

Alternate Delivery Systems



AIA Small Projects Forum

PIA

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It's Common Sense

An editorial

Concerning architectural services, much is expected to change in the next millennium. It's supposed to be similar to our forefathers exchanging the horse for an automobile. Of course, here in Texas we still are horsing around. The computer and Internet explosions are casting exciting images and ideas of how we as architects can provide added services and achieve rapid delivery of documents. Should there be any breakthroughs, SPF will make you well aware of them.

However, I, for one, have a few concerns. I find the time I spend on the Internet increasing. More organizations are now emailing rather than publishing. I read easily available information on my monitor that, while interesting, is not necessary to know. I find that I have spent at least one to one-and-a-half-hours a day at my monitor when I could have done more productive work during that time period. I have developed a habit of printing what I want to read, so I can read it at a more leisurely pace and not strain my eyes. If I don't print material, I find I don't remember everything I have read; and I fear the future will require more of my time in this enterprise.

The dilemma is that this process, which is supposed to save me time, has done just the reverse; and the saved publishing costs for the many organizations is ultimately costing me. Would you agree with me that this looms as a future predicament of royal dimensions?

It's obvious I must rethink my time scheduling, but time is time; 24 hours to a day; 60 minutes to an hour. It can't be expanded or shrunk. I already work 12 hours a day. For my birthday, a friend bought me a 14-hour clock, but it doesn't appear to help. Where do I find the computer/Internet time I'll need in the future?

Bye, but not farewell!

With this issue, I will be stepping out of my chair and three years of service on the Small Project Forum Advisory Group, leaving Pete Wronsky to take the reins (I'm still on my horse). Pete has been a great back-up for me and made my work easier. This year's AG with Pete Wronsky, Gerald Morgan, and our advisor coordinator Laura Lee Russell has been a very smooth working group, and I will miss it. I know I leave you in able hands. Last but not at all least, a very special thanks to our

AIA Director (our workhorse) Richard Hayes, who makes us look great.

My major goals for this year were:

1. *To maintain our membership*
Our membership was substantially increased this year due to the efforts of last year's AG. I'm anxious to see how next year reflects our efforts.
2. *Expand on the depth and content of the Report*
I expanded a trend of adding specific articles from experts outside our organization. I hope this continues. The information from "MasterSpec" gets better with each issue and should continue to be a great benefit to our readers.

My only disappointment was fewer case studies than I would have liked. I believe there is a need for this in the small project arena regarding techniques, services rendered, and construction costs. As I continue as a local advisor, I plan to get one written as a test for your analysis, comments, and guidance for future issues.

Thank you for three wonderful and exciting years on the Advisory Group of the AIA Small Project Forum PIA. A Happy Holiday to all and please keep in touch.

*Hy Applebaum, AIA
1999 Chair SPF PIA*

Director's Notes

The supplement of the Small Project Forum (SPF) Report contains four items that were previously abstracted in SPF Report 15, with the full text on the PIA's portion of AIAOnline. Some of our members expressed concern over the ability to access the full articles. The articles are being reproduced herein in response to those concerns. The American Institute of Architects continues to strive to enter the electronic age without disenfranchising members. To this end, the staff continues investigating ways to deliver future reports in both mediums—electronic and print—to those who prefer one medium to another. For at least the next three issues (18, 19, and 20) the reports will be mailed with articles appearing in entirety. The reports will also, as they have been, available at the PIA's Web site www.e-architect.com/pia. Should you have any thoughts or comments about these efforts please contact me.

Good news on the upcoming AIA National Convention in Philadelphia May 3rd to 7th. The Small Project Forum has had three programs, (in addition to our regular events) selected for inclusion in the convention program: "Marketing for the Small and Medium Sized Firm", "Practicing Small Successfully", and "Can Standard AIA Contracts be used on Small Projects?" Details will be published in Report #18 due out in April 2000.

As my first year as Director comes to a close I wanted to thank you all for making this position a rewarding one. The expertise and heightened awareness of issues that effect the profession provided by the Advisory Group greatly assists me in comprehending what our members are challenged with. The members and staff are deeply appreciative for the continued

efforts and articles contributed to this report series. Please be advised that the Professional Practice staff does synthesize contributions and edits for grammar, style, and consistency. Every effort is made to ensure an author's original meaning is not changed do to this process.

The Demands of Both the Design and Building Practice

*Joseph T. Deppe, AIA
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Can an architect balance the demands of both the design and building practice?

As I contemplate my experience in design/build, I can say in general it was a lucrative experience. But while the financial rewards were short-term, the effects on my established architectural practice were more lingering.

It started quite unexpectedly when clients asked me to build their house after losing trust in the local builders being interviewed for the project. We put this job out to bid twice and could not find a builder with whom we all felt comfortable; some were deceptive with their bid, while others ignored the bidding instructions and provided obviously low "allowances" for various parts of the work where actual costs were required.

Due to an anticipated move-in date for the next summer season, we needed to expedite the project. I assisted the clients with their hiring of a particular piling subcontractor during the builder selection process so that their time schedule could be met. This went very smoothly, and I suppose it is what made them think I could be their builder.

I was apprehensive, but excited by the prospect of being the architect and

builder of the project. I have never liked the adversarial aspect of the construction process. It seemed to me that many builders only sought to make money and would ignore the drawings, if the architect were not there to challenge them. I put so much time and effort into the design and construction documents that I was continually outraged by what I saw as their thievery by virtue of shortcuts. Now I had the opportunity to do it the "right" way and not have to fight with a builder to construct my project as drawn!

I told the clients I would think about it. I thought this could be the start of an easier, less confrontational way for me to make beautiful buildings and make a living. I also knew it would take a lot of my daily time building the house and that I needed help. I couldn't continue to run my full-time architectural practice and build this project within their timeframe, so I approached a friend about partnering on this project and possibly doing other projects together if this one worked out well. He was a talented cabinetmaker and also had some house-building experience. However, while I knew him socially, I didn't know much about his business practices other than the excellent final product he produced.

Except for a few minor things that I overlooked because of my friendship with my new partner, this project went well, was completed ahead of schedule, and earned us nice bonuses on top of our building fee. We decided to do more projects together. Our first clients were so pleased with the result of our collaboration that we had no trouble getting more jobs via their referrals.

I was the architect, a separate entity. He was the cabinetmaker, a separate entity. Together, we were the builders. I provided our new business with jobs I was already designing. My partner's

cabinet shop built all the cabinets. I did most of the office work, created change orders, sent out bills, etc. He did the majority of the fieldwork and daily job supervision. It worked initially, and I thought I could maintain this balance. We were both making more money than we ever had; but, while it was enticing at first, things changed and eventually problems "were rampant."

