

Key Issues in Procurement and Management of Consulting Engineering Services in Public Sector Organizations

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Abstract

This paper presents a research on identification of key issues in procurement and management of consulting engineering services in public sector organizations. The research is conducted with the help of a case study from National Highway Authority of Pakistan by adopting a six-step methodology. The results show that clients do not plan for risk management before embarking on procurement of consulting services. The results include: request for proposal (RFP) is neither prepared diligently nor its provisions implemented in letter and spirit; scope and time are not managed efficiently; quality-based selection procedures are not used; technical and financial proposals need to be evaluated through expert judgement; decision to appoint same consultant for design and supervision is not based on proper analysis; designs are not vetted for value enhancement; client-consultant relationships require to be based on mutual trust; work methodology proposed in technical proposal need to be implemented in true spirit; and the key professional team members as proposed in technical proposal need to be provided preferably without changes.

Keywords

Design, Consultant, Consultant evaluation, Consultant selection, Procurement

1. Introduction

According to 'FIDIC Guidelines for the Selection of Consultants', Consulting Engineering Industry (CEI) is playing an important role related to planning, designing, constructing, inspecting and managing the infrastructure required for meeting the ever-increasing demands for energy, transportation, shelter, health and water (FIDIC, 2003; FIDIC, 2004; FIDIC, 2011a). The role of consulting engineers is very significant for their clients (Al-Rashaid and Kartam, 2005; ASCE, 1995). The 'Guidelines for the Selection of Consultants' emphasize that the most important concern to be addressed by clients during procurement and management of consulting engineering services should be the maintenance of quality of consulting

services, without compromising on suitability, sustainability, economy, efficiency, risk management, public welfare, fair opportunity, business integrity, and thorough transparency of the selection process (FIDIC, 2003). The consultancy costs, most of the time, make a meager portion of project's life cycle cost, yet the selection of an appropriate consultant is critical for the success of entire project (Bunni, 2005). One of the important factors in success of a project is obtaining the services of the most competent and most-experienced consultant (FIDIC, 2011b; ASCE, 2012).

This research will attempt to identify these key issues and then documents recommendations. Different methods for consultant selection are documented in literature (PPRA 2010, ADB 2013). Some clients, who have limited understanding of consulting services, use prescriptive procedures for consultant selection (ADB, 2008). Not all of the procedures acknowledge true value of consulting services (Choudhry, 2016). Choudhry (2016) revealed that most of these procedures are deliverable-oriented. The procedures are essentially quality-based or cost-based (Choudhry, 2016). Quality-based selection (QBS) is focused on selection by according top priority to quality (Choudhry, 2016) while cost-based selection is focused on selecting consultants by giving priority to price (Choudhry 2016). Quality-based selection method is suited to large projects of complicated nature and is used where the owner or sponsor wants only quality of work irrespective of the cost of the project (FIDIC, 2011c). Quality and Cost based (QCBS) selection is suitable where quality is leading concern, whereas cost is a secondary contemplation.

2. Methodology

2.1 Research Design

This research is conducted by following six-step methodology shown in Figure 1. The Figure shows that after determination of objectives and identification of case study, necessary data are collected, compiled, and analyzed. The data analysis is followed by arriving at conclusions.

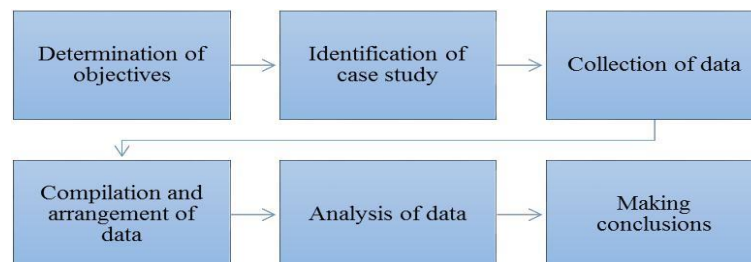


Figure 1: Research Design

2.1.1 Determination of objectives

The objective of this research is to identify key issues in procurement and management of consulting engineering services with the help of a case study, and to give recommendations.

2.1.2 Identification of case study

In the selected case study, client selects and manages a consultant for detailed design, and design review plus construction supervision of “Amri – Qazi Ahmed Bridge Project over River Indus, Sindh” (NHA, 2016). The bridge links National Highway N-5 with Indus Highway N-55. Total project length, including main bridge, is 16.64 km. The project was accorded high priority by the Government of Pakistan, therefore fast-track completion of design and construction was inevitable.

2.1.3 Collection of data

After identification of the case study, necessary data were collected in order to make a meaningful analysis. The data was related to opening and detailed evaluation of technical and financial proposals, consultant selection committee (CSC) proceedings on evaluation results, signing and administration of consultancy agreements and performance of the consultant during contract period.

