

KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY

COLLEGE OF ARCHITECTURE AND PLANNING

DEPARTMENT OF BUILDING TECHNOLOGY

**RISKS ASSOCIATED WITH LOWEST EVALUATED BID SELECTION ON
CONTRACTS PERFORMANCE**

BY

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BSc(Hon).

**A THESIS SUBMITTED TO THE DEPARTMENT OF BUILDING
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TECHNOLOGY IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR THE DEGREE OF MASTER OF SCIENCE IN PROCUREMENT
MANAGEMENT**

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DECLARATION AND CERTIFICATION

I hereby declare that this submission is my own work towards the MSc Procurement Management and that, to the best of my knowledge, it contains no material previously published by another person nor material which has been accepted for the award of any other degree of the University, except where due acknowledgment has been made in the text.

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ABSTRACT

World Bank procurement guideline for procurement of works is largely based on the lowest evaluated bid selection procedure and it has also been indicated in Public Procurement Act.2003 Act 663 Part V section 59 (3) which states that “the successful bidder shall be the bidder with lowest evaluated bid price .With the recent downturn in the construction industry, most of the contractors are competing more and more aggressively to secure the relatively few new contracts that come to the market. Some informed clients appear to consider this to be good news and are reverting to the practice of awarding contracts on the basis of the lowest evaluated tender price and are ignoring the associated risks and adverse consequences. It seems the Public Procurement Act 663 Act 2003 in using the lowest evaluated tender as means of selecting a Contractor does not make provision for comparing the bids to the Consultant’s estimate and this may be one of the causes of project failure in terms of cost, time and quality standards. The study involved sampling the views of A1B1 to A3B3 road contractors and client on the risks associated with lowest evaluated bid selection procedure. Questionnaire survey approach was adopted for the study. Seventy questionnaires were distributed and Sixty three was retrieved representing a response rate of 90%. The study revealed the risks are associated with the lowest evaluated bid selection procedure. The major conclusions from both client and contractors were that termination of contract is the topmost risk associated with lowest evaluated bid selection procedure. From the client, unrealistic low price, time over run, increase overall cost of contract unsatisfactory quality was major risks that would affect contract performance. From the contractors, it was shown that some of the key risks that would affect contracts performance include unsatisfactory quality, unrealistic low price, and contractual claims among others.

DEDICATION

This research work is dedicated to my late parents Mr. and Mrs. Quantson, My lovely wife Katume Baidoo Quantson and my kids Abudul-Majeed Quantson and Mariam Ama Quantson whose encouragement, love, spiritual and moral support have helped me through my education.

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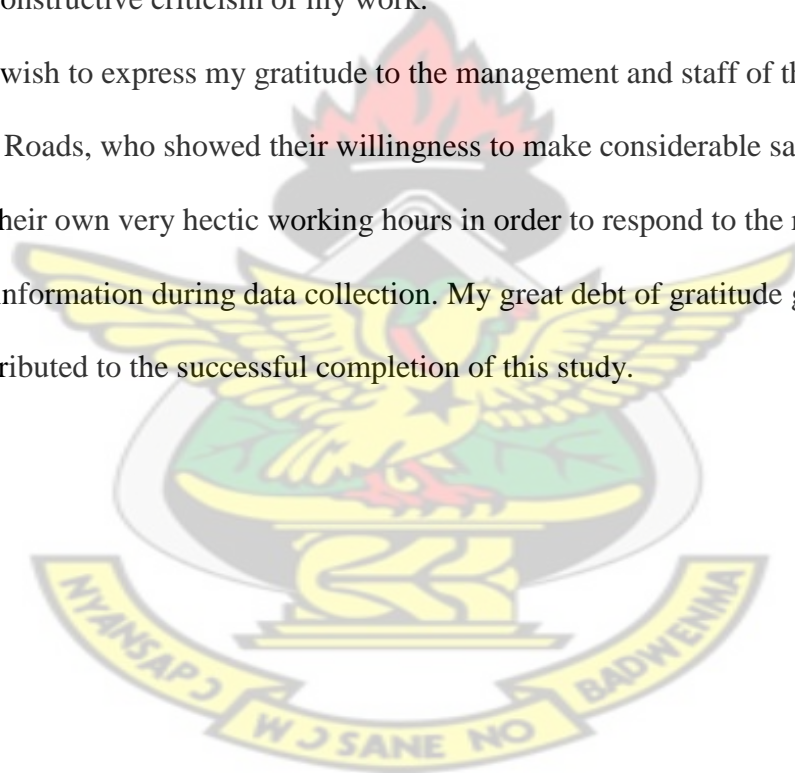
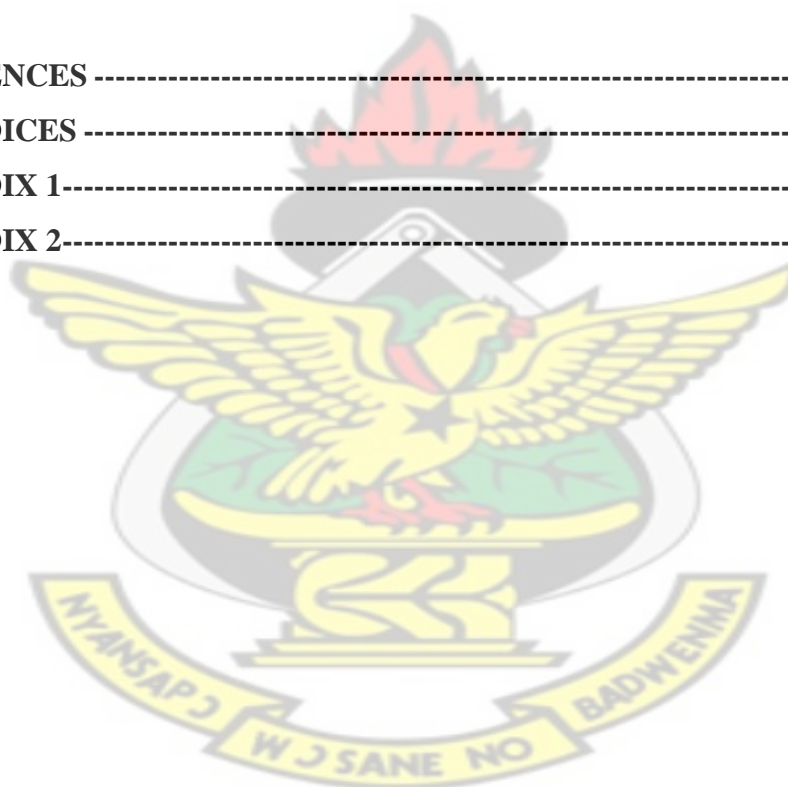


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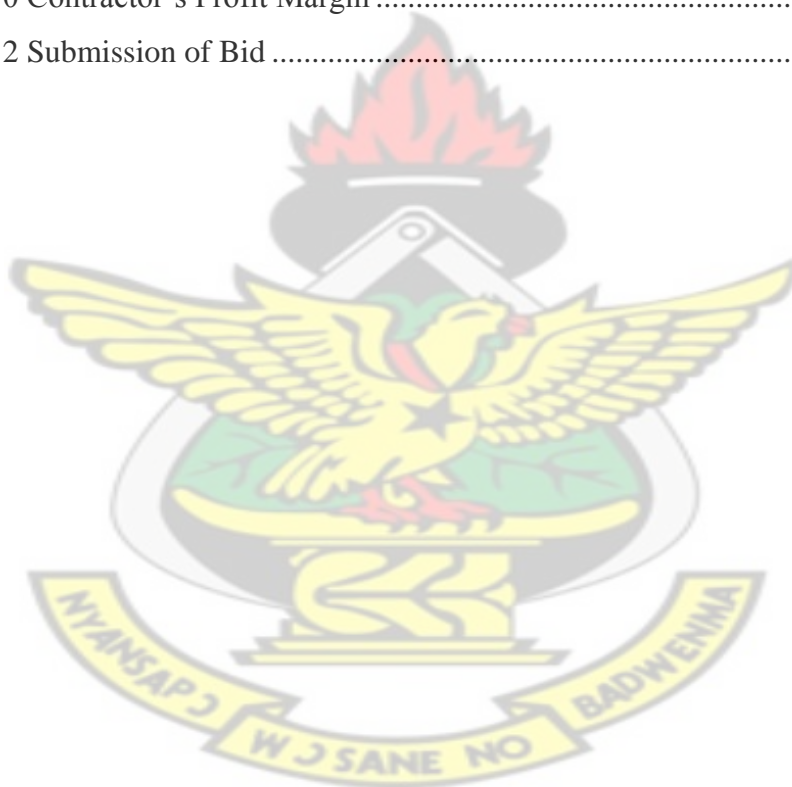
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CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND TO THE STUDY

The construction industry is in a downturn and, as a result, contractors are competing more and more aggressively to secure the relatively few new contracts that come to the market. Some informed clients appear to consider this to be good news and are reverting to the practice of awarding contracts on the basis of the lowest evaluated tender price and are ignoring the associated risks and adverse consequences (Odger et al., 2011).

World Bank procurement guideline for procurement of works is largely based on the lowest evaluated bid awarding system and has it is also as indicated in Ghana Public Procurement Act.2003 Act 663 Part V section 59 (3) which states that “the successful bidder shall be the bidder with lowest evaluated bid price. The customary practice of awarding contracts to a lowest evaluated bidder was established to ensure the lowest cost for completing a project. In public construction works, this practice is almost universally accepted since it not only ensures a low price but also provides a way to avoid fraud and corruption (Irtishad, 1993). While the lowest bid awarding system has a long-standing legal precedence and has promoted open competition and a fair playing field, a long-standing concern expressed by owners/clients and some of their industry partners is that a system based strictly on the lowest price after technical evaluation provides contractors with an incentive to concentrate on cutting bid prices to the maximum extent possible instead of concentrating on quality enhancing measure (Mechegiaw, 2012). Again, even when a higher cost product would be in the owner’s best interest, which could guarantee that the contracts will be awarded to the best performing contractors who will deliver the highest quality projects, the system does not allow. As a result, the lowest evaluated bid

system may not result in the best value for money expended or the best performance during and after construction but rather owners/clients generally faces increased exposure to contractual claims (Rizwan et al., 2008).

The project delivery selection type combination assumes that all contractors submitting eligible bids for the work will perform in an equal manner in terms of quality, skill, risk and time management, project control, and customer satisfaction. Therefore the only discriminating variable is the price of performance (Garner, 2009). As the public sector client is accountable to the public, an open competitive bidding process that is awarded based lowest evaluated price is highly transparent. Lowest evaluated bid price as the sole award criterion encourages unqualified contractors to submit bids which is very low with intent of recovering their losses through change orders and claims, also known as predatory bidding (Bedford, 2009). Therefore, lowest evaluated bid is not necessarily the best value. It is reasonable to conclude that, in the case of the lowest evaluated bidder awarding the contract, it is not contractor that is best placed to perform the contract on time and within budget but rather, the contractor most desperately looking for job and will make unrealistic prices without planning for difficulties that could arise. These incompetent practices pose a serious risk and problems like: delays in meeting project duration, increase in total cost of the project, resulting in bankruptcy or insolvency of companies, descend in construction quality, serious question on public safety and overall project failure (Mechegiaw, 2012)

1.2 STATEMENT OF THE PROBLEM

Construction is a high risk business. It involves a lot of financial commitment and human resource. Sustainability of most construction firms depends on the profit that they made as a result of contracts that they execute. It has been observed that, lowest evaluated bid

selection procedure of awarding contract based strictly on the lowest price after post qualification assessments. (Mechegiaiw, 2012). Even in the situation where the lowest evaluated bidder price is far below the estimated cost of the works as stated in the procurement plan or the Engineers estimate, the procurement entity has no option than to award the contract to the lowest evaluated bidder. Although the law allows public organizations to reject any or all the bids, the rejection cannot be done arbitrarily or in bad faith. When a lowest evaluated bid is rejected, a close scrutiny of the reasons given for the rejection and these kinds of rejections frequently give rise to resentment and may end up in court. To avoid these problems, many public organizations take only responsiveness of the bid in consideration and they do not consider the risk associated with lowest evaluated price before making award decisions (Irtishad, 1993).

As a result, the lowest evaluated bid awarding system may not result in the best value for money expended or the best performance during and after construction but rather owners/clients generally faces increased exposure to contractual claims (Rizwan et al., 2008). Lowest evaluated bid price as the sole award criterion encourages unqualified contractors to submit bids which is very low with intent of recovering their losses through change orders and claims, also known as predatory bidding (Bedford, 2009). Therefore, lowest evaluated bid is not necessarily the best value. It can be argued that, in the case of the lowest evaluated bidder awarding the contract, it is not contractor that is best placed to perform the contract on time, quality and within budget but rather, the contractor most desperately looking for job and will make unrealistic prices without planning for difficulties that could arise. These incompetent practices pose a serious risk and problems like: delays in meeting project duration, increase in total cost of the project, resulting in bankruptcy or insolvency of companies, descend in construction quality, serious question on public safety and overall project failure (Mechegiaiw,

2012).All these affects works contract performance. According to Odger et al. (2011) the lowest evaluated price is associated with a lot of problem. It forces contractors to price work at unrealistically low levels. As it is impossible to maintain standards and make profits, quality of work falls and contractors become more eager to engage in legal battles to recover their ‘losses’. It does not deliver cost savings but in fact is more likely in resulting to cost and time overruns, leading ultimately to poor value for money and greater whole life costs in the maintenance and operation of assets. It attracts a high risk of abnormally low tenders which should be rejected under the provisions of the EU Procurement Regulations or the procuring authority faces a risk of challenge.

It against this background that the research is conducted to identify the effect of lowest evaluated bid awarding on works contract performance in Department of Feeder Roads.

1.3 AIM OF THE STUDY

The aim of the study is to identify the effect of lowest evaluated bid selection procedure on works contracts performance in Department of Feeder Roads.

1.4 OBJECTIVES OF THE STUDY

The specific objectives are;

1. To identify risks associated with the lowest evaluated bid selection procedure.
2. To identify measures to mitigate the risk.

1.5 RESEARCH QUESTIONS

What are the risks associated with the lowest evaluated bid awarding system?

What are the measures to mitigate the risk?

1.6 METHODOLOGY

The early stage of the research reviewed existing literature on risks associated with lowest evaluated bid selection procedure on contract performance in construction industry from Journals, Books, the Internet and other secondary sources. Based on the findings from these sources, questionnaire was designed.

The questionnaire was designed in two (2) sets: Each set was given to contractors and Client. These questionnaires were to find answers to;

What are the risks associated with the lowest evaluated bid selection procedure?

What are the risks mitigation measures?

The population for the study was one hundred and nine respondents (109) made of forty five (45) contractors with Ministry of Roads and Highways (MRH) classification Certificate A1B1 to A4B4 and sixty four (64) Employees of Department of Feeder Roads made up of (Quantity Surveyors) and Civil Engineers who constitute client. Purposive sampling technique was adopted to sample road contractors and the client as respondents.

Each set of the questionnaire was divided into two sections. The first section drew information about the demographic characteristics of the respondents. The other section asked all the necessary questions required to achieve the aim of the study. The questions were closed ended to allow the respondents to answer specific questions. Space was provided for the respondent to express their general comments about the topic. The

questions were analyzed using descriptive statistics. The other types of questions were analyzed to obtain the relative importance on the risk associated with on lowest evaluated bid selection on works contract in the Department of Feeder Roads.