At the outset we worked with many good subcontractors whom I knew from my years of architectural administration. This wasn't to last long. My new partner jumped all over them! He was hard on the subs, and I was put into the role of mediating disputes between them and us. It seemed he didn't want anyone else to make money. I could appreciate his zeal, but I wanted to work with good, trustworthy people who needed less supervision and would make the process easier for us. I was willing to pay a little extra for that peace of mind. His tightfistedness was complicating the process.

He wasn't only hard on the subs; he was volatile with everyone. On a couple of occasions, we had contractual issues with our clients. He was unreasonable with them and created some very tense situations. Each time I was asked by the clients to attempt to resolve the dispute and to talk sense into my partner. I was spending the majority of my time and energy placating clients, subs, suppliers, and my partner.

Eventually he decided to close his cabinet shop, and he wanted me to close my architectural practice so that we could both put all our efforts into being builders. He changed the balance of things. Because he now felt that our time commitments were not equal, he began to demand more of my time on the site. I wasn't willing to give up my architectural practice; I

made more money as a builder, but I got more joy from the architectural design. I decided to quit the partnership with him. My original plan of design/build was evolving into a build/build entity. I wasn't interested in being a builder of other people's design projects, and I certainly wasn't interested in managing an explosive partner.

My partner was that adversarial builder I originally tried to eliminate from my projects. We aren't friends any longer.

Things are slowly returning to the way that they were before I was a builder. It's taking a long time though. I'm doing architecture full time now. I'm repairing relationships with the subs hurt by my partner and also with the builders who still view me as their competition. I lost some potentially major projects because of their "bad mouthing" me through association with my former partner.

Despite the fact that my partnership did not work as I anticipated, I do continue to believe that an architect can manage to balance the demands of both the design and the construction processes. I'd consider design/build again, but I would approach it with hard-earned knowledge from my past experience. In addition to choosing partners more carefully, one must also realize the repercussions taking on the role of builder will have on an established architectural practice.

Siamese Twin Delivery

*Randolph C. Henning, AIA
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I believe that because my architectural apprenticeship was spent in a wide variety of offices on projects of all sizes and types, I am more accustomed to differing approaches to project delivery. Also, six years as an in-house

architect for the Stiles Corporation, a south Florida commercial real estate development company, taught me to recognize that my ego is fallible, my education is incomplete (is that why they call it the *practice of architecture*?), and my construction colleagues are not mortal enemies. It allowed me the opportunity first-hand to realize the importance of teamwork for the benefit of the end product and the ultimate happiness of the end user. Now, as sole-practitioner of my own architectural firm, I confidently offer both the traditional approach and design/build delivery of projects, with a modicum of success in both.

I find it difficult to understand why some colleagues see the design/build delivery approach as a two-headed monster. It is more in tune to Siamese twins—both are joined at the hip and are going in basically the same direction toward the same goal, but each has its own personality. It definitely has its pros and cons, but it isn't threatening if you follow certain rules:

- Just as you should to pick your clients well, you must pick your design/build partner extremely well. After all, in the usual scenario (local developer or owner hires general contractor, who in turn hires the architect, engineer, etc.), *the builder is the client*. Trust, respect, and comfort play important roles in the relationship between the designer and the builder.
- Recognize that design/build is a different animal and not one for everyone. If you are uncomfortable with the design/build concept, refer that type of work to your respected and capable colleagues who aren't. If you are inflexible in your practice, you won't be a good design/build partner.

- Know your client (the builder), listen to the project parameters as defined (and, in most cases, they usually are well defined prior to the architect's involvement), and proceed using the KISS method (*keep it simple stupid*). Produce within the context of the project parameters, not with your ego.
- Listen, you might learn something.
- Work on building types you are familiar with, as familiarity should breed fewer mistakes.
- You usually only need to produce a set of abbreviated permit documents (leave off the redundant and ridiculous door jamb details, etc.), so you shouldn't expect similar fees with projects that require comprehensive construction documents. However, conversely, remember that the builder usually has expectations of making a profit, so don't begrudge your own. And whatever happens, don't lower your fee as part of any value engineering unless the builder is participating in similar value engineering of his profit.
- Typically, you are not retained to provide construction administration, so don't! Remember, as there is no such thing as being partially pregnant, there is no such thing as partial construction administration.

Finally, the more creative the project is, the more difficult it is to find a sympathetic, interested, and reasonable builder. Therefore, in cases of extremely creative architecture, the architect serving as the builder will become more common, purely out of necessity. With a booming economy such as we are experiencing now, builders would rather stick with less risk and more profit.

Experience Along the Way...

(from *Design-Bid-Build to Design-Build*)

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AIA Austin

Our architectural firm has designed (mostly educational) public sector projects in the design/bid/build (DBB) mode for over 40 years. As the pace of growth in our region has accelerated, owners are demanding that projects be built in a fraction of the time traditionally required. Because alternative project delivery methods were—until recently—not available to the public sector in Texas, the urgency of bringing new facilities on line meant less time for architects to do a thorough job of designing projects, and for contractors to do a good job of constructing them.

As a result of this time pressure, the quality of construction documents (CDs) fell, as did the quality of workmanship at job sites. It was becoming increasingly difficult to achieve the owners' requirements for quality projects delivered quickly and within tight budgets. Responding to this problem, the Texas Legislature passed laws enabling public educational entities to utilize several alternative project delivery systems. DBB projects were no longer automatically awarded to the lowest bidder, but to the firm offering a combination of factors that the owner deemed in its best interest; among them price, project team personnel, schedule, and past experience. Other alternative methods now permitted are Construction Management at Risk (CM/R); Construction Management, Agency (CM/A); and design/build. In this article I will concentrate on a comparison of CM/R to DBB, because we now have experience with

these two methods.

The purported advantages of CM/R over DBB involve cost control and construction schedule. The CM/R is hired about the same time as the architect and brings cost estimating expertise to the table during the earliest stages of the design process. The CM/R reviews the CDs at intervals during the CD phase and advises the architect and owner on methods to keep the project within budget. The CM/R offers a Guaranteed Maximum Price (GMP) before the CDs are complete, setting allowances and contingencies within that price for detail work not yet fully documented. The CM/R usually begins construction in a "fast-track" mode, obtaining permits prior to the completion of CDs and bidding on early construction items such as demolition, pier drilling, and site utility work in separate "bid packages." These are produced by the architect simultaneously, with production the balance of the "building package."

