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PRE-CONSTRUCTION PLANNING:

Making Maintenance Concerns Count

BY RICHARD STUKEY

As a collaborative design-build approach to construction gains popularity, building owners are taking into consideration the concerns of building maintenance and operations professionals early in the design process — with positive results for all concerned

When construction projects are completed at universities, museums, corporate headquarters and other organizations, you will frequently hear the same laments: no one took into account the needs, concerns or advice of operations and maintenance (O&M) professionals.

But listen more closely and there may have been an even larger problem with the construction process in those instances: it wasn't just the O&M team that wasn't consulted. Other building stakeholders were ignored as well, including tenants, employees and contractors. In cases like these, owners may only have worked with the architects, engineers and building planners during the pre-construction phase. Other stakeholders, if included at all, were

(L to R): J. F. Ahern Co. Manager of Pre-Construction Services Roy Nation, Administrative Assistant Cindy Neuendorf, and Manager of Pre-Construction Services John Ransom. All photos courtesy of J.F. Ahern Co.





Added Benefits of Design-Build

In addition to helping construction projects stay on time and within budget, the Design-Build Institute of America reports that there are many additional benefits to the a collaborative design-build model:*

■ BETTER QUALITY

Design-builders meet performance needs, not minimum design requirements, often developing innovations to deliver a better project than initially imagined

■ SINGULAR RESPONSIBILITY

One entity is held accountable for cost, schedule and performance

■ DECREASED ADMINISTRATIVE BURDEN

Owners can focus on the project rather than managing disparate contracts

■ REDUCED RISK

The design-build team assumes additional risk

■ REDUCED LITIGATION CLAIMS

By closing warranty gaps owners virtually eliminate litigation claims.

*Source: Design-Build Institute of America website (www.dbia.org)

likely to have been consulted only during or after construction when changes were difficult and much more expensive to make. In the past, this kind of oversight has caused myriad problems — costing individual building owners thousands, if not millions, of dollars in repairs that could have been avoided if caught before the start of construction.

Today, the collaborative design-build process is helping these stakeholders express their insights into how the building design can be improved. Stakeholders, including the O&M team, are being consulted even before construction begins. So if the architectural plans call for lights to be installed high up in a vaulted ceiling for dramatic effect, the O&M team may be more likely than the architect to notice, and that they will get to voice their concerns. For example, the O&M team may note that they will have to rent a lift every time a light bulb needs to be changed, taking up their time and diverting resources from other maintenance projects.

The architect may still insist that the lights need to be placed high up in the ceiling instead of in a more accessible location — but the owner will get to decide if the dramatic effect the architect wants to achieve is worth the much higher cost each time light bulbs have to be changed.

In many areas of the country, the design-build process has been popular for decades. Financially-savvy building owners have long recognized that the true cost of a project — whether it is a new building or an expansion of

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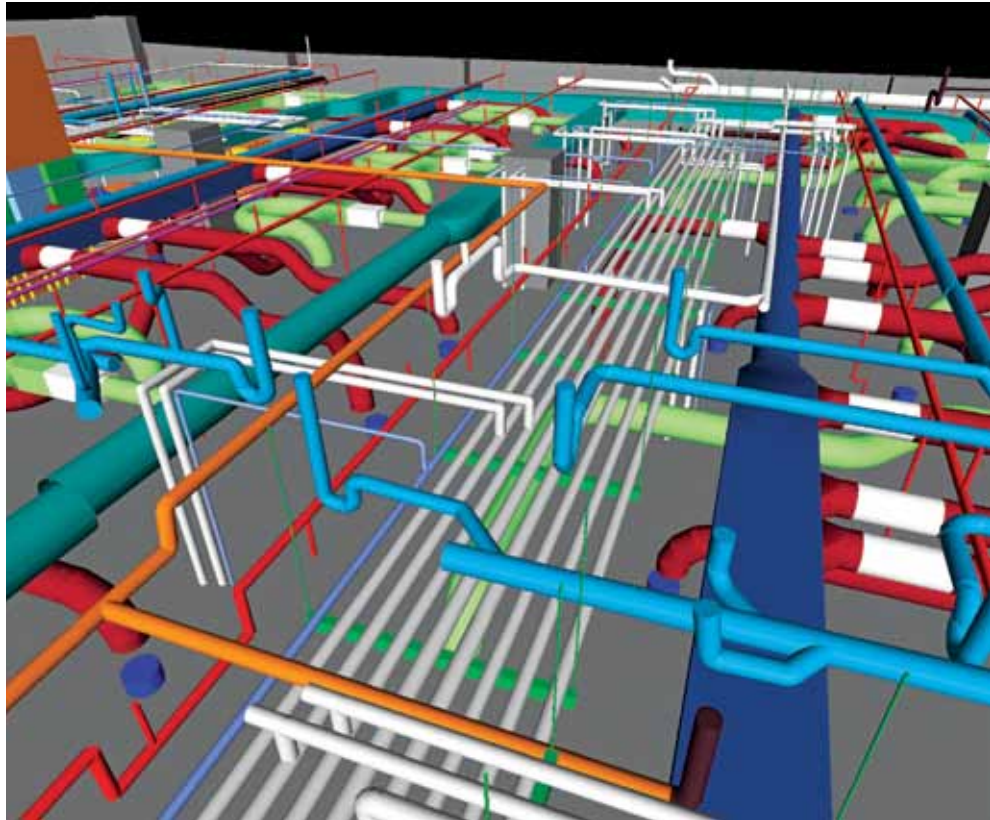
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BIM technology provides an accurate and detailed look at how various systems/components will align. As a pre-construction measure, this allows for system interferences/ clash detection to be identified and corrected prior to install to avoid delays and added project expenses. *Image courtesy of J.F. Ahern, Co.*