1.7 SCOPE AND DELIMITATION

The scope of the study was delimited to risks associated with of lowest evaluated bid selection procedure on works contracts performance in Department of Feeder Roads (DFR) in Ghana and Road Contractors Association in Eastern Region. The study sought information only from the most experienced and well-informed Civil Engineers and Quantity Surveyors from Department of feeder roads in all the regions including head office and A1B1toA3B3 contractors from Eastern Region to enhance the accuracy of data.

1.8 STRUCTURE OF THE RESEARCH REPORT

The report of the study is structured into five (5) chapters. Chapter one involves the background to the study, statement of the problem, research questions, aim and objectives, scope and delimitation of the study, while chapter two involves review of literature of other works which relates to the study. Chapter three looks at the methodological approach to the study. The issues would include the research design, population, sample size and sampling technique, data collection procedure and data analysis. Chapter four involve the data analysis and discussion and finally Chapter five involves conclusions and recommendations

CHAPTER TWO

LITERATURE REVIEW

2.1 INTRODUCTION

This chapter presents a review of literature of other research work and articles that relates to the topic under study.

The literature was arranged thematically under the following themes;

- Definition of works
- Legal Aspect of evaluation by PPA
- Bid evaluation procedure according to Public Procurement Act 2003 Act 663
- Alternatives method of evaluating bids
- Contract performance
- Performance of works contractors
- Factors that affects contract performance.
- The concept of risk
- Risk associated with lowest evaluated awarding system
- Risk mitigation measures of lowest evaluated bid selection

2.2 DEFINITION OF WORKS

Works means work associated with the construction, reconstruction, demolition, repair or renovation of a building or structure or surface and includes site preparation, excavation, erection, assembly, installation of plant, fixing of equipment and laying out of materials, decoration and finishing, and any incidental activity under a procurement contract (Manuals - Public Procurement Act, 2003 (Act 663)).

2.3 LEGAL ASPECT OF EVALUATION BY PPA

2.3.1 Evaluation of tenders

Section 59. (1) The procurement entity shall evaluate and compare the tenders that have been accepted in order to ascertain the successful tender in accordance with the procedures and criteria set out in the invitation documents.

(2) No criterion shall be used that has not been set out in the invitation documents,

(3) The successful tender shall be;

(a) The tender with the lowest evaluated tender price and

(b) The lowest evaluated tender ascertained on the basis of criteria specified in the invitation documents which shall be

(i) Objective and quantifiable; and

(ii) Given relative weight in the evaluation procedure or expressed in monetary terms where practicable if the procurement entity has so stipulated in the invitation documents.

(4) To determine the lowest evaluated tender, the procurement entity shall consider

(a) The tender price, subject to any margin of preference applied under section 60(2);

(b) The cost of operating, maintaining and repairing the goods or works, the time for delivery of the goods, completion of works or provisions of the services, the functional characteristics of the goods or works, the terms of payment and of guarantees in respect of the goods, works or services;

(c) The effect the acceptance of the tender will have on

(i) The balance of payments position and foreign exchange reserves of the country;

(ii) The counter trade arrangements offered by suppliers or contractors;

(iii) The extent of local content, including manufacturer, labour and materials, in goods, works or services being offered by suppliers or contractors;

- (iv) The economic-development potential offered by tenders, including domestic investment or other business activity;
- (c) The encouragement of employment, the reservation of certain production for domestic suppliers;
- (vi) The transfer of technology;
- (vii) The development of managerial, scientific and operational skills; and
- (d) National security considerations.

2.4 BID EVALUATION PROCEDURE ACCORDING TO PUBLIC PROCUREMENT ACT 2003, ACT 663

Procurement under projects financed from the Public Funds of the Republic of Ghana, is carried out in accordance with the procedures laid down in the Public Procurement Act, 2003 (Act 663) This Standard Tender Evaluation Format has been prepared for use by Procurement Entities in the evaluation of Tenders procured through International Competitive Tendering (ICT), as well as through Limited International Tendering (LIT)

2.4.1 Tender Evaluation

Tender evaluation will be conducted by a Tender Evaluation Panel consisting of a minimum of three qualified members. It should be noted that tenderers frequently attempt to contact the Procurement Entity during Tender evaluation, directly or indirectly, to ascertain progress of evaluation, to offer unsolicited clarifications, or to provide criticisms of their competition. The evaluation Panel must evaluate Tenders solely on the basis of the information provided in the respective Tenders and no changes in the Tender price or substance of a Tender will be permitted. No circumstances shall justify meetings or consultation between the Procurement Entity (or its consultants) and tenderers during the Tender evaluation process.

2.4.2 Preliminary Examination of Tenders

The procedures for examination of tenders and clarifications must be conducted in accordance with the specific terms contained in the Tender Document used.

Action:

The Evaluation panel shall:

Conduct a preliminary examination to determine whether tenders are complete and are responsive to the basic instructions and requirements of the Tender Document including checks that:

the Tenderer is eligible to tender where this has not been determined prior to inviting tenders;

all Tenderers are from eligible source countries; the Tender has been submitted in the correct format and there are no missing pages;

any erasures, interlineations, additions or other changes in the Tender have been initialed by the Tenderer;

any required Tender Security has been submitted, in the correct form and amount and valid for at least the period required;

the Tender has been submitted without material reservations or deviations from the terms and conditions of the Tender Document;

the Tender has been correctly signed and authorised;

if the Tenderer is a joint venture, a copy of the joint venture agreement has been submitted;

the correct number of copies of the Tender have been submitted;

the Tender is valid for at least the period required;

all key documents and information have been submitted;

any required samples have been submitted and

the Tender meets any other key requirements of the Tender Document.

If a prequalification procedure was applied, reject and exclude any Tender received from other than the pre-qualified tenderers.

May request clarifications from tenderers concerning ambiguities or inconsistencies in the Tender. As required in the Tender Document, such requests shall be in writing, and no change in the price or scope of the originally offered works may be sought or accepted, except for the correction of arithmetic errors. The responses from Tenderers shall also be in writing.

Notify tenderers of any such arithmetic corrections and request written, agreement of the Tenderer to the correction. If a Tenderer does not accept the correction of an arithmetical error, his Tender must be rejected and the Tender Security may be forfeited. Any communications between the Procurement Entity and a tenderer during the preliminary examination of Tenders shall be made in writing.

2.4.3 Responsiveness of Tenders

Following the preliminary examination of tenders, the Tender Evaluation Panel should examine the tenders to determine whether any issues arising from the preliminary examination affect the responsiveness of an individual tender, and whether each tender is substantially responsive to the technical specifications and contract conditions stated in the Tender Document.

The determination of a Tender's responsiveness is based on the contents of the Tender itself, subject to any clarifications received in the Preliminary Examination of Tenders.

A substantially responsive Tender is one that conforms to all the instructions, requirements, terms and conditions of the tender documents, without material deviation,

reservation or omission. A material deviation, reservation, or omission is one that: affects in any substantial way the scope, quality, or performance of the works specified in the Tender Document; or would limit in any substantial way, inconsistent with the Tender Documents, the rights of the Procurement Entity or the Tenderer's obligations under any resulting contract; or if corrected would unfairly affect the competitive position of other Tenderers presenting substantially responsive and compliant Tenders. Any tender containing a material deviation, reservation or omission, is therefore not substantially responsive, shall be rejected and may not subsequently be made responsive by the Tenderer or the Procurement Entity.

The classification of a deviation, reservation or omission as material or non-material shall be determined by the objectives and requirements of the individual procurement requirement, as stated in the Tender Document, and shall take into account the impact on key factors, such as cost, risk, time and quality. Material deviations, reservations or omissions may typically include:

unacceptable time schedules for completion of the works compared with requirements stated in the Tender Document;

unacceptable alternative technical details, such as inferior design, materials, workmanship, specifications, standards or methodologies; or

unacceptable counterproposals with respect to key contract terms and conditions, such as payment terms, price adjustment, liquidated damages, sub-contracting or warranty.

Non-material deviations may include:

longer completion schedules unless this takes completion of the works past a clearly defined cut-off date stated in the Tender Document;

minor deviations in the payment terms required;

tenders offering goods to alternative, but equal or superior specifications and performance;

tenders offering the specified works but failing to price specific items within the bill of quantities or activity schedule.

The classification of deviations, reservations and omissions as material or nonmaterial must be consistently applied to all Tenders.

Where a Tender is determined to be substantially responsive, the Evaluation Panel may waive, clarify or correct any non-conformity, error or omission, which does not constitute a material deviation. Such non-conformity, error or omission should be quantified in monetary terms to the extent possible and taken into account in the financial evaluation and comparison of Tenders.

Action:

The Evaluation panel may;

Reject and exclude from further evaluation any Tender that is incomplete, unsigned, not accompanied by a Tender Security, not accompanied by essential supporting documents, or not substantially responsive to the technical specifications, contract conditions or other critical requirements stated in the Tender Document.

Reject and exclude from further evaluation any Tender which contains material deviations, reservations or omissions, and is therefore not substantially responsive.

2.4.4 Financial Evaluation of Tenders

Tenders that are determined to be substantially responsive to the requirements of the Tender Document shall be subjected to financial evaluation to determine the evaluated price of each Tender, and the lowest evaluated tender.

The evaluated price for each Tender is determined by: taking the Tender price, as read out at the tender opening; Correct any purely arithmetical errors in tenders in accordance with the procedure stated in the Tender Document. Note that if there is any discrepancy between numbers and written figures, the written figures shall prevail. If both the quantity and the total price are indicated in the Tender form, arithmetic should be checked and if there is a discrepancy, the unit price shall govern. All errors in extension (multiplying the unit price by the quantity) and totaling should be corrected and the tenderer notified. Tenderer cannot be permitted to retain an arithmetical error in extension or totaling and correct the unit price applying any non-conditional discounts offered in the Tender; making financial adjustments in accordance with the Tender Document for any non-material **non-conformity**, error or omission. Pricing of works items or features which are clearly omitted in a Tender may be based on the highest prices for corresponding items in other responsive Tenders.

Note that by convention, un-priced sub-items in bill of quantities are normally assumed to be covered in the price of the main item and no adjustment to the evaluated tender price is made in this case. Note also that no additional credits may be given for offered features that exceed the required standards or specifications;

converting all Tenders to a single currency, using the currency and the source and date of exchange rate indicated in the Tender Document; and

applying any margin of preference indicated in the Tender Document. Tenders shall be compared by ranking them according to their evaluated price to determining the Tender with the lowest evaluated price.

2.4.5 Treatment of Discounts

Tenderers may be permitted to offer discounts to their Tenders, which shall be included in the Tender and read out at the tender opening. Any discount offered after the deadline for submission of Tenders must not be taken into account. Any non-conditional discounts shall be taken into account in the financial evaluation and comparison of tenders. Any prompt payment discount included in a Tender shall become a term of the contract, if that Tender is accepted, and utilised by the Procurement Entity, If payment is made in accordance with the terms of the discount. However, prompt payment discounts must not be considered in the evaluation and comparison of tenders. Post-Qualification of the lowest evaluated responsive Tenderer should be conducted to determine the Tenderer's physical capability to perform the contract. Using the criteria specified in the Tender Document, this review should include an assessment of the Tenderer's technical, financial and physical resources available to undertake the contract, including his current workload.

If pre-qualification was conducted, the lowest evaluated responsive Tender should be recommended for the award of contract, unless the Tenderer's qualifications have since materially deteriorated, or if the Tenderer has since received additional work that reduces the available capacity.

Where pre-qualification has not taken place, the lowest evaluated responsive Tender should be subjected to post-qualification, according to the procedures described in the Tender Document.

If the lowest evaluated responsive Tenderer fails post-qualification, his Tender should be rejected, and the next ranked Tenderer should then be subjected to post-qualification

examination. If successful, this Tenderer should receive the award. If not, the process continues for the other Tenderers.

The rejection of a Tender for reasons of qualification requires substantial justification, which should be clearly documented in the attachments to the Evaluation Report.

A history of poor performance may be considered a justification for failing post-qualification if the Tenderer is unable to demonstrate that steps have been taken to resolve previous problems.

2.4.6 Evaluation Reports and Recommendations

The Tender Evaluation Panel will prepare an evaluation report for submission to the Tender Committee.

The evaluation report should be prepared using the standard format for the Evaluation of Works, and include: a summary of the Tenders received and opened;

the results of the preliminary examination; the results of the technical evaluation;

reasons why any Tenders were declared non-responsive. (Attach copies of selected pages from Tenders if necessary, to show examples of objectionable features);

details of any non-material deviations, which were accepted and the way in which they were quantified and taken into account in the financial evaluation; the evaluated price of each Tender, showing any corrections or adjustments to the tender price and any conversion to a common currency;

An explanation of:

any inconsistencies between prices and modifications to prices read out at Tender opening.

any substantial corrections for arithmetic errors which may affect the ranking of Tenderers.

any additions, adjustments, and priced deviations that may affect the ranking of Tenderers.

any cross-discounts not read out and recorded at the Tender opening.

the ranking of the Tenders, according to their total evaluated price;

a statement of the lowest evaluated substantially responsive tender, for each lot where applicable, clearly establishing the actual amount of the contract award;

confirmation that the total price quoted by the lowest evaluated responsive Tender is acceptable compared with the original estimated cost of the procurement;

the results of any post-qualification examination; and

a recommendation to award the contract or contracts to the lowest evaluated responsive Tenderer or combination of Tenderers, or other appropriate recommendation, such as the cancellation of the procurement process.

The Evaluation Panel may recommend that all of the Tenders be rejected if:

none of the Tenders are found to be responsive;

all of the Tenders are unreasonably high in price compared to the cost estimate;

none of the Tenderers are qualified;

there is deemed to be an absence of competition, (however lack of competition is not usually decided solely on the basis of the number of Tenderers).

Attach to the evaluation report:

copies of any correspondence with Tenderers who raised objections to the Tender or evaluation process, together with detailed responses;

copies of any letters from Tenderers requesting clarifications, and responses by the Procurement Entity, and Tender clarifications requested by the Procurement Entity and Tenderer responses;

any separate evaluation report from a consultant, if one was engaged for this purpose;
all required Tables and supporting documents.

The Evaluation Panel should ensure that the Tender evaluation report is double-checked, signed and complete before submitting for approval by the Tender Committee.

The evaluation report forms a part of the record of procurement proceedings required under Section 28 of the Act.

2.5 ALTERNATIVES METHOD OF EVALUATING BIDS

Contracts are awarded based on successful evaluation of bids. Public procurement Act 2003, Act 663 as made lowest evaluated bid method as a default mode of selecting contractor's for works contracts.

Apart from the default mode by PPA, there alternative methods can also be used to evaluate bids. Some of which are;

- 1) Competitive Average Bid evaluating method (Price-based)
- 2) Multi Parameter Bid evaluating Method (Based on price and “other” factors)
- 3) Competitive Negotiated Bid evaluating method

2.5.1 Competitive Average Bid Evaluating Method (Price-based)

Competitive average bid evaluating method of awarding contracts is based on the principle that the best bid is the bid which is closest to the average of all bids, and not the bid which is highest or lowest. Bids which fall too far below the mean are considered to be unrealistically underbid. Bids which are much higher than the average are considered to be unrealistically overpriced. Methods based on this principle are very common and known, in general, as European Methods (Irtishad, 1993).