We now have nine DBB projects and seven CM/R projects underway. The results of the CM/R method are mixed to date. All the CM/R projects have come in at least slightly over the intended construction cost budget, but they seem to be coming to completion more or less on time. It seems safe to say that the main advantage of CM/R is a net reduction in project delivery time.

But the primary interest of an architect reading this article is probably, "What effects will this alternative delivery method have on the architect's relationships with the owners, ability to carry out design work and objectives, and costs to produce a project?"

The following are some of our observations on things to think about when negotiating the fee for a CM/R project:

1. The Owner may select the CM/R before selecting the Architect. This may lead to disappointment when the Architect discovers that the terms of the Owner-CM/R contract contradict provisions of the General and Supplemental conditions the Architect may deem necessary to achieve quality results in construction. When the Owner-CM/R contract is a *fait accompli*, the Architect can appear negative to the team concept when pointing out such conflicts. Architects should seek to secure an Owner-Architect agreement early enough to already be on board and in a position to influence the language of the Owner-CM/R contract.
2. Selection of the CM/R before the Architect may signal—or result in—a significant reduction in the influence the architect has traditionally enjoyed with the Owner throughout the project, especially if the Owner is a multi-headed political entity. The Architect's relief from cost control liability in a CM/R project is often purchased with a significant loss of influence with the Owner. This is because the Owner often places much more value on receiving a project that is on time and under budget than on receiving one that has good quality design and materials. The Owner also has selected the CM/R based upon qualifications, and will have a significant personal investment in having endorsed and recommended this firm for the job.
3. The CM/R often comes from a general construction background and may have difficulty making the transition to the objective advisory role expected of a CM during the design phases. The Architect also may have difficulty accepting an adverse opinion on the cost of his or her design, especially when that advice comes from a CM newly arrived from the construction community. Such professional cultural barriers must be overcome to permit success using the CM/R project delivery method.
4. The Architect should realize that preparation of the Owner-Architect agreement, the Owner-CM/R agreement, the Conditions of the Contract, and Division 01 of the specifications will take more time to produce than would the equivalent documents in the DBB method.
5. The CM/R's budget advice during design phases may lead to conflict over quality issues, as a CM may tend to favor products that have the potential to shorten construction time or lower costs at the expense of construction quality. PVC versus CI pipe under slabs is an example.
6. The CM/R should commit to a Guaranteed Maximum Price (GMP) prior to the completion of all the CDs. If the CM/R delays committing to a GMP until bids are received based on *complete* CDs, some of the vaunted reduced construction time benefit may be negated, and the Architect may be subjected to untimely value engineering efforts, for which it is difficult to get deserved additional fees. If the CM/R has contractual responsibility for cost control on the project, the Architect should not be required to change completed CDs free of charge.
7. The Architect will be required to make extended reviews of substitutions because of value engineering—regardless of whether these

come early or late in the process — and should allow for this additional cost in fee negotiations.

8. Fast-tracking of construction, involving multiple bid packages, will cause the Architect to spend significantly more time producing the packages than if the CDs were produced all at one time. The CDs also may have to be produced in bursts of concentrated effort for each package, instead of flowing from a natural design sequence. Additional time must be expended in coordinating the interfaces of each package with the others to produce a coherent set of Contract Documents.
9. Fast-tracking will require the Architect to expend much more effort on project administration than that of a DBB project, due to simultaneous CD production, bidding, and contract administration occurring for a portion of the project life.

Most of the above differences are things that can be dangerous only if one is not aware of them and does not act to mitigate them. The CM/R delivery method will take its place on the public sector construction scene. Our firm, however, sees the potential to avoid much of the hassle of the DBB and construction management methods, gain more control over our designs and production costs, and thereby increase profit margins by pursuing the design/build method. Overcoming the professional cultural barriers to such a venture will, of course, be challenging, but that is another article.

design BUILD

*Camilo Parra, Assoc. AIA
AIA San Antonio*

In an area just southwest of downtown Houston, patches of small townhouse developments have sprouted up rapidly over the past two years. These developments of between 2 and 16 units—4 on average—occupy typical urban infill lots. To the dismay of some residents, who have seen their neighbor's bungalow evolve into a three-story wall, there are not enough townhouses on the market to satisfy demand. "People are buying them like they are buying cars these days," proclaims a local Realtor. "They are seasoned buyers and have bought several houses before and now they want to be close to the city."

However seasoned they are, these buyers are buying often poorly crafted design/build homes. The developers know the formula: maximize land value, and reuse the same designs with slight variations but provide granite countertops and a limestone master-bath. The new development plan is to build fast and spend little or no time on design concepts. So little forethought is being given to these projects, in which density and profit seem to be the driving forces, that many townhouses have become an affront to the neighborhoods in which they are being placed.

In response to neighborhood civic organizations, Houston recently enacted a revised development code that seeks to curb density and promote new designs. One of the residents' concerns was that multiple driveways were taking up sidewalk space and encouraging people to park on the sidewalk. The new code provides incentives for common driveways and requires a garage-line setback.

However, rather than comply with the code, some developers filed for their development permits exactly one day before the revised code went into effect, often without holding the actual title to the land.

Overall, townhouse growth is revitalizing downtown Houston and its surroundings. It also is creating opportunities for small developers, architects, and builders, as they can develop two units at a time. Yet not many design/build teams seem to be concerned with the design and aesthetics of the projects they are developing. The one opportunity in this building surge that no one has completely exploited or emphasized is design. It is a seller's market, and as long the townhouse has the trendy interior features, the exterior can look like an art deco Miami beachfront hotel, a Swiss chalet, or even a neo-Gothic structure.

People are buying these campy designs, but there are also well-designed projects with metal-clad buildings and modern facades, townhouses that are the most pleasing and well-integrated into the neighborhoods in which they are being built. These projects have received a lot of praise within the architectural community. However, there are only a handful of developers who have spent more resources on the design part of the design/build project. These developers realize that if the design is outstanding then the project will not only sell faster but will also become a better long-term investment for the buyer. Five years from now, the art-deco look may have lost its appeal.

Design/build is a way to deliver the project as fast as possible, which means more profit. A recent Houston television program focused on developments near the downtown area. Set against the backdrop of nondescript,

gray stucco townhouses, the newsman raised the question "What has happened to design?" The architects interviewed all mentioned lack of time as the limiting factor. Yet it is not an inherent quality of design/build projects that the design portion must be sacrificed because of time constraints. In fact, construction can start before the design is completed, allowing the architect to finish detailing. The additional cost of the time spent on design is a small expense compared to the finance charge of two months or more for the bromidic townhouse that may not sell.

