

Design-Build Delivers

By Mark Ward, Sr.

In 1985, only five percent of all projects were built using design-build. Now, it is on the verge of overtaking what has been the predominant method of project delivery — design-bid-build. Here's why.

Faster and cheaper. According to the Construction Industry Institute, those are the benefits of the design-build method of project delivery. Research conducted by the institute suggests that construction schedules are completed 10 percent faster, and costs are five to 10 percent lower, than for similar projects performed under the conventional design-bid-build method.

"The difference with design-build," explains Martin Sell, AIA, chief operating officer of Horizon Design Build Manage, Madison, WI, "is that you have a single source of responsibility." Rather than contracting separately for design and construction, design-build permits both functions to be performed by a single entity. As a result, adds Frederic Mulligan, president of Cutler Associates, Inc., Worcester, MA, "that means you can get reliable information — about costs, schedules and constructability — earlier in the process."

Proponents say these and other advantages account for the decisive growth of design-build over the past two decades. By the next year, design-build may even emerge as the nation's predominant method of construction project delivery. In 2005, reports the Design-Build Institute of America (DBIA), the method will catch up with "traditional" design-bid-build as each approach commands an equal 45 percent share of the market.

By 2010, continues DBIA, the estimated split will be 50 – 40 in favor of design-build. The trend is even more pronounced if compared to 1985, when design-build accounted for only five percent of the domestic construction market, versus 12 percent for the "construction management" (at risk) method and 82 percent for design-bid-build.

PUBLIC ACCEPTANCE

Yet another argument for the growing recognition of design-build is found in publicly funded construction. Procurement laws have often required competitive bidding to safeguard taxpayer money, yet many federal and state agencies are now allowing projects to be delivered through design-build.

For example, the Army Corps of Engineers is reported to use design-build for about 45 percent of its military construction budget and the Naval Facilities Engineering Command, 66 percent. In addition, the recent Transportation Equity Act authorizes the use of design-build on transportation projects, \$50 million or more, and on intelligent highway system projects of \$5 million or more.

A report from Carter & Burgess, Inc., a leading national provider of design-build services, found that as of 2002, a total of "46 states permit

design-build in the public sector in some form, and the majority of those states have some sort of legislation authorizing the use of design-build. This is either as part of certain pilot programs, or by specific projects or agencies." Nearly 30 of these states, the report adds, possess "some form of broad design-build legislation" that may generally allow the method to be used in certain market segments — such as highways, water treatment or education — or perhaps for buildings, but not for public works projects.

In trendsetting California, for example, Carter & Burgess is providing design-build services for a \$438 million extension of the Pasadena Metro Blue Line. The 13.9-mile project, part of Southern California's light rail transit system, was planned by the Los Angeles County Metropolitan Transportation Authority. Likewise, the company has a \$525 million design-build contract for a Bay Area Rapid Transit (BART) extension to San Francisco International Airport.

Yet design-build is not confined to mammoth, high-cost projects. The Design-Build Institute of America maintains an online database of design-build projects completed over the past decade; of the 260 commercial/institutional building projects listed, contracts of less than \$1 million account for 10 percent of the total, followed by \$1 million to \$10 million (36 percent), \$10 million to \$25 million (20 percent) and \$25 million to \$100 million (25 percent). Only five percent of projects in the database were valued above \$100 million.

Cutler Associates, Inc. was responsible for designing and constructing the Bancroft Lower and Middle School in Worcester, MA. The project won an award for Outstanding Educational Design by *American School & University* magazine.



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WINNING STRUCTURES

In both the public and private sector, more and more projects are being managed under the design-build method of project delivery. Here are two award-winning design-build structures—one private, one public—that received kudos from the Design-Build Institute of America (www.dbia.org) during 2003:



National Academy of Sciences, Washington, DC
Design-Build Excellence Award for Private Sector Building over \$15 million
Design-Build Entity: Centex /KCF-SHG LLC
Owner: National Research Council
Designer-Builder: Centex/KCF-SHG LLC



Capitol Area East End Complex, Block 225, Sacramento, CA
Design-Build Excellence Award for Public Sector Building over \$15 million
Design-Build Entity: Hensel Phelps Construction Co.
Owner: State of California, Department of General Services
Designer-Builder: Hensel Phelps Construction Co.

DEGREES OF SEPARATION

Ironically, points out Martin Sell, “design-build is actually the ‘traditional’ method of project delivery. It goes back at least to the master builders who both designed and built the great cathedrals of Europe.” Until the late 19th century, he continues, design-build remained unchallenged as the standard approach.

With the 1857 founding of the American Institute of Architects to promote the “general advancement of the Art,” however, the profession began a decisive turn toward the practice of design. As official AIA history notes, “Until this point, anyone who wished to call him- or herself an architect could do so. This included masons, carpenters, bricklayers and other members of the building trades. No schools of architecture or architectural licensing laws existed to shape the calling. The first steps of this small group [of AIA founders] were to change the profession of architecture in the United States profoundly.”

Then, as Sell points out, in 1918, the Associated General Contractors (AGC) of America was founded as the nation’s first construction trade association. “The founding of AIA and AGC had the effect of separating the two functions of designing and building,” he believes, “and so in the United States we started getting away from the design-build approach. It’s actually an anomaly, because when you think about it, most other industries — from automobiles to aircraft to computers — do the design and production through a single entity.”