In general, the winner based on the average-bid method is the contractor whose bid satisfies a certain relationship with the average of all bid prices. Different average-bid method use different procedures for calculating the average, or use different criteria for determining the winning bid. For example, some use an arithmetic average or a weighted average, while others use the average of the remaining bids after all bids that differ more than a certain percentage from the average of all other bids are eliminated. Similarly, the winner might be the contractor whose price is closest to the average, or the contractor whose bid is closest to, but less than the average. The former, for example, is used in Taiwan while the latter is used in Italy (Photios, 1993).

A formula to decide a reasonable offer from several competitive bids was developed in Europe, known as “Danish” system, wherein the lowest and highest offers are rejected out right away and the rest of the offers are only considered (Irtishad, 1993). This formula stands as:

$$NA = (NL + 4A + NH)/6$$

Where,

NA = new average;

NL = new low;

NH = new high; and

A = average of all offers.

The bid which is first above this new average is then treated as realistic and acceptable. The major shortcoming of this method is that it is not effective unless the number of submitted bids is eight or more. The basic philosophy behind the average bidding

procedure is that the best bid is the one closest to some average, not the lowest, not the highest. These competitive price-based average bidding methods are used mainly to ensure that the contractor is responsible, to avoid contractor-failure, and to reduce disputes and claims. The underlying principle is that the contractors should get a reasonable and realistic price for their work. In competitive average bidding procedures, as described in the previous section, all the features of lowest evaluated system are retained. The only difference is that the selected contractor is the one whose bid is near the average of all the bids submitted.

The main advantage is that it safeguards an owner against signing a construction contract for an unrealistically low bid price that almost certainly will lead to adversarial relationships during construction (Ioannou et al. 1993). It was also pointed out that, under this method, contractors are protected from having to honor a bid containing a gross mistake or oversight. The basic drawback of the average-bid method is that it does not necessarily promote price competition that leads to higher costs for the owner. Although it has been argued that average bidding method results in significantly higher profits for the contractors that won projects (Irtishad, 1993). When such high profits are available throughout the industry, bid prices should be expected to gradually fall and the savings will eventually be passed to the owner. It has been claimed that the average bid method would increase contractor profitability and it has the potential to improve relationships between the owner and the contractor. Whether contractor profitability is higher or the relationships between the owner and the contractor are better in the countries that practice average bid method cannot be ascertained. There is not enough evidence to conclude that incidence of claims is less in European countries that practice average bid method (Irtishad, 1993).

2.5.2 Multi-Parameter Bid Evaluation Method (Based on price and “other” factors)

A model of competitive bidding that is based not only on cost but also on other parameters was proposed by Herbs man and Ellis; they named it the multi-parameter bidding procedure (Herbs man and Ellis, 1992). They suggest that the major parameters should be cost, time and quality. Given that the amount of time a contractor proposes to complete a project may have a major impact on costs. For instance, a contractor who can complete a building contract for four (4) months prior to his closest competitor may save the employer additional rent monies, by factoring this cost saving into the bid process, a more accurate reflection of total costs can be calculated. Similarly the impact of quality can also be included in the award-decision. The long-term costs of maintenance and repair are directly related to the quality of the constructed facility being built. In the Multi-Parameter Bid evaluation Method, estimates of quality may be measured by the type of materials proposed to be used, the previous experience/past performance of the general contractor and the proposed subcontractors.

Under the Multi-Parameter Bid Method, time and quality concerns are each assigned a maximum attainable number of points. The bids are then reviewed and ranked based upon these factors, as well as upon the contract cost. The total combined costs of all the bidders are then compared to select the best bid. Under this method factors other than price are considered before award decisions are made. This is done in a more rigorous fashion than the customary practice of prequalification procedure. Technical merit, and time and quality-related factors in a bid proposal are being given more emphasis. Some people assert that the innovative methods are needed for the sake of time and quality, to get better value for the government money, to reduce life-cycle costs for the public to encourage quality and innovations, while maintaining a fair profit for the contractor. For many years time was not the most important element in construction projects in many

countries. The element of cost was the most important one, and therefore the procurement systems were mainly for materials and equipment.

2.5.3 Competitive Negotiated Bid Evaluating Method

Sometimes it may become necessary to obtain bids from a selected group of contractors known to have the technical, financial and managerial capability to complete a complex project. In such cases competitive price-based bidding may not be appropriate. Pure sole-source negotiation, on the other hand, is very difficult to practice in public sector since this process may easily lead to allegation of favoritism and corruption. To avoid these inherent problems with pure sole-source negotiated bidding, many agencies and owners have adopted variations with features of both competitive and negotiated procedures. The most common modification of the pure negotiated procedure is to increase the number of firms to negotiate with, thus increasing the options to select from. In some cases, certain firms which are known to be competent to complete a project, based on previous experience or reference, are contacted by the owner or client (Irtishad, 1993). The public body shall negotiate a contract with the most qualified firm for professional services at compensation which the organization determines to be fair, competitive, and reasonable. In making such determination, the public body shall conduct a detailed analysis of the cost of the professional services required in addition to considering their scope and complexity. These methods are usually employed when the project is planned to be built under a design/build contract. Competitive negotiated bidding methods claim that these methods save time, improve quality and reduce number of claims.

The main points against this method are that the cost and time spent by the contractor for preparing a proposal is higher; the system lends itself to a situation where the contractor is reserved to propose any new or innovative ideas because they may not fit the experience of preconceived ideas of the evaluators; contractors are required to disclose

confidential commercial and financial information that should not be released outside the company; the owner may try to get cost-saving ideas from the competing contractors during the interviews and yet may choose not to award the project to the contractor whose ideas would later be utilized; and the processes of evaluation turns out to be subjective rather than objective (Kelley, 1991).

2.6 CONTRACT PERFORMANCE

According to Thomas (2002) the main performance criteria of construction projects are financial stability, progress of work, standard of quality, health and safety, resources, relationship with clients, relationship with consultants, management capabilities, claim and contractual disputes, relationship with subcontractors, reputation and amount of subcontracting. Chan and Kumaraswamy (2002) stated that construction time is increasingly important because it often serves as a crucial benchmarking for assessing the performance of a project and the efficiency of the project organization.

Ugwu and Haupt (2007) stated that, an adequate understanding and knowledge of performance are desirable for archiving managerial goals such as improvement of institutional transformations, and efficient decision making in design, specification and construction, at various project level interfaces, using appropriate decision-support tools. It is generally recognized that both the performance of an organization and its long-term effectiveness are impacted by the mode of their selection. Procurement of contractors is a key factor in the success of organizations in many different industries, including the construction industry (Cameron and Quinn, 2002)

2.7 PERFORMANCE OF WORKS CONTRACTORS

Chitkara (2005) defined performance as prescribed goals or objectives which form the project parameters. From project management perspective, it is all about meeting or exceeding stake holders “needs and expectations from a project”. It considers the three major project elements i.e. time, cost and quality. (Project Management Institute, 2004). The client who is the major stakeholder, want faster delivery of their project with early start of construction work, certainty of performance in terms of cost, time and quality, value for money for their investment, minimal exposure to risk and early confirmation of design (Costa and Formoso, 2004). Neely (1995) defined performance measurement as the set of metrics used to quantify both the efficiency and effectiveness of action. Alwi et al. (2002) also argue that performance measurement is a management tool which has the power to focus attention on desired behavior and results. This means that, measuring performance allows an organisation to objectively determine what is working and what is not. In order to measure performance or calculate the effects of any given change on the construction process, one must first determine the appropriate Key Performance Indicators (KPIs) and measure their impact on project delivery. Ofori and chan (2001) have indicated that measuring performance is a complex problem. This is because every contractor is unique in terms of the manner in which he follows design specifications, method of delivery, administration, and composition of team members. Stevens (1996) suggested that performance measurements are needed to track, forecast, and ultimately control the success of a project. Despite the importance of performance measurement, it has not been widely implemented in construction companies and information on the performance of the construction industry as a whole is also scarce (Dayana et al., 2005). According to Amu, et al. (2005) the untimely completion of construction projects has been found to be a major setback in the construction industry. Odusami and Olusanya

(2000) indicated that projects executed in Lagos metropolis experienced an average delay of 51% of planned duration for most projects. Therefore an improved contractor performance can lead to increased client satisfaction, improvement in reputation and competitiveness in the market (Ogunsemi and Jagboro, 2006). The contractor performance is critical to the success of any construction project which is the determinant of cost, time and quality standard because the contractor converts the design into practical reality (Xiao and Proverbs, 2003)

2.8 FACTORS THAT AFFECTS CONTRACT PERFORMANCE.

Dissanayaka and Kumaraswamy (1999) remarked that one of the principal reasons for the construction industry's poor performance has been attributed to the inappropriateness of the chosen procurement system. The insufficiency and inappropriateness of the awarded contractors has led to sub-standard work, delays, disputes, bankruptcy or insolvency of many company (Hatush et al., 1997). In Ghana, most common procurement method is the competitive lowest evaluated-bid procedure in which contracts are awarded to responsive contractor who offers the least price after technical evaluation. There are definite benefits and drawbacks to the lowest evaluated-bid award system. Promoting competition amongst contractors is a clear benefit to the process. It compels the contractors to lower their costs, usually through innovation, to ensure they win bids and maintain their profit margins. In addition, the process is beneficial, specifically to the public sector because of the transparency, an important criterion of public policy (Photios, 1993). However, allowing contracts to be awarded based on the least price has inherent flaws. Delays in meeting the contract duration, increment of the final project cost due to high variations, tendency to compromise quality, and adversarial relationship among contracting parties are the major drawbacks associated with lowest evaluated bid award procedure (Bedford, 2009). Moreover, the lowest evaluated-bid award system

encourages unqualified bidders in the competition and in contrary it discourages qualified contractors to participate and all these affects contract performance. According to Hardy (1978) the criteria used for bid evaluation should reflect the client's objectives. These are that bids are fully responsive to the contract and bidders are sufficiently well qualified to undertake the contract. The criteria for selecting the successful bidder are then that bid which maximizes the return on the client's investment. Thus he has proposed that bidders should submit a schedule of the payments they expect to fall due to them during the contract. Also, Owusu (1999) identified two main factors affecting contractor performance in Ghana. The two factors were Financial and Managerial Capacities of the firm. Under the financial factors Owusu (1999) mentioned that contractor's financial stability in terms of access to credit was questionable and that has gone a long way to affect their performance over the years.

2.9 THE CONCEPT OF RISK

To understand and mitigate risk in public procurement, it is necessary to understanding what risk actually is. Cambridge Advanced Learner's Dictionary (2008) defined risk as 'the possibility of something bad happening'. Risk may also be understood as 'something happening that may have an impact on the achievement of objectives; it includes risk as an opportunity, as well as a threat' (NAO, 2000, p. 1, OGC 2003). According to Knight (1921) one may include the notion of measurement, of measureable uncertainty. Thus risk can be defined as measureable uncertainty of outcome, whether positive opportunity or negative impact, whereby the measureable uncertainty is expressed in terms of likelihood. While we acknowledge that the definition of risk often used is neutral, i.e. having negative or positive effects on the outcome of an activity, the study is limited to the negative consequence of a risk. To clarify the difference between uncertainty and risk, Perminova et al., (2008) defined uncertainty as 'a context for risks as events having

a negative impact on the project's outcomes. They further stress that, risks are known and possible for managers to deal with, while uncertainty is an event or a situation that was not expected to happen.

According to Keizer and Halman,(2007)and Keizer et al. (2002) general risks have been mapped according to three dimensions, the degree of uncertainty, the degree of controllability and the relative importance (in other words: benefit). If the likelihood of a bad result is high, the ability and resources available to influence and control outcomes are small and the potential consequences of failure is high, a project activity should be labelled 'risky'

2.10 RISK ASSOCIATED WITH LOWEST EVALUATED AWARDING SYSTEM

There are definite risks associated with the lowest evaluated bid award system. A number of studies have shown that the lowest evaluated bid does not guarantee the lowest cost. The contractor with the lowest evaluated bid is the one most likely to have underestimated the cost of the project and it is difficult to understand how that contractor could complete the job profitably (Capen et al.1971). Lowest bidders are required to complete a construction project that no one else was willing to do at that price (Wolfsetter, 1996). According to Chua (2000) and Fayek (1998) the factors that can influence a contractor's decision to bid and the price they submit are imprecise and ambiguous contract documentation, including incomplete drawings which may cause a contractor to make a serious omission in calculating costs.

According to Zack (1993) most contractors intentionally submit low bid in anticipation of making their profit through change orders and claims. Some bidders carefully review the bid documents searching for mistakes and ambiguity in areas that could lead to change orders and claims during the project (Doyle and DeStephanis, 1990). These

bidders can then use this knowledge to submit a lower bid with the expectation of recouping the money later. This practice can be equated to a gambit strategy in chess: making a small sacrifice early to setup up the opponent to be in a vulnerable position later (Crowley and Hancher, 1995). In all cases, the abnormally low bid is not reflective of the final contract cost or the hidden costs incurred by the client when dealing with numerous change orders and claims.

According to Machegiaw (2012) the median bid submitted may be considered a reflection of the fair market value for a contract for the bidders. In some cases, half of the contractors would be willing to take the job at the median price, while the other half of the bidders would not. The median bid is more reflective of the market value than the mean because it is not influenced by high or low bids. For example, Highways road construction contracts that were awarded to lowest bidders that were significantly lower than the median bidder experienced 3.5 to 4 times the cost escalation (from the lowest evaluated bid) than contracts where the lowest evaluated bidder was close in price to the median bid price (Crowley and Hancher, 1995).

Although it is generally accepted that competitive lowest evaluated bid method saves taxpayers money and thus protects public interest, this traditional method has recently been criticized lately for promoting inferior quality, causing too many change orders, furthering adversarial relationships, time overrun, and increasing overall cost of the project (Machegiaw, 2012).

Other problems associated with the competitive lowest evaluated bid method is that when the number of bidders is as large as is the case in a slow economy, an owner runs a significant risk of selecting a contractor that has either accidentally or deliberately submitted an unrealistically low price (Photois, 1993). A contractor cannot adhere to such

a low price and at the same time expect to complete the project according to plans and specifications, and also make a reasonable profit. This often results in excessive claims and disputes during construction that lead to schedule delays, compromises in quality, and increased costs (Irtishad, 1993). The low bid award system encourages unqualified bidders (Carr, 2005). Kim et al. (2008) stated that international construction projects performance is affected by more complex and dynamic factors than domestic projects; frequently being exposed to serious external uncertainties such as political, economical, social, and cultural risks, as well as internal risks from within the project. According to Odger et al. (2011) the following are the major risks associated with lowest evaluated bid awarding system; cost overrun, time over run, insolvency, damage to reputation, legal challenge, poor lifecycle performance, no repeat business and legal cost. According to Anvuur et al. (2006) it appears that this lowest bidder system as practiced in Ghana has consequential effect upon contractor's performance on project delivery. The National Competitive Bidding practice where the lowest evaluated bid is accepted, there is apparently some evidence of winning contracts failing to complete their work or experiencing several delays because low bids they submitted.

