BEST PRACTICES FOR AIRPORT DESIGN/BUILD PROCUREMENT

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ABSTRACT

Budget cuts and decreased airline capacity have caused most airports to scale back their capital programs. Still, over the past few years more and more airport owners have been looking for new methods of designing and building facilities quickly and economically. One project delivery method that is gaining popularity across North America is Design/Build (D/B).

D/B projects combine the design and construction phases into one contract that is awarded to a single entity, usually a joint venture made up of consultants and contractors. In D/B projects, the design firms' role may be significantly different than traditional design/bid/build (D/B/B) projects. These role changes can create significant opportunities for airport consultants and project sponsors, but they can also pose challenges and risks.

This paper summarizes the findings of the Innovative Pavement Research Foundation research report IPRF 01-G-002-06-1 *Using Design/Build Acquisition for Airfield Pavements* including best practices for the successful use of the D/B method for airport pavements.

INTRODUCTION

In the design/build (D/B) project delivery method, the design and construction phases of a project are combined into one contract and awarded on either a low bid or best-value basis. D/B allows for greater collaboration between the designer and contractor. Agencies can focus on policy and planning, while the private sector deals with cost efficiency and construction risk.

Under the traditional design/bid/build D/B/B procurement method, the owner designs the project in-house or through a contract with a consultant. When the design is complete, the project is then advertised and the owner enters into another contract for the construction of the project. The contract is usually awarded to the lowest responsive bidder. This process may be repeated a number of times for different elements of a project until the project is commissioned.

Under the D/B, the owner identifies the project's desired outcome, leaving most of the decision making to the D/B entity. Prospective bidders are provided with a preliminary design and mandatory performance-related requirements. Bidders are asked to prepare a technical and price proposal proposal showing how they intend to complete the remaining design and construction of the project. The contract is awarded to a firm that provides the best value offer.

The use of D/B is attractive because it provides the opportunity to obligate funds quickly. The methodology requires a single procurement phase, the guaranteed maximum price of the project is known, and fast tracking is accomplished by paralleling design and construction activities. In contrast, traditional D/B/B projects use separate contracts for design and for construction, the budget for the project is based on the designer's estimate, and the construction schedule is not detailed or finalized until the construction phase commences.

BEST PRACTICES

D/B is a unique, distinctive project delivery process. Best-value selection combines the best features of both professional qualitative selection and competitive price selection. Accordingly,

documents should be tailored to a D/B process and the project requirements. The following sections outline the various steps in developing D/B procurement.

Step 1 – Determine Suitability of the Project for D/B Procurement

The first step in determining the suitability of a project for D/B procurement is to determine if legislation exists to allow it. Fatal flaws include items such as environmental approvals, record of decision and project funding. The next step is to evaluate whether the project provides the opportunity for any of the following considerations:

- Savings in project delivery time
- Potential for VE for project enhancement
- Project complexity, environmental assessments, design, and construction

If there are no fatal flaws identified, then additional considerations should be analyzed to evaluate the anticipated benefits and risks associated with the D/B procurement methodology. To determine the suitability of a project for D/B, the key factors specific to the project should be considered. Typically, these factors are divided into primary, secondary, and other considerations which may impact the decision to use D/B for a particular project.

A. Primary Considerations (Deal Breakers)

- Time constraints for project delivery
- Status of environmental approval
- Availability of funding
- Well defined scope

B. Secondary Considerations (Advantages of Design/Build)

- Overall project complexity
- Complexity of performance requirements
- Project size
- Availability of qualified teams
- Owner experience and resources
- Cost of the project
- Degree of team collaboration
- Number of contracts
- Allocation of risks
- Interest in innovation

C. Other Considerations (Risk Transfer)

- Airside security
- Operational constraints
- Utility relocations
- QA/QC responsibilities
- Weather conditions
- Performance guarantees/warranties

- Design reviews/approvals
- Impact of unknown site conditions
- Ability to pay stipend
- Ownership of intellectual property

Primary considerations are those that would have an overriding influence on the decision to move forward with the project. Secondary considerations have a lesser influence and usually are taken into account when there are no overriding factors or one type of contacting mechanism is not clearly superior for the particular project. Other considerations may have some influence on the procurement type decision but would not preclude the use of D/B. Primary considerations are weighted the highest to reflect their importance in moving forward with the project and the D/B procurement method. The list is not exhaustive, but rather reflects a particular owner's needs and expectations. Other constraints and project-specific considerations should be added or deleted as necessary with individual weighting modified to reflect local needs and expectations.