an existing structure — is just one aspect of the total cost. They also need to know the cost of operating the building over a period of 15, 20, or even 30 years. And as more building owners recognize the lifecycle cost of a building, they have been favoring collaborative construction methods that take into account the needs of building tenants and employees, and the long-term cost of operating the building.

“Back when I started in the construction business, there was a fairly limited amount of communication between the owners, operators and users of the building,” said Phil Corbin, a 28-year veteran of the construction industry who is also a manager of pre-construction services at J. F. Ahern Co., a privately-held mechanical/fire protection contracting



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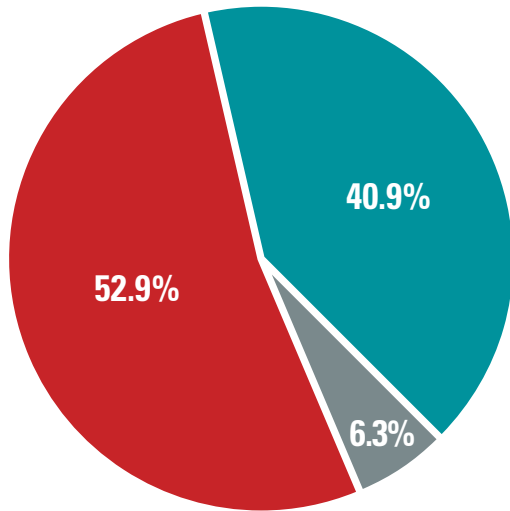


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Project Delivery Market Share for Non-Residential Construction Bids for 2010



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Analysis by RSMMeans Business Solutions a div of Reed Construction Data

services and design-build company headquartered in Fond du Lac, Wisconsin.

“But every year, more owners are turning to design-build and design-assessment models, where stakeholders are consulted early in the process instead of waiting until mistakes are made and have to be corrected,” said Corbin.

Many architects and engineers, too, are proponents of a collaborative design-build process, recognizing that potential difficulties and flaws in the building are best corrected early in the process — before construction begins. Using the design-build process, building owners work with architects and engineers to design buildings that are operations and tenant friendly. More importantly, consulting the O&M team and other stakeholders helps to eliminate change orders that can cause huge, unexpected run-ups in the cost of a project.

Beware the Lowest Bid

Before the emergence of the design-build model as one of the preferred methods for construction projects, the process used almost universally for construction projects seemed simple enough: the owner obtained a set of drawings from an architect or engineer and then put those drawing out to bid. The lowest initial bid was nearly always the winning bid, barring unforeseen circumstances.

But that is where the simplicity of that process usually ended. Without early input from building stakeholders, including the

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J. F. Ahern Co. senior CAD designer Pete Hafemann analyzes multiple system layouts using a BIM application.

O&M team, expensive change orders were the norm as owners learned of the need for changes near the end of the construction phase. By that point, correcting any flaws was more difficult and costly than if stakeholders had been consulted and been able to point out those flaws before construction began.

“The most important thing a building owner can do when starting a construction project is to get the entire pre-construction team involved as early in the process as possible,” said Roy Nation, manager of pre-construction services at J. F. Ahern Co. “The sooner the pre-construction planning team is consulted, the easier it is to steer the project in the direction the owner wants, helping to achieve what they want in the most efficient and cost-effective way possible,” added Nation, who has more than 23 years of experience in both building construction and operations.