2.11 RISK MITIGATION MEASURES OF LOWEST EVALUATED BID SELECTION

According to Odger et al. (2011) there are risks associated with 'traditional' lowest evaluated bid selection, but these could be managed by ensuring the following controls are in place for every contract. The initial price is not the final cost as contracts typically run over, so we need to allow an extra to our budget to cater for cost overrun. Traditional contracts typically finish a bit later than planned, so we will have to add a few extra months to our programmes so that it can cater for time overruns. The extra costs and delays will obviously have to be sorted out, so we had better make extra provisions for

legal and Quantity Surveyor fees to write off the disputed costs that have been incurred. If abnormally low tender bids are not rejected then there is a strong likelihood that we could be legally challenged by the unsuccessful contractors. We will therefore need to make sure we had gotten good lawyers on board and have to add their potential fees to our budgets too. We will have to accept lower quality components in order to achieve our capital budgets, and this will increase our running and maintenance costs in the long term. However, future revenue budgets will hopefully be a lot higher than they are at the moment so we can easily deal with those extra costs later. Uneconomic margins by our contractors may cause them to collapse, it therefore important to award contract within acceptable estimated cost so as to keep our contractors in business. According to World Bank Procurement Guideline (2006), in order to mitigate some of the risk associated with lowest evaluated bid selection, the estimated costs should be published during bidding. There is no reason to keep the estimated cost secret from the bidders – and in most countries, at least some of the bidders will always have way to find out. It is better if everybody has the same information. If the contractors are aware, at least they will submit bid price closer to the estimated cost. Again, when a bid is identified as potentially too low, the bidder should be offered the opportunity to withdraw the bid without further penalty. If the bidder chooses not to withdraw the bid, the bidder should be asked to provide detailed calculation to show that its bid price is justified. This calculation should be checked by an independent engineer (not the engineer who made the original estimate). If, after checking the calculation, the engineer confirms that the bid price is unreasonably low, the bid evaluation committee should make a full report with all the documents placed on file. They can then recommend awarding the contract to the next lowest bidder. The bidder can only gain, if construction supervision is weak. With good supervision, the contractor can only be paid if it's constructed according to

the design, specifications and conditions of the contract. Therefore, if the bidder expects strong supervision, it will not adopt this strategy of submitting low bid. An alternative approach is to award the contract to the bidder submitting the lowest bid price, on condition that the bidder provides additional performance security to cover the loss to the buyer in case of default. If a contractor submits a bid that is significantly lower than the client's estimate and the other bidders, it is difficult to understand how that contractor could complete the job profitably. The European Union defines those bids as Abnormally Low Tenders (Bedford, 2009). An Abnormally low tender is a tender whose price is considered significantly lower than most of or the average of all tenders in the same procurement procedure. The EU introduced legislation to allow public sector clients the option of awarding a construction project using the Economically Most Advantageous Tender (EMAT). The legislation allowed public sector clients to reduce their exposure to some of the adverse effects of abnormally low tenders (ALT) including: unsatisfactory quality through the need to reduce construction costs (Winch 2000); and Predatory pricing and unfair competition that distorts the market, negatively affecting the other bidders (Alexanderson and Hulten, 2006).

European Commission's Europe report on "Prevention, Detection and Elimination of ALT in the European Construction Industry" states that a tender is assumed to be abnormally low if in the light of the client's estimate and of all the tenders submitted, it appears to be abnormally low by not providing a margin for normally levels of profit, and the low tender cannot be explained by economy of the selected construction method, the technical solution chosen, exceptionally favorable conditions available to the tender, or the originality of the work proposed (Bedford, 2009).

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 INTRODUCTION

This chapter outlines the strategy adopted in carrying out the research. It discusses among other things the design of the questionnaires, Population to study, Sampling Technique, Data collection and analysis.

3.2 RESEARCH DESIGN

3.2.1 Questionnaire Design

The early stage of the research reviewed existing literature on the risks associated with lowest evaluated bid selection procedure in construction industry from Journals, Books, the Internet and other secondary sources. Based on the findings from these sources, questionnaire was designed.

The questionnaires were designed in two (2) sets: Each set was given to contractors and Client. These questionnaires will find answers to;

What are the risks associated with the lowest evaluated bid selection procedure?

What are the measures to mitigate the risks?

Each set of the questionnaire was divided into two sections. The first section was to draw information about the demographic characteristics of the respondents. The other section was to ask all the necessary questions required to achieve the aim of the study. The questions were closed ended to allow the respondents to answer to specific questions. Space was also provided for the respondents to express their general views about the topic. Finally, the data collected was analyzed. Based on the findings, recommendations

will be made to the Public Procurement Authority and all stake holders. (Copy of each questionnaire can be found at the Appendix 1&2).

3.3 POPULATION OF THE STUDY

The target population for the study was road contractors registered with Ministry of Roads and Highways classification certificate (MRH) A1B1 to A4B4 and Civil Engineers and Quantity Surveyor of Department of Feeder Roads. According to Roads Contractors Association of Eastern region (2014) a total of forty (45) have registered with the association. According Human Resource Directorate of Department of Feeder Roads (2014) the total number of Quantity Surveyors and Civil Engineers were sixty four (64). Therefore total population for the study was one hundred and nine (109).

3.4 SAMPLING TECHNIQUE

The researcher adopted purposive sampling technique to gather the data. The purposive sampling technique, also called judgment sampling, is the deliberate choice of an informant due to the qualities the informant possesses. It is a nonrandom technique that does not need underlying theories or a set number of informants. Simply put, the researcher decides what needs to be known and sets out to find people who can and are willing to provide the information by virtue of knowledge or experience (Bernard 2002, Lewis & Sheppard 2006).Based on the justification, the most experience Civil Engineers and Quantity Surveyors within the organization as well as A1B1 to A3B3 road contractors were purposively sampled as respondents for the study.

3.5 SAMPLE SIZE

The researcher adopted purposive sampling technique to sample twenty (20) Civil Engineers from the rank of Senior Engineers to the rank of Chief Engineers and twenty (20) Quantity Surveyors. These forty (40) personnel's were experienced in procurement of road works, highly educated and hold high-level positions within Department of Feeder Roads who constitute client for the study. Thirty (30) A1B1 to A3B3 road contractors were purposively sampled. These contractors were well experienced and they are entitled to handle any complexity of works as far as Feeder roads are concerned. Therefore total sample size for the study was seventy (70).

3.6 DATA COLLECTION

As indicated in table 3.1 below, twenty (20) questionnaires were given to Civil Engineers and seventeen (17) were retrieved representing a response rate of 85%, Twenty (20) were administered to Quantity Surveyors and nineteen (19) were collected representing a response rate of 95% and thirty (30) were given to Road Contractors and twenty seven (27) were received representing a response rate of 90%. In all seventy (70) questionnaires were administered and Sixty three (63) were retrieved representing a response rate of 90%.

Table 3.1 Data Collection

| Professionals/ Road contractors | Questionnaires Administered | Questionnaires Retrieved | Percentage |
|---|--------------------------------|-----------------------------|------------|
| Senior Civil Engineers up Chief Engineers | 20 | 17 | 85 |
| Quantity Surveyors | 20 | 19 | 95 |
| A3B3 to A1B1 Road contractors | 30 | 27 | 90 |
| Total | 70 | 63 | 90 |

3.7 DATA ANALYSIS

The responses of the respondents were analyzed to enable discussions to be made on the subjects. Basically, the questions on the demographic characteristics, general particulars of the respondents and all the necessary questions required to achieve the aim of the study was analyzed using descriptive statistics such as frequencies, and percentages. The results were further presented in graphs, charts and tables.

The other types of questions were analyzed to obtain the relative importance of the factors leading to risks associated with lowest evaluated bids selection procedure on contract performance. A Likert rating scale of 1 to 4 with 1 = 'Not Important', 2 = 'Slightly Important', 3 = 'Important', and 4 = 'Very Important'. This 4 point scale was chosen to prevent respondents from providing neutral answers. Relative Importance Index (RII) was then employed to calculate the relative significance/importance index value of each variable. The formula is given by:

$$\text{Relative Importance Index (RII)} = \frac{\sum W}{AN}$$

Where, W = the weighing given to each variable by the respondents, ranging from 1 to 4;

A = the highest weigh (i.e. 4 in the study)

N = the total number of samples

After the analyses the criterion with the highest RII emerged 1st indicating high importance and vice versa. Based on the findings, recommendations were made to the Public Procurement Authority and all stake holders. The results of the analyses were presented in chapter 4.

3.8 VALIDITY AND RELIABILITY OF THE STUDY

Heffner (2004) define validity as degree to which a test or other measuring device is truly measuring what it was intended to measure. It states that reliability is synonymous with the consistency of a test, survey, observation, or other measuring device. The reliability of test is threatened by errors from the participants, bias and observer errors. Considering the extensive use of the data collection instruments and the types of data collected, the validity of the study is assured. Due to the author's role as an employee with Department of Feeder Roads, his independence and objectivity may be questioned. However, efforts were made to avoid undue while conducting the study and this ensures reliability



CHAPTER FOUR

RESULTS AND DISCUSSION

4.1 INTRODUCTION

This chapter presents the results and discussion on the findings from the two category respondents selected for the study namely client and contractors. Each of them is treated under separate section as shown below:

4.1.1 Client View

The client for the study is Engineers and Quantity Surveyors of Department of Feeder Roads. The objectives of the study seek to identify risks associated with the lowest evaluated bid selection procedure and measures to mitigate the risk.

The results of their responses are presented below.

General information about the client

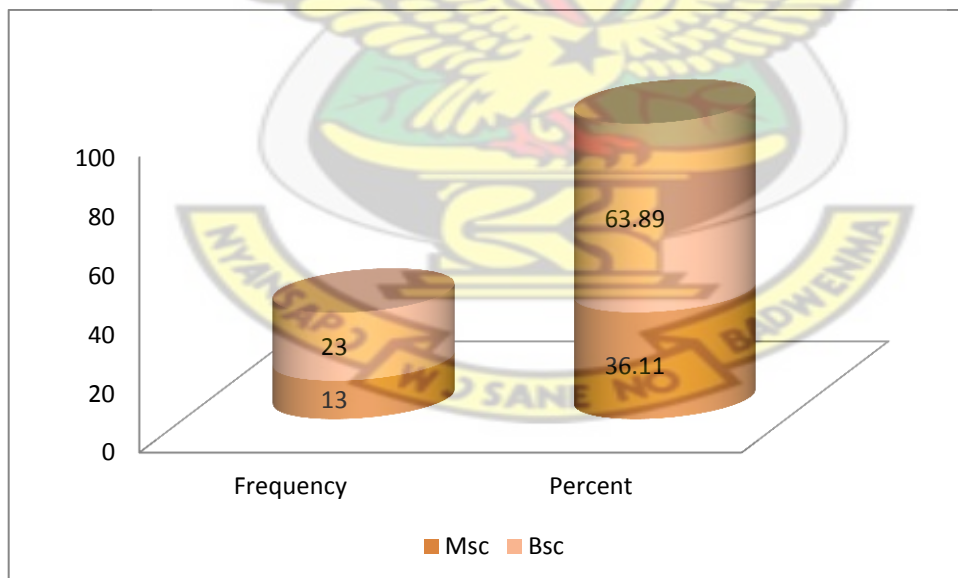


Figure 4.1: Educational Background

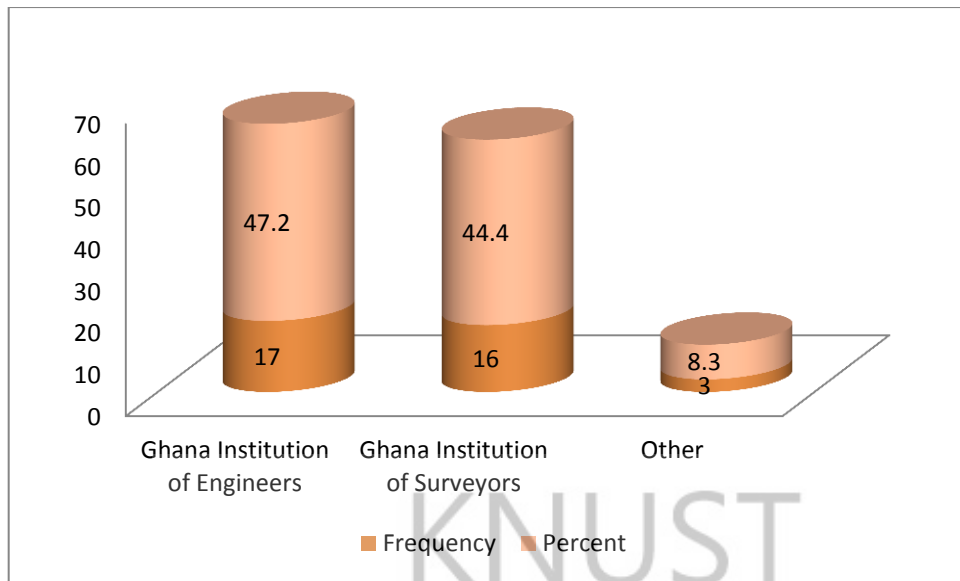


Figure 4.2: Professional Body

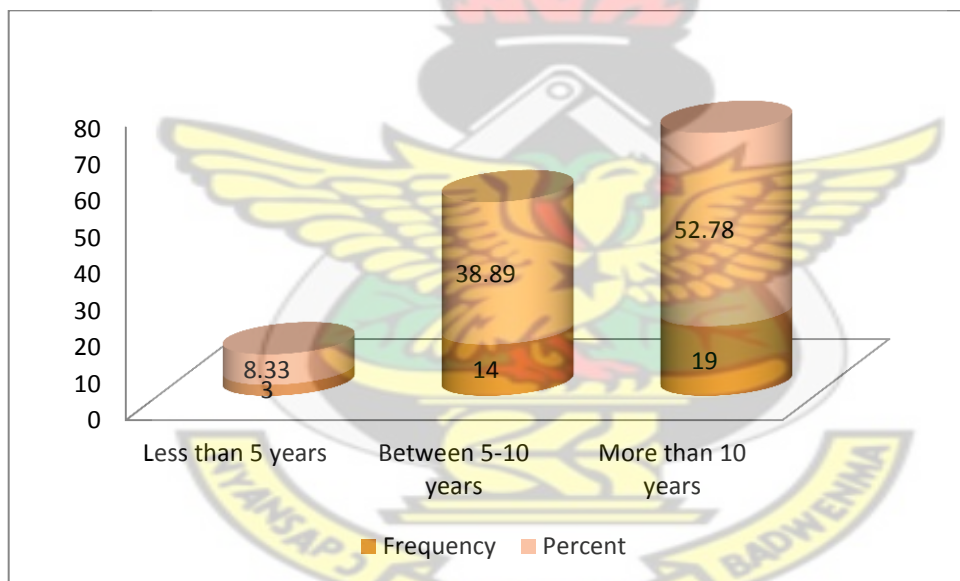


Figure 4.3: Working Experience

Figure 4.1 reveals that 63.89% of the respondents were first degree holder and 36.11% of the respondents were master's holder.

The result of figure 4.2 indicates that 47.2% of the respondents were members of Ghana Institution of Engineers, 44.4% were members of Ghana Institution of Surveyors and remaining 8.3% belong to other professional bodies.

