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**DESIGN BUILD PROJECT DELIVERY - NEW CHALLENGES  
FOR THE SURETY**

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## Historical Development of the Design-Build Method

Far from a new trend, the design-build method of construction project delivery hails back to the ancient traditions of master builders who had complete accountability for their construction. In recent years design-build has gained significant interest in both the U.S. and abroad. In fact, according to Engineering News Record ENR magazine, between 1995 and 1996 alone, the number of U.S. projects (\$5 million and above) completed using design-build grew more than 100%.<sup>1</sup> The most compelling statistic behind the surge in design-build acceptance and popularity has been the recent projection that by the year 2005, over 50 % of public and private construction projects will use this delivery method.<sup>2</sup>

The underlying concept of the design-build construction project delivery method is to simplify the construction contracting process by consolidating the design and construction responsibilities for a project into a single contract. Both public and private sector owners now demand single-source project responsibility in contrast to the conventional de-centralized method of project delivery, design-bid-build.

In the 1970's, the design-build concept first became an organized and accepted approach to project delivery, primarily in private sector construction. The evolution from an ancient concept to a contemporary format was driven by owners seeking ways to reduce the time cycle for design and construction, which in turn reduced the risk and effect of economic inflation on project budgets and financing. Owners also sought solutions to the increasing cost of disputes and delays resulting from what were perceived as adversarial relationships that developed with de-centralized design and construction processes.

There have also been other market-driven factors responsible for design-build's gain in popularity. Traditional architectural and engineering firms were faced with the reality that they had to take back lost professional control of the construction process in order to restore confidence caused by the perception (or reality) that the building design professions were responsible for adversarial relationships that typically developed during construction. Despite fear of a loss of autonomy and professional judgment, design professionals were also forced to embrace design-build by the economics of the marketplace, as they could not survive on perennially marginal design fees alone.

Until recently, acceptance of design-build by the public sector was complicated by legal, licensing and ethical matters. Primary resistance to the concept was driven by ethical concerns; the otherwise independent judgment of architectural and engineering professionals could be affected by influences from the financial risk-taking typically found in the "build" side of the design-build process. Secondary resistance was driven by legal concerns over the potential loss of checks and balance to protect precious taxpayer's money. However, the legal and ethical obstacles in the public sector have now taken a "back seat" to stronger positive attributes: effective budget control, and the speed / quality of construction resulting in saving of precious taxpayer's money.

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<sup>1</sup> "The Top 100 Design-Build & Construction Management Firms", Engineering News Record, June 1998, p. 52

<sup>2</sup> Zweig, White & Associates, Inc., Design Build Survey, 1997

## **Methods of Construction Project Delivery**

There are four methods of construction project delivery in use today. The Design-Bid-Build Method of project delivery is considered the traditional or conventional approach to building construction, especially in the public sector. The Design-Build Method is considered one of three “alternative” approaches in use today. Other alternative approaches are Construction Management-Fee Method and Construction Management-At Risk Method, which are variations of the same basic concept of construction management.

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### ***Methods of construction project delivery***

- ***Design-bid-build***
- ***Construction management - fee***
- ***Construction management - at risk***
- ***Design-build***

### **Design-Bid-Build**

Design-Bid-Build is the traditional approach to project delivery, especially for public sector construction projects. In this method, the planning, architectural and engineering design of a construction project is conceived in a process that is contractually separate from the construction process, thus preserving the design professional’s independent judgment. In most cases, the actual construction cost, schedule and logistical issues of building are not addressed until the bidding process is complete. Using this conventional method of building is a time-consuming exercise that often overlooks budgetary and logistical construction parameters until the construction phase. One phase must be completed before the next phase can begin. Lack of a team approach can create delays and communication problems that lead to, among other things, finger pointing and cost overruns. The primary attribute of this type of project delivery, however, is that design and technical quality of a construction project are not compromised by the profit motivation of construction.

### **Construction management - fee**

Construction management (CM) for a fee, also known as “pure professional” format construction management, was first defined and developed in 1981 by the Construction Management Association of America as an alternative project delivery approach. The CM concept is based on the idea of promoting teamwork and minimizing adversarial relationships that are common with the traditional design-bid-build method. In the CM-fee approach, the construction management entity enters into a contract with the owner and in effect is an independent representative or agent of the owner which manages and coordinates the design, bidding, and construction of a building purely in the owner’s interests. As an independent agent of the owner, the CM for fee typically has no financial liability, and does not assume contractual or other responsibilities of a general contractor.

