Scoring Design-Build Proposals for Military Construction Projects

Douglas D. Gransberg
Iowa State University, dgran@iastate.edu

Follow this and additional works at: http://lib.dr.iastate.edu/ccce_pubs
Part of the Construction Engineering and Management Commons, and the Risk Analysis Commons

The complete bibliographic information for this item can be found at http://lib.dr.iastate.edu/ccce_pubs/119. For information on how to cite this item, please visit http://lib.dr.iastate.edu/howtocite.html.

This Article is brought to you for free and open access by the Civil, Construction and Environmental Engineering at Iowa State University Digital Repository. It has been accepted for inclusion in Civil, Construction and Environmental Engineering Publications by an authorized administrator of Iowa State University Digital Repository. For more information, please contact digirep@iastate.edu.
Scoring Design-Build Proposals for Military Construction Projects
by
Douglas D. Gransberg, P.E., C.C.E.

INTRODUCTION

The advent of widespread use of Design-Build (DB) as a primary project delivery system for public works projects has proliferated a number of methodologies for making a best value evaluation of DB proposals. As a result, the application of competitively negotiated contracts requires a fair and equitable system to allow federal procurement officials a logical method to establish which proposal has the highest probability of successful completing the project at the lowest overall cost. Inherent to the success of this system is a highly developed, well-defined evaluation plan that can quantify many of the qualitative aspects of each proposal. Thus, the purpose of this paper is to identify the component elements of a comprehensive evaluation plan and demonstrate one method to develop quantitative scoring to permit a fair and equitable award recommendation to the source selection board [5].

The most common problem caused by a poor evaluation plan does not involve default. It generally takes the form of a minimally qualified contractor attempting to provide the minimum project quality to avoid losing money on the project [3]. This situation generally finds the government coping with an inordinate amount of change order requests, time extension requests and quality disputes as the contractor uses every contract clause to his to minimize his potential loss. It is not possible to write a perfect specification [3]. Therefore every ambiguity will be used to reduce the overall quality of the completed project. The ultimate end is a dissatisfied customer resulting in another black eye for the federal construction agency occupies a problem project that once completed. Additionally, a check of the final cost of the project will probably show that it cost more than the prices quoted by unsuccessful offerors on the same project [12].

EVALUATION PLAN TYPES

Essentially, there are three basic approaches to developing an evaluation methodology. These are called by the following names:

- Fully Qualified-Lowest Price
- Adjusted Score
- Best Value

FULLY QUALIFIED-LOWEST PRICE

This particular method harkens back to the days of Design-Bid-Build (DBB), award to the lowest responsive and responsible bidder. In a nutshell, the evaluation plan constitutes a set of categories in which a specific minimum standard has been set. Proposals are rated on a satisfactory/unsatisfactory basis with regard to each standard,
and the competitive range is established by disqualifying all proposals that have one or more categories rated unsatisfactory. The remainder has all areas rated as meeting all the standards. The source selection official then opens the price proposals and awards the contract to the lowest priced offeror in the competitive range.

Another approach is to first evaluate the qualifications and design approach detailed in each proposal. The idea is to create a short list of DB contractors using a “Brooks Bill-like” qualifications-based selection process. Once the short list is assembled, the public owner opens the price proposal and awards to the lowest priced, qualified DB contractor. Thus, an attempt is made to satisfy the demands of competitive selection of construction contractors and qualifications-based selection of designers.

Either approach provides a means to expedite contract award and because of its simplicity, minimize the potential for protests. However, it focuses on achieving the minimum standards of quality and leaves no mechanism to exploit the potential for creativity and innovation available in the DB industry. One of the advantages of using DB is the ability to form a contract with a bias toward quality, cost control and timely completion. In DBB, the designer specifies the minimum level of quality in the plans and specifications. Contractors bid the price of furnishing the minimum level of quality, and the owner inspects to see that the minimum level of quality is delivered. As a result, there is no incentive for any of the project participants to enhance the level of quality specified. Fully Qualified-Low Price DB awards perpetuate this condition. As a result they should only be used on projects where the potential for innovation and creativity is low or where the owner’s project budget is so tight that minimizing the price is the preeminent condition for the award.