The result of figure 4.3 reveals that 52.78% of the respondents have practiced their profession more than ten years, 38.89% of them have practiced between five to ten years and only 8.3% of the respondents have practiced less than five years. Their level of education, affiliation with professional bodies and the working experience is a good ground to justify the credibility of the information provided.

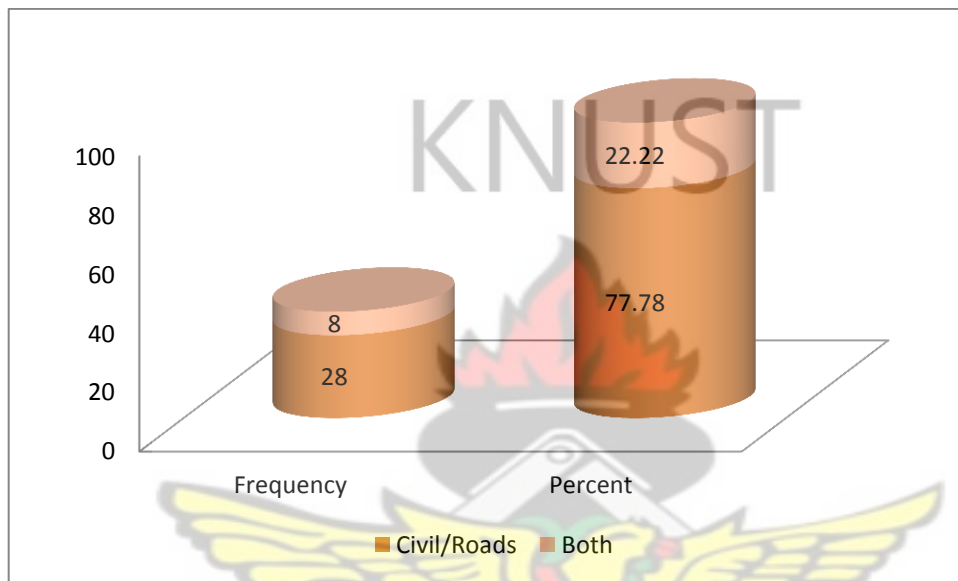


Figure 4.4: Evaluation of Major Works

Results from figure 4.4 above show that 77.78% of the respondents evaluate civil/road works and 22.22% of them evaluate both building and roads works. It was clear indication that the respondents were involved in evaluation of bids and therefore their responses were true reflection of what is happening in their organization.

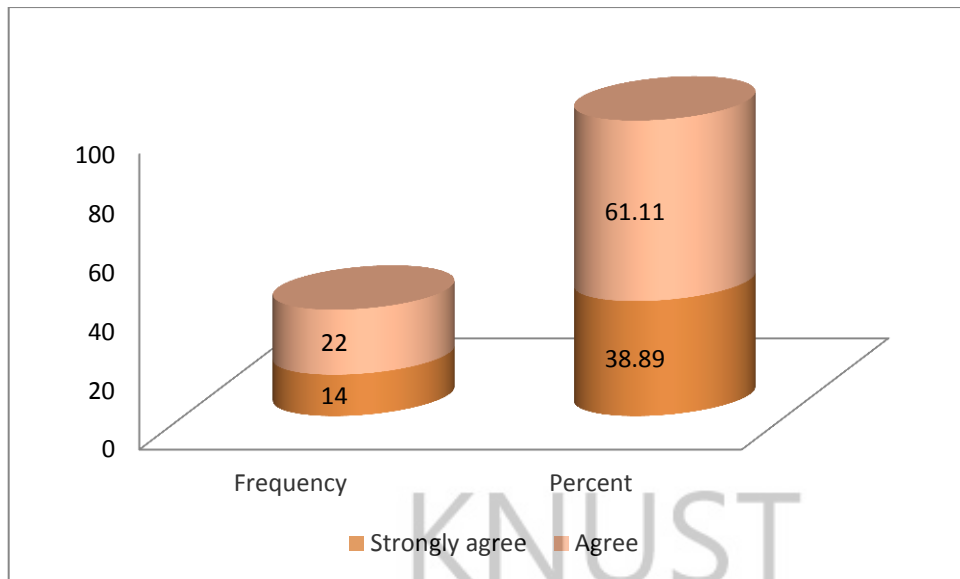


Figure 4.5: Ranking of Bidders

The result from figure 4.5 shows that 61.11% of the respondents agreed and 38.89% strongly agreed with the fact that, price were used to rank the bidders before post qualification assessments.

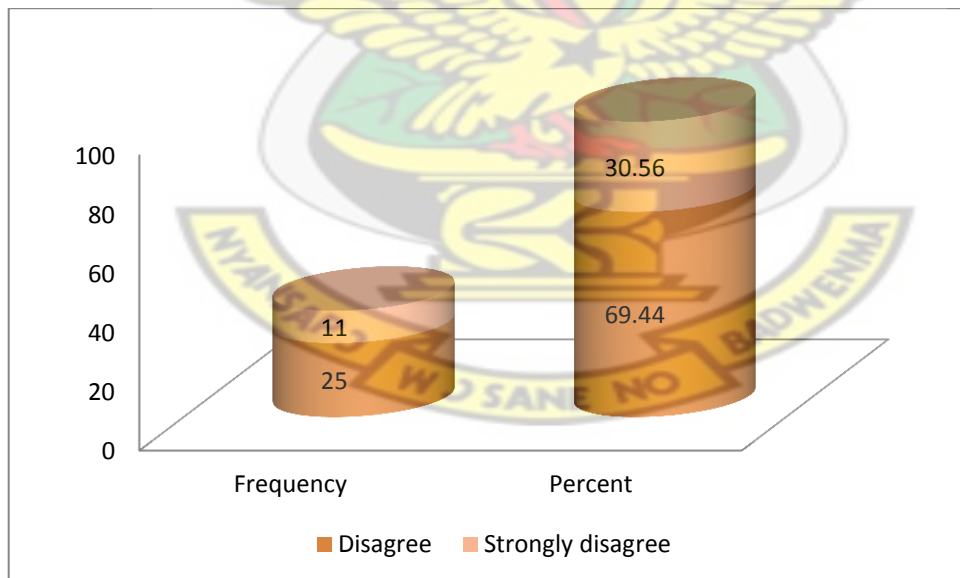


Figure 4.6 Engineers Estimate

The figure 4.6 also indicates that 69.44% of the respondents disagreed and 30.56% strongly disagreed with the fact that bidders prices were bracketing with the Engineers

Estimate to determine the level of deviation. What it means was that the bidder with lowest price would automatically be selected for post qualification assessments.

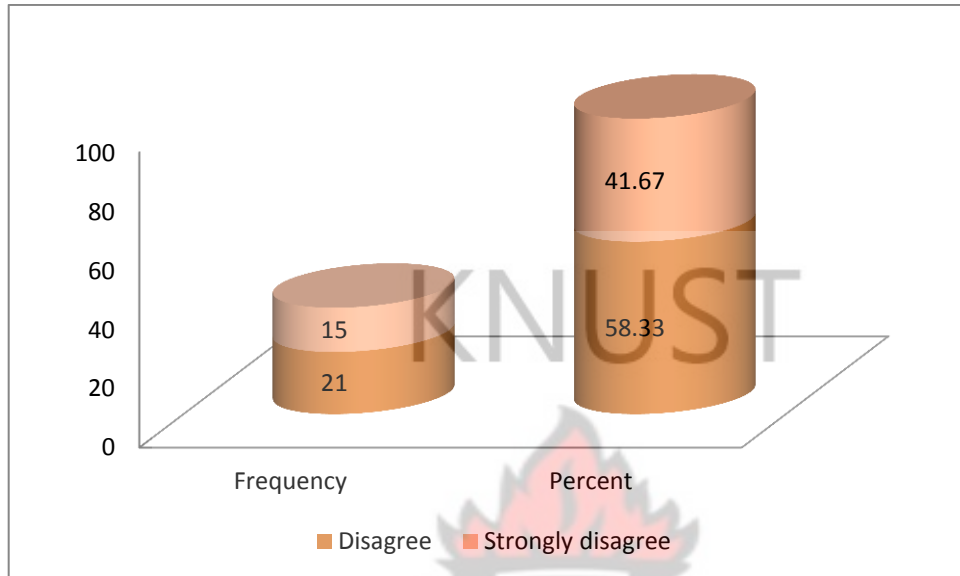


Figure 4.7 Post Qualification Assessments

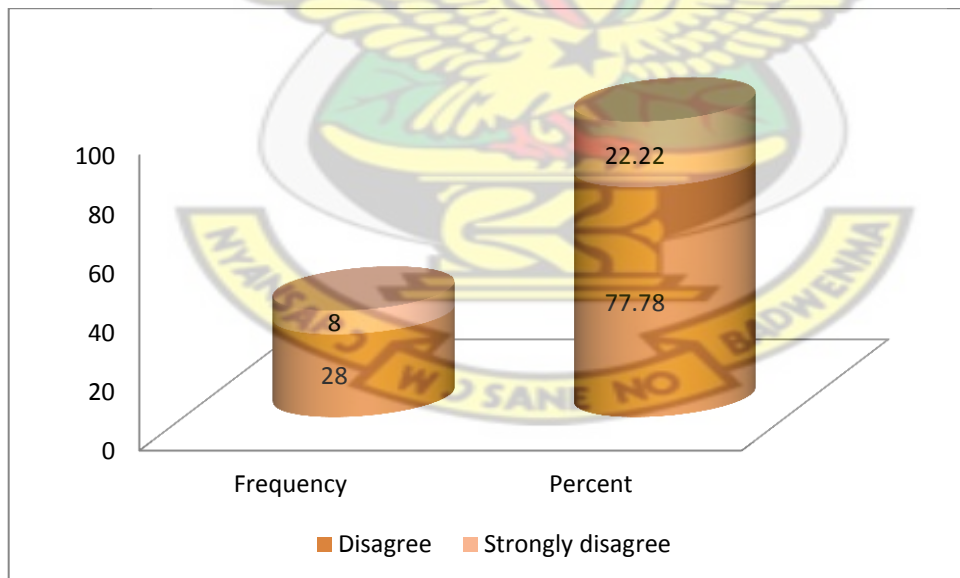


Figure 4.8 Marks for Post Qualification Assessments

The figure 4.7 above reveals that 58.33% of the respondents disagreed and 41.67% strongly disagreed with the fact that post qualification assessments should be carried out for all the bidders.

The figure 4.8 above confirms that 77.78% of the respondents disagreed and 22.22% strongly disagreed with the fact marks should be awarded to the entire bidders before the lowest evaluated bidder could be determined. It means that the post qualification assessments are carried out for only bidders with lowest price at that level and if that bidder was successful, then that bidder automatically becomes the lowest evaluated bidder. If the procedure allowed marks to be awarded for post qualification to entire bidders as in Quality and Cost Base Selection in the consultancy services, it would have added advantage to bidder with good standing in post qualification assessments but not necessary the lowest price to be evaluated as lowest evaluated bidder.

Table 4.1 Contract Performance

| | Frequency | Percent |
|-------------------|-----------|---------|
| Strongly agree | 9 | 25.00 |
| Agree | 27 | 75.00 |
| Disagree | 0 | 0.00 |
| Strongly disagree | 0 | 0.00 |
| Total | 36 | 100.00 |

Results from table 4.1 reveals that 75% of the respondents agreed and 25% strongly agreed with the fact that risks associated with lowest evaluated bid selection affect contract performance.

4.1.2 Client view on Risks Associate with Lowest Evaluated Bid Selection

From the point of view of the client, the risks associated with lowest evaluated bid selection procedure are indicated in Table 4.2 in order of importance based on the RII value.

Table 4.2 Client view on Risks Associated with Lowest Evaluated Bid Selection

| Risks Associated with Lowest Evaluated Bid Selection | RATING | | | | | | | | |
|--|--------|----|----|----|-------|------------|------|-------|------------------|
| | 1 | 2 | 3 | 4 | Total | ΣW | Mean | RII | Rank |
| Termination of contract | | 6 | 11 | 19 | 36 | 121 | 3.36 | 0.840 | 1 st |
| Unrealistic low price | 2 | 3 | 15 | 16 | 36 | 117 | 3.25 | 0.813 | 2 nd |
| Time over run | 1 | 9 | 11 | 15 | 36 | 112 | 3.11 | 0.778 | 3 rd |
| Increase overall cost of contract | 2 | 6 | 14 | 14 | 36 | 112 | 3.11 | 0.778 | 3 rd |
| Unsatisfactory quality | 4 | 5 | 13 | 14 | 36 | 109 | 3.03 | 0.757 | 4 th |
| Cost over run | 4 | 11 | 5 | 16 | 36 | 105 | 2.92 | 0.729 | 5 th |
| Insolvency | 3 | 8 | 19 | 6 | 36 | 100 | 2.78 | 0.694 | 6 th |
| Change orders (variation) | 2 | 12 | 14 | 8 | 36 | 100 | 2.78 | 0.694 | 6 th |
| Unfair competition | 4 | 12 | 10 | 10 | 36 | 98 | 2.72 | 0.681 | 7 th |
| Poor lifecycle performance | 7 | 10 | 12 | 7 | 36 | 91 | 2.53 | 0.632 | 8 th |
| Contractual claims | 4 | 15 | 12 | 5 | 36 | 90 | 2.50 | 0.625 | 9 th |
| Legal cost | 6 | 10 | 17 | 3 | 36 | 89 | 2.47 | 0.618 | 10 th |
| Legal challenge | 7 | 12 | 13 | 4 | 36 | 86 | 2.39 | 0.597 | 11 th |
| Damage to reputation | 9 | 9 | 13 | 5 | 36 | 86 | 2.39 | 0.597 | 11 th |
| No repeat business | 11 | 19 | 4 | 2 | 36 | 69 | 1.92 | 0.479 | 12 th |

Among the risks identified above, client ranked “Termination of contract” as the topmost risk associated with lowest evaluated bid selection procedure. The basis was that, because their rates were very low, there would be the possibility of non- performance and that would lead to the termination of the contract. The second important risk they ranked was “Unrealistic low price”. The reason was that because there is scarcity of jobs, the possibilities of most bidders to lower their prices in order to be lower than their competitors would be very high and it would affect contract performance as a result of the low price. The third important risks were “Increase overall cost of the contract and “Time over run”. The possibility of the contractors not work within schedule is very high as a result of low bid they submitted. The contractor would not likely use right materials; equipment and personnel as it has been specified in the conditions of contracts. These would eventually affect the performance and delay the contract completion date. The fourth ranked risk was “increase the overall cost of contract” It was argued that, if care is not taken and any of the risks do trigger, it would increase the overall cost of the contract. However, they also ranked “No repeat business” as the least risk with the procedure. It indicates that the probability of it happening is low and if it happens, if impact is not significant as well as “Damage to reputation”. “Legal challenge” is the third lowest risk ranked. It means that, it is not likely that the evaluation procedure could be challenge legally and if it do happened, it impact would not affect contract delivery.

4.1.3 Client Views on Risk Mitigation Measures

From the view point of client, the risk mitigation measures are indicated in Table 4.3 in order of importance based on the RII value.

