Design-build is neither a new concept nor a complex one. This project delivery system is similar to that of the Master Builder approach practiced by the Egyptians 4500 years ago during the construction of their pyramids, and in the United States during the early part of the twentieth century when contractors self-performed most of their work and included design services if the client so desired.

Today, the design-build team of architect, contractor, and engineer provide the project owner with a single contract that encompasses design and construction. In 1986, approximately 3 percent of all construction project delivery systems were utilizing design-build. By 1998, this figure had grown to 27 percent, and according to the Design-Build Institute of America (DBIA), it’s projected that 45 percent of all projects will be constructed via design-build during the first decade of the twenty-first century. So far, this projection appears not far off the mark given how public and private sectors have both experienced the benefits of design-build.

General contractors and subcontractors need to become more familiar with design-build, not only because it represents a substantial market, but also because it is a system that allows the contractor/subcontractor to enter a new market—one in which projects can be negotiated, where “low bid” is not the overriding factor, and where profit margins are slightly higher.

**What Is Design-Build?**

Under a design-build approach, a team consisting of a general contractor, architect, and engineer is assembled to provide an owner with a one-source point of contact for the design and construction of their proposed...
Design-build companies can provide all of these services with their in-house staff of engineers and construction professionals, or they can subcontract for the services they don’t normally provide.

Why has design-build garnered so much attention recently?

Numerous surveys have revealed that design-build decreases costs, as well as the overall design and construction time. It is 23-percent faster than a CM-at-risk project and 33-percent faster than design-bid-build projects according to a Pennsylvania State University College of Engineering study. A Construction Industry Institute (CII) report revealed that design-build produced a median of 9000 square feet of construction per month, as opposed to 4500 square feet using design-bid-build.

The more rapid cycle of design and construction allows owners to occupy their facility more quickly and reduce the time for which costly construction financing is required. As far as project cost savings, the CII survey revealed that design-bid-build experienced the highest cost escalation at 4.84 percent while initial costs via design-build escalated only 2.37 percent—presumably because of the impact of change orders associated with design-bid-build projects.

Benefits accruing the design-build team. Zweig White, a management consulting firm headquartered in Chicago, conducts annual surveys of the design, engineering, and construction industries. Their 2005 Design-Build Survey of Design and Construction Firms asked the question to 98 design and construction firm executives, “Are design-build projects more or less profitable than those projects completed using traditional project delivery methods?” Eighty-four percent of respondents said “Yes.” The breakdown of this survey in Figure 14.1 includes the demographics of the survey respondents.

The survey also asked respondents to provide reasons why they thought design-build was more profitable. Their answers are shown in Figure 14.2.

The advantages to the owner and design-builder of one-source responsibility. Combining design and construction in one contract provides the owner with a single source, thereby relieving them of considerable management and coordination responsibility. Since design and budget can be dual-tracked, conformance to the budget as the project proceeds through design development can be carefully monitored, while redesign—with its associated costs and delays—can be avoided entirely or mitigated.

Single-source responsibility avoids the finger-pointing that often arises between the client’s design consultants and the contractor if
errors and omissions or coordination issues surface. This is because the design-build team “owns” those costs to correct—not the owner.

By combining design and construction, the adversarial relationships that often exist between architect, contractor, and owner are lessened substantially and usually disappear entirely. Experience has shown that the number and type of change orders are substantially reduced, along with disputes and claims that often occur during the design-bid-build process.

In Great Britain, design-build is referred to as a “package project,” an appropriate name because the owner no longer buys a service—design or construction—but instead buys a “package”—a product. Studies in England conducted by the University of Reading’s Design-Build Forum revealed that the DB delivery system produced a 12-percent improvement in the speed of construction, and a 30-percent increase in overall project delivery. These British researchers also found that design-build resulted in a 13-percent reduction in square-foot costs, and projects were more likely to be completed within a 5-percent range of their original budget.

### Breakdown of the survey sample

**Sample size**

- 98 design and construction firms completed and returned a valid questionnaire.

**Firm type**

- Integrated design/build 43%
- Design services/consulting 27%
- Construction 31%

**Year founded**

- Prior to 1945 29%
- 1945 - 1959 16%
- 1960 - 1969 11%
- 1970 - 1979 9%
- 1980 - 1989 15%
- 1990 - 1999 14%
- 2000 to present 3%
- Unspecified 2%

**Region of headquarters**

- New England 6%
- Middle Atlantic 10%
- South Atlantic 18%
- North Central 28%
- South Central 6%
- Mountain 12%
- Pacific 17%
- Unspecified 2%

**Staff size**

- Minimum 2
- Lower Quartile 30
- Median 150
- Mean 1,392
- Upper Quartile 650
- Maximum 35,000

**Staff size (breakdown)**

- 1 - 49 33%
- 50 - 99 11%
- 100 - 249 14%
- 250 - 499 13%
- 500 - 999 5%
- 1,000 + 20%
- Unspecified 3%

**2004 gross revenue**

- Minimum $720,000
- Lower Quartile $10,000,000
- Median $50,000,000
- Mean $321,818,352
- Upper Quartile $220,000,000
- Maximum $5,000,000,000

Note: due to rounding, percentages for some questions do not total 100.

FIGURE 14.1  A breakdown of the 2005 Zweig White survey on the design, engineering, and construction industries. (With permission from Zweig White Information Services, LLC, Natick, MA.)
Design/build profitability

Issues
Are design/build projects in general more or less profitable than projects completed using traditional project delivery methods? Why?

Background
Design, consulting, and contracting firms are only going to pursue the design/build market if it is profitable for them to do so. Do firms believe design/build is a viable, profitable way to bring a project to completion?

Survey Findings

- The vast majority of firm leaders (84%) believe design/build projects are more profitable than traditional projects. One of the most common reasons firms cite for this belief is that design/build projects allow the builder to have greater control.

- Firms that consider design/build projects to be less profitable than traditional projects do so for reasons including higher costs and increased risk.

In your opinion, are design/build projects in general more or less profitable than projects completed using “traditional” project delivery methods?