## Construction management - at risk

Construction management at risk (CM@R) is a variation on the “pure” method, where the construction management entity takes a more comprehensive role by assuming legal and financial responsibilities for a construction project. In this approach, the CM guarantees a maximum price for the construction of the project, thereby assuming financial risk and resultant profit motivation.

## Attributes of Design-Build Project Delivery

The unique attribute of design-build is that a single entity has total financial and legal responsibility for both design and construction of a building. Most research today indicates that design-build yields better cost control, speed, and quality equal or better to other methods of project delivery. A recent study conducted by Penn State University and sponsored by the Construction Industry Institute (CII) studied 351 construction projects in 37 states, from 5,000 -2.5 million square feet in area, and representative of three modes of project delivery (design-bid-build (DBB), design-build (DB), and construction management - at risk (CM@R) )<sup>3</sup>. Project type and ownership breakdown was as follows:

Project Type	
Light Industrial	28%
Heavy Industrial	5%
Multi-story residential	8%
Commercial office	24%
Commercial office (complex)	18%
High technology facilities	17%

Project Ownership	
Public sector	43%
Private sector	57%

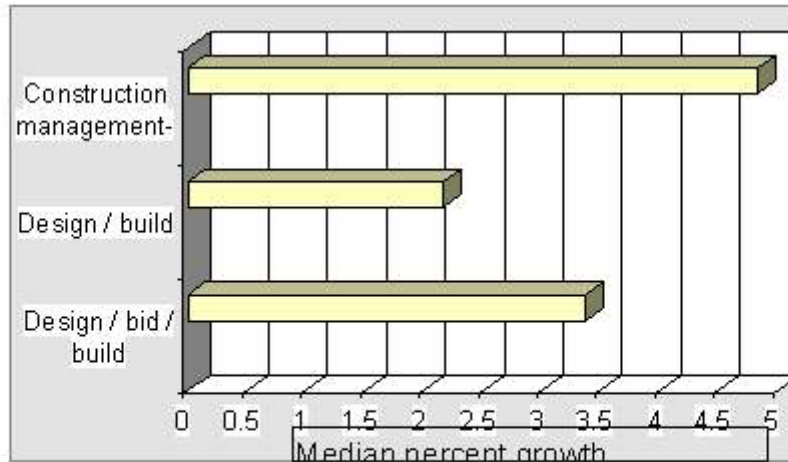
According to the study, DB unit cost was 4.5 % less than CM@R, and 6% less than DBB. Construction speed was measured in square feet completed per month, and DB was 7% faster than CM@R and 12% faster than DBB. Delivery speed (completion) for DB was 23% faster than CM@R and 33% faster than DBB. It is also interesting to note that the Penn State study found that in the worst performing projects using alternative modes of project delivery (DB, CM@R), 73% engaged the contractor too late in the design process, and 76% had teams with little or no prior experience in alternative project delivery. These facts provide

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<sup>3</sup> Konchar, Mark & Victor Sanvido, Penn State University-Construction Industry Institute study excerpted in Design-Build Magazine, April 1998, p- 47

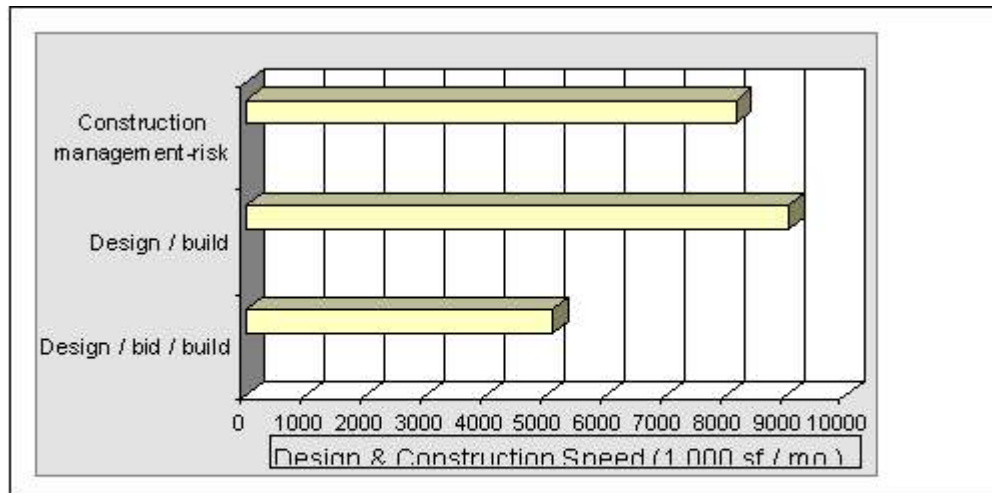
valuable insight for the surety in risk management assessment.