Table 4.3 Client views on Risk Mitigation Measures

| Risks Mitigation Measures | RATING | | | | | | | | |
|--|--------|----|----|----|-------|-----|------|-------|------------------|
| | 1 | 2 | 3 | 4 | Total | ΣW | Mean | RII | Rank |
| The bidder should be asked to provide detailed calculation to show that its bid price is justified | | | 9 | 27 | 36 | 135 | 3.75 | 0.938 | 1 st |
| Good supervision. | | | 15 | 21 | 36 | 129 | 3.58 | 0.896 | 2 nd |
| Award contract within acceptable estimated cost | | | 17 | 19 | 36 | 127 | 3.53 | 0.882 | 3 rd |
| Select Economically Most Advantageous Tender (EMAT). | | | 19 | 17 | 36 | 125 | 3.47 | 0.868 | 4 th |
| Bidder should provides additional performance security to cover the loss to the client in case of default | | | 27 | 9 | 36 | 117 | 3.25 | 0.813 | 5 th |
| Carry out post qualification assessments for all the bidders and award marks. | | | 33 | 3 | 36 | 111 | 3.08 | 0.771 | 6 th |
| Increase the running and maintenance costs in the long term | 3 | 16 | 10 | 7 | 36 | 93 | 2.58 | 0.646 | 7 th |
| 6.The estimated costs should be published during bidding | 8 | 5 | 18 | 5 | 36 | 92 | 2.56 | 0.639 | 8 th |
| Make extra provisions for legal and Quantity Surveyor fees to write off the disputed costs that have been incurred | 4 | 15 | 17 | | 36 | 85 | 2.36 | 0.590 | 9 th |
| To allow contingency to the budget to cater for cost overrun | 7 | 14 | 14 | 1 | 36 | 81 | 2.25 | 0.563 | 10 th |
| To add a few extra months to the programme to cater for time overruns | 5 | 21 | 10 | | 36 | 77 | 2.14 | 0.535 | 11 th |
| Recommend awarding the contract to the next lowest bidder | 11 | 13 | 9 | 3 | 36 | 76 | 2.11 | 0.528 | 12 th |
| The bidder should be offered the opportunity to withdraw the bid without further penalty | 11 | 18 | 7 | | 36 | 68 | 1.89 | 0.472 | 13 th |

Results obtained from table 4.3 above indicate that client ranked “The bidder should be asked to provide detailed calculation to show that its bid price is justified” as topmost

risk mitigation measure. The reason was that, the client would have opportunity to engage independent person who was not part of the evaluation to check the rate build up submitted by the bidder specially the items which neither the client nor the bidder has a control for example fuel, cement and iron rods. If the independent person certified that the rate build up was justified then, the client could go ahead to select the lowest bidder. However, if the rates were not justified, the report could be used as a basis to reject the bid. The second ranked mitigation measure was “Good supervision” there is always perception that, the lowest bidder would compromise on quality and cut corners to make profit. Therefore it would be necessary to back upon good supervision to ensure that the bidder works according to specifications and conditions of contract. “Award contract within acceptable estimated cost” was third ranked mitigation measure by respondents. The reason was that, if bidders are selected within accepted estimated cost, the possibility of the bidder not performing would be minimal. “Select Economically Most Advantageous Tender (EMAT)” was ranked fourth. They also agreed to the facts that if the bidder is Economically Most Advantageous among the other bidders, it would go a long way to reduce the risk associated with the procedure. The fifth ranked mitigation measure was “The bidder should be asked to provide additional performance security to cover the loss to the client in case of default”. The justification was that, the client has the right to call for additional performance security if capability of bidder was in doubt as a result of the low price submitted. “Post qualification assessments should be carried out for all the bidders and marks should be awarded” was ranked as sixth important risk mitigation measure. The reason was that if marks were awarded as in Quality and Cost Base Selection of consultancy service, it would not only give chance to bidders who submit low bids but also to give chance those who were in good standing in post qualification assessments but not necessary the lowest bidder. On the other hand, the

respondents strongly disagreed with the fact that the bidders should be offered the opportunity to withdraw the bid without further penalty. The argument was that, if bidders withdraw without further penalty, there would be no security to protect the client in case of default before awarding the contract. The respondent also disagreed on the grounds that the next lowest bidder should be recommended for award if the first ranked bidder price happened to be too low. They argue that it cannot be possible to recommend to next bidder without any proper justification to the basis of the price offered by lowest bidder.

4.2 CONTRACTORS VIEW

Roads Contractors association of Eastern region provided a list of contractors with Ministry of Roads and Highways classification A1B1-A3B3. The contractors within this category were sampled as respondents.

General information about the contractors

Table 4.4 Working Experience

| Year | Frequency | Percent |
|--------------------|-----------|---------|
| Between 5-10 years | 10 | 37.04 |
| More than 10 years | 17 | 62.96 |
| Total | 27 | 100 |

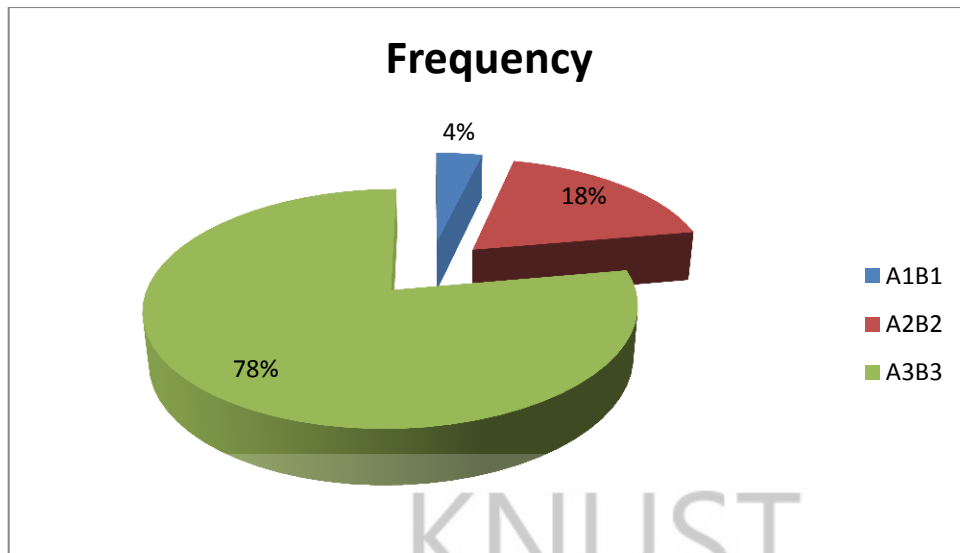


Figure 4.9 MRH Classification Certificate

The result of figure 4.9 above shows that 78% of the respondents were classified as A3B3, 18% of them were classified as A2B2 and only one of them had grown to the status of A1B1.

The results on Table 4.3 reveal that 62.96% of the contractors have worked more than 10 years and 37.04% have worked between 5- 10 year. Their classification category and level of experience is a good reason to justify the credibility of the information provided.

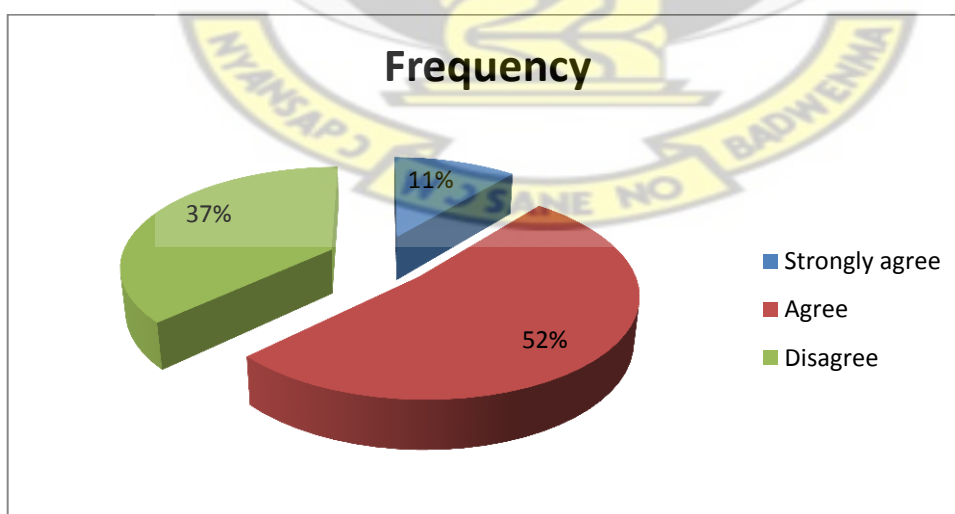


Figure 4.10 Contractor's Profit Margin

As indicated in figure 4.10 above, as much as 52% of the respondents agreed and 11% strongly agreed to fact that they reduced their profit margin before they could win contract. However, on the other hand 37% disagreed to the fact that they have to reduce their profit margin before contract would be awarded to them.

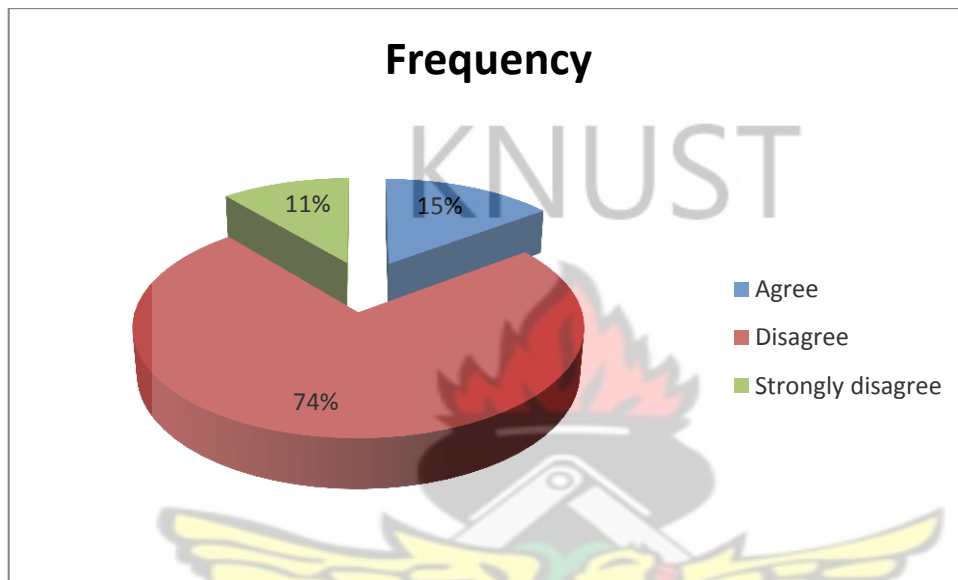


Figure 4.11 Contractor's sustainability in business

The results in figure 4.11 shows that, as much as 74% of the respondents disagreed with the fact that lowest evaluated bid selection procedure would sustained them in business and 11% strongly disagreed to support the statement. However, 15% of the respondents also agreed to the fact that the procedure would sustained them in business.

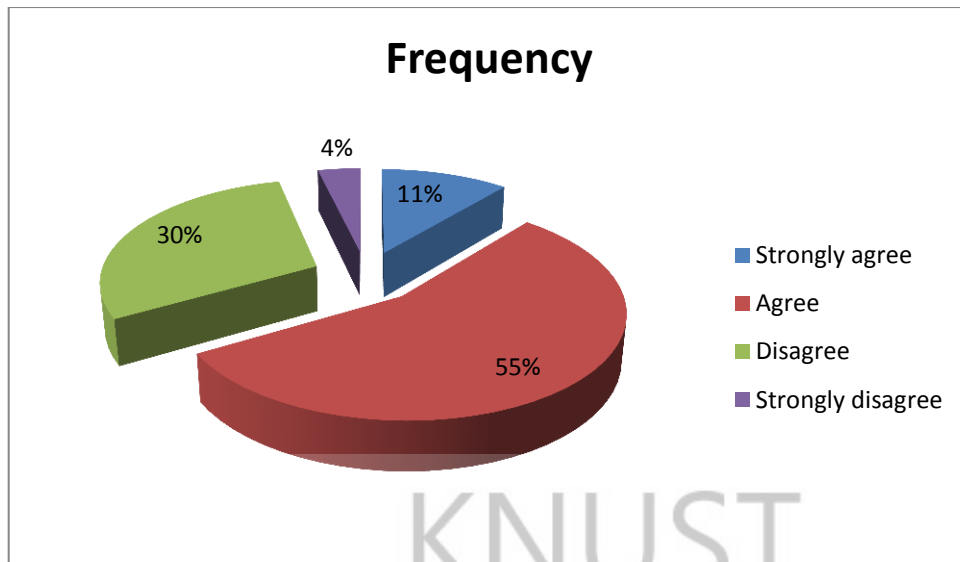


Figure 4.12 Submission of Bid

The figure above indicates that 55% of the respondents agreed and 11% strongly agreed that they submit low bid with the expectation of recouping later. On the other hand, 30% disagreed and 4% strongly disagreed with the fact that they have to submit low bids with the expectation of recouped later.

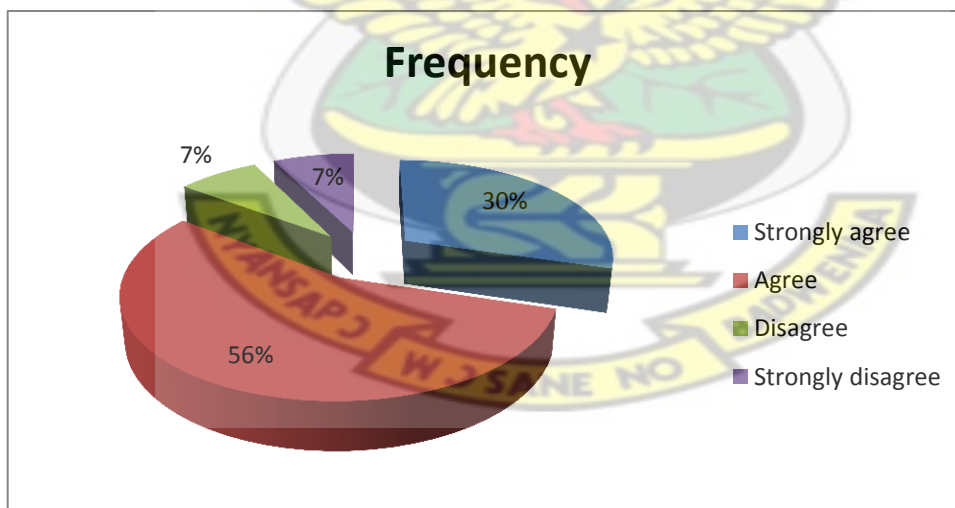


Figure 4.13 Contract Performance

From the figure 4.13 above indicates that 56% agreed and 30% strongly agreed that risks associated with lowest evaluated bid selection affect contract performance. On the other

hand, 7% disagreed and same strongly disagreed with the assertion risks associated with lowest evaluated bid selection affect contract performance.

4.2.1 Contractors views on Risks Associate with Lowest Evaluated Bid Selection

From the view point of the contractors, the risks associated with lowest evaluated bid selection procedure are indicated in Table 4.5 in order of importance based on the RII value.