<table>
<thead>
<tr>
<th>Choice</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>More profitable</td>
<td>84%</td>
</tr>
<tr>
<td>Less profitable</td>
<td>12%</td>
</tr>
<tr>
<td>Unspecified</td>
<td>4%</td>
</tr>
</tbody>
</table>

FIGURE 14.2 Responses by participants as to why design-build was thought more profitable. (With permission from Zweig White Information Services, LLC, Natick, MA.)
Design/build profitability (continued)

Why are design/build projects in general more profitable than projects completed using “traditional” project delivery methods?

- Ability to directly manage all costs and to plan and design to cost
- Able to control costs more
- Assuming owner/regulators don’t hamstring design/build on project submittal requirements
- Assumption of greater risk if managed properly should produce greater reward
- Because of “team effort,” fewer documents are used
- Best value selection
- Better control (2)
- Better coordination between A/E and contractor makes project more efficient and therefore more profitable
- Better defined scope and more efficiencies provide more value to owner and more room under budget for higher contractor fees
- Better risk control when true “team” relationship exists
- Budget control
- But not enough yet—market still learning the value
- Can control schedule
- Client is buying value
- Constant communication with owner prevents out-of-budget changes
- Control
- Control added early in the process
- Control is in hands of those who can keep overall project on track
- Control materials
- Control of cost
- Control schedule
- Control scope
- Control specifications
- Cost savings
- Cost-control ability, but more risk
- Costs are controlled continuously

- Design firms paid for ideas, not hours
- Design/build firm has opportunity to meet scope more efficiently with right design partners
- Faster delivery speed
- Flexibility in design solutions with cost savings and still maintain quality
- For both design/build team and owner provides increased time savings, reduced claims, improved community relations
- For integrated firms—control; client satisfaction = repeat business = profit
- For our firm, we are entering the construction side of the equation, which we didn’t do before
- Full control of the project
- Higher design and construction fee
- Higher fee
- Higher profits for partners by adjusting project costs to accommodate profit
- Higher risk
- If estimated properly
- If managed properly, more profit can be made
- If properly managed
- If you learn to identify, quantify, and manage risk
- It is not (usually) purely fee driven
- Less competition (3)
- Less litigation
- Less time
- Longer-term customer relationship
- More control (2)
- More control during project cycle
- More control equals more cost/profit control
- More control over schedule
- More control over scope
- More cushion/contingency to be spread out on project
- More input into the means and methods
- Need to reduce risk by defining the project
- Negotiated
- No “bad” projects

FIGURE 14.2 (Continued.)

The downside of design-build (with counter-arguments in italics). Critics of design-build cite the following problems associated with general contractors, design consultants, and owners in a design-build mode, many of which represent institutional barriers that are often difficult to overcome.

- The cultural differences between the architect and the general contractor must be reconciled, since each may have had a different agenda
based upon their experience with more conventional design-bid-build project delivery systems. The contractual relationship between the contractor and designer is distinctly different in the design-build process, requiring them to rethink ways to work together harmoniously.

The ability to develop a design-build capability, with its potentially higher profit levels, and an opportunity to negotiate contracts rather than hard bid is a strong incentive to set aside those cultural and institutional differences.

- The owner may be placed in the role of traffic cop, having to insure that their interests are being addressed. In the more conventional design-bid-build program, the architect acts as the owner’s agent and is charged with overseeing the contractor’s obligations and responsibilities to some degree. If the owner engages a CM, they will have their traffic cop, or the owner can hire an experienced consultant to act as their representative.

- The cost savings generally touted as one of the advantages of design-build are not always there. If none accrue, an owner may be left with the feeling that they have been “sold a bill of goods.” If the design-build team has done a first-rate job of extracting the owner’s program, even if no cost savings accrue, the project will probably have been completed more quickly and with little or no change orders and disputes.
To some team members—whether they be owners, general contractors, or architect/engineers—at least initially, design-build is a venture into uncharted waters with all the dangers that such ventures possess. This is true, but with the demonstrated advantages offered by design-build, a carefully orchestrated venture with a small pilot-type project may produce confidence, knowledge, and experience leading to more such projects.

The checks and balances present in the conventional design-bid-build process are not fully present in the design-build delivery system. Once again, employing a CM as the owner’s agent or hiring an experienced construction professional will provide the client with checks and balances.

Both surety and insurance companies take a much more cautious role in the design-build process because their experience to date has been somewhat limited and the liability issues so clearly defined in the design-bid-build process become intertwined. Surety concerns can be lessened when the contractor is the lead team in a design-build venture since they will generally have had prior bonding experience. Insurance issues are somewhat different in a design-build mode and more and more insurance companies are becoming sophisticated in their approach to this process.

Developing a Design-Build Capability

Several ways exist in which a general contractor can develop a design-build capacity: hire an architect to provide in-house design capability, create a joint venture with an architect, or purchase designs just like any other subcontracted service.

Creating in-house design capability

An experienced architect comes at a cost and may seek some form of equity incentive if they were earlier successfully employed by an established firm. Thus, overhead will increase sharply and some losses should be anticipated until such time as additional projects are brought in-house and the added overhead has been absorbed. However, an experienced architect may have developed a list of loyal clients that could form the core of this new venture and bring new business into the construction firm.

The joint venture

The joint venture (JV) is a one-time business entity created for a specific project; when the project is completed, the JV dissolves. This is one vehicle to combine both design and construction and can be formed with
either architect or builder as the lead member. Licensing laws in some states may limit the ability of an architect to obtain a builder’s license or a contractor to practice architecture, so an investigation of any state laws regarding such ventures needs to be made.

The JV must specify the rights, responsibilities, and obligations of each member of the joint venture, which can be accomplished by creating a teaming agreement. The Associated General Contractors of America (AGC) publishes a number of design-build–related contracts, and their AGC Document No.499—Standard Form of Teaming Agreement For Design-Build Project (see Figure 14.3) is an excellent example of a teaming agreement.