A similar study conducted by the University of Reading in the United Kingdom provided evidence that design-build resulted in 12% improvement in construction speed, 30% improvement in project delivery speed, and 13% reduction in unit cost of construction, with most design-build projects studied having on-time completion and completion within 5% of original budget<sup>4</sup>.



### GROWTH OF CONSTRUCTION COST

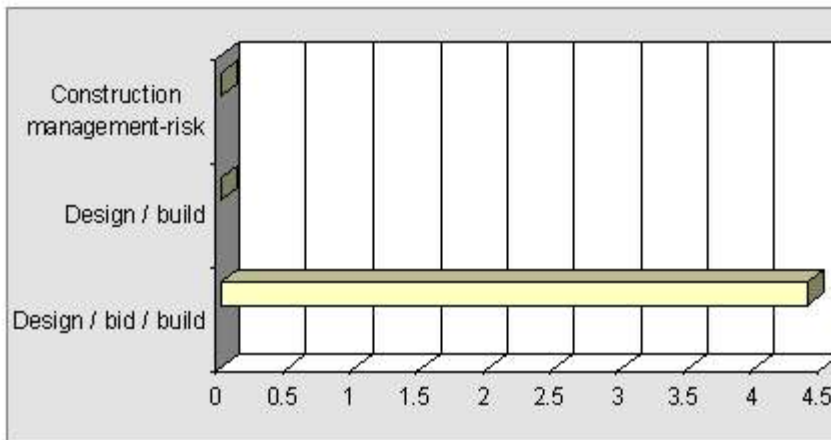
Source: Pennsylvania State University- Construction Industry Institute



### MEDIAN DESIGN & CONSTRUCTION SPEED

Source: Pennsylvania State University- Construction Industry Institute

<sup>4</sup> Konchar, Mark & Victor Sanvido, Design-Build Magazine, April 1998, p. 47



### **MEDIAN DESIGN & CONSTRUCTION SCHEDULE GROWTH**

Source: Pennsylvania State University- Construction Industry Institute

### **Design-Build Legal Issues**

There are a myriad of legal issues affecting design-build that still remain untested or unresolved. The four most important legal issues which directly affect the surety's underwriting risk management are:

- ***Contractual relationship of the parties***
- ***Design professional's obligations***
- ***Licensing, insurance and bond obligations***
- ***Regulation of procurement for design & construction services in the public sector***

***Contractual relationship of the parties*** - The primary difference distinguishing design-build from traditional design-bid-build projects is that the design professional is not the owner's representative, and is instead the contractor's teammate. Design professionals have contractual incentives to perform their services in a manner to achieve the design-build team's goals, which are not always in the owner's best interests. The design professional may have a disincentive to call the owner's attention to difficulties with the construction work. Also, the design professional may value such factors as cost and construction logistics over other design or technical criteria of importance to the owner, such as life-cycle performance.

The existence of a team comprised of contractor and architect/engineer raises unique legal contractual issues. Will one be prime to the owner with the other as a subcontractor? If the design/builder is not already a single entity, do the contractor and designer form a single entity to contract with the owner, and if so, should the entity be a joint venture, corporation or limited liability company. Within the design-build entity, how will decisions be made, and how will disagreements be resolved?