To assist in evaluating the suitability of projects for the D/B procurement method, a project suitability matrix (template) was developed. The matrix includes the considerations outlined above with appropriate weighting factors for each group. Within each group, the individual consideration items also are given weighting factors. Each factor is assessed using specific criteria of the owner's needs and expectations for the project. Once the factor is rated, the total scores are summed on a scale of 0 to 100. If the score totals less than 50, the project is not considered a good candidate for D/B procurement. Between 50 and 65, the project can be considered for D/B. Scores over 65 indicate that the project is well suited for D/B.

Step 2 – Prepare Procurement Development Plan

This phase of the project involves the preparation of the procurement development plan, including project description, strategic planning, etc. This phase ensures the owner has prepared a blueprint for the project and establishes core guidelines for project delivery.

Strategic Planning

Current and future airside requirements are assessed to determine the general facility development for the owner/user. Inputs for strategic planning may include the airport master plan, airport pavement management system, maintenance reports, pilot and tenant feedback, operations reports, and traffic forecast. For specific projects, the relevant environmental documents should be completed and approved.

Project Description

The owner (or the owner's program manager) establishes the project requirements in terms of project limits, design and performance criteria, quality standards, applicable codes, regulatory standards, and so on. The project description:

- Outlines the owner's expectations of the key physical aspects

- Identifies the available funding, expected design work, construction work, prospective schedule, technical criteria, reviews project constraints (environmental, third party involvement, etc.), and warranty considerations
- Summarizes the selection process and scoring
- Identifies important project issues that are not readily apparent through the technical requirements

Risk Management

D/B shares risk between the owner and the D/B team. The areas of risk should be well defined in the RFP so that the D/B team understands their responsibility for risk. The airport owner normally maintains responsibility for high-risk areas throughout the duration of the contract. If differing site conditions pose increased risk due to such issues as unforeseen ground conditions, hazardous materials, underground utilities, archeological sites, endangered species, or other environmental concerns, the airport owner should accept responsibility unless specified otherwise in the contract. An effective way to identify and allocate the risks associated with a project is through the use of a risk allocation matrix.

Selection Method

The three common approaches to selecting a D/B entity are:

- Low bid – selection based on the lowest construction bid
- Best value bid – combination of a weighted technical approach and low bid
- Qualifications – the construction bid is not a factor in the final selection

The two-step bid appears to be the preferred approach—specifically, an approach where the first phase consists of an evaluation of bidder qualifications and a second phase which evaluates the technical and financial submission of shortlisted bidders. Some agencies may not be able to use best value or qualifications-based selection because of legislatively mandated low bids only.

There are also a number of different methods that can be used to evaluate best value and qualifications-based bids:

- Pass/fail
- Modified pass/fail
- Qualitative rating
- Direct points scoring

The pass/fail method uses a list of evaluation criteria that proposers either meet or do not. If they do not meet the criteria, the bid may be disqualified. The modified pass/fail method allows some “gray area” where a reviewer may pass a bid if the majority of the criteria are met and the others are close to being met. The qualitative rating uses a system such as good, fair, poor to rank the submissions. The direct points scoring method assigns points to each rating criterion, with a minimum number of points considered acceptable to move forward in the bidding process.