**The limited liability corporation—the LLC**

The LLC is another business entity that can be employed to form a design-build team. The LLC offers the liability protection of a corporation but is usually created for a single purpose or specific venture. Like other business entities, the LLC requires the services of an attorney to set it up. Apart from its limited liability features, there are other benefits of the LLC:

- Unlike a regular corporation, no formal meetings are required and therefore no minutes are necessary.
- No corporate resolutions are required.
- The distribution of profits can be individually tailored.
- All business profits, losses, and expenses flow through the corporation to the individual members of the company, thus avoiding the double taxation of paying corporate and personal taxes on the money earned.

The disadvantages of an LLC are

- The LLC is dissolved when a member dies or undergoes bankruptcy, whereas a corporation can theoretically live forever.
- Because of the nature of an LLC, lending institutions are reluctant to provide funds without personal guarantees from its officers.
- Clients may be reluctant to do business with an LLC because they recognize its single-subject nature.

**An architect- or contractor-led design-build team?**

When considering a design-build team, the question of who is best suited to assume leadership may arise: builder, architect, or engineer? There are several answers to this question, but Question No.1 may well be
THE ASSOCIATED GENERAL CONTRACTORS OF AMERICA

AGC DOCUMENT NO. 499
STANDARD FORM OF TEAMING AGREEMENT
FOR DESIGN-BUILD PROJECT

This Agreement is made this __________________day of ______________________ in the year __________, by and between

TEAM LEADER ____________________
(Name and Address)

and TEAM MEMBER ____________________
(Name and Address)

and TEAM MEMBER (if applicable) ____________________
(Name and Address)

and TEAM MEMBER (if applicable) ____________________
(Name and Address)

the parties collectively referred to as the TEAM for services in connection with the following PROJECT

____________________________
(Name, Location and Brief Description)

for OWNER ____________________
(Name and Address)

AGC DOCUMENT NO. 499 • STANDARD FORM OF TEAMING AGREEMENT FOR DESIGN-BUILD PROJECT
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FIGURE 14.3 AGC document no.499—standard form of teaming agreement for design-build project contract. (All materials displayed or reproduced are with the express written permission of the Associated General Contractors of America under copyright license No.0115.)
“Which firm through their marketing efforts, or through personal contact was approached by a prospective client to discuss considering design-build for their next project?”

**Contractor as lead.** The predominance of contractors as team leaders has evolved for many practical reasons:
ARTICLE 2
STATEMENT OF QUALIFICATIONS AND PROPOSAL

2.1 The Team Members shall use their best efforts to prepare a statement of qualifications in response to the request of the Owner. Each Team Member shall submit to the Team Leader appropriate data and information concerning its area or areas of professional expertise. Each Team Member shall make available appropriate and qualified personnel to work on its portion of the statement of qualifications in the time frame prescribed, and shall provide reasonable assistance to the Team Leader in preparation of the statement of qualifications.

2.2 The Team Leader shall integrate the information provided by the Team Members, prepare the statement of qualifications and submit it to the Owner. The Team Leader has responsibility for the form and content of the statement of qualifications and agrees to consult with each Team Member, before submission to the Owner, on all matters concerning such Team Member’s area of professional expertise. The Team Leader shall represent accurately the qualifications and professional expertise of each Team Member as stated in the submitted materials.

2.3 If requested by the Owner, the Team Members shall prepare and submit a proposal for the Project to the Owner. Each Team Member shall support the Team Leader with a level of effort and personnel, licensed as required by law, sufficient to complete and submit the proposal in the time frame allowed by the Owner. A clear and concise statement of the division of responsibilities between the Team Members will be prepared by the Team Leader. The Team Leader shall make all final determinations as to the form and content of the proposal. The Team Leader shall use its best efforts, after the Team has qualified for the Project, to obtain the contract award, and each Team Member shall assist in such efforts as the Team Leader may reasonably request.

ARTICLE 3
CONFIDENTIAL INFORMATION

3.1 The Team Members may receive from one another Confidential Information, including proprietary information, as is necessary to prepare the statement of qualifications and the proposal. Confidential Information shall be designated as such in writing by the Team Member supplying such information. If required by the Team Member supplying the Confidential Information, a Team Member receiving such information shall execute an appropriate confidentiality agreement. A Team Member receiving Confidential Information shall not use such information or disclose it to third parties except as is consistent with the terms of any executed confidentiality agreement and for the purposes of preparing the statement of qualifications, the proposal, and in performing any contract awarded to the Team as a result of the proposal, or as required by law. Unless otherwise provided by the terms of an executed confidentiality agreement, if a contract is not awarded to the Team or upon the termination or completion of an contract awarded to the Team, each Team Member will return any Confidential Information supplied to it.

ARTICLE 4
OWNERSHIP OF DOCUMENTS

4.1 Each Team Member shall retain ownership of property rights, including copyrights, to all documents, drawings, specifications, electronic data and information prepared, provided or procured by it in furtherance of this Agreement or any contract awarded as a result of a successful proposal. In the event the Owner chooses to award a contract to the Team Leader on the condition that a Team Member not be involved in the Project, that Team Member shall transfer in writing to the Team Leader, upon the payment of an amount to be negotiated by the parties in good faith, ownership of the property rights, except copyright, of all documents, drawings, specifications, electronic data and information prepared, provided or procured by the Team Member pursuant to this Agreement and shall grant to the Team Leader a license for this Project alone, in accordance with Paragraph 4.2.

4.2 The Team Leader may use, reproduce and make derivative works from such documents in the performance of any contract. The Team Leader’s use of such documents shall be at the Team Leader’s sole risk, except that the Team Member shall be obligated to indemnify the Team Leader for any claims of royalty, patent or copyright infringement arising out of the selection of any patented or copyrighted materials, methods or systems by the Team Member.

ARTICLE 5
POST AWARD CONSIDERATIONS

5.1 Following notice from the Owner that the Team has been awarded a contract, the Team Leader shall prepare and submit to the Team Members a proposal for a Project-specific agreement of association among them. (Such agreement may take the form of a design-builder/subcontractor agreement, a joint venture agreement, a limited partnership agreement or an operating agreement for a limited liability company.) The Team Members shall negotiate in good faith such Project-specific agreement of association so

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Relationships with lending institutions have created significant lines of credit that are necessary in that business.