2.1.4 Compilation and arrangement of data

After collection of required data, it was arranged in a logical and chronological sequence in order to make a meaningful analysis.

3. Analysis and Results

This section presents analysis and results of the case study for detailed design as well as construction supervision. The case study is analyzed in its unique capacity without bias towards project or consultant.

3.1 Design Contract

3.1.1 Technical evaluation of design consultants

QCBS method was used for selection of design consultant. Reason(s) for resorting to QCBS were not documented. Request for Proposal (RFP) documents were issued to 4 shortlisted consultants. Three consultants submitted technical and financials proposals in single stage – two envelope process while one shortlisted firm did not submit proposal. The financial proposals were kept safe in sealed condition while the technical proposals were opened and evaluated by three different sections of NHA. Total marks were 1,000 with 700 as passing figure. Table 1 contains result of technical evaluation and shows that M/s AA Associates stood first with 809 marks.

Table 1: Technical Evaluation for Amri - Qazi Design Contract

Consultant	E-1	E-2	E-3	Mean Score	Technical Rank
M/s AA Associates	820	808	799	809	1 st
M/s REC – MIHA JV	783	743	729	752	2 nd
M/s EA – BMC JV	785	807	780	791	3 rd

E-1: Planning Section, E-2: Design Section, E-3: Procurement & Contract Administration Section

3.1.2 Financial evaluation of technically responsive consultants

The results of technical evaluation show that all 3 consultants passed through technical evaluation, therefore, sealed financial proposals of all three consultants were opened in the presence of consultant selection committee (CSC) and authorized representatives of the consultants. Financial evaluation showed no arithmetic error or omission. The lowest proposal was given financial score of 1,000 points while financial scoring of other proposals was carried out by following formula: -

$$\text{Financial Score} = \frac{1000 \times \text{Amount of the lowest financial proposal}}{\text{Amount of financial proposal under consideration}}$$

Table 2 contains summary of financial proposals along with corresponding financial scores and shows that M/s AA Associates obtained the highest financial score of 1000. All costs are in Pakistan rupees (PKR).

Table 2: Financial Evaluation for Amri - Qazi Design Contract

Consultant	Salary Cost	Non-Salary Cost	Total	Financial Score
M/s AA Associates	15,347,500	3,720,000	19,067,500	1000.00
M/s EA-BMC JV	37,030,000	10,705,000	47,735,000	399.44
M/s REC-MIHA JV	61,730,000	12,980,000	74,710,000	255.22

3.1.3 Combined evaluation

The combined evaluation was carried out by giving 80% weight to technical score and 20% weight to financial score. The results of combined evaluation are shown in Table 3. It shows that M/s AA Associates obtained highest marks (847.20) in combined evaluation.

Table 3: Combined Evaluation for Amri - Qazi Design Contract

Consultant	Technical Evaluation			Financial Evaluation			Combined Evaluation	
	Technical Score (St)	Technical Weight (T)	Technical Points (St x T)	Financial Score (Sf)	Financial Weight (F)	Financial Points (Sf x F)	Combined Score (St x T) + (Sf x F)	Rank
M/s AA	809.00	0.80	647.20	1000.00	0.20	200.00	847.20	1 st
M/s REC-MIHA JV	752.00	0.80	601.60	255.22	0.20	51.04	652.64	3 rd
M/s EA-BMC JV	791.00	0.80	632.80	399.44	0.20	79.88	712.68	2 nd

3.1.4 Award of contract

Keeping in view the results of combined evaluation, the CSC recommended that contract may be awarded to M/s AA Associates at quoted price of PKR 19,067,500. The competent authority accorded approval of the recommendations and the contract was subsequently signed.

3.2 Contract for Design Review and Construction Supervision**3.2.1 Technical evaluation of supervision consultants**

QCBS method was used for selection of 'Design review and construction supervision consultant' for Amri – Qazi bridge project. Reason(s) for resorting to QCBS were not documented. In response to RFP, 5 shortlisted consultants submitted proposals in single stage – two envelope process. The financial proposals were kept safe in sealed condition while the technical proposals were opened and evaluated by three different sections of NHA. Total marks were 1,000 with 700 as passing figure. Table 4 contains result of evaluation and shows that all the consultants passed.