D/B presents a unique opportunity to optimize price and other issues. The most effective selection results from a competitive process that balances first cost with life cycle costs, design aesthetics, maintenance/operational costs, and other project-specific qualitative and efficiency factors. The Design-Build Institute of America indicates that D/B selection is typically weighted about 60 percent towards the technical submission and 40 percent towards price. Current trend indicates the maintenance of this heavy weighting in favor of technical submissions.

Roles of the Owner and D/B Contractor

In the development stage, the agency oversees the development of the design criteria, the contract documents, and the procurement process. During the design and construction phase, the agency is responsible for controlling the process through design review, notices to proceed, monitoring contract compliance and schedules, processing progress payments, performing QA overview, negotiating contract amendments, and resolving disputes. With respect to QA, the agency needs to monitor compliance with the contract documents and verify the contractor's compliance with the project quality control plan. The agency's team must be developed to ensure rapid review and processing to avoid schedule impacts to the D/B team.

There are no inherent "design/build" roles and responsibilities simply because a contract is called design/build. To increase the probability of a successful D/B contract, it is necessary that both the Agency and D/B contractor have a clear understanding of their respective roles, responsibilities, and risks. The general descriptions of the D/B roles may change to meet the requirements of individual projects.

Agency Role

The role of the agency is to:

- Clearly establish the roles of the Agency and D/B Contractor in the RFP.
- Express the intent of the design and provide an adequate and complete facility design/construction scope and criteria in the RFP.
- Establish execution requirements (e.g., customer schedule, customer operations, and any constraints on Contractor work, Contractor submittals, permits, special work acceptance requirements) and identify appropriate requirements in the RFP.
- Monitor design and construction during implementation for contract compliance.
- Respond quickly to the design and construction needs of the Contractor to avoid slowing down or otherwise impeding the Contractor's schedule.
- The Agency must not assume responsibility for the design adequacy by "approving" design or construction submittals, except to approve requested deviations from the contract when acceptable and appropriate.

D/B Contractor Role

Whether the prime is the designer or contractor, or both (joint venture), its role in a D/B contract is expanded from the conventional D/B/B to include the following:

- Project management

- Integrated schedule for design and construction
- Extensions of designs
- Permit preparation (sometimes application)
- Cost control
- Material and equipment acquisition
- Construction
- Inspection and quality control
- As-built survey for acceptance and record purposes
- Training for operation and maintenance
- Turnover, warranty and record drawings.

The D/B Contractor employs the designer(s) of record (DOR). The DOR must personally ensure the integrity of all extensions of the designs and ensure that all equipment and materials meet the design criteria requirements. This is a D/B Contractor function, not an agency function, which is a significant role reversal from D/B/B contracting.

Owner's D/B Consultant

An outside firm with adequate experience and expertise may be engaged to assist owners who do not have in-house experience with defining, procuring, or administrating D/B projects. This role typically is called a design/build consultant or a program manager.

Supplemental Technical Experts

Some owners have sufficient expertise within their organizations to prepare the necessary documents and administer a D/B contract, such as the USACE or large airport authorities. Others without sufficient internal resources may need to use external consultants to provide specific subject matter expertise. These external consultants may be responsible for developing the RFP technical documents, performance specifications, monitoring contract compliance, processing progress payments, performing QA activities, and assisting with the negotiation of contract amendments and disputes.

Schedule and Planning Budget

The short project delivery schedule as compared to D/B/B is the reason many owners choose the D/B procurement methodology. The owner will need to establish major procurement and construction milestone dates. In addition, the owner will need to have an understanding of the overall cost of the project for budget allocation.

Step 3 – Development of the Request for Qualifications

The professional, financial, and experience requirements for D/B teams and the general project parameters are articulated in an RFQ prepared by the owner, in-house, or by the owner's representative or program manager. The RFQ should include an information session to present the general requirements of the project and their expectations. Guidance is provided in FAA AC 150/5300-9A for pre-design, pre-bid and pre-construction conferences for airport grant projects.

Prequalification Requirements

The project is advertised and qualification statements are received in response to the RFQ. The selection criteria required to determine who the D/B team will be is critical and need to be well defined, and an evaluation method or rating system needs to be established for items such as experience, management, and so on. Large projects require bonding; this may limit the number of firms that can qualify.