Long-term dealings with surety provide easy access to bonds.

A detailed estimating capability is available from a large database of current costs.
that a written agreement may be executed by the Team Members on a schedule as determined by the Team Leader or by the Owner, if required by the request for proposal. The Team Leader shall use its best efforts, with the cooperation of all Team Members, to negotiate and achieve a written contract with the Owner for the Project.

This Agreement is entered into as of the date set forth above.

WITNESS: TEAM LEADER:

_________________________ ◆

_________________________ ◆

BY: ______________________ ◆

PRINT NAME: ______________________ ◆

PRINT TITLE: ______________________ ◆

WITNESS: TEAM MEMBER:

_________________________ ◆

_________________________ ◆

BY: ______________________ ◆

PRINT NAME: ______________________ ◆

PRINT TITLE: ______________________ ◆

WITNESS: TEAM MEMBER:

_________________________ ◆

_________________________ ◆

BY: ______________________ ◆

PRINT NAME: ______________________ ◆

PRINT TITLE: ______________________ ◆

WITNESS: TEAM MEMBER:

_________________________ ◆

_________________________ ◆

BY: ______________________ ◆

PRINT NAME: ______________________ ◆

PRINT TITLE: ______________________ ◆

12/01

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FIGURE 14.3 (Continued.)

- Relationships with subcontractors and the legal contracts that evolved to establish and control these relationships is already in place.
- A cadre of experienced field supervisors and project managers are on hand.
- Accounting procedures to handle receivables, payables and to monitor cash flow and project budgets have been firmly established.
Schedule preparation and the experienced personnel to create, monitor, and update them are already in place.

**Contractor as prime.** A builder can engage an architect and form a design-build venture by merely subcontracting work to them in much the same manner as they subcontract work to the trades. By negotiating the services to be provided, and the interaction between contractor and subcontractor (in this case, the architect and their design consultants), the method of payment for services and other obligations and responsibilities similar to a Teaming Agreement can be developed. This prime/subcontractor relationship can effectively operate as a design-build team.

**The architect as team leader.** Architects often have very close relationships with clients, and the institutional concept of the architect as the defender of the client is hard to dismiss, adding much to their possible role as team leader. There are other rationales behind the idea of the architect acting as team leader. These include the following:

- A proven track record of successfully designing the type of project currently under consideration
- Extensive experience in providing construction services
- A nucleus of experienced field supervisors
- Experience in a specific design-market niche, such as pharmaceuticals, medical devices, or recreational facilities

It was not until 1978 that the American Institute of Architects lifted their ban on design-build. But by 1985 they had issued their first edition of design-build documents. As of 1996, a complete new series of design-build documents for architects and others was available from AIA.

**The architect as prime contractor; builder as subcontractor.** One only has to look at high-end residential construction to see an operation where the architect is prime, and the builder is the subcontractor. The same process can be applied to nonresidential design-build work.

The AIA, recognizing the need for a contract between architect and contractor, developed their Document A491-Standard Form of Agreement Between Design/Builder and Contractor, which in 2004 superseded AIA A141. These contracts were two part agreements:

- Part1—The contractor is to provide the preliminary evaluation of the owner’s program, advise on the selection of materials and constructability issues, prepare the schedule and preliminary estimates, and develop a fixed-price or guaranteed maximum price (GMP) depending upon the form of contract.
Part 2—This part of AIA A491 is basically a standard contract for construction requiring that the contractor provide all labor, materials, and equipment to complete the work outlined in the plans and specifications.

Developing a Design-Build Program

One of the first requisites to consider in developing a design-build strategy is to review the company’s accumulated data base of historical project costs for that segment of the design-build market the company wishes to enter. What is the contractor’s experience? Is it in warehousing, commercial office buildings, medical facilities?

What type of project(s) has the company successfully completed in the past five or ten years that would lend itself to a design-build marketing approach?

Other issues to consider:

- Is there a database of costs for these projects, including square-foot costs, unit costs, extractable component costs for structures, finishes, and MEP work?
- Does the company have deep experience in conceptual estimating and have they utilized these skills in negotiating work?
- Has the company worked successfully with a cadre of subcontractors experienced in critical trades—structures and MEP—that they could call upon as members of a design-build team?

A competent staff and a strong database of costs for the selected sector of the industry will arm the general contractor with the tools necessary to let the world know that they have the necessary skills to be considered a candidate for the design-build project under consideration. Having worked well with an architectural firm or two in a specific field of design may also become the genesis of a design-build venture.

Developing design-build proposals

Several executives from successful design-build firms say that a preliminary proposal to a prospective owner should not be free. There will be lots of owners on “fishing expeditions” without any real interest in pursuing a new design-build project, and these experienced design-builders strongly recommend setting a fee for any proposal. The fee doesn’t have to be substantial and maybe not even cover all the costs, but it should be large enough to weed out the interested from the merely curious.

After an initial conference with a prospective client, a typical phased proposal will be prepared, listing the various stages of project development
and their associated costs. For projects in the $10 million range, an initial fee of $25,000 to $50,000 might be proposed, depending upon the complexity and type of project under consideration. If accepted, this initial proposal would provide the owner with the following:

- A floor plan and a typical floor plan if multistoried
- Wall sections and elevations—front and typical
- Definition of the structural system to be employed
- Finish schedules, door schedules
- One-line electrical drawing
- Riser diagrams for HVAC, plumbing, and fire protection systems
- Outline specifications for all components included the previous entry
- A narrative describing the design
- Additional information that more closely defines the project—for instance, catalog cuts and manufacturer’s product brochures

The total cost of the project will be included as either a lump-sum or guaranteed maximum price contract format.

If this initial phase is acceptable to the client, the design-builder will move on to the next phase—at an incrementally increased cost. This next phase—call it Phase B—will provide the client with a 50-percent complete design, but will include more defined plans of all the construction components and systems via detailed specifications. Phase C will afford the client 100-percent complete design documents—for an additional fee. Phase D is actually the contract signing and the authorization to proceed with building.

