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owner values. Cross-disciplinary exposure and training can make this quite apparent. With trust and respect among the teaming members, the rest of the challenges are quite manageable and success is inevitable. However, even if all of the proper procedures and processes are put in place, without the presence of trust or respect the challenges associated with contractor-led design-build will be greater. First, choose the right teaming partners, and then figure out what and how you will work together as one team.

The contractor-leader of a design-build team must understand that his first job is to create an environment in which every member of the team can succeed. This requires knowing what success looks like for each party, and architects and contractors measure success by different criteria. Under the segregated services model of design-bid-build, the contractor did not need to understand or be concerned with the interests of the architect. They simply needed to deliver the project in accordance with the plans and specs. However, in contractor-led design-build the contractor must be concerned with the interests of the architect because the owner is concerned with the interests of the architect. Failure to recognize the design as a significant design-build deliverable will jeopardize the contractor's relationship with the owner, and perhaps risk the potential for repeat business with that client. Reputable design-build contractors are not interested in risking this potential, particularly in today's economic climate.

Contractor-led design-build, when done right, presents an opportunity to change the traditional architect-contractor experience from a negative one to a positive one. If the experience changes, then people's beliefs about one another will change. If their beliefs about one another change, then their behaviors and actions will change. If their actions change, the outcomes will change.

For More Information

Design-Build Essentials (Delmar Cengage Learning, 2011) by Barbara J. Jackson, Ph.D., DBIA.

Design-Build Institute of America (DBIA): www.dbia.org.

Analytical Design Planning Technique (ADePT): <http://www.amltechnologies.com>.

Value in Design (VALiD): <http://www.adeptmanagement.com/amltechnologiesus/valid.html>.

Construction Management Jump Start (Sybex, 2010) by Barbara J. Jackson, Ph.D., DBIA.

9.5 Architect-Led Design-Build

Peter L. Gluck, Architect

Design-build is a fast-growing project delivery method, generally led by contractors. The same methodology led by architects is conceptually appropriate for projects where design is paramount. Architects have an opportunity to provide more complete and efficient services to their clients by "jumping in" and taking leadership in construction.

OVERVIEW

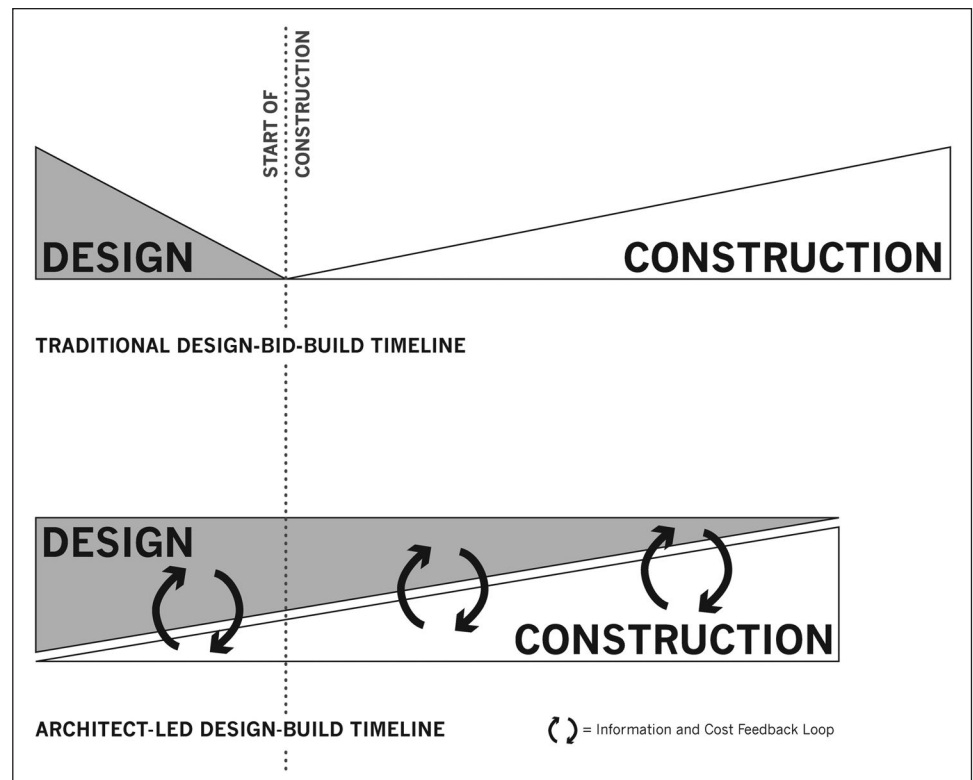
Over the course of the twentieth century, design-bid-build (DBB) has become the most common project delivery system for architects. In this process, an architect designs, contractors bid, and one contractor is selected to build. According to the 2012 AIA Firm Survey, design-bid-build work constituted 55 percent of projects designed by architects in

