

WHITE PAPER

Enhancing Design-Build Projects by Incorporating an Optimization and Refinement Period

By Steven Beam, PE, Mike DeBacker, PE and Keli Wylie

The scope of a traditional design-build project can change even before ground is broken. On these projects, an optimization and refinement period — an interval of time when the owner and project team collaborate on project details before locking in the price — can make all the difference.



During the nearly three decades since the Design-Build Institute of America was formed and states like California began authorizing design-build's use by state and local agencies, the project delivery approach has become a go-to for public and private industry alike. Yet, this approach continues to pose challenges to owners and design-builders, particularly on projects that involve complex design, a constrained budget relative to the desired project scope or when the delivery method is new to the owner.

However, that can change. Before negotiating a final price, owners might follow the Arkansas Department of Transportation's (ARDOT) lead and add a new project phase where the owner and design-builder work collaboratively to refine the project requirements and value engineer its design. In addition to providing an owner with a clearer understanding of what will — and will not — be included in the design, this optimization and refinement period can increase confidence that the project will meet the owner's expectations.

Updating the Traditional Design-Build Process

A traditional design-build project typically begins with the owner — with or without the assistance of an engineering consultant — developing requirements for the new project. This information is released to prospective design-build teams that then submit their qualifications for completing the project. Using these qualifications and an interview process, the owner creates a shortlist of teams for further consideration.

The shortlisted teams are then invited to develop a preliminary design that addresses the project requirements and a cost estimate for its construction. During this competitive stage of the proposal process, opportunities for face-to-face collaboration between the design-build team and owner are limited. At the end of the process, the owner reviews the proposals and selects a design-build contractor. Upon completion of successful contract negotiation, a contract is signed and the design-build phase formally begins.

While traditional design-build delivery is highly effective for many project types, unexpected or changing requirements are sometimes discovered later, especially if the project is atypical. In this instance, it's possible that change orders would be necessary, potentially expanding the project scope agreed to at the contract signing. The design-build team will present schematic drawings based on project requirements, but more exhaustive and nuanced development of the project scope typically doesn't happen until after contracts are signed. If project requirements change or are discovered after the design has reached a later stage, change orders and the associated cost and schedule ramifications are more likely. This presents an opportunity for conflict between the owner and design-builder.

The Benefits of Adding an Optimization and Refinement Period

For projects where it is possible that change orders could come into play, an optimization and refinement period can serve as a safety net for catching these and other challenges before the owner and design-build team are locked into a design and a price. It is typically inserted into the project schedule at a critical moment: after a design-build firm is selected but before the final contract is signed.

During the period designated for optimization and refinement, many things can happen. Working in collaboration, the owner and design-build team can explore the project requirements in greater depth than was possible earlier. In doing so, the design-build team learns more details about the owner's priorities. The owner, in turn, gains a better understanding of the solution the design-build team is proposing. Through this process, the owner and design-build team can build rapport, establish trust and refine communication channels before construction begins.

The optimization and refinement period can also be used to value engineer the design to identify cost-saving opportunities. Value engineering can be especially beneficial if the project team discovers requirements that were omitted from the original scope, or when the full scope turns out to be larger than the budget can accommodate.

This time can also be used to innovate. It may be possible to add new requirements without increasing costs if alternative approaches or suitable trade-offs can be identified. Most importantly, it enables the parties to make these decisions without the pressures of a live construction project looming over them when delays have dollars-and-cents ramifications.

Given the consequential decisions made during an optimization and refinement period, success hinges largely

on the design-build contractor's ability to assemble a highly functional, multidisciplinary design team that understands both the project and the region in which it will be constructed. Careful attention must be paid to the assignment of both the project manager and individual task leaders to allow dedicated team members to focus on their roles, including the support and mentoring of subconsultants.

The length of time needed for an optimization and refinement period varies according to the project size and the owner's comfort with design-build methods. Typically, it can run anywhere from a few weeks to six months or more. If used for the first time, establishing processes will require more time than on subsequent projects. During the optimization and refinement period, the design-builder is compensated with either a fixed amount, as was the case on ARDOT's 30 Crossing project, or it can bill hourly for its services using rates comparable to those for traditional design or preconstruction services. The optimization and refinement period concludes with a change order to the original contract that redefines the project scope, specifications and price.

Another Alternative: Progressive Design-Build

An owner contemplating the addition of an optimization and refinement period to a traditional design-build project may also want to consider progressive design-build as another alternative. This project delivery method maximizes collaboration, flexibility and management of risk through a phased, transparent contracting approach that refines the project requirements and scope before establishing a contract price. The design-builder is selected predominantly on qualifications, which reduces both the owner's and the design-builder's investment in the selection process. Given capacity challenges facing owners, contractors and engineers alike, this latter benefit is not one to overlook.

Like traditional design-build, progressive design-build is a two-phase approach consisting of preconstruction and construction phases. It begins with the development of project requirements and a request for qualifications from prospective design-build teams. After these steps, the process moves in a different direction. Rather than requiring design-build teams to develop preliminary designs and cost proposals, the owner and/or the engineer determine the shortlist based on qualifications alone. A design-builder's qualifications could include project-specific innovations it might propose in schematic alternatives that are less detailed than a traditional design-builder's technical proposal. Following interviews with shortlisted teams, the owner selects its design-build contractor, and the parties enter a preconstruction contract.

With progressive design-build, preconstruction activities are similar to those performed during an optimization and refinement period on traditional design-build — only in this case, the goal of owner and design-builder collaboration is not to optimize and refine an existing preliminary design. It is to identify risks, develop the design-build proposal, incorporate innovations, refine the scope and come to an agreed-upon contract price for final design and construction.

An “off-ramp” for owners is built into the progressive design-build process at the close of Phase 1. At this point, owners can “tap the brakes” and assess whether the guaranteed maximum price is fair and reasonable. If the owner is satisfied with this review, the design-builder can enter a contract for final design and construction. Those with reservations can choose the off-ramp and procure final design and construction in whatever manner they choose.

One of the most significant benefits of progressive design-build is its simplicity. The qualifications-based selection of the design-build team is streamlined. Both parties can then devote their time and energy to detailing the project requirements and developing a value-engineered solution that satisfies them.

The Bottom Line

Similar to design concepts and construction materials, project delivery methods continue to evolve. Decades of use on public and private projects have resulted in multiple enhancements to the design-build process. The optimization and refinement period and its cousin, progressive design-build, are among the latest and most effective innovations to the process.

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