At any step along the way, the client can decide to terminate their agreement with the design-builder and upon receipt of their total fee, the design-builder will turn over all documents developed to that point to the client for their unconditional use.

**Another approach**

Other design-builders, following similar steps outlined earlier, may limit their proposal to three steps:

- Step 1—Provide the client with a schematic design and preliminary estimate for a relatively nominal fee. If acceptable, go to the next step.
- Step 2—Develop enough scope to provide a guaranteed maximum price within a variance of plus or minus 5 percent.
- Step 3—If acceptable, go to the contract and develop construction documents while executing competitive pricing as the design proceeds,
thereby creating the fast-track process that will reduce interest on capital and enable the client to occupy the facility more rapidly. As the last buy-outs occur, generally the MEPs, the owner will be presented with a fairly good estimate of what the final GMP will be. Each-month-costs to date and projected costs to complete are prepared by the design-builder and presented to the owner.

With this type of proposal, a small fee will be negotiated with the client for the first stage, while a much larger fee is assessed to proceed to Step 2. The final step or stage is actually the contract signing with both GMP and the design-builder, in which the fee structure is included.

How Owners Select Design-Builders

Most design-build projects are awarded on the basis of either a direct competition cost/design evaluation process or the low bid, which is very similar to design-bid-build.

Owners generally look for the following qualifications when considering a design-build firm:

- The builder’s financial and bonding capabilities
- The design-build team’s experience in the type of construction being considered
- A track record of successful design and technical engineering competence
- The experience of both the designer and contractor’s key personnel and staff
- The firm’s overall experience in the design-build process
- The organization and management of the design-build entity
- The design-build team’s quality control program and administration
- The design-build team’s record of on-budget performance
- The design-build team’s record of on-time delivery performance

The selection process

The most common selection process for awarding design-build projects can take any one of the following paths:

- **Direct Selection**: Similar to a negotiated contract process, an owner may select a design-builder on the basis of reputation and previous experience, or on the recommendation by others. This method of engagement is generally limited to private sector work.
- **Competitive Negotiation:** A short list of design-builders may have submitted bids, so the owner will review each bid for compliance with the program, preliminary design considerations, fees, the time frame for design and construction, and the experience of the design and construction personnel. The owner may then elect to negotiate the project with one of the bidders, a practice common in the private sector.

- **Cost/Design Evaluations:** Also referred to as the “best value” selection, this method is used by many owners. A series of technical criteria is submitted to a short-listed group of bidders, and upon the receipt of responses, an evaluation process to review each proposal is established. Both cost and qualitative considerations are considered in the selection process.

- **Cost Competition:** Much like the design-bid-build process, this selection method is based upon a bidder’s response to a fairly complete and tightly prescribed set of requirements provided by the owner in their Request for Proposal (RFP). The owner, assuming that all bidders are submitting proposals of equal scope, then makes a selection based upon the “low bid.”

A typical contract between owner and design-builder is one prepared by The Associated General Contractors of America—AGC Document No.400—Standard Form of Design-Build Agreement and General Conditions between Owner and Design-Builder. This contract, shown in Figure 14.4, is included at the end of this chapter.

**A typical design phase agreement between a design-build entity and an owner.**
The American Institute of Architect’s (AIA) Document A491—Standard Form of Agreement between Owner and Design-Builder—is divided into two parts. Part 1 deals with the preliminary design, budget, and schedules, and the submission and acceptance of the design-builder’s proposal prior to the execution of Part 2—the agreement for construction and other services required to complete the design-build project. Whether this specific contract form is used or not, this two-phased approach is nearly standard practice in both private and public sector work.

The Basic Services clause in AIA A491 sets forth the elements to be included in the proposal in order to obtain acceptance by the owner and thus proceed to Part 2, the completion of design and the start of construction. These first-phase elements include:

- A description of the preliminary design documents. Preliminary design documents can include a typical floor plan, an elevation, wall sections, rough rendering, and a site plan outline specifications.

- A statement regarding the proposed contract sum and the form of contract being proposed—for instance, lump-sum, cost-plus-a-fee, or GMP.
A proposed schedule for both the completion of the design and the start and completion of construction.

A statement containing any deviations from the owner's stated program.

As stated previously, Phase 2 is basically a contract for construction.
Formalizing the design-build team in two phases. The team of contractor, architect, engineer, and possibly some key subcontractors will form the basis of the design-build team either in a contractor- or architect-led team. Because a design-build venture with an owner may be a two-part affair, as described previously, so must the relationship between the design-build team follow this two-part, or two-phased, relationship.
The teaming agreement

One of the first agreements to be created when a design-build venture is being considered is the teaming agreement (see Figure 14.3) between the contractor and designer to designate the rights and responsibilities of each participant during the proposal stage. If the design-build proposal testing in its preliminary evaluation. The Design-Builder shall also propose alternative architectural, civil, structural, mechanical, electrical and other systems for review by the Owner, in order to determine the most desirable method of achieving the Owner’s requirements in terms of cost, technology, quality and speed of delivery. Based upon its review and verification of the Owner’s Program and other relevant information, the Design-Builder shall provide a Preliminary Evaluation of the Project’s feasibility for the Owner’s acceptance. The Design-Builder’s Preliminary Evaluation shall specifically identify any deviations from the Owner’s Program.

3.2.3 PRELIMINARY SCHEDULE The Design-Builder shall provide a preliminary schedule for the Owner’s written approval. The schedule shall show the activities of the Owner and the Design-Builder necessary to meet the Owner’s completion requirements.

3.2.4 PRELIMINARY ESTIMATE The Design-Builder shall prepare for the Owner’s written approval a preliminary estimate utilizing area, volume, or similar conceptual estimating techniques. The level of detail for the estimate shall reflect the Owner’s Program and any additional available information. If the preliminary estimate exceeds the Owner’s budget, the Design-Builder shall make written recommendations to the Owner.