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2011. Under DBB, the architect observes the work of the selected contractor, thereby assisting the owner in knowing that the contractor is following the requirements of the design. The system is based on a contractual prescription that is intended to provide checks and balances to protect the owner's interests. However, this methodology, with separation of functions between those who design (architects) and those who build (contractors), has become cumbersome, inefficient, and adversarial. Since 1980, as construction litigation has become more and more prevalent, architects have been advised to absent themselves from most aspects of the construction process. Section 3.6, Construction Phase Services of the AIA Standard Form of Agreement Between Owner and Architect (AIA Document B101™-2007), says that the architect shall not be responsible for construction means, methods, or sequences. Architects are advised only to become generally familiar with the process of construction in order to evaluate it. This separation of responsibilities is intended to shift the risk of construction away from the architect and onto the builder.

This fear of litigation has had a tendency to drive a wedge between builders and architects, creating an intractable wall between the two players. As architects have limited their representation on the construction site, they have also potentially reduced feedback that fuels good practice, and the ongoing educational and technological knowledge that is critical in the rapidly evolving world of building technology. The wall has also apparently exacerbated cultural differences between architects and builders, leading to a perceived antagonism between design and construction, dichotomizing the arts and business, professionals and tradespeople, visionaries and technocrats—despite the common interests and goals they share.

Design-build is one answer being provided by the marketplace to mitigate the inefficiencies of the design-bid-build process. Design-build is typically described as collaboration among design and construction professionals who form one integrated team responsible to and under one contract with the owner. This article describes an integrated entrepreneurial approach for architects to assume an active role in leading the design-build endeavor. (See Figure 9.10.)



Peter L. Gluck, Architect

FIGURE 9.10 DBB-ALDB Project Timeline

However, architects have not historically been at the forefront of this movement. Design-build methodology has generally been led by contractors, for it has been the contractor who has been willing to take the risk involved with a building project. This circumstance also results from the fact that many design-build methods first made inroads for projects that are essentially prescriptive in their design requirements. For example, the design of highways, military barracks, manufacturing facilities, or the simple enclosure of a predetermined production process can be defined by performance criteria and design standards, sufficient to measure the success or failure of the resulting construction. In such cases architectural considerations are less of an issue than cost or time of completion.

Possibly because most architects have not seen the loss of these projects as a challenge to their core business, design-build remains a minority “alternative” project delivery method. Nevertheless, design-builders are taking on a greater and greater portion of architects’ work, including projects that involve more complex design criteria. The Design Build Institute of America (DBIA) suggests that design-build construction projects led by builders are increasing steadily and more traditional architectural projects are being produced within this paradigm.