Table 4: Technical Evaluation for Amri - Qazi Supervision Contract

Consultant	E-1	E-2	E-3	Mean Score	Technical Rank
M/s AA Associates	823.0	818.0	802.5	814.5	1 st
M/s EA Consulting	808.0	819.0	810.25	812.4	2 nd
M/s Sambo – SANAFIFE JV	804.5	817.0	809.5	810.3	3 rd
M/s ACE – ACC JV	782.0	763.5	758.0	767.8	4 th
M/s REC – Umar Munshi JV	733.5	780.0	754.0	755.8	5 th

E-1: Planning Section, E-2: Design Section, E-3: Procurement & Contract Administration Section

3.2.2 Financial evaluation of technically responsive consultants

M/s Sambo passed through technical evaluation; however, it was not found to be registered with PEC, hence the firm was disqualified. The financial proposals of remaining consultants were opened in the presence of authorized representatives of the consultants. Detailed financial evaluation revealed that M/s AA did not include the man-months of Resident Engineer and Quantity Surveyor for extended time period of 3 months after completion of project. M/s ACE included the salary of computer operator under salary cost, whereas it was to be charged from provisional sum reserved for non-technical staff. Additionally, they included provisional sum of PKR 5.0 million instead of PKR 6.0 million. Similarly, M/s EA missed out a hefty provisional sum of PKR 6.0 million in their bid. No error was found in the proposal of M/s REC. Corrections were incorporated in bids.

The original quoted bids, corrected bids, and corresponding financial scores are given in Table 5. All amounts are in PKR. The lowest financial proposal was given score of 1,000 points while financial scoring of other proposals was used by following the formula mentioned earlier.

Table 5: Financial Evaluation for Amri - Qazi Supervision Contract

Consultant	Salary Cost	Non-Salary Cost	Total Quoted Amount	Corrected Amount	Financial Score
M/s AA Associates	36,483,216	7,276,000	43,759,216	44,549,236	1000.0
M/s EA Consulting	46,130,000	730,000	46,860,000	52,860,000	842.8
M/s ACE – ACC JV	52,053,640	5,930,000	57,983,640	58,841,128	757.1
M/s REC – Umar Munshi JV	43,052,458	6,684,000	49,736,458	49,736,458	895.7

3.2.3 Combined evaluation

Combined evaluation was carried out by giving 80% weight to technical score and 20% weight to financial score. The results are shown in Table 6. M/s AA Associates obtained highest score in technical as well as financial evaluation. Their mean technical score was 814.5 while financial score was 1000. Therefore, they obtained 1st rank in combined evaluation with 851.60 marks. M/s EA obtained 2nd rank with 818.48 marks, while M/s REC-Umar Munshi JV obtained 3rd rank with 783.78 marks.

Table 6: Combined Evaluation for Amri - Qazi Supervision Contract

Consultant	Technical Evaluation			Financial Evaluation			Combined Evaluation	
	Technical Score (St)	Technical Weight (T)	Technical Points (St x T)	Financial Score (Sf)	Financial Weight (F)	Financial Points (Sf x F)	Combined Score (St x T) + (Sf x F)	Rank
AA Associates	814.5	0.80	651.6	1000.0	0.20	200.00	851.60	1 st
EA Consulting	812.4	0.80	649.92	842.8	0.20	168.56	818.48	2 nd
REC – Umar Munshi JV	755.8	0.80	604.64	895.7	0.20	179.14	783.78	3 rd
ACE – ACC JV	767.8	0.80	614.24	757.1	0.20	151.42	765.66	4 th

3.2.4 Award of contract

Keeping in view the results of the combined evaluation, the CSC recommended that construction supervision contract be awarded to the highest evaluated bidder at PKR 44,549,236. The competent authority approved the recommendation and the agreement was subsequently signed.

4. Discussion

4.1 Design Contract

In the TOR, there was no provision for design validation by third party which indicates that client was not fully cognizant of what was involved. There is an indication that the client neither understood risks, nor managed them equitably or prudently (Kometa *et al.*, 1996; Choudhry and Iqbal, 2013). Validation of the original design by an independent consultant leads to value enhancement and economization by highlighting design errors and discrepancies (Choudhry, 2016).

Financial evaluation shows that M/s AA Associates submitted the lowest quote (PKR 19,067,500) while M/s EA – BMC JV submitted the second lowest quote (PKR 47,735,000). The difference between said quotes (PKR 28,667,500) is considerable. The documents show that this difference was not deliberated in the CSC meeting. When cost is used as a factor in consultant selection, the consultants attempt to submit unrealistically low bids in an attempt to win the project (World Bank, 2010). By hiring the consultants at costs incommensurate with scope of services, the clients can place themselves, the project, and the consultant at greater than normal risk (Sturts and Griffis, 2005; Choudhry, 2016). The cost factor is to be used cautiously with an understanding of what is involved (Ling, 2004).

Keeping in view the high priority accorded by Government to the project, the client expected the consultant to complete the detailed design at the earliest. Stringent timeline hindered the consultant in proper planning, and allocating technical resources for appropriate time period for producing a quality design. Consultants can be expected to compromise on the quality of services if completion timelines are too stringent (Pellicer, 2005; Ullman, 2001).