**ADJUSTED SCORE EVALUATION**

Adjusted Score Evaluation is an attempt to derive a unit price of quality and use that as a basis to objectively justify awarding the contract to other than the low bidder. The public owner sends the technical proposals to a Technical Review Committee (TRC) and holds the sealed price proposals until after the technical proposal scores are provided by the TRC. Each offeror’s technical proposal is evaluated on specific rating criteria provided in the RFP. Each TRC member scores the contractors’ proposals. The TRC submits a final technical proposal score for each offeror. The public owner then publicly opens the sealed price proposals and divides each contractor’s price by the score given by the TRC to obtain an adjusted score. The offeror selected will be the one whose adjusted score is lowest. An example of how the selection formula would work is shown in Table 1. Unless all proposals are rejected, the owner awards to the offeror with the lowest adjusted score.

**BEST VALUE EVALUATION**

To reconcile, Best Value contracting with government procurement regulations, a public agency must devise a “fair and equitable system” of evaluating offerors’ proposals [10].
To do this, an objective methodology for individually comparing each proposal must be developed and its content published in the RFP [5]. There have been many solutions to this problem in the past ten years. Some are relatively simple and parallel the existing evaluation systems for Architect/Engineer design service contracts. Others are very complex [8] and require computer based expert systems and special technical knowledge to understand. One such system was developed by Construction Engineering Research Laboratory and uses fuzzy logic and a myriad of input to identify the optimal condition [9]. This type of system may be justified for use on complex projects with a large number of competitors. However, its effectiveness is probably reduced when applied to routine facility procurement. To achieve widespread acceptance, an evaluation methodology must be simple enough to be understood by both engineers and procurement professionals and flexible enough to be applied to the full gamut of possible project types without the help of outside expertise [1, 6, 12].

Best value inherently requires the evaluation of qualitative information. Such things as professional competence or past experience are difficult to describe in quantitative terms. The easiest method to compare these qualities in a manner that is both fair and objective is to rank the qualities of each offeror against the same qualities of all other offerors. This ranking can then be the basis for assigning a relative value to each piece of data, and the sum of the relative values in each category for each offeror becomes the quantified value of each proposal when compared to all other proposals. However, this system does not comply with the requirements of the Federal Acquisition Regulation (FAR). It directs that each proposal be rated against a standard, not compared with each other [4]. Thus the simplest form of utility theory (i.e. rank ordering each proposal) would be prohibited by regulation. Additionally, the FAR also requires that cost be evaluated separately [5] from other evaluation criteria [4] and that the award should be made on a cost-technical trade-off.

EVALUATION PLAN COMPONENTS

A comprehensive DB Evaluation Plan will establish definitive standards for each project in four general categories: technical, schedule, management, and price. Each standard will be characterized by an objective metric against which evaluators can measure the relative responsiveness of each proposal to the performance criteria detailed in the RFP. Examples of typical metrics are as follows:

- Technical: The parking lot shall contain a minimum of 40 parking spaces.
- Schedule: The latest acceptable delivery date is March 1, 2001.
- Management: The on-site quality control supervisor shall be a registered professional engineer with a minimum of 5 years of experience.
- Price: The maximum acceptable price is $4,000,000.

Next, a weight must be assigned to each category. The weight should correspond to the given evaluation criterion’s importance in the success of the project with respect to all other criteria. For example, if DB were selected for a project because it is impossible to
complete the project by its required delivery date using the traditional method, then schedule should be given a proportionately higher weight than technical or management. Thus, a proposal that promises to deliver the project at an earlier date would be mathematically favored over one whose strong point was the experience of its management team. In establishing evaluation weights, the public owner must ensure that the weights mirror the reasons for selecting DB as the project delivery method. In federal procurements, price must be evaluated separately and is typically not be given a weight in the overall evaluation plan.

CONDUCTING THE EVALUATION

Most solicitations require contractors to submit the following categories of information in their proposals [3]:

- Technical Approach.
- Management Capability.
- Financial Capability.
- Personnel Qualifications.
- Prior Experience.
- Past Performance.
- Projected Schedule and Milestones.
- Project Pricing Information

Methodology

The system of evaluation can take many precise forms depending on the complexity of the project and the needs and regulations of the owner, but the basic methodology will remain the same as described above. The simplest form, called weighted rating, can best be described by example.