Table 4.5 Contractors view on Risks Associated with Lowest Evaluated Bid Selection

| Risks Associated with Lowest Evaluated Bid Selection | RATING | | | | | | | | |
|--|--------|----|----|----|-------|------------|------|-------|------------------|
| | 1 | 2 | 3 | 4 | Total | ΣW | Mean | RII | Rank |
| Termination of contract | | | 13 | 14 | 27 | 95 | 2.64 | 0.660 | 1 st |
| Unsatisfactory quality | 2 | 2 | 8 | 15 | 27 | 90 | 2.50 | 0.625 | 2 nd |
| Unrealistic low price | 1 | 5 | 8 | 13 | 27 | 87 | 2.42 | 0.604 | 3 rd |
| Contractual claims | 2 | 4 | 8 | 13 | 27 | 86 | 2.39 | 0.597 | 4 th |
| Insolvency | 1 | 4 | 7 | 13 | 25 | 82 | 2.28 | 0.569 | 5 th |
| Time over run | 1 | 8 | 8 | 10 | 27 | 81 | 2.25 | 0.563 | 6 th |
| Increase overall cost of contract | 3 | 5 | 8 | 11 | 27 | 81 | 2.25 | 0.563 | 6 th |
| Cost over run | 1 | 9 | 7 | 10 | 27 | 80 | 2.22 | 0.556 | 7 th |
| Change orders (variation) | 4 | 5 | 7 | 11 | 27 | 79 | 2.19 | 0.549 | 8 th |
| Poor lifecycle performance | 1 | 5 | 16 | 5 | 27 | 79 | 2.19 | 0.549 | 8 th |
| Damage to reputation | 2 | 10 | 8 | 7 | 27 | 74 | 2.06 | 0.514 | 9 th |
| Unfair competition | 4 | 6 | 12 | 5 | 27 | 72 | 2.00 | 0.500 | 10 th |
| Legal cost | 2 | 13 | 6 | 6 | 27 | 70 | 1.94 | 0.486 | 11 th |
| Legal challenge | 6 | 5 | 12 | 4 | 27 | 68 | 1.89 | 0.472 | 12 th |
| No repeat business | 1 | 19 | 6 | 1 | 27 | 61 | 1.69 | 0.424 | 13 th |

From the table 4.5 above, contractors also indicates “Termination of contract” as the topmost risk associated with lowest evaluated bid selection procedure. The basis was that, because their rates were very low, there would be possibility of non- performance and that would lead to the termination of the contract. The respondents ranked “Unsatisfactory quality” as a second risk associated with the procedure. It means that, the

likelihood of contractors to cut corner and compromise on quality in order to break even as a result of their rate been too low would be very high. “Unrealistic low price” was ranked as the third important risk with the procedure. The contractors were desperately looking for job and with the scarcity of jobs in the country; the possibility of the contractors to lower the rates to get competitive advantage over others would be very high and it would eventually affect project delivery. The fourth highest ranked risk was “Contractual claims”. The probability of the respondents to put in contractual claims is very high. The reason was that, they have priced very low, so the only to make ends meet was to find out ambiguity in the contract document or anything possible contractually that could help them to increase their profit margin. “Insolvency” was ranked as the fifth risk associated with lowest evaluated bid selection procedure. The reason was that, the likelihood that contractors would not be able to settle their debts as a result of low bid would be high and this would eventually grand them into insolvency. However, the respondents also ranked some to the risks to the very low and even if it happens, it impact would be very minimal. They outline the following risks to be at the lower side including “No repeat business”, “Legal challenge” “Legal cost “among others as indicated in table 4.4 above.

4.2.2 Contractors views on Risk Mitigation Measures

From the view point of the contractors, the risk mitigation measures are indicated in Table 4.6 below in order of importance based on the RII value.

Table 4.6 Contractors views on Risk Mitigation Measures

| Risks Mitigation Measures | RATING | | | | | | | | |
|--|--------|----|----|----|-------|----|------|-------|------------------|
| | 1 | 2 | 3 | 4 | Total | ΣW | Mean | RII | Rank |
| The bidder should be asked to provide detailed calculation to show that its bid price is justified | | | 13 | 14 | 27 | 95 | 3.52 | 0.880 | 1 st |
| The bidder should be offered the opportunity to withdraw the bid without further penalty | | | 14 | 13 | 27 | 94 | 3.48 | 0.870 | 2 nd |
| Select Economically Most Advantageous Tender (EMAT). | | | 18 | 9 | 27 | 90 | 3.33 | 0.833 | 3 rd |
| Award contract within acceptable estimated cost | | 2 | 14 | 11 | 27 | 90 | 3.33 | 0.833 | 3 rd |
| The estimated costs should be published during bidding | | 1 | 17 | 9 | 27 | 89 | 3.30 | 0.824 | 4 th |
| Good supervision. | | 10 | 14 | 3 | 27 | 74 | 2.74 | 0.685 | 5 th |
| Carry out post qualification assessments for all the bidders and award marks. | 1 | 9 | 14 | 3 | 27 | 73 | 2.70 | 0.676 | 6 th |
| To add a few extra months to the programme to cater for time overruns | | 13 | 14 | | 27 | 68 | 2.52 | 0.630 | 7 th |
| Bidder should provides additional performance security to cover the loss to the client in case of default | 2 | 13 | 11 | 1 | 27 | 65 | 2.41 | 0.602 | 8 th |
| To allow contingency to the budget to cater for cost overrun | 2 | 15 | 9 | 1 | 27 | 63 | 2.33 | 0.583 | 9 th |
| Recommend awarding the contract to the next lowest bidder | 4 | 14 | 8 | 1 | 27 | 60 | 2.22 | 0.556 | 10 th |
| Make extra provisions for legal and Quantity Surveyor fees to write off the disputed costs that have been incurred | 4 | 17 | 6 | | 27 | 56 | 2.07 | 0.519 | 11 th |
| Increase the running and maintenance costs in the long term | 9 | 16 | 2 | | 27 | 47 | 1.74 | 0.435 | 12 th |

Results obtained from table 4.6 above indicate that contractors also ranked “The bidder should be asked to provide detailed calculation to show that its bid price is justified” as topmost risk mitigation measure. The reason was that, the client would have opportunity

to engage independent person who was not part of the evaluation to check the rate build up submitted by the bidder specially the items which neither the client nor the bidder has a control for example fuel, cement and iron rods. If the independent person certify that the rate build up was justified then, the client could go ahead to select the lowest bidder. However, if the rates were not justified, the report could be used as a basis to reject the bid. The second ranked mitigation measure was “The bidder should be offered the opportunity to withdraw the bid without further penalty”. The reason was that, if a bidder was allowed to withdraw without any penalty, the bidder would not have accepted an offer which probably might be determined to be too low which eventually would affect contract performance. . “Select Economically Most Advantageous Tender (EMAT)” was ranked third important risk mitigation measure. They argue that if the bidder was Economically Most Advantageous among the other bidders, it would go a long way to reduce the risk associated with the procedure. Again, “Award contract within acceptable estimated cost” was also ranked third measure by respondent. It was also argued that if bidders are selected within accepted estimated cost, the possibility of the bidder not performing would be minimal. Fourth ranked risk mitigation measure was “The estimated costs should be published during bidding”. The basis was that if estimated cost was published, they would not have any doubt in their minds and the risk of the bidders submitting low bids would be minimised. On the other hand, the respondents ranked the following risk mitigation to be at lower side. “increase the running and maintenance costs in the long term” as least mitigation measure followed by “Make extra provisions for legal and Quantity Surveyor fees to write off the disputed costs that have been incurred” among others as in shown in table 4.5.

CHAPTER FIVE

CONCLUSION AND RECOMENDATIONS

5.1 INTRODUCTION

The study aimed at the effect of lowest evaluated bid selection procedures on contracts performance and also to identify the risks associated with lowest evaluated bid selection and measures to mitigate the risks. The results of the survey have revealed a number of findings from the two respondents selected for the study.

5.2 FINDINGS

From the analysis of the data obtained from the survey, the following findings were made.

5.2.1 To identify risks associated with the lowest evaluated bid selection procedure.

The analysis from view point of client revealed that, termination of contract was rank the topmost risk associated with the procedure, it follows by unrealistic low price (2nd), time over run (3rd) increase overall cost of contract (3rd), unsatisfactory quality (4th) among others and no repeat business was ranked as least risk associated with the procedure. It was also confirmed that the identified risks affects contact performance.

The analysis from the view point of contractors also revealed that termination of contract was the topmost risk associated with the procedure; it follows by unsatisfactory quality (2nd), unrealistic low price (3rd), and Contractual claims (4th) among others and no repeat business was ranked again as least risk associated with the procedure. It was also confirmed that the identified risks affects contacts performance.

5.2.2 To identify measures to mitigate the risk.

The analysis from the client ranked the bidder should be asked to provide detailed calculation to show that its bid price is justified as the topmost risk mitigation measure. It follows by good supervision, award contract within acceptable estimated cost and select Economically Most Advantageous Tender (EMAT) as a major risk mitigation measures.

The analysis from the contractors also ranked the bidder should be asked to provide detailed calculation to show that its bid price is justified as the topmost risk mitigation measure. It follows by the bidder should be offered the opportunity to withdraw the bid without further penalty, award contract within acceptable estimated cost, select Economically Most Advantageous Tender (EMAT) and the estimated costs should be published during bidding as a major risk mitigation measure.

5.3 CONCLUSION

The results of the survey have revealed a number of findings from the two respondents selected for the study. The concluded that termination of contract is the topmost risk associated with lowest evaluated bid selection procedure and it affect contract performance. It is therefore necessary to ask bidders to provide detailed calculation to show that its bid price is justified before contracts are awarded to them in order to mitigate the risks with the procedure.

5.4 RECOMMENDATIONS

The recommendations under this section are grouped into two: firstly, recommendations arising from the study (section 5.4.1& 5.4.2); and secondly, recommendations for future research (section 5.5.1).

5.4.1 Recommendations to Client

Recommendations have been suggested to help mitigate identified risks associated with lowest evaluated bid selection procedure. The following are the major recommendations made by client:

- The evaluation panel to ask bidder to provide detailed calculation to show that its bid price is justified.
- The contract management team should ensure good supervision by making sure that the bidder works according to specifications and conditions of contract.
- The awarding authority should ensure that they award contract within acceptable estimated cost.
- Evaluation panel should ensure that the bidder selected is Economically Most Advantageous Tender (EMAT).

5.4.2 Recommendations to Contractors

The following are the major recommendations made by contractors:

- The evaluation panel to ask bidder to provide detailed calculation to show that its bid price is justified before contracts are awarded.
- The bidder should be offered the opportunity to withdraw the bid without further penalty if the bid price consider to be unrealistically too low.
- The evaluation panel should ensure that the bidder selected is Economically Most Advantageous Tender (EMAT).
- The estimated costs should be published during bidding to avoid bidders submitting unrealistic low price.

5.4.1 Recommendations for Future Research

It is recommended that further research be conducted to determine the causes of identified risks associated with lowest evaluated bid selection on contract performance.

In this way, the various causes that attribute to a particular risk would be would be identified.

Further research may also be conducted into factors leading to non- performance of bidders lowest evaluated. The study should adopt case study approach, in this way; the researcher will report directly and not people opinion.

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REFERENCES

- Alexanderson, G. and Hultén, S. (2006), “Predatory bidding in competitive tenders: A Swedish case study”, *European Journal of Law and Economics*.
- Alwi, S.; Hampson, K. and Mohamed, S. (2002), Factor Influencing Contractors’ Performance in Indonesia, A Study of Non Value-Adding Activities. Proceedings of the International Conference on Advancement in Design, Construction, Construction Management and Maintenance of Building Structure, Bali, pp. II-20-34
- Amu, O.O., Adeoye, O.A. and Faluyi, S.O. (2005), Effects of incidental factors on the completion time of projects in selected Nigeria cities. *Journal of Applied Sciences*, 5(1), 144-146.
- Anvuur, A., Kumaraswamy M. and Male S. (2006), CIB W107 Construction in Developing Countries International Symposium “Construction in Developing Economies: New Issues and Challenges” Santiago, Chile.
- Bernard, H.R. 2002. *Research Methods in Anthropology: Qualitative and quantitative methods*. 3rd edition. AltaMira Press ,Walnut Creek, California.
- Bedford, T. (2009). Analysis of the low-bid awarding system in public sector construction procurement. University of Toronto, Canada
- Cambridge Advanced Learner’s Dictionary (2008). <http://dictionary.cambridge.org/> Chapman and Ward, 2004)
- Cameron, K.S. and Quinn, R.E. (2002), *Diagnosing and changing organisational culture: based on the competing values framework*. Addison-Wesley Publishing.
- Capen, E. C., Clapp, R. V. and Campbell, W. M. (1971), “Competitive bidding in high risk situations.” *JPT, Journal of Petroleum Technology*. 23 (6): 641–653.
- Carr, P.G. (2005), “Investigation of Bid Price Competition Measured through Prebid Project Estimates, Actual Bid Prices, and Number of Bidders”, *Journal of Construction Engineering and Management*. 131(11): 1165-

- Chan, D.W.M .and Kumaraswamy M. M. (2002), Modeling and predicting construction durations in Hong Kong public housing. *Construction Management and Economics* 17 3 (1999), pp. 351–3.
- Chitkara, K. K. (2005), *Project Management - Planning, Scheduling and Controlling* – Tata McGraw Hill, New Delhi.
- Costa, D. B. and Formoso, C. T. (2004), A set of evaluation criteria for performance measurement systems in the construction industry, *Journal management property construction*, 9-2.
- Crowley, L.G., and Hancher, D.E. (1995), “Risk Assessment of Competitive Procurement”, *Journal of Construction Engineering and Management*. 121(2): 230- 237.
- .Dayana, B. C., Formoso, C. T., Kagioglou, M. and Alarcon, K. (2005), Performance measurement systems for benchmarking in the construction industry.
- DGIII Working Group on Abnormally Low Tenders (1999), “Prevention, Detection and Elimination of Abnormally Low Tenders in the European Construction Industry”, <http://europa.eu.int/comm/enterprise/construction/alo/altfin.htm>.
- Dissanayaka, S. M. and Kumaraswamy M. M. (1999), comparing contributors to time and cost performance in building projects, *Building and Environmental*, Vol.34, pp 31-42.
- Dowle, W.J. and DeStephanis, A. (1990), “Preparing bids to avoid claims.” *Construction Bidding Law*. John Wiley & Sons, Inc., New York, N.Y. 17-45. *Economics*. 24(3), 253-258.
- Fayek, A., Ghoshal, I. and AbouRizk, S. (1999), “A Survey of the Bidding Practices of Canadian Civil Engineering Construction Contractors,” *Canadian Journal of Civil Engineering*, Vol. 26, No. 1, pp.13-25.
- Garner A. B. (2009). *Alternative to Low-Bid Selection in Air Force Reserve Military Construction: Approach to Best Value Procurement*. Headquarters Air Force Reserve U.S.A

- Hardy, S.C.(1978).Bid evaluation study for the World Bank, Vol 1, The University of Manchester, Institute for Science and Technology, Manchester.
- Hatash, Z. and Skitmore, M. R. (1997).Criteria for contractor Selection.Construction Management and Economics.
- Heffner, C. L. (2004), Research Methods Licensed Psychologist Published, March 11, 2004 Edn, McGraw-Hill Education, New York
- Herbsman, Z. and Ellis, R. (1992).“Multi-parameter bidding system – Innovation in contract administration”.ASCE Journal of Construction Engineering and Management
- Herbsman, Z., and Ellis, R. (1992), “Multi-parameter bidding system – Innovation in contract administration”, ASCE Journal of Construction Engineering and Management. 118(1): 142-150.
- Ioannou, P. G., and Leu, S. S. (1993), “Average-Bid Method-Competitive Bidding Strategy,” Journal of Construction Engineering and Management, ASCE, Vol. 119, No. 1, pp. 131-147.
- Irtishad Ahmed P.E (1993).Alternative Bid-Evaluation and Contract-Award Systems: Department of Construction Management College of Engineering and Design, Florida International University, Miami, Florida.
- Kelley, M.N.,Ft.(1991). Drum Estimating and Bidding from Contractor’s Point of View, Journal of Construction Engineering and Management ASCE, Vol. 117
- Keizer Jimme A. and Halman, Johannes I. M. (2007). Diagnosing risk in radical innovation projects. Research Technology Management. Vol. 50, Issue 5, Pp. 30-36.
- Keizer Jimme A. and Halman, Johannes I. M. and Song Michael (2002). From experience: applying the risk diagnosing methodology. The Journal of Product Innovation Management. 19, pp. 213-232.
- Kim Du, Y., Han, S. H., Kim, H. and Park, H. (2008), Structuring the prediction model of project performance for international construction Projects: A comparative analysis, Expert Systems with Applications.

