

The Rise of In-House Design

By Ryan Howsam

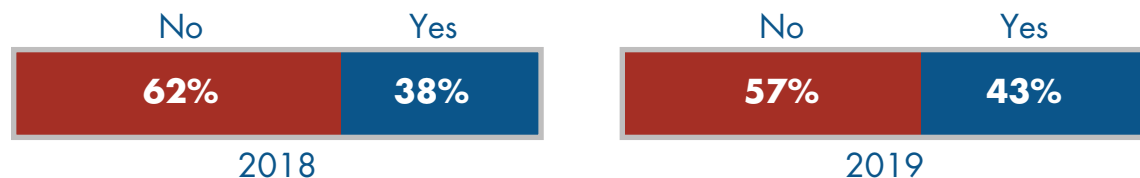
The pros and cons of bringing the project design function in-house.

Look around the engineering and construction (E&C) industry right now, and you're likely to notice an increase in the number of companies that are enhancing their in-house project design capabilities. So rather than outsourcing this function fully to a third party, these firms are taking on more of the responsibility of designing and building the projects that they get involved with.

The proof is in the numbers. This year more than 43% of contractors say they're going to do more in-house design compared to just 38% in 2018, according to the most recent AGC/FMI Risk Study (Exhibit 1).¹ This is a 5% increase in the number of organizations that grew their in-house design capabilities over the prior 12 months, with an additional 25% of organizations thinking about increasing their design capabilities in the near future (but not yet actually doing it).

Exhibit 1. In-House Design Is on the Rise

Is your organization considering an increase in its in-house design capabilities?



Source: 2019 AGC/FMI Risk Management Survey

¹ The 2019 AGC/FMI Risk Study published in March 2019.

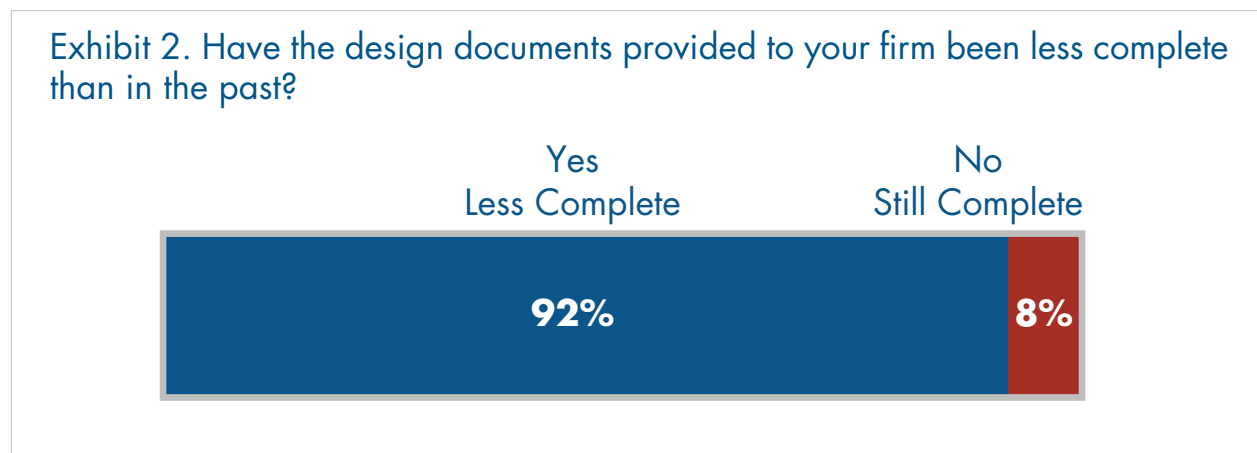
As we ponder this interesting trend, we must ask ourselves questions like:

- What is driving this trend of increasing in-house design capabilities?
- What implications does this trend present for contracting firms, designers and owners? How does this change project stakeholders' risk profiles?
- What are the various approaches for bringing design in-house?
- What are the associated benefits and risks?
- Will the trend last long-term?

