NAC Executive Insights

Design-Build Advice

Key Points

- Design-build project delivery is a growing project delivery model.
- Design-build project performance has created new challenges for owners, contractors, and engineers.
- This Executive Insight provides advice to each of these three parties that should improve individual and collective project success.

Introduction

Design-build is a growing project delivery model especially in the delivery of large complex projects. Design-build requires owners, contractors, and engineering subcontractors to modify their project management and contracting practices to reflect the changed roles each assumes under a design-build project delivery model. There are differences between design-build and design-bid-build.

In simplest terms, under design-bid-build (DBB), the owner retains significant interface risk between the designer and builder, each of whom has been retained separately by the owner, often sequentially. Effectively this creates a “white space” risk between each of the contracting parties and is often not adequately considered in project planning, budgeting, and schedule development. Further, the basis of design in DBB frequently does not reflect construction input—this being accomplished at a later stage through constructability reviews. In addition, the multiple parties involved in DBB create difficulties in effective partnering. Project performance is adversely impacted if interface risks emerge. In all instances the owner is warranting the completeness and accuracy of the design to the contractor, thus directly holding this interface risk, often referred to as Spearin Risk (discussed later).

The use of a design-build (DB) project delivery approach significantly modifies the risk profile of the owner as the DB contractor now largely assumes this interface risk. Under a DB approach, a single integrated entity is contracted to execute both design and construction. This brings forward construction input into the basis of design and design development. The owner holds risks associated with the contract with the DB contractor. These risks may include any shared risks or owner-retained risks that may have been negotiated between the DB contractor and owner.

Advice for each of these roles is provided below. The advice is intended to represent some of the more important elements in design-build. It is acknowledged that similar advice may apply as well under a design-bid-build delivery model.

The content here is not exhaustive. Additional advice is welcomed for an update to this Executive Insight.

Advice to Owners

1. **SBOs —** Know the strategic business objectives (SBOs) that you want to accomplish. Write them down, get agreement on them, and communicate them continuously. This is the number one reason large complex projects fail.
2. **Scope #1 —** Confirm that the planned design-build contract achieves the SBOs completely. If not, identify what must still be done by the owner's organization or through other contracts to meet the SBOs. Ensure that activities in the contract package are not better delivered through a few decoupled contracts.
3. **Scope #2 —** Recognize that performance-based contracts and scopes create a framework for design-build innovation.
4. **Risk —** Assign risk to the party best able to manage the risk. This must also include recognizing the financial capacity of the design/build contractor and risks, such as Spearin risk, which cannot be effectively transferred. (Spearin risk or the Spearin doctrine is a legal principle that holds that when a contractor follows plans and specifications furnished by an owner that produce defective or insufficient results, then the contractor is not liable to the owner for any loss or damage resulting from the defective plans and specifications. Virtually all state courts have adopted this rule.)
5. **Stakeholders engaged —** Ensure that stakeholders who can impact efficient design-build project execution have been positively engaged. These include internal stakeholders such as a board of directors or political leadership. Treat this as a retained risk.
6. **Organizational readiness —** Ensure the owner's organization is ready and the necessary frameworks are in place. Readiness includes supporting elements such as accounts payable.
7. **Understand changed owner's role under design-build —** The owner organization is in an accepting and approving role, not a directing role. Compliance with project scope may be in a different manner than owner team preferences, but focus must be limited to meeting project needs (as defined in the contract) and not incorporating "wants."
8. **Assess owner team performance —** The owner organization must have a clearly defined capability to provide oversight of implementation by the owner program organization. This is typically represented by a PMO (project management office) in large organizations. In any instance, however, the owner must internally have an ability to assess owner team performance to ensure it is enabling the contractors to be engaged in implementation and thus avoid erecting barriers to success (i.e., the tendency to play "gotcha") and duplication of efforts ("Man-marking" is a classic behavior in duplication of efforts; the phrase is borrowed from soccer, where a specific player is assigned to a specific opponent to limit or prevent that opponent's plays).
9. **Realistic schedule —** Managing to an unrealistic schedule drives inefficiencies.
10. **Strong regular (monthly) project reviews —** Look "past the headlines" and focus on delayed prerequisites for progress (permits, right-of-way acquisitions, subcontract awards, in-place

supporting infrastructure); delayed decision-making, including owner organization approvals; productivity levels, trends, and opportunities for improvement; and supply chain issues.

11. **Resolve open items (now) —** Potential items of dispute, change orders, and claims are best dealt with contemporaneously and not saved for a "big bang" at the end of the project.
12. **"Cash is king" —** Pay invoices in a timely manner and put in place a process for payment of items in dispute (do not withhold payment on entire invoices). Agree to a payment format and process prior to the first invoice.
13. **Clear closeout criteria —** Define completion and document turnover requirements in the contract. Challenge contractors to achieve final completion soon after substantial completion or beneficial occupancy.
14. **Incentivize success —** Upside and downside penalties and rewards must be balanced.