3.2.5 SCHEMATIC DESIGN DOCUMENTS The Design-Builder shall submit for the Owner’s written approval Schematic Design Documents based on the agreed upon Preliminary Evaluation. Schematic Design Documents shall include drawings, outline specifications and other conceptual documents illustrating the Project’s basic elements, scale and their relationship to the Worksite. One set of these Documents shall be furnished to the Owner. When the Design-Builder submits the Schematic Design Documents, the Design-Builder shall identify in writing all material changes and deviations from the Design-Builder’s preliminary evaluation, schedule and estimate. The Design-Builder shall update the Preliminary Schedule and preliminary estimate based on the Schematic Design Documents.

3.2.6 ADDITIONAL SERVICES The Design-Builder shall provide the following Additional Services:

3

FIGURE 14.4 (Continued.)

The teaming agreement
ARTICLE 4

OWNERSHIP OF DOCUMENTS

4.1 Upon the making of payment as required by this Agreement, the Owner shall receive ownership of the property rights, except for copyrights, of all documents, drawings, specifications, electronic data and information prepared, provided or procured by the Design-Builder, its Architect/Engineer, Subcontractors and consultants, and distributed to the Owner for this Project ("Design-Build Documents"). The Owner shall not have the right to use, reproduce and make derivative works from the Design-Build Documents for other projects without the written authorization of the Design-Builder, who shall not unreasonably withhold consent. The Owner’s use of the Design-Build Documents on other projects or without the Design-Builder’s written authorization or involvement is at the Owner’s sole risk, and the Owner shall defend, indemnify and hold harmless the Design-Builder, its Architect/Engineer, Subcontractors and consultants, and the agents, officers, directors and employees of each of them from and against any and all claims, damages, losses, costs and expenses, including but not limited to attorney’s fees, costs and expenses incurred in connection with any dispute resolution process, arising out of or resulting from such use of the Design-Build Documents. The Design-Builder shall obtain from its Architect/Engineer, Subcontractors and consultants property rights and rights of use that correspond to the rights given by the Design-Builder to the Owner in this Agreement.

ARTICLE 5

OWNER’S RESPONSIBILITIES

5.1 The Owner shall provide to the Design-Builder all relevant information for the Project, including the Owner’s Program, unless the Owner’s Program is developed and prepared with the assistance of the Design-Builder as an Additional Service. The Owner shall timely review and approve schedules, estimates, Schematic Design Documents and other documents provided under this Agreement.

5.2 OWNER’S ELECTION TO PROCEED If the Owner elects to proceed with the Project beyond the Preliminary Design-Build Services provided in this Agreement, the Owner and the Design-Builder shall enter into an additional agreement for the completion of the design and the construction of the Project. If the Owner elects not to proceed with the Project, the Owner shall have no further obligation to the Design-Builder other than its indemnity obligation pursuant to Paragraph 4.1 and the payment of compensation as set forth in this Agreement.

ARTICLE 6

CONTRACT TIME

6.1 The Design-Builder’s Services provided under this Agreement shall commence on or about ______________ and shall be completed on or about ______________.

ARTICLE 7

COMPENSATION

7.1 The Owner shall compensate the Design-Builder monthly for Preliminary Design-Build Services and any Additional Services performed under the Agreement on the following basis:

(State whether a stipulated sum, actual cost or other basis. If a stipulated sum, state what portion of the sum shall be payable each month.)

FIGURE 14.4 (Continued.)

is ultimately accepted by the owner and a contract for design and budget (Part 1 or Part A) is awarded, the design-build team will use the teaming agreement as a guide in the preparation of a contract between each member of the team. Part of the teaming agreement will be devoted to establishing the organizational structure between contractor and designer, defining the division of responsibility between team members and dealing with the issues during the proposal stage, which, hopefully,
will terminate when an award for construction (Part 2 or Part B) is executed.

The teaming agreement will concern itself with the following issues:

- Organizational Structure
- Joint venture
Limited Liability Corporation (LLC)
Prime-subcontractor agreement where the general contractor is usually, but not always, the “prime,” and the design team the “subcontractor(s)”

Division of Responsibility among Team Members
- During the proposal stage
- During the construction stage
- During post-construction

The Proposal Preparation Stage
- Which party will prepare the technical and design work necessary to comply with the owner’s Request For Proposal (RFP)? Will the architect be the lead in the design work, or will the various design disciplines report to the general contractor as the Team Captain?
- How will the costs for the proposal preparation and presentation be shared?
- If confidential information, such as financial statements, must be shared by the team members, how will this confidential and/or proprietary information be protected?
- Exclusivity and noncompeting clauses need to be addressed so that one party or the other cannot withdraw from the process and team up with another group competing for the same project.
- The establishment of penalties if one party or the other withdraws from the proposal process and the remaining members have to seek the services of other participants or abandon the project.

Pre-Client Contract Award Issues
- Agreement on the design-build team contract format
- Agreement on the scope of participation and corresponding remuneration for services
- Establish construction and design fees to be incorporated into the design-build contract with the owner
- Establish a contingency amount for both design and construction
- Set procedures for the coordination and tracking of design with the construction budget, and how adjustments are to be made in order to meet the budget
- If there is a savings clause in the contract with the owner, how are savings to be shared among the team members?
- Indemnity, bonding and insurance considerations, participation, and responsibilities are to be defined.
- Warranty issues—including design errors, omissions, and construction matters—are to be clarified.

The owner’s responsibility to the design-build team. A successful project will depend upon dealing with a knowledgeable owner who has developed a detailed, well thought-out, and defined building program. Just
as the owner will investigate the design-build team’s capabilities, so must the design-build team investigate the owner’s ability to provide the management structure to support such a venture. Some of the questions that ought to be asked, or areas to be observed, are:

- Does the owner’s management team fully support a design-build approach to the project?
- Are the owner’s representatives involved in the project technically capable of dealing with design and construction professionals?
- Will these owner representatives have the power to act, or will they only be conduits to decision makers? And will those decision be made promptly?
- Will any outside consultants join the management team, and if so, what will be the extent of their participation (for instance, permitting, zoning, legal, or technical)?
- What financial controls will have to be dealt with for requisition approval, and payment and changes to the budget?
- Does the owner require hands-on involvement in the design and construction phases in order to feel comfortable with the process? Will their representatives require notification of all meetings in case they wish to attend?