To accurately answer these questions, we should first define in-house design and work to understand the broad spectrum of capabilities that are associated with design-build contractors. Here are some key definitions to keep in mind:

- In-house design capabilities come in many forms that range from the typical design elements done by contractors (e.g., formwork, falsework, means and methods) to those normally handled by a designer (e.g., pen to paper design of permanent structures).
- At one end of the design spectrum are the contractors that have in-house architects and engineers on staff. These professionals assist with design coordination with the third-party/external designers who are hired by the owner.
- At the other end of the spectrum is the contractor that retains a full-time, dedicated team of designers and expertise to fully design the permanent structure.

With this in mind, many of today's contractors are trying to figure out whether they want to move past the lower end of the design spectrum and handle actual design coordination and design permanent structures (or not). This consideration is based on the perceived risk of incomplete design today: According to the [2018 AGC/FMI Risk Study](#), 92% of participants reported receiving less complete design documents than in the past (Exhibit 2).



Source: 2018 AGC/FMI Risk Management Survey

The issue of incomplete design is not just a large contractor problem. It also affects all other project stakeholders—small and midsize firms as well as bigger public-private stakeholder groups. It's a universal issue with the design-build model, where loss and claims can be equal to \$10 million on a \$50 million project (yet owners are still trying to pass on these risks to the general contractor). No contractors or designers want to take on unlimited liability for their current fees, so they're trying to get more control over project design in order to reduce risk for all project stakeholders.



The Pros of Bringing Design In-House

There are numerous reasons for bringing design in-house. Here are seven of them:

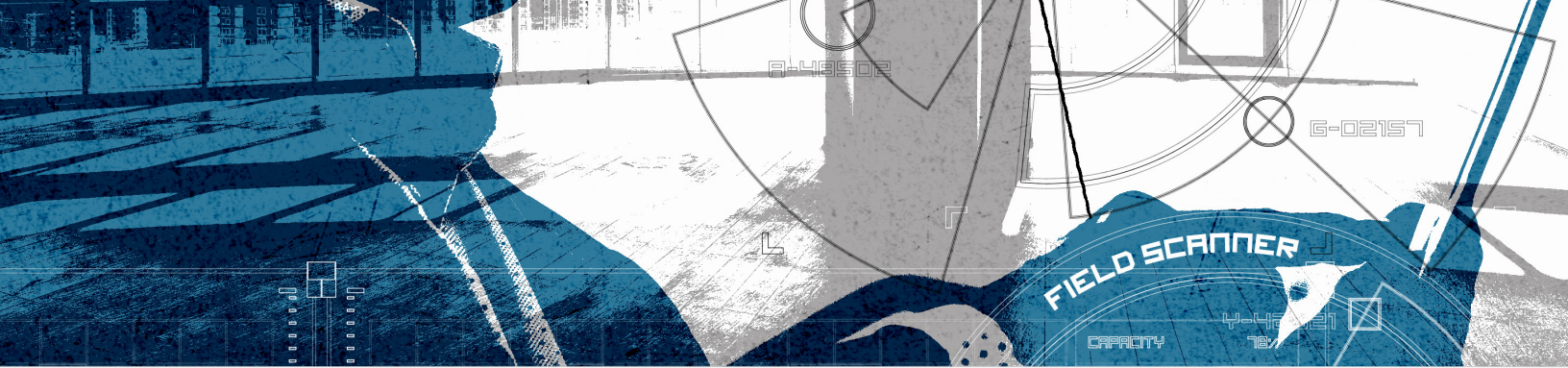
1. Today's contractors witness a considerable increase in less complete designs within the design-build model where bids are routinely made against designs often at only 30% complete versus in the past under the design-bid-build delivery model where designs were at 100% complete when put out to bid.
2. Overall, builders and designers are taking on more design risk for the same fees (yet many contractors are leery of design).
3. Many contractors think the design-build model is broken because it doesn't adequately address the risk that design-build contractors are forced to take on.
4. When the design is less than 50% complete, contractors can't provide cost certainty and must make assumptions on pricing and developing the appropriate contingencies for the project.
5. Contractors want to improve design coordination to ensure a design will ultimately be constructible since the owner will ultimately hold the builder responsible for completing the project on time and on budget.
6. To prevent potential delays, contractors want better control over the design schedule.
7. The design-build process often will only support the costs of a partially complete design pre-bid. Thus the designers complete the design only to the point of what they are compensated for versus to 100% complete as was typical of the design-bid-build model. Faced with this budget reality, designers will look to limit their liability in some reasonable way to the limitations of an incomplete design, leaving the contractor to manage and mitigate the risks associated with the design gap.