It is doubtful whether most developers will come to realize the advantage of a well-designed house as long as the market stays strong. The effect of the new development code will not be seen for some time. And the code does not prescribe aesthetic criteria, which, in fact, is good. It is really up to the architects and design/build teams to emphasize the importance of design. Several new design/build teams in Houston are developing well-planned townhouses. Perhaps as the architectural community recognizes them, their design-conscious developments will lead to community awareness of aesthetically pleasing townhouses.

Info-Techno Evolution

*Laura Lee Russell, AIA
AIA Oklahoma City*

As the info-techno evolution continues to surge forward, architectural services should reflect the advantages and pass on these tools to our clients. With the availability of Internet service, potential clients have easy access to trade publications and product data we have typically librated in our offices. We communicate with our allied professions, our vendors, and our clients

electronically through email, Internet, and CD-ROM. Project communication and construction coordination information can be circulated throughout the process electronically to each member of the team without delay in time or adding dollars to our overhead. Information access and rising construction costs may encourage small-firm and small-project architects to tailor the project delivery system outside of the traditional approach.

There are numerous approaches to project delivery that have proven successful, including partnering/joint venture and design/build projects. As a small project architect, I am working with my clients to create the most cost-effective and quality-controlled project through a combination of each of these approaches. Each project delivery system is designed to include the owner as a team member and reflect the amount of participation expected from the owner as the team member. In the past, the contractor was restricted to communication with the architect. The architect in turn transmitted information to the owner in terms selected by the architect. In an effort to provide owners with quality projects for realistic prices, the project delivery system must be edited to spread profits/savings across the project team.

In summary, outlined below is the project delivery proposal for a regional service company. The project is a retrofit of a three-building/split-site complex to include an office, warehouse, and equipment maintenance garage. This proposal was developed because few contractors were available for a design/build approach during the construction calendar requested. The contractors that were available were requesting overheads and profit margins far above acceptable rates. The

owner would drop the project rather than sacrificing portions of it.

The opportunity to propose an alternative solution to the project appeared to be the only way to meet the client construction schedule and cost requirements. Eliminating a full-time general contractor on site reduced the overhead and profit margin but made the construction coordination a challenge. The architect of record will be on-site during the construction process and could function as the construction project manager with a reasonable addition to the professional fees. The owner, who would be on site regularly, was willing to participate as the project coordinator. By modifying the design/build approach to include a "partnering" concept, an avenue might be created to achieve the requirements for both the owner and the participating contractors.

Project Team for Design and Construction

The design team comprises the owner, the architect of record, and all selected contractors.

- The owner (familiar with construction and with many ideas for the retrofit) will work with the architect and contractors as the project coordinator to achieve the design and budget expected within the anticipated time schedule. Regular participation will minimize delays and will provide for client education during the process.
- The architect/construction project manager will lead the project team through the design and construction process. Regular coordination of materials, details, schedules, and team recommendations will be processed through the owner's Web site at a construction project link.

accessible to all team members and through email correspondence. Application for permits, inspections, and communication with the city will be coordinated by the architect, except applications for trade permits.

Each trade contractor will be required to provide materials specific to their trade. Contractor coordination of materials, means, and methods, as well as any non-trade specific items, will be identified during the pre-approval review and a pre-construction conference.

The Process

The architect of record serves as the design team leader and the construction project manager. The program and schematic design are created and developed by the architect of record. Upon completion of the schematic design, an invitation to both contractors and subcontractors is issued to those interested in participating in a design/build project managed by the architect of record.

The project budget is established by the owner, and each team member is charged with the challenge to propose means, methods, and material substitutes as appear necessary to achieve the design intent within the budget and time schedule. The architect of record works with each contractor to identify preferred materials and details that compliment the program and the other contractor proposals. This coordination is handled during the design development phase. A monthly meeting will be held to ensure that all members are current and in agreement.

The construction drawings will be developed as required for permit purposes and to communicate the design and construction to each of the contractors. The completed documents

will be reviewed by each of the contractors for clarification and confirmation of time and budget before submittal to the owner for approval.

The owner and the architect will be available for on-site visits. A schedule will be determined at the pre-construction meeting. The construction schedule will be created and circulated to each of the contractors and posted at the Web site for modifications.

Contracts and Sub-Contracts

The owner will contract independently with each contractor for the work proposed. The terms of the contract may be by lump sum or by materials and labor, with a limit or not to exceed a set amount. This will allow the owner to control the budget. Change orders will be limited and are discouraged. The contractors have reviewed the project prior to construction and have agreed to a time and cost budget. Changes initiated by the owner or the contractors may disrupt the team consensus and could affect the entire construction process. The AIA documents are recommended.

Draw Requests

Draw requests may be contractor specific or project specific. The owner will process weekly draw requests and maintain daily coordination of the construction schedule. The architect of record will make monthly visits to the site and will process the final and month-end draw requests for all contractors. Any withholdings will be noted and identified by the architect.

Project Close-out

Upon substantial completion, the final punch list will be prepared by the architect of record and copied to each contractor as required for follow-up. A Certificate of Occupancy will be

requested, and all warranties, lien releases, and equipment manuals will be presented to the owner from each contractor.

This proposal was created to meet the needs of the owner. The Web site as a coordination tool will become a tool standard to the industry. The architect as construction manager is an extension of the qualifications of the architect and provides confidence to the owner. The participating contractors are aware of the need for coordination and are empowered by their input and participation from the beginning of the project. The project team will produce a project that is both on time and on budget if each team member maintains understanding and support of the process.

As the architect of record, I am confident custom project delivery can become part of the design process for small projects. By assuming more responsibility throughout the project, the owner will appreciate how valuable you are and will recognize the benefits of creative project delivery. The team process experience will present realization of a successful project in many aspects to all team members.

Ten Keys for Turn-Key

*Lisa K. Stacholy, AIA
AIA Atlanta*

We are all too familiar with the project that begins with a conceptual bang, progresses nicely through schematics, raises our hopes during design development, and orchestrates heart palpitations with completed construction documents. Then comes the low bidder, offering the client a means to "save some real money with only a few changes" under the auspices of *value engineering*. We usually look at

the process, sigh, frown, and think to ourselves, "If only we had more control." In fact, the design/build process has the potential to yield a project with the attention to detail the architect craves, the constructability the contractor desires, and the bottom line that makes the owner smile.