The RFQ is used in the two-stage process for D/B procurement to shortlist qualified D/B entities for receipt of RFPs and the opportunity to prepare a detailed proposal for the project. Key considerations of the RFQ are to establish the team's ability to complete the design and construction, the experience and past performance of the team and of key individuals, and the financial capacity of the team to undertake the project.

Below are some of the considerations that could be included when reviewing RFQ submissions:

- Team's understanding of the project
- Individual and corporate team members and experience with design/build
- Previous experience of team members working together
- Relevant design capabilities
- Specialized construction capabilities
- Experience with complex construction staging, airport operations, site conditions
- Safety record
- Key project team member availability and time commitment (project director, design manager, construction manager, quality manager, etc.)
- Quality control organization and performance
- Bonding record or proof of bonding ability
- Past performance (completion, quality, claims, fines, schedule)
- Financial capability
- Understanding the local and political environment of the work location
- Project management and schedule control
- Risk management

Overly extensive proposal requirements are financially burdensome to the proposers, serve to discourage the participation of quality firms, and add unnecessarily to the owner's proposal review process. The quantity of proposal deliverables should be limited to information necessary to adequately judge competing proposals and to protect the owner's interest. Care must be taken establishing acceptable qualifications and experience. Raising the bar too high may preclude firms that normally would be well qualified to undertake the assignment.

The RFQ submissions should be evaluated by a qualified evaluation committee. To ensure consistency in the evaluation process, some agencies have held training sessions for the committee members in advance of the review process.

The Federal Acquisition Guidelines (FAR) suggests that the maximum shortlist number should be limited to five. However, in consideration of the effort required to respond to the RFP, consideration should be given to shortlisting no more than three.

Disclose Selection Criteria and Weighting

The basis for evaluating submissions should be identified in the RFQ/RFP documents. Specific evaluation criteria, or a fully defined point award system, will allow proposers to provide submissions that maximize benefits and optimize solutions to the owner's needs.

Requirements for Financial Capability

The RFQ should require submitters to provide some form of financial capability by the D/B entity. This may include a list of similar size projects completed, bonding capacity backlog, equipment and staffing etc. This ensure that the firms are capable of undertaking the project.

Shortlist Qualified Firms

The first stage of a two-step procurement should limit the final competitors to a field of three to five best qualified D/B firms. Shortlisting more than five teams undermines the credibility of the process and discourages high-quality proposals. For FAA projects awarded under the AIP Handbook, the method must meet with requirements of both Paragraph 904(b)(2) from Order 5100.38c for professional services and the price competition requirements for construction.

The number of prospective bidders can impact the suitability of a project for D/B. If the owner anticipates fewer bids than the desired shortlist number, then alternative procurement should be considered if this would increase the number of bidders. If only the desired shortlist number or fewer submit bids, do not shortlist.

Step 4 – Development of the Request for Proposals

The development of the RFP establishes the requirements, standards, and expectations for the project. It should outline the owner's organization and how it integrates with the D/B team.

Balance Responsibility/Risk in Contract Language

D/B inherently imposes additional risk and responsibility upon the D/B entity. Contract language should not needlessly exacerbate this situation by attempting to pass the owner's legal risks and responsibilities on to the proposers. Examples of unbalanced risk transfer include making the D/B entity responsible for zoning or environmental permits, concealed conditions, differing site conditions, third party delays over which it has no control, obtaining property/ rights-of-way, etc.

The information that the owner provides in the RFP also will impact the allocation of risk. The owner should be aware that risk allocation may impact the cost of the project, as well as affecting the D/B firms' cost of developing technical submissions. For example, if the owner provides only limited or no geotechnical information, it may be necessary for the proposers to

undertake their own geotechnical investigations in order to complete technical submissions. This not only impacts the costs to the proposers but also likely will impact operations at the facility.