While these are the more prominent upsides of bringing design in-house, it's important to note that many contractors are leery of design liability and would rather count on the expertise of architects and engineering firms to address design needs—instead of enhancing their in-house design capabilities. After all, in an industry where outsourcing design has been the norm for decades, making the major shift to a more vertically integrated business model comes with new risks and challenges.

Five Key Challenges

Like any business shift, bringing design in-house also comes with its fair share of challenges that E&C firms must work through to successfully merge their various capabilities. Here are some of the key issues that companies may face:

- 1. Culture and behaviors.** Being aware of the organizational friction points of having a designer in-house and adequately supporting him/her with financial resources, technology tools and continuing to build his/her expertise are paramount. With cultural differences comes the potential for poor communication and coordination. When design is brought in-house, the need for good communication and coordination among contractors and their key partners becomes that much more critical.
- 2. Lack of a partnership mentality.** Contractors need to treat designers as partners in the process rather than viewing them in the typical general to subcontracted relationship. Both parties should work to create strong alliances with their internal and external business partners if they want to play larger roles on their projects.
- 3. Not understanding how design teams work.** In-house design can range from the typical design elements completed by contractors (e.g., formwork, falsework, means and methods) to those normally done by a designer (e.g., pen to paper design of permanent structures)—with construction engineering and engineering services for design and construction falling somewhere between those two extremes. Construction firms will need to decide where they want to fall on this spectrum, based on their comfort level with design liability.
- 4. Insufficient clarity about how deep into design you want to go.** Do you simply want to have some level of in-house design understanding and capability to coordinate design better in the design-build model, or do you want to go further into the design of permanent structures? Knowing the answers to these questions is important as they relate to your long-term strategy and your understanding of the insurable risks and corresponding risk tolerance level to engage in design activities.
- 5. Being unaware of the increased liability.** If your firm is involved in a design-build project, then you'll have design liability whether or not you've subcontracted the design. A few key considerations will include:
 - Owning cost/quantity growth.
 - Acting as the engineer of record.
 - Understanding whether insurance programs are adequate (i.e., Contractor's Protective Professional Indemnity and Liability Insurance—will it respond as primary for the contractors' own design liabilities rather than excess of all other collectible insurances).
 - Having design liability that's adequate coverage for a contractor.
 - Licensing requirement for contractors: At what point do you go over the line in design to the point where licensure is required?
 - Understanding operational risk and design risk: What insurance programs can you rely on?



- Finding new solutions: Owner specifications prevent flexibility and the ability to buy insurance in the most efficient way, given market realities of Insured vs. Insured and Equity Interest Exclusions in commercially available professional liability policies. This could result in the need to procure additional layers of insurance with redundant costs to adequately address the design liability exposures for various parties in the design-build team.

There are also inherent conflicts between owner specifications and available insurances to consider. In fact, this is a primary challenge that all E&C firms must work through when taking on the design responsibility. In the old design-bid-build world, for example, the designer bought its professional liability insurance and was first-named insured. If a claim occurred, whether during or after construction, there was no issue with coverage regardless of whether the claim came from the owner for the contractor since neither was a Named Insured or Additional Named Insured under the designer's policy.