Assume that an owner has decided to request each offeror to submit information on the eight topics shown in the previous section. Three proposals are received. The owner then assembles an interdisciplinary team of experts to evaluate the various proposals. Several types of design engineers are required to evaluate the various technical aspects of the Technical Approach category. An architect may be require to evaluate the aesthetics and architectural integrity of the proposed design concept. A business management consultant may be retained to evaluate the Management Capability category, and an accountant may be needed to check Financial Capability. The owner will want a professional construction manager to evaluate the proposal’s Past Performance and Projected Schedule and Milestones, and a cost engineer to evaluate Project Pricing Information. All the members of the team will probably evaluate the Prior Experience and Personnel Qualifications categories. The owner may even want to have an attorney assess the various levels of contractual risk associated with the different proposals and make input to the process for determining the weighting of each category.
The process will be kept to its simplest form by asking the interdisciplinary evaluation team to merely rate each proposal from minimally responsive to most responsive in each category to with the minimally responsive proposal getting a score of one point and the most responsive receiving a score of three points. Each of the eight categories has a weight based on its individual importance to the owner and its overall contribution to the successful outcome of the project. The sum of the weights equals 100. Therefore, if a given proposal was rated the best in all categories, it would receive a weighted total score of 300, the theoretical perfect score. Table 1 illustrates the mechanics of this particular application to this example.

{Insert Table 1}

It can easily be seen that Proposal 2 would be the winning proposal on the basis of this extremely simple procedure. Its strong technical presentation combined with the assembly of a strong interdisciplinary team allowed it to win in spite of having the poorest showing in terms of project schedule and being the second low project price. As can be seen by the category weighting, the owner was more concerned with the technical quality of the finished project than he was with the project delivery time frame or final project price. If the weighting had been different, the outcome could have been different based on the same evaluation criteria.

BEST VALUE CONTRACTING CRITERIA

As that simple example illustrated, the evaluation criteria development is critical to the success of the selection process. In the Federal system, the criteria must spring from the standard against which the proposals are to be evaluated [7]. The criteria are then elaborated in some fashion that permits a technical score to developed for all the RFP requirements. This can be done in two ways.

Adjectival Rating System

First, an adjectival rating system, such as unsatisfactory, satisfactory, or exceptional, can be combined with a quantifiable standard in each category and then a point rating can be assigned to each adjectival description [10]. For example, an owner who would like to get a project completed as quickly as possible may choose to compete the project delivery date. However, that owner would certainly have a required delivery date by which the project must be done. That date can be used as the minimum standard, and proposals which promise completion after that date can be rated as unsatisfactory; proposals which promise delivery on that date are rated satisfactory; and proposals containing schedule which finish earlier are rated as exceptional. Thus, the evaluation panel can restrict its activities to determining the relative rating against the standard in qualitative terms while allowing the rating system to provide the quantitative final score of each proposal. This method has several advantages. First, when more that one evaluator must rate a specific portion of each proposal, it is easier for the group to agree on the definition of an adjectival rating than it is to reach consensus on a point score. Secondly, it is reasonably
simple to add intermediate adjectives if an evaluation panel feels the need to further differentiate between proposal quality. Finally, when a standard is clearly defined, it is easier to defend an adjectival rating as being above, below, or at the standard than it is to detail the rationale used to arrive at a specific point score.

Again, the theory is best demonstrated by example. Taking the simple example shown in Table 1, evaluation criteria would need to be developed for each of the areas to be evaluated. Assume that in the “Personnel” category, that owner would like to have a registered professional engineer as the construction quality control supervisor on the project. However, not wanting to unnecessarily constrain potential offerors, the owner is willing to accept an unregistered, degreed engineer with ten years of specific experience. Therefore, under the adjectival rating system, the standard would be a degreed engineer with ten years of experience and this would be rated as satisfactory. Anything less would be unsatisfactory. A proposal that offers a P.E. would be rated as above average, and a proposal that offers a P.E. with ten or more years of quality control experience would be rated as outstanding. Thus the rating system would be as shown in Table 2.