Other owner responsibilities to be considered. Owners in the design-build process, generally retain responsibilities relating to physical site conditions—not to be confused with sitework—and in that respect furnish the following information and/or services.

- Property surveys, metes and bounds, topographical studies, the location of existing utilities
- Geotechnical surveys of subsurface conditions, and test borings for foundation-bearing design determinations
- Temporary and permanent easements, zoning compliance, notification of any encumbrances affecting land use; any rules, regulations, or ordinances that would affect the type of construction being considered
- A legal description of the property
- Any existing records or drawings of previous structures on the site
- Any environmental or hazardous conditions studies pertaining to the site, such as impact studies
- Other documents to sufficiently establish the size of the project; the anticipated quality levels; a description of the structural, MEP systems and types of materials to be used in the project.
Contract Provisions Unique to the Design-Build Process

The two-part contractual relationship between the design-builder and the owner includes a termination clause that can be affected in one of two ways:

By either party, upon seven (7) days notice if the other party fails to perform “substantially in accordance with the terms through no fault of the party initiating the termination.” A “no fault” provision. Or By the owner without cause, upon at least seven (7) days written notice to the design-builder.

In the event that the cause for termination was not the fault of the design-builder, they will be compensated for all services performed to the date of termination along with reimbursable and termination costs attributed to that termination, including a reasonable amount for overhead and profit.

The Part 1 agreement generally provides for an initial payment upon the execution of the agreement. During the life of the Part 1 agreement, the design-builder may receive reimbursement of expenses on the basis of “multiples” of the amounts actually expended, if a list of reimbursable expenses was included in that agreement. This allows the design-builder to recapture some costs during the design phase, including overhead and profit.

Special provisions of design-build contracts

The standard of care provision. To ensure that the designers will use the same degree of professionalism in preparing a design for a design-build project as they would for a design-bid-build project, a standard of care provision, similar to the one listed next, is often included in the contract with the owner.

Standard of Care: The standard of care for all design services performed under this agreement shall be the care and skill ordinarily used by a member of the architectural and/or engineering profession practicing under similar conditions at the same time and locality. Notwithstanding the previous, in the event that the contract documents specify that portions of the work are to be performed in accordance with a specific performance standard, the design services shall be performed so as to achieve such standards.

Contingency clauses. Contingency clauses are common provisions in design-build contracts—their purpose being to somewhat cushion the design-builder against such events as errors or omissions that may have occurred during the design, review, and approval stages. These contingency clauses must be very explicit and leave no doubt in anyone’s mind
why they are there and for what purpose they may be tapped. One such clause in a GMP contract could read as follows:

The GMP includes a contingency in the amount of $_______ which is available for the design-builder’s exclusive use for costs that are incurred in performing work that was not included in a specific line item, or which constitutes the basis of a change order under the agreement. By way of example, and not as a limitation, such costs include trade buy-out differentials, overtime, acceleration, costs in correcting defective or damaged or nonconforming work, nonnegligent design errors and omissions, and subcontractor defaults. The contingency is not available to the owner for any reason, including changes in the scope or any other items which would enable the contractor to increase the GMP under the agreement. The design-builder shall notify the owner of all anticipated charges against the contingency.

When this contingency issue is discussed with the owner, it should be stressed that the owner should also include a contingency in their project proforma to be reserved strictly for their use and be employed for unanticipated costs such as unforeseen subsurface conditions, severe weather, the contractor’s compensable delays, and so on.

**Contract provisions relating to defining the owner’s program**

When the design-build proposal is being formulated with the owner to define their program, any deviations to that program need to be defined and discussed with the owner. This can best be accomplished by developing an Exclusions List (or Deviations List), prefaced by a contract clause similar to the following:

The design-builder’s proposal shall specifically identify any deviations from the owner’s program, the identification of which shall be set forth on a separate exhibit in the proposal identified as either Exclusions or Deviation List. In case of an inconsistency, conflict, or ambiguity between the owner’s program and the design-builder’s proposal, the inconsistency, conflict, or ambiguity shall be resolved in accordance with the following order of precedence:

1. Deviation or Exclusion List
2. Owner’s program
3. Design-builder’s proposal (excluding the Deviation or Exclusion List)

Some owners may include an “intent” clause in the contract to insure that the design-build team fully understands their program, particularly when the design documents are not fully complete at contract signing.

The intent of the contract documents is to include all of the work required to complete the project, except those portions specifically excluded (and set forth in the Exclusion/Deviation List mentioned earlier). It is acknowledged
that as of the date of the contract, the plans and/or specifications are not complete but define the scope and nature of the work and are sufficient to establish the contract sum. No adjustment shall be made in the contract sum if, as a prudent contractor, the contractor should have been aware of the anticipated work as may be required to produce a first-class (office building or whatever the project is).”

**The role of the subcontractor in the design-build process**

A design-build team will be strongly advised to assemble a select group of qualified subcontractors and suppliers during the proposal stage and actual design stage.

Contractors, architects, and engineers recognize the value that experienced, quality subcontractors can bring to the table during the initial stage of a project’s development. The subcontractor’s intimate knowledge of cost, constructability, what works, and what doesn’t work is invaluable to both builder and designer whether developing conceptual estimates, discussing design considerations, proposing value engineering options, or establishing schedules.

Subcontractors who can provide these services are sought out by design-build companies—and if they prove themselves, they can develop long-term relationships with the design-build team. Subcontractor involvement with the contractor during the design-build exercise can take several forms, some of which may be different from their relationship in a design-bid-build project. Key subcontractors assembled in the early stages of the project require some type of commitment in order to entice them to expend their time and money in the project. The subcontractor may agree to fully participate in the process in exchange for an award of a subcontract agreement, if the design-build venture is successful. But some “what if” scenarios must be explored, such as the following:

- If the project proceeds, will these subcontractors be awarded contracts for their particular scope of work via a negotiated contract?
- If the project is aborted along the way, will the subcontractors and vendors expect to be compensated for their involvement to date, and if so, what will be the order of magnitude of their compensation, and who will pay them (another item to be included in the teaming agreement)?
- If the project proceeds to contract, but along the way the owner requires that competitive bids be obtained for all major items of work, will these subcontractors agree to that arrangement?