Disclose the Project Budget

If there is a budget amount above which an award absolutely will not be made, this should be stated. Proposers have the right to know that funding is available for the project before investing the resources that a D/B proposal requires.

Create Knowledgeable Selection Panel

The panel responsible for evaluating proposals should include individuals knowledgeable in the D/B process and the technical issues related to the project. The panel should consist of sufficient members with representative expertise reflecting the requirements of the RFP to ensure that a full and detailed technical evaluation of the selection criteria can be completed.

Consider Applicability of a Stipend

The owner should consider paying a stipend to the unsuccessful proposers. While many firms may compete in the absence of such payments, excessive submittal requirements and preliminary design effort is considered abusive to contractors and designers and may discourage quality teams from participating. A stipend also is an indication that the owner is serious about awarding and receiving a quality project. A stipend in the order of 0.01 to 0.2 percent is considered typical. The value of the stipend should be commensurate with the work required to prepare the bid. Typically, smaller projects use a higher stipend percentage.

D/B Team Organization

One of the chief benefits of D/B is that the owner will deal with a single entity for both the design and the construction of the project. The D/B entity should be required to submit a management plan as part of the technical submission. The management plan should include details on the organization of the team, internal and external lines of communication, and levels of responsibility.

Many owners have found that independent engineers, retained by mutual agreement between the owner and the contractor, can act as the owner's agent. The independent engineer can also provide overview, certify works and payment, mediate dispute resolution, etc. The independent engineer's mandate should be defined clearly in the D/B contract. It is also very important to choose an independent engineer who understands the D/B process and is willing to work with the D/B team to ensure that the technical requirements are met, and not to dictate design.

Design-Construction Team Experience

The RFP typically includes a section on construction team experience. D/B contracts should require information to be submitted in the proposal that addresses the experience of the D/B team. References and information relative to experience should be provided by the RFP offerors for those specific types of design and construction pertinent to the project, such as:

- Airport pavement
- Airport lighting and visual NAVAIDS
- Electronic NAVAIDS
- Aircraft fueling system

General Design Guidelines and Mandatory Design Requirements

The project documents should outline general design guidelines and mandatory design requirements. General design guidelines, for example, would include the FAA and UFC design manuals [1-3], as well as local and state design criteria. Mandatory design requirements would include aircraft design group requirements, aircraft traffic mix and frequency, design life, FAA and DoD lighting and navigational aids requirements, etc.

Subcontracting Requirements

The perception in the contracting community is that small business cannot compete with larger firms for D/B projects. However, experience has shown that many large firms tend to subcontract to local companies. Further, in the acquisition process, many RFPs award points to technical proposals that have a balanced approach to subcontracting. Agencies that encourage, or have mandated, DBE participation should include these requirements in the RFQ/RFP process.

Operational Requirements

The RFP documents must outline operational requirements for the project. This includes access to the site, available working times, security requirements, restrictions on proximity to live surfaces, height restrictions, noise, etc.

Use of Performance-Based Criteria/Specifications

The technical requirements listed in the RFP should, as far as possible, be defined in performance terms. They should be comprehensive enough to ensure that the intended result is achieved, but not restrictive in a way that would inhibit creative solutions and best value. The owner should identify the specifications that should be followed and the limitations for changes to the specifications that would be accepted. The standard project specifications should be edited and of sufficient detail to ensure that the owner's requirements for construction quality are met.

Owner Provided Information

The owner needs to provide adequate information to the bidders to permit the completion of a preliminary design and costing. This information may include: topographical survey; geotechnical; as-built plans (existing electrical, underground utilities); performance documentation; design criteria; airside layout; design requirements (life, aircraft mix, drainage, electrical, lighting, navaids); operational requirements; master plan; staging areas; access and security.

There is a minimum amount of information that must be provided. This would include performance specifications, environmental approvals, geotechnical information, and

topographical survey. To minimize the amount of disruption to airside operations, it often is impractical to allow each D/B team to undertake its own geotechnical investigation and topographical survey. Therefore, the owner may elect, schedule permitting, to solicit scope from the teams and consolidate this information into one overall information gathering plan. The resultant data from this investigation are then shared with all bidders.