{Insert Table 2}

**Direct Score Rating System**

The second method for scoring evaluation criteria is to assign a specific point score for each criterion. Again, a standard must be assigned for each criteria, and in this method, a specific amount of points must be assigned to the standard. Thus, each proposal will be rated on how it relates to the standard with those exceeding the standard receiving more than the standard’s point score and similarly, those that do not meet the standard receiving a lower score. In the example of the previous paragraph, proposals which do not meet the required delivery date would be given no points in that category, proposals which beat the date could be given varying point scores above the minimum points for hitting the standard. This system’s main advantage is that it permits a greater range in variability between proposal criteria scores. It also allows evaluators to normalize their individual rating system and provide for “shades of gray” in their evaluations. The system’s chief disadvantage is that is very difficult to reproduce the rationale used in assigning a specific point score to a specific evaluation criterion after the fact. This disadvantage often raises its ugly head during the mandatory debriefings of unsuccessful offerors [4,5,10] and during the legal proceedings attendant to protests. The direct point score system would be very similar to the adjectival system. However, the evaluators would only be given the minimum, maximum, and standard score values and would be expected to differentiate between those values to score against the standard. Table 3 illustrates this outcome of this method.

{Insert Table 3}

It can be seen that by allowing each individual evaluator to directly score a criteria that a greater degree of variability is introduced into the system. The adjectival system will have variability as well. However, mathematically, it will be less than the direct
score system because consensus has been reached across the team regarding adjectival definitions, and the scores flow directly from the definitions and do not require personal interpretation during the evaluation process. Furthermore, the owner can more easily define the standard criteria for each evaluation element in terms of what is minimally acceptable and what is actually desired. When the evaluation plan is taken as a whole, the owner is able to build in flexibility and trade off costs for elements of quality. Finally, when discussing the evaluation results with unsuccessful offerors, it is easy to demonstrate those areas where the proposal in question fell short of the standard without introducing an argument as to whether the direct score was fair.

**COMPETITIVE RANGE DETERMINATION**

Once the evaluation process is complete for all proposals, the competitive range can be determined for federal procurement. This so-called range is established by eliminating those proposals that require major revisions or have fatal deficiencies from further competition [5]. Thus, the proposals that remain define the competitive range. These proposals are by no means perfect, but they can all be made responsive by correcting minor deficiencies or by providing additional detailed information. The proposals within the competitive range are all asked to make revisions based on individual discussions and requested to resubmit a “Best and Final Offer” (BAFO).

Once again, the value of an accurate and objective evaluation method is paramount. The key at this stage is to ensure the fair identification of those elements of each proposal that constitute major deficiencies. It is especially important to specify those deficiencies that must be considered fatal in the evaluation plan. For example, if financial capability were a key element in the identification of a potentially successful contractor, the ability to obtain a performance bond without having to pledge collateral would be an excellent evaluation criterion. Thus, an offeror whose proposal offers a performance bond requiring collateral would be found have a major, uncorrectable deficiency and hence that single deficiency would be considered fatal. Thus, the proposal would be eliminated from the competitive range. This type of criterion would be easy to explain during debriefing and unassailable during a potential protest.

**TIMING OF EVALUATION PLAN DEVELOPMENT**

All of the above discussion is founded on a single assumption: the offerors can readily identify all the areas to be rated by reading the Request for Proposal (RFP). Obviously, there is little benefit to the owner by keeping the contents of the plan a secret and the evaluators cannot expect to rate information that was not originally requested. This discussion might seem a bit frivolous, but in the author’s experience this is a common problem. The solution is quite simple. The authors’ of the RFP should also develop the evaluation plan. In fact, an outline of the evaluation plan should be developed before the RFP is written. In that way, the evaluation plan can act like a table of contents for the RFP, and the owner can ensure that offerors have been fairly notified of the expected form and content of their proposals. The evaluation process can be made less
complicated if the RFP specifies a uniform format for all proposals that mirrors the
format of the evaluation plan. Thus, evaluators do not have to hunt through each
proposal to find the answers to each evaluation criterion. This allows the evaluation
process to flow in an orderly manner, permits the evaluators to readily spot deficiencies,
and reduces the number of minor informational questions that must be handled in
discussions.