The effect of design-build contractual relationships on the surety's obligations can be best understood by reviewing the design and construction contract documents and guidelines

for design-build published by the American Institute of Architects (AIA) and the Associated General Contractors of America (AGC). The American Institute of Architects (AIA) design-build family of contract documents are all two stage contracts; the first stage is for preliminary design and budgeting, and the second stage is for design and construction as follows:

- AIA document A191-1996 ed. "Standard Form of Agreement between Owner and Design-Builder"
- AIA document A491-1996 ed. "Standard Form of Agreement between Design-Builder and Contractor"
- AIA document B901-1996 ed. "Standard Form of Agreement between Design-Builder and Architect"

The Associated General Contractors of America (AGC) design-build family of contract documents and guidelines are as follows:

- AGC 400 "Preliminary Design-Builder Agreement between Owner and Contractor"
- AGC 405 "Design-Build Guidelines for Building Construction"
- AGC 410 "Standard Form of Design-Build Agreement & General Conditions between Owner & Contractor (basis of payment cost plus fee with guaranteed maximum price)"
- AGC 415 "Standard Form of Design-Build Agreement & General Conditions between Owner & Contractor (basis of payment lump sum)"
- AGC 420 "Standard Form of Agreement between Contractor & Architect/Engineer for Design-Build Projects"
- AGC 450 "Standard Form of Agreement between Design-Builder Contractor & Sub-Contractor"
- AGC 460 "Standard Form of Agreement between Design-Builder Contractor & Sub-Contractor(sub-contractor provides a guaranteed maximum price)"
- AGC 480 AIA/AGC joint document "Recommended Guidelines for the Procurement of Design-Build Projects in the Public Sector"
- EJDC 1910-20 Engineer's Letter to Owner Requesting Instructions Re: Bonds & Insurance During Construction'
- EJDC 1910-21 Owner's Letter to Engineer Requesting Instructions Re: Bonds & Insurance During Construction
- AGC Contractor's Reference Manual for Design-Build

***Design professional's obligations*** - The design-build relationship allows, but does not require, a change in the designer's standard of care. In a traditional role, an architect or engineer is only held responsible for exercising the degree of skill or care that the average, similarly trained architect or engineer would employ, and does not typically guarantee a successful outcome for services. However, the standard of care for a contractor is different; contractors provide both implied and express warranties of a successful project as a result of their services, provided that the design and other factors over which they have no control are properly performed and appropriate.

The courts have upheld the definition that a design-build entity is more similar to a

contractor than to a design professional. Accordingly, design-build entities are usually held to the same warranty standards as construction contractors. This is true even of the design services that they offer. This is one of the primary reasons why owners like the design-build method of project delivery; the whole truly is greater than the sum of its parts because the design professional is held to a stricter standard in a design-build context than in a design-bid-build context where design services are under separate contract. One of the untested legal issues affecting the surety is this shifting of design liability risk to the design-build contractor, and resultant bond obligations for performance of design services. The design-builder's liability for design problems can be returned to the usual "appropriate levels of skill and care standard by including risk-shifting provisions in the design-build agreement, or using industry standard contracts such as the AIA or AGC documents which allow responsibilities and risk to be allocated along more traditional lines<sup>5</sup>. It is essential for these limitations of liability and remedies be stated expressly in the design-build contract.

One of the most interesting dilemmas (and resulting risk for the surety) in the design-professional's role in design-build lies in the conflict of interest with licensing obligations. The design professionals' duty to protect public health and safety remain paramount even if it is in conflict with the goals and interest of the design-build entity. The design professional has a legal obligation when a design-build decision violates applicable law or compromises public safety.

***Licensing, Insurance and Bond Obligations*** - Professional licensing statutes in every state regulate the practice of professional engineering and architecture. A design-builder would typically retain an independent licensed design professional under a separate contract. However, even where contractual relations separate these roles, some states may apply licensing laws that a design-build contractor by definition is practicing architecture or engineering, and therefore can not legally execute a design-build contract unless the contracting entity is a licensed design professional. Two cases illustrate the inconsistent interpretation of licensing laws.

