

By David Kalina

How to Select a Project Delivery Method for School Facilities



THE FOURTH IN OUR SERIES ON IMPROVING ENVIRONMENTS FOR LEARNING EXPLAINS THE PROJECT DELIVERY METHODS AVAILABLE AND HOW TO SELECT THE RIGHT ONE FOR YOUR NEEDS.

HOW CAN OUR FACILITIES IMPROVE students' learning environment? What is a facilities master plan? How do I select a professional planning or design firm?

The first three articles in this series offered insight and guidance on these key topics. This month, we focus on a vital decision that relates to all facilities construction projects—project delivery.

The Early Days

In the beginning, there were master builders. Prior to the industrial revolution, in the late 18th and early 19th centuries, master builders designed and guided the construction of facilities. With the onset of the industrial revolution, science and mathematics were applied in many fields, including construction. The role of the master builder was replaced by architects and engineers, who applied the principles of math and science to design structures, and the craftsmen who built them.

This form of project delivery, called design-bid-build, was reinforced with passage of the Brooks Act almost 50 years ago. The Brooks Act requires a qualifications-based selection of design professionals for federal work. Design-bid-build is still the predominant method of project delivery for public works and school construction in the United States.

Design-Bid-Build

In design-bid-build, the owner hires a design professional to prepare a complete set of construction documents—plans, specifications and bidding requirements. When the documents are complete, the project typically is advertised publicly, bids are received, and the contract is awarded to the lowest, responsible

bidder. In some states, the law requires that separate prime contracts be bid—typically for a general contract, a mechanical contract (heating, ventilating and air conditioning), a plumbing contract and an electrical contract. The design-bid-build form of delivery is legal in all states.

Into the 1970s, building design had become progressively more complex. Codes and regulations continued to expand. The foreign oil embargo threw the U.S. economy into a crisis. Driven by rising oil prices, inflation was running at double-digit rates nationally. Since so many building products and processes were based on derivatives of oil, building material costs were skyrocketing, and availability was uncertain. Environmental issues moved to the forefront with lead-based paints and asbestos—staples in the construction industry—identified as potential sources of liability. Project budgets and timelines were constantly in jeopardy.

In 1981, a walkway collapse in a Kansas City hotel focused the industry on professional liability issues. In a response to a flood of legal battles, the insurance industry advised the design community not to promise anyone anything. Design professionals could no longer use words like “guarantee,” “inspection,” or “warranty.” Use of these words in contracts would jeopardize the ability of a design professional to obtain liability insurance. Owners, who for the past 200 years had relied on architects and engineers, were left out in the cold as design professions retreated from the liability-strewn landscape.

The Construction Manager

Contractors stepped into the void with the rise of a new delivery method—the construction manager (CM). Contractors dealt with

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guarantees and warranties all the time. They had no problem making the promises that the design profession was unable to make.

The CM form of delivery developed in two variations—CM at risk and CM adviser (or agency). In the CM at risk form, generally, the owner hires a design professional and a CM to develop the design to certain level—often about 30 percent. At that time, the CM is required to submit a guaranteed maximum price (GMP). That price includes fixed costs and an agreed upon contingency. In this form, the CM bids and holds contracts for the construction and manages the schedule and subcontractors. There also may be a negotiation that provides incentive to the CM so that savings below the GMP are shared between the CM and the owner. Several states prohibit CM at risk as an allowable delivery process for public projects.

The second variation is CM adviser. In this form of delivery, the owner hires a design professional and a CM who works for a consulting fee in a role similar to the design professional. The CM works with the owner and the designer throughout the design, making suggestions that reduce either cost or time. The CM develops the schedule and the estimate with input from the design professional. The design professional prepares the plans and detailed specifications, and the CM develops the

bidding documents.

The CM may bid many separate contracts, just as if he were acting as a general contractor. He may bid concrete, structural steel, masonry, windows, site work, etc., as separate contracts to get the most favorable pricing. Then the CM manages the schedule. In this form of delivery, although the CM prepares the bid packages, the bids are public, and the owner holds the contracts. The CM adviser form of delivery is legal in all states and avoids any conflicts with public bidding laws that states may have, since the CM is acting as an owner's consultant.

Design-Build

The most recent development has been the rise of the design-build (DB) delivery method. In this form, the owner will develop a preliminary design ranging from 15 to 30 percent with a detailed method of evaluation defined. This preliminary design is usually developed with the assistance of a design professional. At the conclusion of the preliminary design, the owner will publicly or privately (depending on the legal constraints) solicit DB proposals to complete the design and construction, all from one contractual entity for a firm

price and fixed timeframe. Contractors predominately lead DB teams, most often hiring architecture and engineering firms to develop the design.

The DB model has realized strong growth in both the private and public sectors since the 1980s. DB is prohibited in several states but is making significant headway as a delivery option. In 2005, five states added DB as a delivery option for education facilities (other states previously allowed its use). There are five states that prohibit the use of DB for any public projects and several others that limit the types of projects allowed.

Which Method is Best for You?

According to an old saying in the building business, there are three variables in any building project: price, quality and speed. The owner gets to pick any two; the design and building process controls the third. The rise in popularity of the CM and DB forms of delivery was in response to schedules and budgets getting out of control. You know how to lead the educational process, but you're not expected to be an expert on facilities design and construction. Which delivery method is best for your project? Here are some guidelines.

For smaller, straightforward projects with construction values in the up to \$10 to \$15 million range, the traditional design-bid-build process works well, if you are comfortable with the architect/engineering design team. Generally, the construction value and time you may save with one of the other delivery methods may not recapture the cost you'll pay for the CM, or compensate for the shifting in project responsibility issues in DB.

For larger projects, or if you decide on an alternative delivery for smaller projects, an issue becomes one of control—how much are you willing to give up?

You can still use design-bid-build, but industry experts will advise that your process will be longer and more expensive. With larger and more complex projects, there is value in having a construction enti-

ty involved in the design process. They can make suggestions on materials, assemblies, sequencing and construction approaches that can save time and money. If you're in a CM adviser delivery process, you have the advantage of moderating the banter between the CM and the designers throughout the entire process, participating in the decision-making process. They both work for you. Once you've gone beyond the GMP in a CM at risk, or the fixed cost in DB, frequently, you are at arm's length to the design and construction process. You can still make changes, but you'll pay for them. Often, you won't even know that decisions have been made until you see them in the building.

These forms of delivery can be very cost driven, potentially compromising quality and long-term value. Unless it's very clearly built into the evaluation processes, there is little incentive to provide a design that is more efficient over time, if it costs a dollar more. If you are thinking of using CM at risk or DB delivery, be very careful and thorough as you define the program, the project requirements and your evaluation criteria, so that you don't sacrifice value for cost.

For example, drywall construction

is fine in restrooms until a disgruntled senior kicks a hole in the wall. Perhaps the additional cost for concrete block would have been worth considering. A flat roof is less costly to install than a sloped roof, until roof maintenance gets deferred and you develop leaks (and you can't even find where they originate!). Fewer zones of HVAC control are less expensive, except when the sunny side of the building is always hot, and the shady side is always freezing because they're on the same zone. Or, if to operate a limited portion of the building during the summer or off hours, you have to run the entire central plant heating or cooling.

What you want in the facility has to be well defined or you risk not getting it. The contractor will only bid what you specify in order to keep the bid low. In design-bid-build, the architect is constantly trying to bring you the best function and value. With DB delivery, more caution and diligence are required. If it's all about cost and time, quality is at risk.

Newer Concepts in Delivery

Another trend is emerging—that of an owner's representative. An owner's rep may be an individual or a company. The theory is that you and your staff already have demanding, full-time jobs running and managing a school and the educational process. Managing a construction project—especially a significant one—can be another full-time position with millions of dollars at stake. Therefore, some districts hire a firm, or an individual that they know and trust who is familiar with construction and school operations, to be their representative throughout the process. This is sort of a CM adviser “light” concept. This role can be used in conjunction with any of the delivery processes and can provide more enlightened engagement in representing the owner's (your) perspective and interests.

In addition to the traditional delivery methods for the design and construction of facilities, more complex forms are avail-

For More Information

These associations represent the design and construction industry and are a source of additional material on project delivery.

The American Institute of Architects
www.aia.org

The Design-Build Institute of America
www.dbia.org

The National Society of Professional Engineers
www.nspe.org

able that primarily address nontraditional funding methods. Design-build-finance and design-build-finance-operate with lease back terms defer major capital outlays by transferring the financing component to long-term leases. Although this type of delivery has seen a dramatic increase, especially in higher education and some other public-sector arenas, its use in K-12 and career and technical education has been very limited.

Ready to Start?

Talk with professionals in the design and construction business in your area *and* your legal counsel regarding delivery methods available to you. Most of the associations that represent the design and construction industry have information available on project delivery. The American Institute of Architects (AIA), the National Society of Professional Engineers (NSPE), the Design-Build Institute of America (DBIA), and a host of others offer extensive written materials.

Remember, no matter what approach you take, design-bid-build, CM or DB, the critical elements to overall success are thoughtful planning and a cohesive project team.

The more removed you are from the delivery process, the more important good planning and people become to ensure that you get what you want and what you need at an acceptable value. **T**