CONCLUSIONS

To properly implement Design-build Contracting, the owner must ensure that the
evaluation plan is solidly founded on a definable set of standards without unnecessarily
constraining the ability of potential offerors to propose project features that exceed the
owner’s initial expectations. The front-end investment of the necessary creative energy
to prepare a thorough evaluation plan pays dividends by expediting the selection process
and reducing the probability of delays due to protest action. This is the crux of DB
Contracting. Experience has shown that most proposals contain features that are
unexpectedly pleasant surprises for the owner. By providing a system that allows those
proposals that go above and beyond the standard to be rewarded, the owner not only
encourages creativity and innovation in the proposal process but also ends the project
with a product that is of generally higher quality than the one that would have been built
by a low bidder.

REFERENCES


3. Ellicott, M.A. Best-value Contracting. Proceedings, Area Engineer’s Conference,

1994.

D.C., 1996.


Paradigm. 1996 AACE International Transactions. Morgantown, West Virginia, 1996:
51-54.


TABLES

Table 1: Example of the Weighted Scoring of Three Hypothetical Proposals.

<table>
<thead>
<tr>
<th>Category</th>
<th>Wt</th>
<th>Prop 1</th>
<th>Wt Score</th>
<th>Prop 2</th>
<th>Wt Score</th>
<th>Prop 3</th>
<th>Wt Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technical</td>
<td>30</td>
<td>2</td>
<td>60</td>
<td>3</td>
<td>90</td>
<td>1</td>
<td>30</td>
</tr>
<tr>
<td>Management</td>
<td>5</td>
<td>3</td>
<td>15</td>
<td>2</td>
<td>10</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>Financial</td>
<td>5</td>
<td>1</td>
<td>5</td>
<td>2</td>
<td>10</td>
<td>3</td>
<td>15</td>
</tr>
<tr>
<td>Personnel</td>
<td>10</td>
<td>2</td>
<td>20</td>
<td>3</td>
<td>30</td>
<td>1</td>
<td>10</td>
</tr>
<tr>
<td>Experience</td>
<td>15</td>
<td>1</td>
<td>15</td>
<td>3</td>
<td>45</td>
<td>2</td>
<td>30</td>
</tr>
<tr>
<td>Past Perform</td>
<td>15</td>
<td>1</td>
<td>15</td>
<td>2</td>
<td>30</td>
<td>3</td>
<td>45</td>
</tr>
<tr>
<td>Schedule</td>
<td>20</td>
<td>3</td>
<td>60</td>
<td>1</td>
<td>20</td>
<td>2</td>
<td>40</td>
</tr>
<tr>
<td><strong>TOTALS</strong></td>
<td>100</td>
<td>190</td>
<td>235</td>
<td>175</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Price</strong></td>
<td></td>
<td>$4.4  million</td>
<td>$4.3  million</td>
<td>$4.0 million</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 2: Best Value Adjectival Evaluation Criteria Example

<table>
<thead>
<tr>
<th>Item</th>
<th>Weight (wt)</th>
<th>Unsatisfactory</th>
<th>Satisfactory</th>
<th>Above Average</th>
<th>Outstanding</th>
<th>Total Score (wt*pts)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personnel</td>
<td>Total 10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>QC Supervisor</td>
<td>2 of 10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Proposal 1</td>
<td>2</td>
<td></td>
<td>7</td>
<td></td>
<td></td>
<td>14</td>
</tr>
<tr>
<td>Proposal 2</td>
<td>2</td>
<td></td>
<td>5</td>
<td></td>
<td></td>
<td>10</td>
</tr>
</tbody>
</table>
Table 3: Best Value Direct Point Score Example

<table>
<thead>
<tr>
<th>Item</th>
<th>Weight (wt)</th>
<th>Minimum BSCE, some exp (1)</th>
<th>Standard BSCE, 10 yrs QC exp (5)</th>
<th>Maximum BSCE, PE ≥10 yrs QC exp (10)</th>
<th>Score (pts)</th>
<th>Total Score (wt*pts)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personnel</td>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>QC Supervisor</td>
<td>2 of 10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Proposal 1</td>
<td>2</td>
<td></td>
<td>8</td>
<td>8</td>
<td>16</td>
<td></td>
</tr>
<tr>
<td>Proposal 2</td>
<td>2</td>
<td></td>
<td>5</td>
<td>5</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Proposal 3</td>
<td>2</td>
<td></td>
<td>10</td>
<td>10</td>
<td>20</td>
<td></td>
</tr>
</tbody>
</table>

Final approved manuscript – published as: