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Progressive-Design Build: A Tool for Our Times

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Rising costs, disrupted supply chains and a constricted labor market will pose challenges to the many construction projects now coming to market. Using a progressive design-build approach, owners can mitigate costs and minimize risks by reducing upfront cost and time investment, while fostering innovation.

Progressive design-build (PDB) is a two-phased project delivery method that enhances collaboration, teamwork and value, while reducing upfront time and investment in procurement. In phase 1 of progressive design-build, the design-build team, which is selected predominantly on qualifications, collaborates with the owner to develop the project scope, schedule, preliminary design and a cost-certain offer or guaranteed maximum price (GMP) to complete detailed design and construction. If an owner finds the proposal acceptable, the team enters phase 2 for detailed design, construction and startup.

When the owner selects its progressive design-build partner based on qualifications, experience and past performance, the cost of entry is typically lower and the procurement timeline is accelerated for both owners and design-builders. Owners can focus on finding the team that is most qualified, is most suited to their needs and can most effectively manage cost, schedule and risk. Their obligation to manage multiple bidders, approaches and proposals is eliminated. From a macro level, progressive design-build represents a more efficient use of both the owner's and the market's limited resources.

The even greater benefit of progressive design-build, however, is the collaboration it allows between the owner and design-builder from the project's onset. From day one, the design-build team can parse through the owner's goals and requirements, looking for opportunities to optimize design and construction, thereby reducing costs, risks and the project schedule.

Owners who want to enhance accountability under a progressive design-build contractual framework have multiple opportunities to address concerns. 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" on a project and assess whether the GMP is fair, reasonable and transparent. 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 any alternative manner they choose. Owners are under no obligation to contract for detailed design and construction until they are satisfied that the phase 2 proposal is transparent and the cost is competitive. If desired, owners can validate costs using an independent cost estimator.

Why It Matters

While progressive design-build offers benefits on all types of projects, it can be especially advantageous when construction costs are rising and design and construction labor demand is high. Here are some of the benefits of progressive design-build:

Saves time and money: The time owners save with progressive design-build is one of the biggest drivers for its use. If the owner is satisfied with phase 1 results, final design and construction can begin immediately, without the added time and expense of soliciting further design and construction proposals from multiple bidders. Projects with shorter schedules simply cost less.

Eliminates waste: Progressive design-build is often less costly for the owner to administer. In addition, all the tasks completed during phase 1 of a progressive design-build project would be completed regardless of the procurement approach, so there is no wasted effort, even if the owner and design-builder do not reach a price consensus.

Improves owner flexibility: Owners that wish to reduce or refine the scope of work after phase 1 in a progressive design-build project have opportunities to reframe project scope. They can choose to continue working with the design-build team or bid the work out in a traditional way. In short, progressive design-build gives owners the flexibility to adjust the project's direction without penalty.

Provides early pricing confirmation: Progressive design-build brings cost certainty to these projects at the earliest possible stage. Designers can adjust the scope of work and implement small course corrections, as needed, to remain within the owner's budget as a project moves through phase 1. Progressive design-build also enables owners to lock in a GMP and financing early — a particularly strong incentive during periods in which inflation and interest rates are rising.

Delivers transparent, competitive pricing: While progressive design-builders can choose to self-perform critical path items to keep a project on schedule, all major subcontracting and equipment packages can be bid competitively. An open-book, transparent-pricing approach provides owners with a clear sightline for bids from multiple subcontractors and vendors. Owners can influence final selection of subcontractors and suppliers based on their prior experience. Even self-performed work has checks and balances when the design-builder shares hours, labor and pricing information with the owner.

Sheds owner risk: With progressive design-build, the owner transfers these risks to its design-build partner. Progressive design-build projects also shed risk as they proceed, with increased collaboration and additional engineering bringing clarity to the owner's needs and expectations. A progressive design-builder is more confident in early pricing than bidders who must factor unknown risks into traditional design-build cost proposals.