“Every year, more and more owners are turning to design-build and design-assessment models, where stakeholders are consulted early in the process instead of waiting until mistakes are made and have to be corrected.”

The BIM Walk-Through

One reason why the “putting the project out to bid” method may have been so popular in the past was that rolls of drawings from the architect or engineer were sometimes difficult to envision for those stakeholders who were not accustomed to reading architectural plans on a daily basis. Reviewing the plans involved lengthy in-person meetings with the architects and engineers.

Technology is changing all that, making a collaborative building process the norm. Firms like J.F. Ahern Co., whose design-build team includes 13 engineers with decades of experience in building construction and operations, now provide futuristic 3D “walk-throughs” over phone or computer conference systems, such as GoToMeeting or Webex, eliminating travel time for clients.

More importantly, instead of pulling out large, unwieldy sets of plans, high-tech Building Information Modeling (BIM) software gives stakeholders “virtual walk-through” using 3D

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technology. This type of walk-through provides stakeholders an accurate vision of everything — from where light fixtures and electric switches are located to where pipes will be located behind bathroom walls.

And these BIM plans aren't just for the construction phase — they can also be used by the O&M staff after the building is completed, helping to fix problems more efficiently and cost-effectively. Any changes to the plans, or modifications to the site after construction is over, can be incorporated into the BIM virtual model for future reference.

“By aligning the latest technology and the most qualified industry professionals with the needs of our clients, Ahern’s design-build team is able to bring increased accuracy, lower costs, improved quality and fewer changes to the construction process,” said Nation. “We take out the guesswork — and so we’re able to provide our clients with reliable, on-time delivery of the project.”



“The most important thing a building owner can do when starting a construction project is to get the entire pre-construction team involved as early in the process as possible.”

According to the Design-Build Institute of America, “design-build is a method of project delivery in which one entity—the design-build team— works under a single contract with the project owner to provide design and construction services.”

The design-build process results in what Nation calls “a solid budget that reduces or eliminates the ‘change orders’ that were once such a big part of the construction process.”

He emphasized the importance of learning the needs of the O&M team before construction begins. “The needs and concerns of the O&M team should be taken into account right from the beginning — instead of as an afterthought — if build-

ing owners want to operate their new buildings or expansions more efficiently and cost-effectively,” he said.

Corbin believes that the collaborative design-build process keeps maintenance staff more positive and productive. “Operations people love the collaborative method we employ,” he said. “In the past, their opinion was not asked, and maintenance personnel were excluded from the process. In the traditional construction process, the first time someone from the maintenance team was likely to see the building was when construction was completed,” he added. “The design-build process takes into account the longer term operations and cost effects—not just the ‘works right’ effects.” In other words, building systems won’t just “work right”—they’ll work *right* for all stakeholders.

Early Involvement Assists In LEED Certification

Any building owner who may be interested in obtaining LEED certification from the United States Green Building Council should consider the design-build process, according to Nation. “Early involvement of the stakeholders can help owners get all the LEED points they possibly can,” Nation said. “For example, they may want to speak with tenants about when, where and how they will be occupying the building can help us to set up systems for CO₂ energy and utilities monitoring,” he continued. “Using a collaborative design-build model allows that information to be factored into all aspects of building operations before construction starts — instead of as an afterthought, when it may be too late to do anything about it.”

Adopting the Design-Build Method

Given all the benefits of the design-build model — both in terms of a more efficient construction process and lower operations costs — why has it taken so long for building owners and governments to change from simply sending drawings out to bid?

“Change has been taking place at different times in different markets,” Corbin said. “In St. Louis, where I started in the construction business, we saw the change [to design-build] early on,” he continued. “The West Coast was also quick to adopt it. But the Northeast was a little slower to adopt design-build, partly because many architects were slow to want to give up control.”

Although the federal government has adopted design-build on many of its projects, some state governments and municipalities have been slower to change the process. Why the reluctance? “Laws had to be changed to alter the process,” Corbin responded. “It will continue to be a gradual change as states and federal agencies see that the process represents the best value for the taxpayer.”

Not to mention a stronger voice for the operations professionals who will be maintaining the building long after the construction phase has ended. ■■

Richard Stukey is senior editor of the *Facilities Engineering Journal* and business development director for the Association for Facilities Engineering.