Design/build projects can be cause for great concern among architects who see it as a further erosion of the "architect as master builder" position. However, we consider the design/build delivery method a fantastic opportunity to get more involved for a longer period of time and using the potential for a greater impact on the final outcome. We have a number of projects that are design/build, using only a select few of the general contractors that normally bid on our traditional-delivery projects. Upon examination, 10 key points have been identified and utilized in each of the successful design/build projects. For basic understanding, this article is limited to experiences where we have worked directly for the general contractor, just like sub-contractors they hire to perform other portions of work. In our experience, a better outcome results when the general contractor hires the entire architect/engineer design team, rather than subbing the mechanical, electrical, and plumbing engineering to the sub-contractors who will perform the work.

1. Choose Carefully

Limit your playing field. Only enter design/build with general contractors (and subs) with whom you have had previous traditional delivery experience, so you know that they will take care of business. Be especially wary of entering into the design/build relationship with a firm that is a known entity, but with an unknown (to you) project manager

or superintendent. It will be up to you to evaluate the potential merit of an arrangement where unknowns exist.

2. Give Attention

Give the general contractor the same amount of attention that you would give to any client. Be available and connected to the project, and your general contractor will extend the courtesy to you as well.

3. Define Your Role

Prepare a proposal letter in which the architect's role is defined, reference B901, and highlight important articles. Provide a condensed checklist with article reference numbers for use by the design/build team.

4. Use a Contract

We determine an ideal work scope list, along with time related to each activity, and review it with the general contractor (similar to the new B141 document). Using this list, we know how much time should be spent at each phase of the project and when to ask for help if unanticipated issues arise. Don't be afraid to tell a general contractor that something the owner has asked for will be an additional service of specified value. Specify in the contract how fees for additional service will be determined.

5. Project Kick-Off

Request and participate in the project kick-off meeting. Meet the owner, know who the point of contact is for each discipline, and have the general contractor name a primary point of contact for you to use. Request an anticipated project schedule that includes design time, owner's review, and construction activities.

6. Educate/Learn

Plan on spending some time educating the general contractor on exactly what the architect does prior to the drawings being released for bid. Ask specific questions regarding materials and manufacturers they typically use (especially appreciated is the statement "tell me how you'd like to build it and we'll solve the details together"). Learn what the general contractor does at various stages of the process to plan how and where you'll have opportunities to maintain design input.

7. Maintain Records

Refer to and issue updated checklists to the general contractor. The checklist developed prior to the project kick-off can be a valuable road map to monitoring the progress of the project.

8. Visit Sites

Plan on making regular, scheduled visits to the job site during construction. Even if nothing significant is occurring on the site during a particular visit, take the opportunity to let the general contractor or the superintendent give you the "nickel tour" with an eye for the construction activities that are immediately upcoming, as well as those further down the road. Most general contractors we work with encourage a second pair of eyes on the project. Also, you'll be surprised what you can learn from the site superintendents just by asking. They'll appreciate the opportunity to teach us something about their side of the construction documents.

9. Follow Procedures

It seems as though at present, most design/build projects take on this delivery form as a reaction to

either time or financial constraints. Acknowledging that, we are careful to provide any information not only to the main point of contact, and provide courtesy copies to related parties. This helps us work as a single team that is apparent to the owner (this is the single best way we've found to start the repeat project process).

10. Project Closeout and Post Occupancy Evaluation

We've found that maintaining a presence during construction means the required effort for project closeout is greatly reduced. Assisting the general contractor in preparing operations and maintenance manuals or training sessions materials for delivery to the owner are examples. There are two benefits to this: first, you'll do a better job on your next traditional delivery project; second, you'll have the opportunity to take a project full-circle with the owner, and they won't soon forget it. Keep track of the 6-month and 12-month anniversaries for post-occupancy evaluations. Remind the general contractor and copy the owner if any construction issues need attention. It is also a good opportunity to remind the owner what you and the design/build team have accomplished.

We've found that these 10 key points (or variations thereof) are a good reference for our design/build projects. Develop your own list and add design/build to the list of your capabilities; you will become a better architect by learning the process!

Specifications Used with Alternate Delivery Systems

Buz Groshong
Arcom MASTERSPEC

Design/build and construction management are increasingly popular project delivery systems, and both are applicable to small projects. An obvious question to the architect who is considering using these methods is: How do these delivery methods affect my specifications?

For design/build, the most important question is "To whom are the specifications addressed?" Do the specifications indicate what the contractor is to provide, or do they indicate to the owner what the design/build will provide? In the latter case, should the specifications be addressed to the owner rather than to the contractor? While some master documentation systems make this switch, it really is not necessary because the construction contract addresses both parties: it tells the design/build what must be provided, and it tells the owner what must be paid. Each provision is addressed to the entity responsible for fulfilling the requirement. Addressing the specifications to the design/build allows the specifications to also be used for subcontracting portions of the work.

What about the extent of the specifications—do the contract documents need to be as detailed for design/build and construction management projects as for the traditional system of project delivery? Many think so, but that may not always be the best answer. Complete documents help ensure good communication with the owner. Unclear contract documents that lead the owners to believe they are getting something that they are

actually not could result in the design/build providing a more costly installation than anticipated (remember that discrepancies in contracts are generally construed against the maker of the contract). Tight documents also help ensure good subcontracts, and therefore help avoid costly disputes with subcontractors.

Finally, what about division 1 administrative requirements? For design/build and construction management, this is an area where less may be appropriate. Because the design/build or construction manager is administering the construction, it may not be necessary to fully describe administrative processes to the owner. On the other hand, some requirements, such as how applications for payment and submittals are processed, and procedures for project closeout, are probably still required.

As is true with any project, the better the communication, the better the final result. Alternative delivery methods are no exception, and care should be taken to provide the appropriate level of specification necessary.

The Utility of the SPF Report Series

The following is an excerpt from a letter to Local Advisor Kevin Harris, AIA from an SPF member John A. Mele, AIA regarding the Residential Renovation August issue (report #16) pertaining to Residential Design Consultations.

Dear Kevin:

Your article struck a chord with me. I am in the process of setting up a small practice to provide design and construction services to the residential market. I have already had my share of

client meetings I should have charged for. I have also been trying to "standardize" as much of the "process" as possible. I believe that this is the key to being profitable or not. Interviews done for free extract needed time from the office and put a burden on overhead cost. Your approach to charging an hourly fee for consultation alleviates this.... Thank you for taking the time to write the article. If more architects took your approach, we would gain more respect. After all, what doctor makes house calls today?