4.2 Supervision Contract

The documents do not show any risk management activity by the client during initiating phase of supervision contract. Moreover, the documents show that the consultant for construction supervision was selected and appointed through QCBS procedure, and reasons thereof were not documented.

The proposal of M/s Sambo was non-compliant with the mandatory requirement of registration with PEC and was, therefore, non-responsive. But, it was not disqualified during technical evaluation as preliminary screening was not carried out. It was disqualified during financial evaluation stage.

High caliber key personnel help the consultant's proposals in obtaining high marks in technical evaluation. The key personnel proposed by the consultants are well qualified and well experienced (Choudhry, 2016). However, after award of contract they resort to less qualified and less competent staff in order to save salary costs. This does not only make the technical evaluation meaningless but also places the project at risk. Poor enforcement of RFPs provide the consultants with a chance to propose high caliber staff in proposals but depute low caliber staff for carrying out services (Ng and Chow, 2004).

During financial evaluation, errors and omissions were found in three proposals. Professional vigilance is required not only during technical evaluation but also the financial evaluation. The erroneous financial proposals can have far reaching consequences (Choudhry, 2016). The financial proposals are therefore, to be checked prudently in the light of respective technical proposals and provisions of RFP.

4.3 Constraints and Limitation

The scope of this study is limited to public sector organization in the country. All public sector organizations are required to carry out procurement of goods, works and services by following the rules and regulations of PPRA (2010). A major limitation in this study is the reluctance of public sector organizations in sharing data for the case study due to confidentiality issues. This research may be repeated with a larger number of case studies.

5. Conclusion

Detailed analysis of the study is carried out in the foregoing section. Conclusions of the study are presented in this section.

- a) **Risk management:** The discussion and analysis shows that clients do not carry out risk management planning before starting procurement consulting engineering services. The clients need to turn themselves into well-informed purchasers by appropriately planning for risk management. The clients need to identify the risks involved, conduct quantitative and qualitative analysis, and plan appropriate risk responses. Inexperienced clients should seek suitable experts to assist them in understanding the requirement of services, and appointment and management of client – consultant services contracts.
- b) **Request for proposal:** RFP is not prepared diligently nor its provisions properly enforced. The request for proposal should be drafted diligently and its provisions be implemented in letter and spirit.
- c) **Scope management:** Clients need to give appropriate time and attention to scope management i.e. collecting requirements, defining scope of services, developing work breakdown structure, managing scope, and then validating and controlling scope by deputing appropriately experienced and knowledgeable staff. The scope of services must highlight the required competence of key personnel for completion of services. The deliverables are to be clearly defined.
- d) **Time management:** Time management is one of the keys to successful procurement and management of consultancy agreements. Stringent timelines are rarely of any value to achieving quality services. Consultants should be given appropriate time for completion of the services.
- e) **Selection procedure:** Selection of consultants should be preferred through quality based procedures. If ‘quality and cost based selection’ procedure is resorted to, then the reasons thereof should be documented. Weight of cost should preferably be 20% or less. It is in the interest of client to maintain transparency regardless of the selection method and the source of project financing.
- f) **Technical and financial evaluation:** The technical proposals are to be evaluated thorough expert judgement in a transparent and unbiased manner in the light of evaluation criteria. Compliance of technical proposals with mandatory requirements of RFP should be checked during preliminary screening. The financial proposals of consultants are to be evaluated prudently for discrepancies. As financial errors may have far reaching consequences, cost management requires due attention.
- g) **Cost management:** Consultants are to be discouraged from deliberate cost cutting by ensuring that the proposed remunerations are commensurate with the scope of services.
- h) **Same consultant for detailed design and construction supervision:** The decision to appoint same consultant for detailed design and subsequent construction supervision is to be made only after careful quantification of advantages that are not likely to be obtained if a different consultant is appointed for construction supervision, and removal of any possible conflict of interest.
- i) **Vetting of designs by third party:** Vetting of designs by an independent third party can lead to value enhancement. A provision, thereof, in the scope of services can be beneficial to the project as well as client. The fees of design vetting are to be kept commensurate with the complexity of design.
- j) **Client – consultant relationship:** Client – consultant relationship should be based on mutual trust and confidence from the outset of selection process as it helps in successful completion of assignment.

- k) **Work methodology:** After award of contract to successful consultant, the clients need to ensure that the consultant carries out the assignment by following the work methodology that was proposed in the technical proposal, or preferably a better methodology.
- l) **Key professional team:** Clients need to ensure that after award of contract the consultant engages exactly the same key professional team that was proposed in the technical proposal. If replacement is necessitated, it should be of equal or better competence.

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