Advice to Contractors

1. **Understand the owner's context —** Confirm and document the owner's outcomes and objectives to understand the context of the design-build scope.
2. **Prescriptive scope —** If scope is prescriptive, identify all elements and services. Document all elements required for a "complete" project that are not within the prescriptive scope, and confirm whether they are to be provided by the owner or through another contract. Document interfaces. Also, include in the contract those items to be provided by the owner. Document and include the owner's responsibilities in the contract. Take advantage of inherent flexibility to optimize design for construction.
3. **Design for construction —** Develop an expanded basis of design (BOD^X is discussed later) before bid stage design begins. Continue to search for additional opportunities to facilitate construction through the early stages of the design process.
4. **Safety first —** Establish the primacy of safety culture in the first minutes of the first meeting and build that culture as the project team is being built. Engage the designer to focus on eliminating safety hazards through design. Remember safety incidents are a source of project disruption and also affect site productivity.
5. **Startup team —** Deploy a project startup team on day zero with a 90 day-by-day schedule. Focus on getting the project processes, procedures, and infrastructure set up while the project team focuses on delivery.
6. **Start well —** Ensure the designer-led permitting and right of way activity schedules are granular and tied out to individual construction work packages. Ensure sequencing of related design activities support the construction sequence.
7. **Value time —** Know the value of a day's worth of time and drive actions and decisions with this in mind. Recognize and be prepared for the "agile execution" that large complex projects demand. Lost productivity is seldom recovered.
8. **Manage the contract, not just the project —** Assign a dedicated prime contract manager to ensure all contractually required notices and deliverables are managed in a timely fashion.

9. **Stay in line —** Conduct project alignment meetings early and often (remember the composition of a project team is continually changing). Include alignment meetings around owner activities such as invoicing and approvals; timely reviews; and owner-furnished materials and services.
10. **Engineering matters —** remember that the contractor's success is highly dependent on the engineering subcontractor. Build a strong, positive relationship with the engineering subcontractor.
11. **Notices —** Process all engineer notices related to changed conditions, the client, and the prime contract in a timely manner to avoid "owning" them later due to failure to provide timely notice to the owner. Establish a habit of noticing per the contract immediately after contract initiation. Make it a non-threatening and regular activity.
12. **Documents matter —** Recognize added document turnover responsibilities the design-build contractor will hold under design-build and regularly audit this function and sharpen its focus to facilitate release of retainage.
13. **Finish strong —** Dedicate a close out team to ensure any warranty periods are not unnecessarily extended. Recognize close out is a project within the project. Do not wait until the end to start.
14. **Deliverables —** The deliverables will require the owner's acceptance.
15. **Performance based scope (preferred) —** If scope is performance based, identify the scope of facilities and services envisioned to meet the performance criteria.
16. **Ribbon cuttings —** Annotate the master schedule with potential points that lend themselves to ribbon cuttings/celebrations. These are important to owners, especially public owners.

Advice to Engineering Subcontractors

1. **Dedicated project manager —** On large complex projects, project teams need to be staffed to reflect the large complex undertaking. The project manager (PM) should be assigned full time, not simply "dedicated" to the project team.
2. **Startup team —** Put a startup team in place at day zero for 30 to 90 days, depending on the function. Their role is to start the job up correctly. Think about schedulers, document control, project processes and procedures, IT, office, and other important elements of the project.
3. **Scope to do —** The engineering scope must be detailed and well beyond what was likely in the proposal, then sent to the contractor for confirmation, and finally used as a "guard rail" to control the various disciplines involved in the project.
4. **BOD^X —** BOD^X is an expanded basis of design. This begins at the bid stage. It engages the contractor and reduces contractor-driven changes that often occur later.
5. **Engineers to the field —** Before engineers put pencil to paper or fingers to keyboard, they need to see the reality of what they are dealing with. This does not happen routinely and is a justified recurring complaint by contractors.
6. **Alignment meetings —** An alignment meeting is not simply a "one and done" event. These meetings should include discussions of what the design-build team is trying to deliver, and even better, they should include the client in the alignment. There also needs to be functional alignments with the contractor on invoicing, design reviews, and approvals. Design teams should

be aligned with the various construction area managers. Realignment should happen regularly, especially given the normal staff turnover in both the contractor and engineering organizations.

7. **Granular early schedule —** The first 90 to 180 days of activities should be scheduled in exhausting detail before the contract is signed. A particular sore point is the tie out of engineering packages for permits and approvals to specific construction work activities. Randomly submitting packages for permit approval often results in the most needed permit packages not being prepared first and permitting agencies working submittals without a sense of priority.
8. **Review meetings —** Review meetings should be among the most painful events in an engineering subcontractor's career, but experience has shown these meetings are worth every minute.
9. **Early document control —** Continue a rigorous focus on document control from startup and on through the project life cycle. Early document control is essential for reducing the not uncommon claims and other legal matters found in design-build.
10. **Prime contract administration —** Notices are broken out to highlight their importance. Have designers received a summary of the contract? Do they know what you must do, can do, and cannot do? Do designers know the details of the scope to be delivered and, importantly, what is out of scope? And, at some level, do the designers know how you plan to make money and what are the opportunities to make even more?
11. **Notices —** If the contractor "put it in the contract and we agreed," then do it. Accept that the contractor can initiate a contract change should the contractor so desire. This is a common trap for the engineering subcontractor. Similar advice applies to the contractor.
12. **Develop deputy project managers —** There are never enough good PMs. Designate deputy PMs on all design-build projects and assign them clear responsibilities and authorities. Develop them. Dedicate them to the project—as painful as that may be since they should be among the engineering subcontractor's bright stars and could be needed elsewhere. Stay the course with them to insure they grow.
13. **Three PMs —** Projects have a beginning, middle, and end phase. The same PM may not be the best through all phases. This is also an area in which to develop deputy PMs.

About the Author

Bob Prieto was elected to the National Academy of Construction in 2011. He is a senior executive who is effective in shaping and executing business strategy and a recognized leader within the infrastructure, engineering, and construction industries.