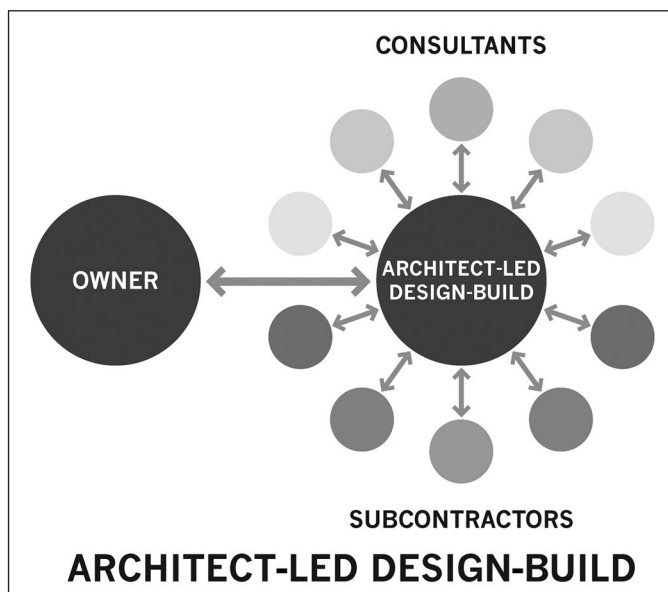
Architects looking to engage with this trend have the opportunity to do so with architect-led design-build (ALDB). However, according to the 2012 AIA Firm Survey, while the number of architect-led design-build projects doubled from 2008 to 2011, those jobs only comprise 2 percent of overall work.

Architectural Projects

Most will agree that the role of the architect cannot be minimized when it comes to buildings that must be designed for a specific site, a specific context, a specific purpose, and for a specific budget. The ongoing relationship between the owner and the architect in this scenario is paramount, often requiring the architect to interpret the owner’s needs throughout the design and the construction phase of the project. This context, and the skills architects possess, affords the architect an opportunity to lead in the design-build process.

Architect-led design-build can be accomplished contractually by a joint venture between two entities (the builder and the architect), with the architect holding the prime contract with the owner. (See Figure 9.11. Other possible structural relationships include the creation of a separate construction company, or division, within and wholly owned by the principals in the architectural firm.

► For more on design-build project delivery, see Contractor-Led Design-Build (9.4).



Peter L. Gluck, Architect

FIGURE 9.11 ALBD Relationships

In addition, architects can increase their participation in the construction process by creating a variety of contractual relationships with a builder to deliver a project. However, simple contractual relationships do not necessarily erase the barriers of siloed knowledge, experience, and culture. Care should be taken not to enter into any relationship or responsibilities that expose architects to risks not covered by their professional liability insurance.

Nevertheless, it is commonly agreed that the expansion of engagement in construction processes by architects is generally beneficial to all involved in the building process, including architects, builders, and owners. Architects have the foundation to lead design-build, and the opportunity to apply their energy, intelligence, and assertiveness to develop and expand their roles.

Architect-Led Design-Build

In architect-led design-build, the architect is the full-service leader of the design-build team, taking responsibility for the entire process. This fully integrated process represents the pure design-build methodology with the architect taking the lead rather than a contractor. From the owner's point of view this can better reflect the need for a single source that is responsible for the design, costing, and production of the project, led by the entity that has originated the design and can take responsibility for its execution.

Architects traditionally work and cooperate with a multitude of design consultants and product manufacturers. For most, it should not be a problem to also coordinate the work of craftspeople, subcontractors, and tradespeople. It is a continual collaboration between the architect and the construction trades and manufacturers, as well as the owner, which can provide agile responsiveness to the nonlinear process of producing a building. In ALDB, this process can be a continuum from conceptual design to the ultimate commissioning of the building.

Architects might accept the potential value of ALDB, but fear the complications and risks of construction. When considered specifically, the tasks simply represent another set of operations that are closely allied to those normally performed by the architect. In addition to standard design responsibilities, the architect as design-builder would have responsibilities for the following:

- *Bidding, negotiating, and “buying” subcontractor work:* For the most part, this is an administrative and evaluative process. Even in the design-bid-build method, the architect prepares the concept for and content of this work. In the ALDB process, the construction drawing set is likely to be separated out into drawing subsets by construction trade and sent to a series of subcontractors to determine what their portion of the work will cost. Normally, this process must be done by the contractor, who cannot conceptually alter the design documents. The subcontractor bids are then tabulated, and a determination is made as to which contractor is best qualified to perform the tasks as drawn and specified by the architect. In this process, which is a departure from traditional, discipline-based construction documents, the architect has the opportunity to meet face-to-face with the bidders and to incorporate their comments into the final bid documents, often of great benefit to the project. The technical feedback inherent in this process assists in producing a well-conceived set of drawings and contributes to a series of subcontractors who understand the ultimate shape of the project, financially, technically, and professionally.
- *Fiduciary matters related to payment of costs of project:* Another critical task of the contractor is to keep track of the project's cost. This is an outgrowth and extension of the architect's standard contract administration responsibility to certify the percent of completion of a subcontractor's work. With full-time representation on the job site assured by the architect's role in ALDB, managing project costs can be accomplished with a great degree of accuracy. All other job costs, such as employee salaries, rental cost of job trailer, telephones, etc., are easily tracked by bookkeepers

assigned to the project. Many architects perform these same operations for their own businesses and are familiar with principles of cost management.

- *Dealing with cost overruns:* The fear of being responsible for significant construction cost overruns may be the major factor inhibiting architects from engaging in ALDB. However, by embracing the world of construction and becoming familiar with the costs of each aspect of their design, architects have the opportunity to better estimate and control costs. Entering into an ongoing dialogue with those who construct the architect's design is also likely to create better design.
- *Coordinating approvals and inspections:* The overall responsibility for producing designs that comply with local and national building codes, zoning ordinances, etc., is generally under the architect's purview. And there are many sign-offs required of architects engaged in contract administration during construction. There are additional inspections required during construction that are normally organized by the contractor, but they are, in essence, extensions of what the architect would ordinarily perform.
- *Coordinating turnover of MEP systems to Owner:* The commissioning of all mechanical systems, and their coordinated turnover to the owner, may be underperformed on many projects. This can cause problems that owners may potentially see as being created by the architect. In the traditional process, the architects' disassociation from construction disallows opportunity for them to remedy this situation. In ALDB, the design-build entity is responsible for commissioning. It is a logical extension of the architect's work, since the architect and mechanical engineer have the most knowledge of the systems and their operation. When the architect has full knowledge of the mechanical contractor's work and can assist in educating the owner about systems operation, a successful result is likely. With the increasing complexity of mechanical systems, owners will benefit from professional commissioning, an operation that must start during the installation of those systems.
- *Preparing and obtaining lien releases and insurance certificates from contractors and suppliers:* Another administrative task required by the ALDB entity is to collect lien releases at the time of payment to subcontractors, and to obtain insurance certificates from all who work on the construction site. The architect involved in contract administration normally certifies the percent of completion of the subcontractor's work. It is a simple additional task to secure lien releases for each at the time of payment of the many requisitions. And it is a simple management task to see that anyone working on the construction site has proper insurance.
- *Scheduling and controlling means and methods of construction:* This is traditionally the major responsibility of a general contractor, and in this case becomes the responsibility of the ALDB entity. It involves determining the most efficient sequencing of the work and allocation of resources for construction and is essentially a problem-solving task. While this may seem challenging to some architects, it is a logical extension of the thinking that drives the production of architectural drawings. In time, daily contact with the subcontractors, provided by full-time presence on the construction site, and collaboration with experienced builders, can provide architects with the information necessary to develop job scheduling.
- *Providing and monitoring a site safety program:* Job safety is a critical responsibility for any builder. It has become a specialty task that must conform to industry guidelines, common sense, and a multitude of government regulations. It has evolved into a specialty in itself, with consultants who manage its prescriptions, write safety manuals, and monitor the site for compliance. Hiring consultants to manage site safety is common practice and, with proper training, it can be another management operation that architects are capable of directing.

GETTING STARTED

How does an architectural office accumulate the knowledge and personnel to augment its existing staff and integrate those skills that it might lack?

► For more on design-build agreements, see the backreader Design-Build Agreements accompanying Project Team Agreements (17.2).

An architectural office has these options:

- Hire a construction professional. This approach is similar to how contractors have expanded their expertise to include design by hiring architects.
- Form a joint venture with, or buy, a construction company.
- Develop construction expertise within the design firm. Many architects are highly skilled and comfortable in the construction environment and perform contract administration and construction phase services for their clients. These architects could form the leadership group for a new internal division of an architectural firm.

BUSINESS-RELATED ISSUES

Contracts

There are many contracts designed specifically for design-build projects, but most have been designed for contractor-led projects. The AIA A141TM-2004 family of contracts are specific to design-build projects, and have the ability to be flexible in terms of the role of the architect as leader of the project.

Fees

Two sets of fees are generated from a building project: design fees and construction fees. The design fee is generally comparable to the construction fee, with one significant difference. While the architect must produce the work and reserve some of the fee as profit, a good part of the contractor's work is not considered part of their fee, but rather is covered under the general conditions of the construction contract. For example, site supervision, accounting, and all costs of the site office are generally reimbursable expenses or overhead. A good part of the contractor's fee can then become profit, often as much as the architect's entire fee. The ALDB entity benefits from this situation, since the entity receives a combination or a portion of both the architects' and the contractors' fees.

Licensing

Similar to the licensing of architects, there is no national licensing for contractors. Each state has its own requirements, sometimes overridden or augmented by local towns or cities. Qualification for contractor licensure is often, but not always, quite simple. There is normally a test for which study materials are readily available to the applicant. In general, the testing procedure is significantly less demanding than for architectural licensure.

There is usually a minimal cost to take the test and a small fee for yearly renewal. In some cases a character check is required; for example, in New York City applicants are investigated to uncover jail time or child support delinquency. In many states a financial assets threshold must be demonstrated. In some instances, the solvency of the construction entity may be tested by the requirement that the entity hold a certain bank balance for a period of time. Additional financial requirements may also have to be met, depending on state law and the nature of the project.

Risk Management and Insurance

The prevalence of litigation in American society is legendary. In the construction environment, whenever there is a conflict, legal actions can spill over to every entity on the project, whether reasonable or not. Holding insurance is necessary, but insurance policies can become the "deep pockets" of the industry. Because of their central role, architects and their insurance carriers have been prime targets in construction litigation.

The reality of risk management for architects is that reducing errors and conflicts can reduce overall risk of legal action. Paradoxically, this is made more possible by increasing an architect's involvement in construction rather than the common practice

of reducing risk by avoiding involvement in construction. Architect-led design-build streamlines the construction process, improves communication, and maximizes close supervision of the work, thereby minimizing errors and risk.

General liability insurance, paid by the contractor, is a necessary part of the building process and it is quite expensive. Its cost (usually from 1 to 3 percent of the cost of the construction) is considered a general overhead expense. Insurance rates for first-time contractors tend to be as much as 1 percent higher than for established companies, but these rates go down as a history of successfully completed projects is established.

Owners or contractors generally carry a builder's risk policy that names the owner as coinsured and covers them from liability and loss during the construction of their building. This insurance is either part of the cost of construction or simply a soft cost attributable to the owner's project.

Architects generally carry professional liability insurance, the cost of which reflects the degree of risk involved with the project and the architect's claim history. In analyzing that risk, insurance companies have shown their preference for design-build projects because there has been a record of less litigation in projects with single source responsibility. Involvement in design-build has the potential to reduce insurance costs for architects.

Because of insurance requirements, a design-build company might consist of two legal entities: a design professional corporation, which would obtain professional liability insurance; and a construction limited liability corporation that would hold construction liability insurance. Ownership of both corporations could be the same.

► For more on professional liability insurance, see Insurance Coverage for Business and Professional Liability (16.2).