In the design-build model, on the other hand, the most likely lawsuit is not coming from the owner, but from the contractor during construction. The challenge is that when an owner's specifications state that the design-build contractor, designer and all subcontractors must be Named/Additional Named Insured covered under the same policy, the designer winds up at a disadvantage. This is due to the fact the entity has the design liability exposure but not any coverage from the policy that is being bought (due to the insured versus insured exclusion). This can result in the need for the design team to buy additional insurances that would actually respond to claims during construction.

The good news is that integrated joint ventures can circumvent this challenge by using a project-specific professional liability approach, provided all parties' corporate programs will respond in excess of the project-specific professional owners' liability requirements.

Getting Into the Design Business

As more E&C companies integrate at least some form of design capability into their business models, more of them will be creating joint ventures with existing designers. In such relationships, it pays to create expectations and formal processes for communicating design expectations to the owner and the architect right at the outset of the project. Early and effective coordination of design, constructibility reviews and costs are critical to maximizing the benefit of this approach.

Other companies are placing project team members at the designer's location for a period of time (i.e., to assist in meeting details and increasing communication of all aspects of the project design) or employing in-house designers to help coordinate design. This creates an additional "set of internal eyes" that can help manage the external design risk.

Having building information technology (BIM)/virtual design and construction (VDC) capabilities is a key element to successfully managing the design risks of a project. This expertise allows increased coordination of the BIM model with subcontractors around the design and can be an important communication tool with owners.

As prefabrication becomes an important part of the design-build model, the BIM model can help the contractor manage the prefabrication process far more effectively. In fact, many contractors believe having BIM/VDC capabilities (with BIM being the “sole source of truth” in design) far outweighs the benefits of having an in-house design team. And when considering the future technological and innovation advances in our industries, having BIM/VDS capabilities to leverage these advances is one approach to warding off potential disruption from other entrants into the E&C industry.

Another way E&C firms can get into the design business is by acquiring firms that already have their own in-house design capabilities. In these scenarios, the contractor must ask itself: Do we have the expertise to manage effectively and help grow that new discipline in our business by providing the right focus and capital to do so? If the answers to those questions are yes, then this may be a viable model for bringing design in-house.

What’s Ahead for Design?

In today’s world, many qualified contractors have engineering capabilities that rival most mechanical firms. For example, designers live in the design-risk world, so their internal processes, procedures, contract management practices, quality assurance and quality controls are all centered around managing design risk. They are also comfortable taking on the design risk. Contractors are generally not focused on design and may not have internal processes and procedures nor the expertise to support design activities.

As design-build continues to grow, integration of design with construction will also gain momentum. What form that takes is yet to be determined. It may happen within one single firm or by integrating DBJVs of E&C firms with different skill sets—but more likely a mix of the two. We think an integrated approach offers quite a few advantages in a world where engineers are striving to better understand the construction process as a whole and where design integration is well underway on many different projects.

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Ryan Howsam, CRIS®, **LEED AP BD+C®** is a principal with FMI. Ryan works across many disciplines with specializations in risk management services and strategic planning. He can be reached via email at rhowsam@fminet.com.



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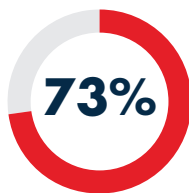
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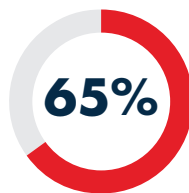
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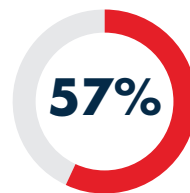
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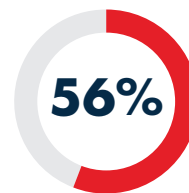
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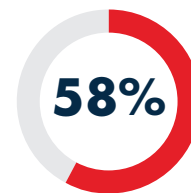
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