Typically, information is provided to the preliminary (30 percent) design level. This information should state the purpose, function, and characteristics of the project. This typically would include a project site plan, facility layout, geotechnical information, topographical information, performance specifications, pavement sections and critical details, airport master plans, and utility plans.

As the majority of airside projects have security and operational constraints, it is not realistic to require D/B teams to complete their own geotechnical investigations. The owner should complete sufficient geotechnical investigations characterize the site to adequately. If insufficient information is provided in the bid phase, the inherent risk of the D/B team increases significantly, and this risk is reflected in the bid price.

Limit Design Direction in RFP

Certain specific areas of design that are critically important to the owner—and that should not be compromised under any circumstances—should be stipulated in detail without reducing opportunities for full creativity elsewhere throughout the project. In general, limiting direction in design/construction will increase the potential for D/B teams to achieve innovative solutions.

Use Lump Sum Contracts When Selection is Competitive

The contract for D/B services obtained competitively generally should be made on the basis of a lump sum fixed price which is common in the industry. The use of cost plus contracts when price was a factor in the initial award is inappropriate and fails to recognize the special risk position imposed on the competitors.

Requirements for Financial Guarantee

A requirement for proposers to submit bid bonds or other forms of financial guarantee assures the owner that the selected D/B team is financially capable of performing the work and reduces the possibility that unrealistic designs are submitted without financial risk.

Project Management Plans

As part of the RFP submission, the D/B team typically is required to submit an outline of its project management plans. Once selected as the preferred bidder, detailed project management plans that govern all aspects of the delivery of the project must be delivered. The plans include:

- Mandatory Project Management Plans
  - Overall Management Plan
  - Design Management Plan
  - Construction Management Plan

  - Quality Management Plan
- Optional Project Management Plans
  - Environmental Management Plan
  - Safety Management Plan
  - Airfield Traffic Management Plan

Bonding and Insurance

Basic comprehensive liability coverage is typical in the construction industry and would include vehicles and equipment, employers, workers compensation, builder's risk, and excess liability. These policies usually exclude liability arising from design errors and omissions. D/B agreements should consider project-specific liability insurance with limits commensurate with the size of the project. These policies have terms that continue through construction to upwards of 10 years after construction. These types of policies would insure both the design professionals (and subconsultants) and the constructor (and subcontractors).

Contract surety bonds provide financial security and construction assurance on construction projects by assuring the project owner that the contractor will perform the work and pay certain subcontractors, laborers, and material suppliers. Traditionally, surety bonds excluded coverage for errors and omissions. Bonding and insurance coverage should be commensurate with the project size and in accordance with specific agency requirements.

Warranty and Performance Measures

The D/B team is responsible for QC and process control. The owner relies on the team's quality management plan to identify and correct non-conformities in the project. As the owner is not directly involved in the quality management of the project, many defects may not be readily identifiable.

Warranties should require repair or replacement of defective work, or work that does not conform to the contract requirements during the warranty period. The warranty should reference the specific performance measures for the item in question over the term of the warranty. Often, warranties will have extensions for remedial works completed during the warranty period. Warranty terms typically range from 1 to 5 years. One year is thought to be too short in consideration that the owner is limited to an oversight role during the construction process, and beyond 5 years can raise surety issues and is thought to be excessive. Two to 3 years is reasonable for the initial progression of pavement distress.

Construction Phasing

Construction operations in, adjacent to, or requiring construction traffic through an airport's air operations area (AOA) will require a phasing plan. The purpose of the plan is to establish guidelines and constraints the Contractor must follow during construction in these areas. This basic information for the phasing plan must be included in the RFP:

- AOA facilities that will be closed or partially closed for construction

- Phasing required to maintain minimum aircraft operation with those airfield facilities that will be opened and closed during each phase identified
- Maximum duration of each phase (or closure)
- Time allowance between phases for preparation to redirect air traffic
- Requirements for temporary marking and lighting
- Liquidated damages if closure and construction extend beyond the phase time limit

The Contractor shall submit the phasing plan with the first design submittal and include Contractor-furnished drawings showing phasing details and notes.