This meeting of the minds needs to be worked out early in the game. An owner may initially elect to accept a lump-sum construction contract, but as the project proceeds through the design stage, may elect to switch to a
GMP contract and therefore wish to receive competitive bids on all items of work. The project manager should be prepared for this turn of events.

**Tracking design development and the estimate.** At each stage of the schematic or design development (DD) drawings, the estimate must be compared with the scope of work being defined in these preliminary documents. Now is not the time to scrimp on the costs of reproducibles, even if insufficient sums were not included in the estimate. Copies of the DD drawings should be distributed to all interested parties. Subcontractors should be sent copies of these drawings with a request to review and comment on the scope of the work being developed. Periodic meetings ought to be held to receive any comments that surface during these reviews, and if scope increases are discovered, they need to be dealt with promptly and professionally. At these meetings, all parties will be asked the same questions:

- Is the owner’s program being met?
- Does it appear that the emerging design is compatible with the budget?
- If the answer to the preceding question is “Yes,” no further questions need to be asked. If the answer is “No,” then three more questions will be necessary: Why not? Where is the scope increase? And what do we need to do to get back on budget?

Each design development meeting must produce meeting minutes documenting agreement or disagreement on key issues, whether further development is required to finalize the design of certain systems or components, or agreement that certain developing components or systems must be changed in order to meet budget requirements but still remain within the owner’s program parameters. If action items are noted in these meeting minutes, the party(s) expected to respond and the proposed response date should be included.

As outline specifications are being fleshed out during design development, these too require scrutiny to insure that the proper product(s) designated, as well as the materials specified, are in the “acceptable” price range. This process will continue until the final set of plans and specifications has been completed and accepted by all parties as contract documents.

The project manager assigned to the design-build project must keep meticulous and detailed notes during the various exchanges between designers, subcontractors, and vendors. Misunderstandings will occur, and when subcontract agreements or vendor purchase orders are being finalized, it is not uncommon to hear, “I never agreed to that” or “You do recall, I took exception to that” or “Don’t you recall that I said my price included X and not Y which is part of the plans or specifications.”
Detailed notes taken during this period of intense “give and take” may prove invaluable if such disagreements occur—and they will.

Several design-builders have stated that costs to assemble and monitor the design development of a design-build project are considerable and draw heavily on human resources within the company. A project manager may be required to work full time on one design-build project from initial proposal through design development and well into the construction process. So allocation of the company’s manpower needs to be reviewed when considering embarking on their first design-build project.

Risk allocation and design-build. The design-build team will assume risks considerably different from those associated with the more conventional design-bid-build process as noted in the following. Not only will the design-builder assume risks associated with the design of the structure, but may also assume responsibility for site conditions if they are requested by an owner to provide geotechnical services. Some design-builders exclude this service and request that the owner provide basic geotechnical surveys for evaluation. (See Table 14.1.)

Design-Build in the Public Sector

In July 2004, the Commonwealth of Massachusetts became the 46th state to adopt design-build as an acceptable project delivery system. One universal benefit from design-build, as reported from states surveyed by the American Association of State Highway and Transportation Officials (AASHTO) in 2002, is more rapid delivery time. In Florida, a review of 11 completed design-build projects revealed a 36-percent decrease in design and construction time, while in North Carolina, their department of transportation, NCDOT, reported that the speed and innovations provided by design-build can shorten some highway projects by three years.

Public agency contracting methods. Various methods were developed to create a public-private partnership that would allow private corporate innovation and participation while preserving the public interest. In

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**TABLE 14.1 Design-Build Teams Assume Risks Different from Those Associated with the More Conventional Design-Bid-Build Process**

<table>
<thead>
<tr>
<th>Risk Category</th>
<th>Traditional Design-Bid-Build</th>
<th>Design-Build</th>
</tr>
</thead>
<tbody>
<tr>
<td>Geotechnical services</td>
<td>Owner</td>
<td>Design-builder</td>
</tr>
<tr>
<td>Design criteria</td>
<td>Owner</td>
<td>Design-builder</td>
</tr>
<tr>
<td>Design defects</td>
<td>Owner</td>
<td>Design-builder</td>
</tr>
<tr>
<td>Constructability</td>
<td>Owner</td>
<td>Design-builder</td>
</tr>
</tbody>
</table>
response, these states began to develop a series of bid selection criteria for that purpose, which included the following:

- **Direct selection**: A competitive process where the design-builder is selected based on definable, objective criteria, prior experience, complete scope of work, terms, and price.
- **Best value**: An award based on the combination of price and qualitative evaluations.
- **Equivalent design/low bid**: A best value selection where technical submissions are followed by a critique of the proposal and respondents are afforded an opportunity to change their design and adjust their bid accordingly.
- **Fixed-price design**: The agency’s Request for Proposal (RFP) contains the maximum cost of the project, with the award based on the best qualitative design proposal.
- **Adjusted low bid**: On selection of the qualified low bidder, the price may be adjusted by further negotiations.

**The two-part RFP.** At the federal level, Federal Acquisition Regulation (FAR) 48FAR, Chapter 1, Part 15 is representative of the way in which a two-part design-build proposal is offered, a process which many states have adopted.

- **Part 1 or Part A**: This portion of the RFP is devoted to establishing the bidder’s qualifications, which will be evaluated before shortlisting and proceeding on to the next phase. This questionnaire invites responses to:
  - Verify the bidder’s technical competence and experience in the type of project being considered.
  - Document past performance of the proposed design-build team—both contractor and design consultants.
  - Detail the capacity of the team to meet the criteria included in the RFP.
  - Answer other factors that may be appropriate to the specific situation or project at hand.

- **Part II or Part B**: This phase of the RFP requires bidders to:
  - Provide a technical proposal to meet the goals established by the agency.
  - Provide cost and pricing information commensurate with the technical data submitted.

As more and more private owners and public agencies seek design-build as their preferred project delivery system, a construction company should consider the many options open to them to enter this dynamic and profitable aspect of the business.