Sincerely,
John A. Mele, AIA
Knoxville, TN
October 11, 1999

The Incoming SPF Advisor Profile

*Mark Robin, AIA
2000 Advisor*

Mark Robin is presently serving in Nashville, Tennessee as a sole practitioner of architecture with an emphasis on small projects. Current projects range from a fifteen thousand dollar covered front stoop addition to a sixty-five hundred square foot residence. Prior to establishing his private practice, Mr. Robin was the project manager for MDC, Metro Development Corporation, then the eighteenth largest multi-family housing developer in the country. He also worked in a small architectural design firm in Atlanta, Georgia after working in Knoxville, Tennessee as a member of the architectural design team for the 1982 World's Fair. Currently he is treasure of AIA Tennessee.

Selecting a Contractor for Your Project

Jerald A. Morgan, AIA

Personally, I have been involved with a few different alternative delivery type of projects. Probably the most dissatisfying were projects where I was working for a contractor/developer who was developing a project for a client. Decisions on these projects were clearly driven by cost first. On the other hand, negotiated contracts have become almost routine. Understanding how to put together a project team has begun to create a series of successful projects for my practice.

On negotiated projects, my preference is to work with a client to develop a program and schematic drawings before interviewing at least two or three contractors for the job. In this manner, I maintain the dialogue I need in order to solve my clients-goals functionally first and then give the contractors a much clearer picture of what they will be involved with. When a contractor has schematics, he is much more prone to talk about his strengths that are pertinent to the project rather than how many successful projects they have completed, or how many guys are on his crew, or other less meaningful information. I am seeking through this process to find the right company to deal with my client, me, and the project at hand.

Many times in doing this process, my clients want a budget estimate and estimated construction schedule to be given by the contractors at this interview stage. This is often difficult for them, and we never hold them to the estimate, but it does generate much conversation and creative thinking on the contractors part as they seek ways to gain an apparent advantage. When we are finished interviewing contrac-

tors, I never make a recommendation. Rather, I suggest that they follow their gut instincts and go with the contractor they feel most comfortable working with. If price is their biggest concern, you can still work with the contractor you are comfortable with to find ways of meeting the project budget.

Recently, I have begun to understand the importance of a contractors financial capabilities and his relationships with subcontractors, suppliers, and financial institutions. On one recent project for instance, my client was able to save several thousand dollars in the financing process because the contractor had an established relationship which allowed the owner to forego the cost of a bond. And his subcontractors who are loyal to him offered value engineering proposals and held their bid prices for longer than usual while the financing process was completed, again saving thousands of dollars. Without these relationships the project may have suffered additional design revisions to bring it in on budget.

Lastly, in selecting contractors, one of the last items I discuss with my clients is how many projects has the contractor built which are similar to that which we are considering. Rather, I ask them to demonstrate their capability in completing the project we have identified for them. I attempt to educate my clients that it is much the same as hiring the architect—that one should look for problem solving skills, creative thinking, and professional attitudes. If a contractor possesses these attributes, my projects are always successful no matter how complex they are.

Emerging Trends in Single Source Project Delivery Systems

Brad Buchanan, AIA

What an exciting time to practice architecture! Exciting to some, that is, but stressful to others. Hopefully our experience is the former rather than the latter. If it is, you are among the part of the profession that is thinking outside the box, trying to anticipate our clients needs in new ways. What has spurred this spirit of innovation? For one thing, clients are operating in more competitive markets with fewer resources in terms of both in-house expertise and budget for facilities capital expenditures. While that sounds like bad news, it's actually good news. Our clients now need more out-sourced help with better solutions. That's where AIA architects come in.

Architects are positioned perfectly to provide their clients and potential clients with "new and improved" project delivery solutions to address these staffing and budget hurdles. Positioned perfectly because of our "owner's agent" relationship. Clients look to us for guidance, and for protection and advice on all these new project delivery systems that they keep hearing about. Design/build, construction management, design/bid/build; your clients want to understand these systems and they are worried that they are missing out on the cutting edge of our industry. Are these approaches better? Will I save money? Can we get it all done faster? What about quality? What about risk management? All these issues are on the tip of your client's tongue. You need to know the answers. And, strategically, you need to know what services you will offer and be

able to fill in the gaps of any skill sets lacking in your practice.

Why should you be thinking about this? First of all, survival. The amount of project budget being spent on the design phase is shrinking; and, because of the many single-source project delivery firms and joint venture groups, the level of construction documentation required is lessening as well. So, either deal with fewer opportunities and smaller commissions, or seriously consider adding some new services to your marketing package.

In addition, this issue is primary to our profession. As the playing field levels and there are more opportunities, there is also more competition. A second factor is quality. Single-source, design-led project delivery systems yield greater quality and customer satisfaction. I base this statement on more than just my opinion. A study completed in 1998 by the University of Reading Design and Build Forum at the Centre for Strategic Studies in Construction reviewed 500 clients, 330 projects, 150 interviews, and 700 individual responses, and came up with some interesting data points. The study compared design/build with traditional project delivery systems, and it looked at the impact of design-led teams. Overall, design/build provided faster solutions for less money. But in the quality client satisfaction categories, the design-led teams were the only teams that showed increased scores over traditional delivery systems. The study is called *Designing and Building a World Class Industry* and is available by calling 011 44 (0)118-931-8190.

Either you agree with my suppositions or you have just skipped to the next article because you think this will never apply to you. If you're still with me you may be wondering what your first step might be. Maybe you start by

offering construction management services as an add-on to your standard scope. Pick a trusted repeat client on a familiar project type and offer to take on the whole process, then team up with your favorite contractor and see how much more you have to offer your client by staying involved from schematics to punch list. By the way, once you've worked with a client in this capacity, they will begin to talk with you at a different level—that of a partner rather than just a design consultant. Once you've experienced this, you're hooked and you will seek to elevate all of your client relationships to this new level.

Beyond the increased depth of your client relationships, you will find the additional scope of work achieved with virtually the same overhead marketing dollars very appealing to your bottom line. The inherently larger construction-phase budgets produce greater cash flow and greater profit percentages. Yes, you really can make money doing this! This reward increases with greater risk management. For example, there is greater profit potential in guaranteed maximum price (GMP) design/build contracts than with CM as agent contracts, but the trade-off is well worth it.

More opportunities, more design involvement, greater client impact, better return on your investment: all reasons why our profession is looking at our service approach and why you should too. If you have questions about any of this, contact me at (303) 861-4600 or via email: bbuchanan@bygroun.com. For further study go to the DB PIA Web site to get more information on the regional Designer Led Project Delivery seminars sponsored by the AIA, the ACEC, and DPIC.