Capital Requirements

Construction is a business that need not require high capitalization. Whereas large general contractors might own much expensive heavy equipment, most equipment is rented and tools are amortized over the course of each job. In fact undercapitalization is an industry-wide weakness. When a project is required to be bonded, the financial worth of the contractor is investigated and bonding capacity relates directly to the company's financial statement. Bonding is generally required by government projects or for high-value projects where contract prices are guaranteed by the contractor. Private owners often find the cost of bonding an unnecessary expenditure. However, some jurisdictions will require bonding as a prerequisite to obtaining a contractor's license. Operating capital may also be necessary to cover construction costs while waiting for owner payments.

Guaranteed Pricing

There is real risk to the ALDB entity when it guarantees a fixed price (a guaranteed maximum price, or GMP) to complete a construction project. However, the ALDB process provides the financial means to manage costs when adequate funds are allocated in the general conditions of the construction contract. And, it is common for costs to remain as estimates until the major portions of a project have been bid to the actual subcontractors who will perform the work. Moreover, to account for the risk involved in providing a GMP, the ALDB entity is entitled to hold a contingent amount above the anticipated actual cost. If this contingency is not used, it may be absorbed by the ALDB entity as profit or may be shared with the owner, depending on contractual agreements.

CONCLUSION

The architect's separation from construction appears to have led to unfortunate consequences. Scope of services and the associated fees have been reduced; control of design and detailing has been lessened; professional respect by some owners and others in the construction community has been compromised; and legal risks arguably have been increased. To reverse this state of affairs, the architect can reengage in the construction process through architect-led design-build. It is sensible that architects engage in the construction of their projects, not only because they are the most familiar

with the goals of the project, having seen it through design, but also because their skills and experience lend themselves to the managerial requirements of construction—including sequencing, supervising, bookkeeping, and organization of employees (sub-contractors). Taking a role in construction can energize an architectural practice, enhance owners' experience of designing and building their projects, and improve the building industry as a whole.

BACKGROUND

ARCHITECT-LED DESIGN-BUILD AND ARCHITECT AS CM FOR SMALL PROJECTS AND SMALL FIRMS

James A. Walbridge, AIA

Small firms whose practices focus on smaller projects have a great opportunity to expand their services and increase their profitability by adopting leadership positions in alternative project delivery methods as either Construction Managers or leaders of Design-Build teams.

James Walbridge is President of Tekton Architecture, an architect-led design-build firm in San Francisco. His design and construction experience has led to national leadership positions in the AIA. Walbridge has lectured on the architect as master builder, architect-led design-build, and building information modeling on a local, state, and national level.

Small firms have a great opportunity to control design and make more money by considering leadership positions as either construction managers or leaders of design-build teams. Adopting and implementing an architect-led design-build or architect as construction manager project delivery method is very well suited to the small firms that focus on smaller projects and practices on a more local and regional basis.

For example:

- The scope and size of a small project practice allow the architect to expand into construction management and construction services more easily than their larger-firm counterparts, whose projects may be spread out nationally or internationally.
- Small projects typically require fewer team members than larger, more complex projects that often depend on multiple AE teams, consultants, prime and subprime contractors, fabricators, and vendors to complete the work.
- As a project moves into the construction process, the opportunity to more closely control and monitor the design for a small project is increased due to the architect's involvement in the management and execution of the construction.

Therefore, small firms have the opportunity to participate in small projects in a much larger role—and for additional revenue—than solely providing the architectural services

typically offered in the traditional design-bid-build project delivery system.

ARCHITECT AS CONSTRUCTION MANAGER

For the small firm seeking to embrace a leadership position in construction, the Architect as Construction Manager (adviser, with no risk, CMa) is often a good place to start. The risk to the architect is the lowest and the capital costs for implementing construction management services into the firm can be minimal. This is a good strategy for firms that do not have additional resources or experience with project management in construction. The small firm can staff for this additional service by hiring an experienced construction manager on a permanent, part-time, or even per-project basis as a consultant, thus allowing flexibility for the small firm to provide such CM services.