The Bottom Line

When construction demand is high and resources are in short supply, owners that use a progressive design-build project delivery strategy can streamline the project delivery process while significantly reducing project delivery time, cost and risk to the owner. With added flexibility and significant owner input through the delivery process, owners can spend their time and effort fulfilling their operational missions, rather than running procurement exercises and managing multiple designers and contractors during the delivery of their capital program.

Case Studies

Bridge-Raising Program | Kansas Turnpike Authority

Challenge: When the 236-mile Kansas Turnpike was constructed in the 1950s, bridge overpasses had a standard vertical clearance of 13 feet, 6 inches. To accommodate the taller height of today's trucks, the Kansas Turnpike Authority (KTA) sought to raise its bridge crossings by more than 2 feet without closing the turnpike to the traffic below. However, initial cost estimates were high.

Solution: Using progressive design-build, the KTA worked in collaboration with Burns & McDonnell to develop solutions that cut construction time and cost. From 2016 through 2022, KTA raised 40 bridges through four separate progressive design-build packages, with another 15 bridges in various stages of design and construction. All have been completed without disrupting the turnpike traffic below. The collaborative delivery approach resulted in a 40% cost reduction and a 2019 Engineering Excellence Award from the American Council of Engineering Companies.

30 Crossing | Arkansas Department of Transportation

Challenge: With its 30 Crossing project, the Arkansas Department of Transportation sought to replace functionally obsolete bridges and interchanges throughout Little Rock. It would have been the capstone project of one of the largest highway improvement programs ever undertaken by ARDOT. However, the proposals exceeded the project budget.

Solution: A six-month optimization and refinement period added to the fixed-price design-build process enabled the design-build team to define a scope of work that could be completed with available funding. Adding the optimization and refinement period to the process provides many of the same benefits as progressive design-build, and it is a good alternative when owners do not have authority for progressive design-build. Construction is now underway on projects that improve the condition and operation of existing, high-traffic roadways. The remaining scope will be delivered under future projects as funding becomes available.

Water System Upgrades | Siloam Springs, Arkansas
Challenge: Recent engineering assessments of Siloam Springs' aging 9-MGD water treatment facility indicated that any improvement project would need to include an expansion of its treatment capacity. This would be difficult to accomplish on the city's fixed budget of $31 million for the project. After completing a phase 1 contract, Burns & McDonnell concluded otherwise, enabling the city to recalibrate its expectations for the project's size and scope.

Solution: When design was 30% complete, the firm submitted a $29.4 million fixed-cost proposal to complete the remaining design and construction under a progressive design-build contract, with the remainder of the $31 million budget held in a contingency fund. The firm's open-book approach proved helpful during final design, providing the city with the flexibility to evaluate and implement minor changes. For example, the city saved $22,500 by contracting with two flow meter vendors, which allowed reallocation of the savings to pay for lighting upgrades that had been eliminated during value engineering.

While state revolving funds are typically used for traditional design-bid-build projects, the Burns & McDonnell team worked with the state of Arkansas to bridge these requirements and adapt them for use on this progressive design-build project — a first in the state.

Northwest Wichita Water Facility | Wichita, Kansas
Challenge: The 120-MGD Northwest Wichita Water Facility is one of the largest infrastructure projects ever undertaken by the City of Wichita. To achieve a diverse and sustainable water supply, the facility will include multiple treatment schemes to treat water from several sources, 24 hours of water storage and a high-service pump station to facilitate water delivery. To stay within its capital budget, the City entered a progressive design-build contract with a joint venture between Burns & McDonnell and Alberici.

Solution: After defining the requirements for the new facility and completing the preliminary design, value engineering and process optimization, the progressive design-builders team delivered a $494 million cost proposal — $15 million below the City's budget — with a projected $6 million per year in operational savings. When completed in 2025, it will give the City flexibility to switch between water sources depending on climatic condition, while serving more than a quarter of Kansas' population.

About Burns & McDonnell

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