Brad Buchanan is a principal with Buchanan Yonushewski Group, a 30-person, architect-led, single-source architecture and construction firm. Brad is also a member of the advisory group to the DesignBuild Professional Interest Area of the AIA, as well as one of three architects appointed to the National Joint Committee of the AIA and the AGC.

Partnering: Are Cooperative Relations Improving the System?

*Dennis Eriksen, PE, President,
ATI Systems*

The construction industry has established a new style of project management, a style that is so effective it is now being emulated and applied by project managers in industries far beyond just construction. Partnering, a form of team building among the organizations contributing to a project, is based on the premise that energy spent on suspicion and defensive posturing is wasted, that we can accomplish more in an environment of mutual trust and respect.

The effect of partnering is to eliminate adversarial styles of management by developing commitments to cooperative relationships, by seeking common objectives, and by redesigning the project management processes around win-win precepts. The goal is to reduce the claims, disputes, and litigation that had become such a defining element of the construction industry.

Background

Their industry became so mired in claims and litigation that in the mid-1980s the Construction Industry Institute established a task force to search out better management prac-

tices. That task force developed partnering, though they recommended initially that it be used only for long-term, multiple-project business relationships. In 1988 the U.S. Army Corps of Engineers led the broader construction industry—which uses single-project, low-bid business relationships—to adapt the CII partnering program to project-based partnering.

The partnering method is straightforward. It starts with recognition that all the participant organizations are stakeholders in the success of the project. Each stakeholder can affect the results of the others, for good or bad, so a partnership indeed exists. The success for all is measured by a set of common objectives: meeting the performance requirements, controlling schedule and costs, and completing the project in such a manner that all of the stakeholders are very satisfied with the results. An atmosphere of trust is a prerequisite, a trust in the other stakeholders and in their intent to complete the best job possible.

Partnering introduces a structured process to build these project teams. The first step is establishing a commitment to and endorsement of partnering by the senior managers of the stakeholder organizations. The next step is to bring the project managers together in a workshop environment where they can:

1. Become acquainted
2. Thoughtfully consider the relationships they want among their organizations
3. Jointly assess and develop team solutions to the project's unique opportunities and risks
4. Understand the goals of each stakeholder and select the best of those goals for a project partnering charter to guide the team

5. Design a set of project management processes that emphasize open communications, mutual progress evaluation, and rapid issue resolution.

Finally, when back on the job, the stakeholders must regularly assess the project's partnering effectiveness and establish management mechanisms to allow the team to make course corrections.

Results

Owner organizations report high levels of satisfaction and continuing support for partnering. The Arizona Department of Transportation (ADOT) is one of the long-term advocates. As of June 1999, it has completed 682 contracts that use partnering. ADOT reports successes that include saving 9,688 contract days (12.4 percent average time saving) and \$24.5 million, as well as achieving a stunning reduction in its construction claims from 109 valued at \$132.0 million during 1992 to a single claim for just \$66,614 during the past five years.

The Project Managers Institute (PMI) sponsored studies by the College of Business, Oregon State University, including a survey by Erik Larson of the partnering experiences of PMI's construction industry members. The survey, to which 280 project managers responded, graded recently completed projects for meeting schedule, controlling cost, technical performance, customer needs, avoiding litigation, satisfaction of the participants, and overall results. They respondents identified whether the owner-contractor relationship had been adversarial, guarded adversarial, informal partnering, or project partners. The results, published in the March/April 1995 *Journal of Management in Engineering*, p. 30–35, indicated pro-

jects yielded the worst results for every measure of the project when adversarial relationships existed, and they yielded the best results for every measure of project success when the stakeholders worked as project partners.

Major design insurance firms Victor O. Schinnerer & Company Inc. and the Design Professional Insurance Companies (DPIC) promote partnering by policyholders as a dispute avoidance strategy. DPIC believes so strongly in partnering that it offers to help to pay for it on projects it is covering.

Architects and engineers have indicated through a survey conducted by the Construction Industry Dispute Avoidance and Resolution Task Force (DART) that they view project partnering "as a superior method" when rating various forms of alternative dispute resolution.

Partnering has received the endorsement of many industry associations. Associations that have developed materials to promote the use of partnering include The American Institute of Architects, the American Consulting Engineers Council, the Construction Industry Institute, the Associated General Contractors of America, the American Society of Civil Engineers, the National Society of Professional Engineers, and the Society of American Military Engineers.

We should tip our hats to the men and women who have brought these results to the industry. They have made America work better while making it a better place to work.

Improvements Based on Feedback from Architects While partnering certainly is working, we should continue seeking improvements in its methods and its effectiveness to users. Architects are among the principal stakeholders using partnering. Feedback based on their hands-on experiences

participating in project partnering relationships is valuable and should be included in the body of knowledge about partnering. To date there has been little hard experience collected from the architectural community.

We seek to remedy that by conducting an architects' survey of partnering effectiveness in conjunction with this article. This survey is posted at <http://ati-sys.com/aia>. You are encouraged to visit this site and establish a voice for the architect community. Relate your partnering experiences, compare your results on projects that did and did not use partnering, identify what worked well and what did not, suggest improvements that should be made to the partnering methods. An article reporting on the survey results is planned for a future issue of the Construction Management/Design-Build PIAs Project Delivery Report.

Further Partnering Publications

Visit the survey Web page; after completing the survey, use the hyperlinks provided to obtain partnering publications from the Arizona DOT, Victor O. Schinnerer & Company, the Design Professional Insurance Companies Inc., the U.S. Army Material Command, the U.S. Navy Acquisition Reform Office, and ATI Systems.

For questions or further information: www.ati-sys.com or (818) 347-3280.
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Dennis Eriksen founded ATI Systems, a management consulting firm that provides facilitation services to aid organizations to work together as effective project teams. His industry experience includes 30 years with Litton Industries. While facilitating partnering workshops, Dennis has had the opportunity to observe a large number of construction teams come

together. He actively contributes to improving the methods of partnering, and his experiences are related in a number of articles that he has authored. Dennis holds a BS from UC Berkeley and an MS from UCLA.

Design/Build—Is It Right for Every Owner?

Michael Loulakis

Owners are being flooded with information attesting to the benefits of design/build, including single point responsibility, early commitments for total project cost, and speedier project delivery. This has lulled some owners into erroneously thinking that design/build is a cure-all for anything that can go wrong on a project.

Design/build (like construction management and other project delivery systems) is not a magic solution that guarantees project success. Rather, it is a tool available to help achieve project success. If design/build is used properly, experience shows that there is a high likelihood of meeting the owner's needs. But owners who misuse the design/build process, or don't understand the limitations of it, are likely to be seriously disappointed.