Firms should consult with their professional liability carriers, as the insurance required for Architect as CM adviser (CMa) is typically covered in professional liability insurance policies for traditional design-bid-build project delivery. Another important insurance risk factor to review is both responsibility for and liability for job site safety measures during construction, and means and methods for the execution of the construction itself. Typically, the standard errors and omissions policies for Architect as CMa will not cover these construction risks. Care should be taken to organize and craft professional service agreements accordingly, outlining which parties will be responsible for this during the construction.

Fee structures for Architect as CMa can be done on a lump sum basis, hourly basis, or guaranteed maximum price based on the scope of construction management to be required, project timeline, and complexity. Contractually, the AIA has developed agreements required for construction management services by architects. They are readily available and can be easily tailored to meet the scope of services as required. The financial rewards can be great, owing to the low initial investment up front, the higher overall net profit, and the ability to manage the project to achieve a faster completion time, thus allowing the firm to move on to newer projects more quickly.

For the owner, having the continuity of their interests maintained with the architect's representation from the design phase into the construction phase is a value-added benefit.

ARCHITECT-LED DESIGN-BUILD

As a firm gains more experience integrating Architect as CM into their business model, it may want to progress toward architect-led design-build (ALDB). With ALDB, the risk to the architect (ALDB firm) will be the greatest, as the firm is assuming responsibility for the design, project management, and construction of the project. However, proportional to this responsibility is the opportunity for greater income and profit from controlling the project from its inception through completion.

The greatest challenges for the small firm considering ALDB are with business organization and insurance. Attention should be given to how the legal ALDB entity will be organized and formed, based on the goals for the firm and the legal requirements of the state(s) where the firm is practicing. This can be done as one individual business entity comprising the architecture and construction or as two separate legal entities, and will require legal work to setup correctly. The insurance requirements will increase in scope and cost, since policies for both the professional and the field office need to be in place to cover all aspects of the ALDB liability umbrella.

Creating the construction arm for an ALDB entity can be accomplished in various ways, including the following:

- Establishing a joint-venture partnership with a separate general contractor on a per-project basis
- Forming a new general partnership and merging with an established GC
- Staffing a complete in-house construction crew employed directly by the new ALDB entity

Although these initial challenges will need to be addressed in adopting ALDB, the small firm that has gained experience employing Architect as CMa has already devel-

oped the core requirements, with construction management being the key component, to move toward ALDB efficiently. The rewards for this increased risk are far more substantial with ALDB. The potential income streams include design fees; CM fees; contractor's overhead and profit; and, depending on the business organizational structure, can include markup on construction labor as well. This equates to a much higher per-project profit for each project, increasing the small firm's bottom line far more than if only providing design services.

As the world of architecture and construction move closer together in a much more integrated manner, the idea of the architect employing the ALDB and Architect as CMa project delivery methods makes more sense and is a natural progression. Acting as a single-point of responsibility, the ALDB/Architect as CMa entity can minimize and, with some small projects, eliminate the inherent conflicts typical with a design-bid-build project delivery method, when all the team members are not present at the inception of the project. Bringing together those project team members at the onset of each project, all under one umbrella led by the architect, makes good business sense to owners, as the accountability is centralized and the goals for the project are shared by a team versus individuals. Owners are more likely to consider this integrated team approach led by the architect on smaller projects than on larger, more complex ones that are typically done with design-bid-build project delivery.

By reclaiming a role in the construction process, architects can expand their services and increase potential revenues. ALDB and Architect as CMa are market differentiators for the small firm that can lead to more work and increased profitability. As leader of the team, the architect is in the position to promote leadership for architecture on the very front lines of the profession—the small project.

9.6 Architect Developer

Bruce Redman Becker, AIA, AICP, LEED AP

This article addresses the benefits and challenges of practicing in the dual role of architect and developer. This includes integrated project delivery, different types of property development, the key elements of a successful real estate development plan, and strategies for mitigating development risks.

ADVANTAGES OF COMBINING ARCHITECTURE AND DEVELOPMENT

Architects who serve as developers can gain more control over the design and construction process by initiating projects and leading the development process, rather than relying on developer clients to hire them and define or limit their role.

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