In 1988, the New York Court of Appeals ruled that design-build contracts between an owner and construction contractor are not necessarily void, merely because the contractor is not a licensed architect or engineer<sup>6</sup>. In this case, the agreement between the owner and design-build contractor named a specifically designated and licensed design professional as part of the design-build team (contract). After disputes arose, the owner refuse payment to the design-build contractor, claiming the design-build agreement was void and unenforceable. The Court of Appeals held for the design-build contractor, deciding that the contract did not provide for the unauthorized practice of architecture / engineering, as the designated design professional was properly licensed. This case illustrates the minimum requirement that in New York, a design-build contract must not only designate a licensed design professional to perform design services in a design-build contract, but more important

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<sup>5</sup> AIA Document A491, "Standard Form of Agreement between Design-Builder & Contractor", Section 7.2 Design-Builder's Liability Insurance, Section 7.4 Performance & Payment Bonds, Section 11.7 Indemnification

<sup>6</sup> *Charlebois v. J.M. Weller Associates*, 72 N.Y.2d 587, 535 N.Y.S.2d 356, 531 N.E.2d 1288

that the building contracting entity must state in express terms that it will not itself perform any design duties.

Conversely, in Missouri, a design-build contract was held to be illegal under Missouri law where the design-builder entity itself lacked a license to practice architecture / engineering, despite provisions for contract of a licensed design professional in the design build contract<sup>7</sup>.

The issue of professional licensing is complicated by some state statutes which may require majority ownership by licensed architects / engineers and licensing board approval of entities providing professional design services<sup>8</sup>. Similarly, a design professional entity which enters into a design-build contract may in some states require licensing as a building contractor in order to legally perform as a design-build entity.

Consider the following hypothetical situation to further illustrate more specific conflicts between provisions in standard performance bond and design-build contract documents: an investigation of a design-build contractor's default under a performance bond determines a design error / omission as the fundamental cause of construction problems, which in turn is determined to be the direct cause of the contractor's failure to perform. The design-builder contractor had entered into an agreement with the owner using AIA document A191 "Standard Form of Agreement between Owner and Design-Builder". The design-builder in turn sub-contracted the professional design services to a separate entity licensed to practice architecture / engineering using AIA document B901 "Standard Form of Agreement between Design-Builder and Architect"; the design professional entity is insured with conventional errors and omissions professional liability insurance. The design-build contractor executed a standard AIA document A312 Performance Bond with the surety.

AIA document A312 Performance Bond states in paragraph 7, [The surety shall not be liable to the owner or others for obligations of the contractor that are unrelated to the construction contract....]. However, AIA document A191 states in Section 1.2, paragraph 1.2.1 defining responsibilities for design services [ The contractual obligations of such (design) professional persons or entities are undertaken and performed in the interest of the Design-Builder.] Furthermore, paragraph 1.2.4 of same document / section states [ The Design-Builder shall be responsible to the owner for act and omissions of the Design-Builder's...sub-contractors and their agents...and other persons, including the Architect and design professionals, performing any portion of the Design-Builder's obligations....].

This hypothetical example illustrates that the performance bond and owner / design-builder agreements require close scrutiny and coordination to manage the surety's risk of liability for design professional errors and omissions.

***Procurement of design & construction services in the public sector*** - A federal construction services procurement reform bill passed by the U.S. Congress in 1996 and

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<sup>7</sup> *Kansas City Community Center v. Heritage Industries, Inc.*, 972 F.2d 185 (8<sup>th</sup> Cir. 1992)

<sup>8</sup> Example, Conn. Gen. Stat., Chapter 390, Architects Statutes & Regulations

implemented in 1997 was the first major public recognition and definition of the procurement requirements for design build project delivery in the public sector. This law requires a two-step process in selection of design-build teams and their proposals to counter past improprieties in the team selection process.. The process involves an initial assessment of a design-build team's technical qualifications prior to submission of any design or price proposals (qualification-based selection), then short-listing to a field of five design-build teams for submission of design / price proposals.

In addition to federal legislation, a recent survey by the Buildings Futures Council <sup>9</sup> found that thirteen states allowed the use of design-build, either through designated agencies, or legislation defining allowable types of projects and procurement procedures. In most states though, procurement laws require separation of design and construction services, where the selection process for design services is qualification-based, and construction services are procured based on a competitive bid system in which contracts are awarded to the lowest qualified bidder for a completed design. While these states do not expressly prohibit design-build procurement , the competitive bidding system precludes the use of the design-build.