How do owners determine whether to use design/build for their delivery system? First, they should have a clear understanding of how the process works and how it compares to other systems. Additionally, they should identify what factors are driving the project and whether these factors can be best accomplished through design/build. Finally, owners should keep in mind that project success will not only be determined by what project delivery system is used, but also by how the overall project is managed and administered. As you ponder these issues, consider the following.

Project Drivers

The design and construction of each project are controlled by a combination of unique factors and drivers. Some of these drivers are project specific, such as those affecting price, schedule, and quality. Others are dictated by the personality of the owners and how they want to manage the project. Project delivery systems are intended to establish a framework to help the owner achieve these drivers, with some systems being better than others at meeting specific drivers.

Consider, for example, an owner who wants to use design/build to accomplish three goals: (1) getting a value-engineered design; (2) eliminating any claims against it for design defects; and (3) obtaining the lowest price possible. Add to the equation the owner's expectation that it will control the design using detailed, restrictive (rather than performance) specifications developed by its A/E prior to involvement of the design/build. Can design/build be used in this scenario? Certainly. Will the owner's objectives be met? Hardly.

The problem is created by the owner's need for control, which seriously jeopardizes each of the project drivers. By controlling the design, an owner stifles the ingenuity and creativity of the design/build team, because the team is required to use the owner's design ideas. As a result, the ability of a design/build team to achieve meaningful value engineering or cost savings is seriously impeded. Similarly, if an element of the owner's design is faulty, the owner will likely be held responsible, effectively nullifying the single point of responsibility benefit of design/build.

Many other examples show how misaligned project drivers can result in an unsuccessful design/build project.

A number of these involve owners who select design/build because of the need for early project completion, yet insist on processes that delay the process (such as delaying construction until design for the entire project is completed or reviewing every iteration of the design as it is being developed). In short, if you are an owner who (a) distrusts your service providers, (b) cannot make decisions to keep pace with tight schedules, and (c) micro-manages by committee, you will probably be better off using another delivery system, such as at-risk construction management.

Relationship of Procurement and Contracting Methodology

As with all project delivery systems, the design/build process merely establishes the roles and relationships among the key members of the project team. Owners sometimes forget that for specific project goals to be achieved, the project delivery system must be compatible with the owner's contracting methodology (e.g., lump sum, cost plus with guaranteed maximum price-GMP) and procurement process (e.g., direct selection, competitive best value). If any of these three elements are out of alignment, the owner's expectations are not likely to be met.

When speed of overall project delivery is the major driver for selecting design/build, the owner should seriously consider using a procurement strategy based on qualifications and competitive negotiations, with price competition, if any, limited to fee and general conditions expenses. Owners interested in selecting the design/build team on the basis of a fixed low price will undoubtedly spend significant time in the procurement process, eroding much of the time-savings obtained in the merging of design and construction.

Matching an owner's high quality expectations with its procurement and contracting preferences can also be problematic. When a design/build team is selected primarily on price, it may have little incentive to spend its money or time to consider life-cycle costing issues, or to give the owner quality that exceeds what is being specified. If quality is a significant driver, the owner should ensure that qualifications of the design/build team are part of the selection process, as well as proposed life cycle costing approaches. Likewise, if the owner wants to have more control over what is being designed—which is particularly important in projects with rigorous architectural standards (such as courthouses and luxury hotels)—it should consider selecting the design/build team on qualifications, with a GMP set after the design has evolved.

Attributes of Successful Projects

As noted above, project success is not determined solely by the choice of project delivery systems. Instead, a host of other factors help predict project success or failure. This was confirmed by a recent study on project delivery undertaken by Professor Victor Sanvido on behalf of the Construction Industry Institute. The study showed that the best-performing projects have the following attributes:

- Adequate to excellent ability of owner to make decisions
- Adequate to excellent scope definition
- Excellent team communications
- Qualified contractor pool
- High ability to restrain the contractor pool through prequalification and shortlisting.

Likewise, the worst-performing projects were characterized by:

- Contractors engaged late in the design process
- Limited or no prior team experience
- Onerous contract clauses
- An owner lacking ability to make decisions
- No prequalification of bidders.

Given this, it is clear that if a design/build relationship is organized with all the features of the worst-performing projects in the CII study, the project is likely to be troubled.

What Should You Do?

If you are an owner who is thinking about using design/build for a project, what should you do? Successful project owners will, at the outset, carefully consider whether their unique personality and goals can be addressed through design/build. Many do this analytically, often by using a selection matrix process to consider the attributes of available delivery systems and balancing them against the project drivers and the owner's personality. If design/build scores well, you then need a procurement and contracting plan that takes advantage of this system's strengths. Think through what you realistically need to review, approve, and control the design and construction. If you make your needs too severe and restricting to the design/build team, you will likely find that you have a problem that impacts your long-term project goals.

Above all, do not delude yourself into believing that simply by calling your project "design/build" you have a fail-safe mechanism for meeting all of your needs. You need to carry the prin-

ciples of design/build forward into your procurement, contracting, and management of the project.

In-Depth Information on Project Delivery Systems

Although there are a number of articles that give snapshots of the attributes of project delivery systems, few resources are available that provide an in-depth discussion of these systems. Those who would like access to this in-depth information in one place should consider the following:

- Handbook on Project Delivery, published by The American Institute of Architects, California Council (1996)
- Project Delivery Systems for Building Construction authored by Robert Dorsey and published by the Associated General Contractors of America (1997).

Finally, those interested in reviewing project delivery through an interactive CD-ROM format should consider Construction Project Delivery Systems: Evaluating the Owner's Alternatives. This program, published by A/E/C Training Technologies at www.aectraining.com, is not only a comprehensive resource, but also provides owners with specific assistance in using the analytical matrix process discussed above. It is a training program registered for CEU credit with AIA/CES.

Michael C. Loulakis is a shareholder in the Vienna, Va., office of Wickwire Gavin, P.C. Mr. Loulakis' legal practice is exclusively devoted to representing parties in the construction industry, including owners/developers, sureties, contractors, and design professionals. Mr. Loulakis is also the author of a

widely acclaimed interactive CD program (registered with AIA/CES) titled Construction Project Delivery Systems: Evaluating the Owner's Alternatives, produced and distributed by A/E/C Training Technologies www.aectraining.com.

If you would like to report on issues relevant to the Small Project Forum from your area on a regular basis, we invite you to join our network of Local Advisors. Please call Laura Lee Russell, AIA.

The opinions expressed in this report do not necessarily reflect those of the Advisory Group, the AIA staff members who prepared the report, or The American Institute of Architects.

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