Safety and Security Plan

Safety and site security during construction is a primary consideration. The RFP should require a safety program which includes guidelines for accident prevention. On airfield projects, a safety plan is also necessary to acquaint construction personnel with airfield operations and provide a safe environment for aircraft operations and personnel during construction. A security plan is required to assure security at the construction site and the airport.

Step 5 – Evaluate and Award

Evaluation and award will include answering bidder questions and possibly individual bidder meetings. Once the proposals are submitted, the owner would evaluate the bidder submissions based on the established selection criteria and weighting factors and award the contract. Some agencies allow meetings with individual bidders during the bid phase to assist in clarifying specific points of the design and procurement process. Once received, proposals are evaluated on the basis of quality of design, price, and other predetermined factors (best value). Qualitative issues are best evaluated before prices are revealed. This prevents the tendency of allowing knowledge of price to short-circuit a thorough review of qualitative issues. Owners should request that qualitative and cost sections of a proposal be submitted in separate sealed envelopes, with the price envelope opened only after the qualitative evaluation has been concluded. Typically, shortlisted bidders are asked to present their technical bids at a meeting in front of the evaluation panel. This gives the panel an opportunity to gain a better understanding of the bidder's proposal and evaluate their team qualifications and the technical concepts of the bid.

Once a selection has been made, the project should be awarded in a prompt and straightforward manner without on-going adjustments to the proposer's submission. Review meetings with the owner for the purpose of design modification should be conducted following selection and prior to award, not while proposers are in a competitive posture. This principle also applies to price, which should not be subject to negotiation or modification between formal submission and selection.

The winning design proposal submitted in a D/B competition is the design that ultimately should be constructed. Providing a stipend reduces the proposers' cost for participating in D/B projects, and in return the owner may require that all innovations and concepts used in their proposals become the property of the owner. Use of design concepts from unsuccessful proposers without compensation is inappropriate and unethical.

Prior to the award, the contents of both the technical and financial proposal must be reviewed to ensure that the proposer is meeting the expectations of the owner. The selected proposer enters into a contract that incorporates both the owner's requirements and the D/B entity's proposal. The contract should incorporate both the owner's requirements and the D/B team's proposal.

Step 6 – Project Performance

The last step in the D/B procurement process is the administration of the contract. This would include monitoring of compliance with management plans, including documents and submittals. This may also include the owner's right to complete independent QA inspection and testing.

Upon completion of the design documents for all elements (or for specific phases) of the project, construction commences. The contract may call for fast track methods, allowing for construction to commence after logical phases of design and permitting are completed, but prior to completion of the entire body of construction documents.

Although the contractor is fully responsible for the quality of all work, D/B agreements should provide for the owner's right of access at any time to all records produced in the performance of the work, including inspection records and test results, and to conduct sampling, to ensure the contractor is adhering to all requirements of the agreement. D/B agreements also should include provisions confirming the owner's right to audit the contractor's work to ensure that the owner's requirements are being achieved.

Prior to final acceptance of the work, all systems being inspected shall be completed and approved for acceptance by the quality management plan. A final inspection should be completed to verify that the facility is complete and ready to be accepted. A "punch list" should be developed as a result of this inspection, and the quality manager will ensure that all items on this list are addressed prior to final acceptance.

The D/B contract should outline a method for dispute resolution. One way to minimize dispute is through partnering, which fosters cooperation between the owner and the contractor. Many owners and contractors have established dispute resolution boards to diffuse issues before they become formal disputes. Typically, the board consists of three respected, experienced individuals: one appointed by the owner, one appointed by the contractor, and a third appointed jointly. Arbitration is another frequently used method for dispute resolution.

REFERENCES

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