. It has been the primary project delivery system since the Massachusetts Legislature passed a law in 1963 requiring public works projects to be awarded to the lowest responsible and eligible bidder. However, as infrastructure projects have become increasingly complex, alternative approaches to project delivery have begun to take hold, with Massachusetts being one of the states at the forefront of this revolution.

Beginning in 1998, the Massachusetts Legislature first authorized the Massachusetts Department of Transportation ("MassDOT") to use the design-build delivery method for the Route 3 North Transportation Improvement Project, a design-build project involving the addition of a travel lane, two 10' shoulders in either direction, the replacement of 47 bridges and environmental upgrades. Although somewhat behind schedule, this significant project was delivered by the successful bidder, Modern Continental, in less than five years. That project demonstrated perhaps the most significant benefit to the design-build method – expedient project completion. The Legislature has since extended the use of the design-build procurement and delivery method to public works projects estimated to cost more than $5 million.

In 2010, the Massachusetts Inspector General's Office approved four applications submitted by public agencies for the use of the design-build method and issued "Notice to Proceed to Use Design Build" letters to those applicants. The use of design-build is increasing in infrastructure projects as well. As of 2010, MassDOT had completed two design-build projects, with 11 more projects either in construction or procurement stages with a handful of future projects also on the drawing board. Unlike other public agencies, MassDOT is exempt from having to obtain approval from the Inspector General's Office before utilizing the design-build method, provided its procedures satisfy the requirements of Chapter 149A of the Massachusetts General Laws. MassDOT must, however, submit its procedures for approval by the Inspector General's Office on an annual basis.

Design-build offers a unique set of advantages and disadvantages from the perspectives of both owners and construction firms. One thing is clear: design-build is a significant part of the future for large infrastructure construction. Being attuned to this change, and the challenges the

design-build delivery method presents can mean the difference between profit and loss.

The Benefits Of Design-Build

According to the Design-Build Institute of America, the design-build delivery method incorporates both design and construction disciplines under a single contract, with a single entity shouldering the risk for a complete, buildable design. The obvious benefit to this system is the streamlining of the entire process. The design-build team works together to decide the most cost effective materials and methods of delivery before finalizing the design, to more accurately quantify costs and schedule duration and to deliver a more coordinated design. Having this integrated approach can result in cost savings for the owner, especially in the reduction of potential change or extra work orders for design changes for which the owner is no longer liable except under the most unusual circumstances. In addition, design-build allows for more value engineering during the design process by having the constructors evaluating the design early and often. This is particularly beneficial in the heavy-highway context where environmental issues often arise, requiring the design-build firm to be able to adjust design and means and methods on the fly. Having a single point of contact streamlines these inevitable bumps in the road and theoretically reduces the risk of litigation arising from the inherent positional conflict between designer and constructor in the traditional design-bid-build scenario.

Because the procurement process for the design-build method involves an evaluation of the technical merits of the proposal, and is not just based solely on price, it enables the owner to choose the best qualified team, design and value for the project. By having the design and construction disciplines involved at the outset, it also provides for potential time savings for the owner. It eliminates the need for multiple phases for bidding, including bidding of the design phase in the event that the project is not performed in-house by a contracting agency. For fast-tracked projects, this is especially true as the design can continue to evolve while the construction process gets underway. Similarly, having the contractor involved during the design phase enhances the overall constructability of a project and contributes to the development of innovative designs. The unique experiences of a contractor can benefit the design team and assist in overcoming conflicts and potential delays during the actual construction process. That, however, as discussed below, may also be a possible disadvantage to using a design-build project delivery system in terms of decreased competition and oversight.

The Potential Pitfalls Of Design-Build

Opponents of the design-build method believe that it reduces competition by excluding smaller firms without the design capabilities of larger national engineering construction firms. Larger firms with in-house design capabilities are at a distinct advantage in bidding design-build projects due to economies of scale. Smaller firms who need to subcontract the design component must often do so at a premium that makes their ultimate bid uncompetitive. The cost of preparing a design-build proposal can also be significant, which tends to preclude smaller firms from competing.

In addition, unifying the design and construction disciplines eliminates a clear system of checks and balances between the designer and

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constructor. With the design and construction team being unified, there is no longer a competing interest between disciplines to ferret out design errors and omissions or construction defects. The traditional role of the designer as monitoring the construction to ensure compliance with the construction plans and specifications on behalf of the owner is replaced by a design-builder who is not obligated to protect the owner's interests exclusively. As a result, some owners may feel compelled to retain a construction manager or representative to represent its interests, at an added cost of course.

Design-builders also assume all the risk. Under the design-build method, the design-builder loses the protection of the Spearin Doctrine which ordinarily provides a contractor with a guarantee of the accuracy of the construction documents. The design-builder assumes the role of designer and constructor and can no longer rely upon the argument that the owner is liable for flaws in the construction documents which result in greater costs to it. Since the design-build scheme is bid and awarded prior to having a complete design, this may result in permitting, environmental and owner preference issues which could result in costly delays and changes. Traditional design-bid-build delivery methods typically resolve these issues during the design stage rather than during the construction phase as with design-build method. In addition, failing to have a complete design will often result in the potential for cost escalation for materials and final design. The design-builder may also add large contingencies in its bid to protect itself against unknowns and possible disputes with the owner. This ultimately results in added costs to the owner.

The Future for Design-Build

While many state transportation agencies, including MassDOT, currently use design-build for only a small percentage of projects, one can expect the use of design-build method to increase in the future, especially with our aging infrastructure calling for cost-effective, expeditious and creative design alternatives. In March, construction activities began for the 93 Fast 14 project, a $98.1 million project to replace fourteen bridge superstructures in Medford, Massachusetts part of the Accelerated Bridge Program, a $3 billion recovery effort to reduce the number of structurally-deficient bridges in the Commonwealth. MassDOT anticipates the 93 Fast 14 project to be complete in one year – a typical project of this magnitude would ordinarily take five years to complete, according to MassDOT. The design-build method for transportation projects represents a significant change in the way projects are managed and delivered by transportation agencies, and Massachusetts is clearly ahead of the curve. These types of projects delivered by the design-build method are indicative of the future for major infrastructure projects in the Northeast. To remain competitive for these projects, construction firms need to either develop or expand their design capabilities.