As a result, Sell suggests, an industry culture has developed in which “architects are risk-averse and don’t want to be responsible for budgets and schedules. So they have been willing to push this off to the contractors, while they just do the design.” On the other hand, he believes, “A lot of general contractors have been happy with the current system, with separating design and construction, because they can make very good money by finding design problems and then doing change orders.”

Yet times are changing. As recently as 1978, when Sell graduated from college, he recalls that AIA prohibited its members from doing design-build. “That changed a year or two later,” he says, “and since the 1980s, design-build has started to catch on. The contractors have done the most to lead the charge, because they began seeing the benefits of design-build. They could go from the hit-and-miss of bidding jobs, to getting negotiated contracts.”

Architects have been less receptive, continues Sell, and his view is borne out by research from the Design-Build Institute of America. In a survey of design-build projects, DBIA found that 55 percent were contractor-led, and only 12 percent were designer-led; 26 percent were led by integrated design-build firms and eight percent through joint designer/contractor ventures.

“This is a time of change for the architectural profession,” Sell advises, “and designers must change, or risk becoming just another subcontractor who happens to do design work.” According to Sell, only a handful of architectural schools, perhaps a dozen, currently teach design-build. But fortunately, he says, AIA offers resources such as seminars and workshops. “If you’re an architect and want to go into design-build,” he suggests, “the best ways are either to partner with a contractor or to hire people with construction experience.”

VALUE-ADDED BENEFITS

Cutler Associates’ Frederic Mulligan, who is immediate past president of the DBIA New England Chapter, believes that building owners — more so than contractors or architects — are the main driving force behind the popularity of design-build. “Owners are saying that they’re not getting enough value from the ‘traditional’ delivery method,” he states.

Value depends, Mulligan continues, on the needs of each owner. “The real purpose of every construction project,” he explains, “is to create value above cost. If you’re building a college dorm, you have a drop-dead completion date. If you’re building an industrial facility, you may need to know what

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The Pros and Cons of Design-Build

In design-build, a single entity known as the design-builder is contractually responsible for the project's design and construction. Under design-bid-build, the project's design and construction are contracted separately. Like anything else, there are both benefits and drawbacks to each process.

Design-Build Advantages:

- Uses a team concept that focuses on common goals and objectives;
- The input of the actual builder is available during the design phase to help determine most cost-effective design;
- Takes advantage of the contractor's ingenuity and innovation in working with architectural/engineering firms to reduce price and schedule, which, in the best-case scenario, will be reflected in the owner's final total cost for the project;
- Saves time, because it is on a faster track than design-bid-build, with a faster schedule delivery;
- A single point of responsibility and fewer contracts between the owner and others;
- Reduces owner's administrative costs due to combining the solicitation process for design and construction.

Design-Build Disadvantages:

- Requires decisions to be made earlier in process or owner loses control of quality and details;
- Team concepts, such as commitment, communication and trust must be implemented early in the process;
- More expensive for contractor team to bid and not receive contract for this particular type of project;
- Difficult for owner to evaluate nonprice factors;
- Changes are more expensive due to fast-tracking, and cost of items that are affected by changes are not competitively bid;
- More difficult to question decisions of engineer or architect of record;
- Possibility of perceived favoritism in procurement decisions;
- Small contractors concerned that design-build projects will be fashioned on a larger scale, precluding their participation;
- More difficulty in protecting design concepts.

Design-Bid-Build Advantages:

- Design is more precise and detailed at outset;
- The engineer/architect of record works for the owner and represents the owner, not the builder;
- Greater ability to determine the acceptability of the final end product — not just the acceptability of the design, but also of the final product produced by the design;
- More design and construction company competition.

Design-Bid-Build Disadvantages:

- More likely to be a higher overall cost and require a longer schedule;
- Coordination of responsibility between multiple design, construction, systems and procurement contracts is costly to owner in terms of staffing, possible delays and possible change orders;
- Increased probability of disputes;
- Increased owner involvement costs.

Source: Carter & Burges, Inc.



Bancroft School, Worcester, MA, Design-Build project created a new lower and middle school and the complete renovation of the science facility.

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your plant will cost because you can only sell your products for so much money. Or if you're building an office park, the earlier you can begin selling units, then the better off you'll be. So there can be a lot of value in things like accelerating your construction schedule, and having more information and more flexibility earlier in the project."

Design-build also offers the prospect of fewer claims, Mulligan points out, since design and construction are both performed by a single entity. "That's good for the building owner," he notes. "By comparison, under the traditional design-bid-build arrangement, the architect is legally regarded as the owner's agent. So any flaws in the design are ultimately the owner's responsibility." But with design-build, adds Martin Sell, "the design-builder is liable."

Building owners can locate firms that offer design-build services, Sell suggests, by checking the membership of DBIA. He says, "Most design-build firms aren't shy about advertising. So the real trick is finding out what companies are *really* design-builders and which ones only do it as a sideline. Look at each company's history and see how many design-builds they've done."

Both Sell and Mulligan, and many other construction industry observers, believe that design-build will continue in the future to grow in popularity. "In fact, the next step beyond design-build," says Mulligan, "could be design-build-own-manage. I can see where design-build firms could be in a good position to also finance their own construction projects, then own the facility and either operate it or lease it back to the tenants. When it comes to design-build, we may only be seeing the beginning." ■

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Cutler Associates, Inc.

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