In one recent court case, a state appeals court ruled that a city was bound to accept the lowest bidder on a design-build contract for a public building, despite qualification-based design procurement laws. It was ruled that the design component of a design-build contract does not remove it from consideration of the requirements of the state's competitive bidding statute during the bidding process.

## **New Challenges for the Surety**

The primary challenges for the surety industry lie in understanding of the practical considerations necessary to assess the risk of underwriting bonds for design-builder entities and handling claims involving design-build contracts.

### ***Risk Assessment of Design-Build Bonds***

- ***Determine the legality of the project and design-build contract relationships***
- ***Examine the proposed design-build contractual relationships***
- ***Assess the qualifications of the design-build contractor***
- ***Assess the project owner***
- ***Investigate project scope, scheduling, financing***

***Underwriting*** - The most valuable resource for understanding and assessing potential design risk are claims analysis studies conducted by design professional liability insurers. Examining design professional liability data is not only essential in addressing the changed role of the building contractor in design-build contracts, but also in assessing the surety industry's risk in bonding the increasing market for architects and engineers who act as the "prime" contractor in design-build contracts.

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<sup>9</sup> Buildings Futures Council Fifty State Survey on State Bidding Laws, September 1994

In a Design Professional Insurance Company (DPIC) study of 3,700 closed architectural claims<sup>10</sup>, roofs, walls, code compliance and HVAC system problems accounted for 25% of the claims and 77% of claims dollars paid between 1989 and 1995. Causes of the claims were also analyzed according to the chart below, and in many cases, more than one element was the cause of a claim.

**CAUSES OF ARCHITECTURAL LIABILITY CLAIMS**

Cause	% of Claims
Field changes	14%
Consultant	24%
Design Error	29%
Field Observation	30%
Construction Problems	45%

**Field changes** - changes made without the design professional’s knowledge, usually by the owner or the insured’s consultant.

**Consultant** - errors due to changes during design or construction that were not communicated properly to the architect, or errors that were manifest after another problem occurred. Uninsured consultants created the most problems.

**Design error** - in one in four cases, the consultant was to blame, but a similar percentage of architects were at fault.

**Field Observation** - the lack of time spent and inexperience of the staff assigned to the task by architects.

**Construction problems** - Poor workmanship and replacement of contractors are red flags.

Another practical consideration in underwriting risk assessment of the design-build method risk is to examine the legal relationships of the design-build parties. A framework for further study can be formed by reviewing the previously referenced AIA and AGC design-build contract documents and guidelines.

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<sup>10</sup> Williams, Barry, California Polytechnic Institute, “Study of Architectural Closed Claims”, Commissioned by Design Professionals Insurance Company, Monterey, CA

To illustrate this point, consider the *Spearin Doctrine* established by the U.S. Supreme Court, whereby a project owner is made responsible for project design and related omissions, errors, and deficiencies in the specifications and drawings of a construction project. Under a design-build contract, an owner of a project is primarily responsible for providing a clear statement of the owner's requirements so that the project which is designed and constructed does in fact meet the owner's needs. However, it is the design-builder's responsibility to procure design and construction for a project in conformity with an owner's requirements; in other words, a design-build contractor can not claim deficiencies in a design or specifications as a reason for performance failure. How will the *Spearin Doctrine* be interpreted in a design-build context ?

The Design Build Institute of America's (DBIA) "Guide to Insurance, Surety and Risk Management", targeted for completion by the end of 1998, should also prove to be a valuable practical resource for the surety. This document will provide an overview of the legal relationship between the design-build partners, including responsibilities, indemnity agreements, and insurance requirements.

**Claims handling** - the surety industry has just begun to develop practical experience in handling design-build performance and payment bond claims. Recent claims have proven the need for the surety to develop in-house expertise or engage consultants experienced in architectural / engineering practice and principles.

## **Conclusion**

There has been remarkable growth in the market for design-build services, and it is almost certain that this method will become the dominant project delivery system in the construction industry. Empirical data now seems to indicate that design-build offers the highest probability of successful project attributes and built-in mechanisms to reduce the disputes and problems which lead to bond defaults.

The surety's success in management of the increased risk and exposure to liability posed by the design-build concept will be dependent on understanding practical design-build issues, and development of new products and services to meet the market's demand for this new approach to construction project delivery.