Knight (1921) Risk, Uncertainty and Profit. New York: AM Kelley.

Lewis, J.L. & S.R.J. Sheppard. 2006. Culture and communication: can landscape visualization improve forest management consultation with indigenous communities? *Landscape and Urban Planning* 77:291–313.

Manual, Public Procurement Act. 2003 Act 667

Mechhegiaw, L. (2012). Performance study of lowest bidders bid awarding system in public construction project. Addis Ababa University

NAO (2000). Supporting Innovation: Managing risk in government departments. Report by the Comptroller and Auditor General. National Audit Office.

Neely, A. D., Gregory, M. and Platts, K. (1995), Performance Measurement System design – a literature review and research agenda, *International Journal of Operations and Production Management*, 15(4), 80-116.

Odger, K., Rowsell, S., Thomas K., and Ward, D. (2011). *Constructing Excellence*, Warwick House, 25 Buckingham Palace Road, London SW1W 0PP.

Odusami, K.T. and Olusanya, O.O. (2000). Client's contribution to delays on building projects, *The Quantity Surveyor*, 30, 30-33.

Ofori, G. and Chan, S.L. (2001), Factors Influencing Development of Construction Enterprises in Singapore, *Journal of Construction Management and Economics*, 19:2, 145-154.

Ogunsemi, D. R. (2006), Time-cost model for construction projects in Nigeria.

Owusu, T. (1999), Factors affecting the performance of Ghanaian owned construction firms, Unpublished M.Sc. Thesis, Dept. of Building Technology, KNUST, Kumasi

Perminova, Olga, Magnus Gustafsson, Kim Wikstrom (2008). Defining uncertainty in projects – a new perspective. *International Journal of Project Management* 26, 73– 79.

- Photois, G.I. (1993). Average-Bid Method-Competitive Bidding Strategy: Journal of Construction Engineering and Management Vol. 119, No. 1, Public Procurement Act, 2003(Act663)
- Rizwan, U., Farooqui, M., Ahmed, K. and Azhar, S.M. (2008), Cost overrun factors in construction industry of Pakistan. Advancing and Integrating Construction Education, Research & Practice, pp. 499-508.
- Stevens, J. D. (1996), Blueprint for measuring project quality, Journal of Management in Engineering, ASCE, 12(2): 34-3.
- Thomas, S. N., Palaneeswaran, E. and Kumaraswamy, M. M., (2002), A dynamic e-Reporting System for contractors' performance appraisal, Advances in Engineering Software Vol.33, pp. 339-349.
- Ugwu, O.O and Haupt, T.C (2007), Key performance indicators and assessment methods for infrastructure sustainability in a South Africa construction industry perspective, Building and Environmental, Vol.42, pp 665-880.
- Wolfsetter, E. (1996), Auctions: An introduction, Journal of Economic Surveys 10, 4, 367-420.
- Winch, G. M. (2000), "Institutional reform in British construction: Partnering and private finance", Building Research Information, 28(2): 141–155.
- World Bank, (2006). Guidelines for Procurement under IBRD Loans and IDA Credits.
- Xiao, H. and Proverbs, (2003), Factors influencing contractor performance: an international investigation, Construction and Architectural Management, 10(5), pp 322-332.
- Zack and James G. (1993), "Claimsanship: Current Perspective", Journal of Construction Engineering and Management, 119(3): 480-496.

APPENDICES

APPENDIX 1

KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY

DEPARTMENT OF BUILDING TECHNOLOGY

Questionnaire for Client

Topic: “Risks associated with Lowest Evaluated Bid Selection on Contracts Performance”

The researcher is a final year post graduate students of the Kwame Nkrumah University of Science and Technology (KNUST), Department of Building Technology studying Master of Science Degree in Procurement Management. The specific objectives of the research are as follows;

To identify risks associated with the lowest evaluated bid selection.

To identify measures to mitigate the risk.

Your response to the following questions would be highly esteemed for the success of the project. Any information given would be treated with utmost confidentiality.

Instructions

Please tick (✓) or circle (○) the most appropriate answer to each of the questions.

Where applicable, tick all that apply

SECTION I: GENERAL INFORMATION

1. Please indicate your level of education?

☐ PhD

☐ MSc

☐ BSc

2. What professional body do you belong to?
- ☐ Ghana Institution of Engineers
 - ☐ Ghana Institute of Surveyors
 - ☐ Other (please specify.....)
3. How long have you practiced your profession?
- ☐ Less than 5 years
 - ☐ Between 5 – 10 years
 - ☐ More than 10 years
4. What major works do you evaluate?
- ☐ Building
 - ☐ Civil /Road
 - ☐ Both
- “Please indicate your level of agreement;”
5. Do you use price to rank bidders before post qualification assessments?
- ☐ Strongly agree
 - ☐ Agree
 - ☐ Disagree
 - ☐ Strongly disagree
6. Do you use Engineer’s Estimate as a basis for bracketing?
- ☐ Strongly agree
 - ☐ Agree
 - ☐ Disagree
 - ☐ Strongly disagree

7. Do you carryout post qualification assessments for all the bidders?

☐Strongly agree

☐Agree

☐Disagree

☐Strongly disagree

8. Do you award marks for post qualification assessments for all the bidders?

☐Strongly agree

☐Agree

☐Disagree

☐Strongly disagree

9. Do you think risks associated with lowest evaluated bid selection will affect contract performance?

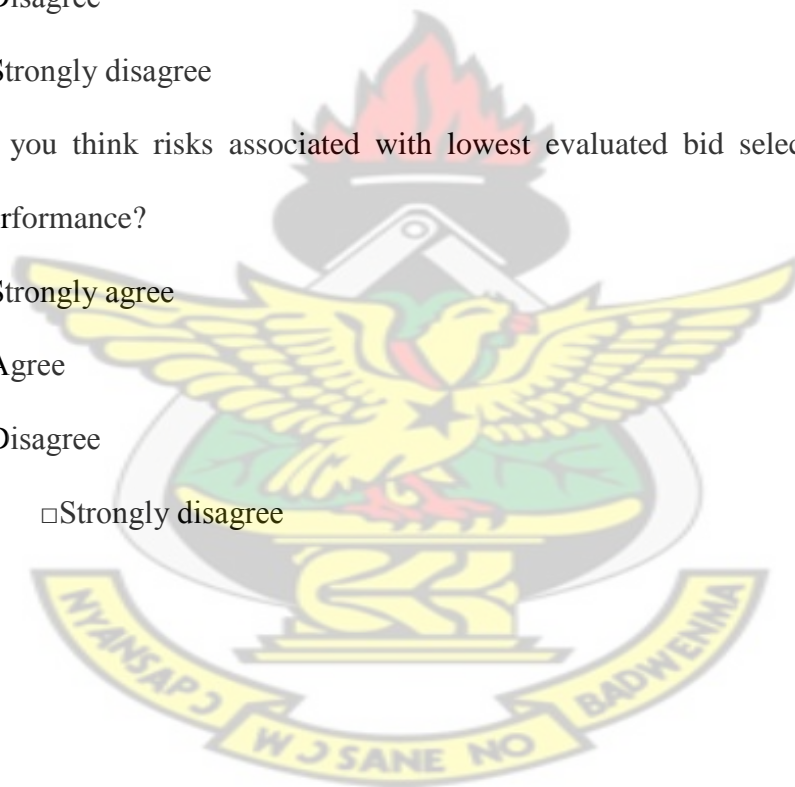
☐Strongly agree

☐Agree

☐Disagree

☐Strongly disagree

KNUST



SECTIONII: RISK ASSOCIATED WITH LOWEST EVALUATED BID SELECTION

This section seeks to draw information on the risk associated with lowest evaluated bid selection.

Please rank in order of importance, the risk associated with lowest evaluated bid selection.

1 = Not important 2 = Slightly important, 3 = Important, 4=Very important

| Risk associated with lowest evaluated bid selection. | 1 | 2 | 3 | 4 |
|---|----------|----------|----------|----------|
| 1. Cost overrun | | | | |
| 2. Time over run | | | | |
| 3. Legal cost | | | | |
| 4. Insolvency | | | | |
| 5. Unrealistic price | | | | |
| 6. Unsatisfactory quality | | | | |
| 7. Contractual claims | | | | |
| 8. Change orders (variation) | | | | |
| 9. Increase over all cost of contract | | | | |
| 10. Termination of contract | | | | |
| 11. Unfair competition | | | | |
| 12. Legal challenge | | | | |
| 13. Damage to reputation | | | | |
| 14. Poor lifecycle performance | | | | |
| 15. No repeat business | | | | |

SECTION III: RISK MITIGATION MEASURES

This section seeks to draw information on Risk mitigation measures.

Please state your level of agreement, do you agree or disagree that the risk associated with lowest evaluated bid selection can be mitigated with the following measures?

1 = Strongly Disagree 2 = Disagree, 3 = Agree, 4=Strongly Agree

| Risk Mitigation Measures | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| 1. To allow contingency to the budget to cater for cost overrun | | | | |
| 2. To add a few extra months to the programme to cater for time overruns | | | | |
| 3. Make extra provisions for legal and Quantity Surveyor fees to write off the disputed costs that have been incurred | | | | |
| 4. increase the running and maintenance costs in the long term | | | | |
| 5.Award contract within acceptable estimated cost | | | | |
| 6.The estimated costs should be published during bidding | | | | |
| 7.The bidder should be offered the opportunity to withdraw the bid without further penalty | | | | |
| 8.The bidder should be asked to provide detailed calculation to show that its bid price is justified | | | | |
| 9. Recommend awarding the contract to the next lowest bidder | | | | |
| 10.Bidder should provides additional performance security to cover the loss to the buyer in case of default | | | | |
| 11.Good supervision | | | | |
| 12.Carryout post qualification assessments for all the bidders and award marks | | | | |
| 13.Selecting Economically Most Advantageous Tender (EMAT) | | | | |

Please indicate any general comment about the topic

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THANK YOU VERY MUCH!!!

APPENDIX 2

KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY

DEPARTMENT OF BUILDING TECHNOLOGY

Questionnaire for Contractors

Topic: “Risks associated with Lowest Evaluated Bid Selection on Contracts Performance”

The researcher is a final year post graduate students of the Kwame Nkrumah University of Science and Technology (KNUST), Department of Building Technology studying Master of Science Degree in Procurement Management. The specific objectives of the research are as follows;

To identify risks associated with the lowest evaluated bid selection procedure.

To identify measures to mitigate the risk.

Your response to the following questions would be highly esteemed for the success of the project. Any information given would be treated with utmost confidentiality.

Instructions

Please tick (✓) or circle (○) the most appropriate answer to each of the questions.

Where applicable, tick all that apply

SECTION I: GENERAL INFORMATION

1. How long have you been in operation?
 - ☐ Less than 5 years
 - ☐ Between 5 – 10 years
 - ☐ More than 10 years
2. Which class does your organization belong to?
 - ☐ A1B1
 - ☐ A2B2

☐ A3B3

“Please indicate your level of agreement;”

3. Do your company reduce profit margin in order to win contract?

☐ Strongly agree

☐ Agree

☐ Disagree

☐ Strongly disagree

4. Do you think lowest evaluated bid selection can sustain companies in business?

☐ Strongly agree

☐ Agree

☐ Disagree

☐ Strongly disagree

5. Do your company submit low bid with the expectation of recouping later

☐ Strongly agree

☐ Agree

☐ Disagree

☐ Strongly disagree

6. Do you think risks associated with lowest evaluated bid selection will affect contract performance?

☐ Strongly agree

☐ Agree

☐ Disagree

☐ Strongly disagree

SECTION II: RISK ASSOCIATED WITH LOWEST EVALUATED BID

SELECTION PROCEDURE

This section seeks to draw information on the risk associated with lowest evaluated bid selection.

7. Please rank in order of importance, the risk associated with lowest evaluated bid selection system.

1 = Not important 2 = Slightly important, 3 = Important, 4=Very important

| Risk associated with lowest evaluated bid selection system | 1 | 2 | 3 | 4 |
|---|----------|----------|----------|----------|
| 1. Cost overrun | | | | |
| 2. Time over run | | | | |
| 3. Legal cost | | | | |
| 4. Insolvency | | | | |
| 5 Unrealistic price | | | | |
| 6. Unsatisfactory quality | | | | |
| 7. Contractual claims | | | | |
| 8. Change orders (variation) | | | | |
| 9. Increase overall cost of contract | | | | |
| 10. Termination of contract | | | | |
| 11. Unfair competition | | | | |
| 12. Legal challenge | | | | |
| 13. Damage to reputation | | | | |
| 14. Poor lifecycle performance | | | | |
| 15. No repeat business | | | | |

SECTION III: RISK MITIGATION MEASURES

This section seeks to draw information on Risk mitigation measures.

8. Please state your level of agreement, do you agree or disagree that the risk associated with lowest evaluated bid selection can be mitigated with the following measures?

1 = Strongly Disagree 2 = Disagree, 3 = Agree, 4=Strongly Agree

| Risk Mitigation Measures | 1 | 2 | 3 | 4 |
|---|----------|----------|----------|----------|
| 1. To allow contingency to the budget to cater for cost overrun | | | | |
| 2. To add a few extra months to the programme to cater for time overruns | | | | |
| 3. Make extra provisions for legal and Quantity Surveyor fees to write off the disputed costs that have been incurred | | | | |
| 4. increase the running and maintenance costs in the long term | | | | |
| 5. Award contract within acceptable estimated cost | | | | |
| 6. The estimated costs should be published during bidding | | | | |
| 7. The bidder should be offered the opportunity to withdraw the bid without further penalty | | | | |
| 8. The bidder should be asked to provide detailed calculation to show that its bid price is justified | | | | |
| 9. Recommend awarding the contract to the next lowest bidder | | | | |
| 10. Bidder should provide additional performance security to cover the loss to the buyer in case of default | | | | |
| 11. Good supervision | | | | |
| 12. Carry out post qualification assessments for all the bidders and award marks | | | | |
| 13. Selecting Economically Most Advantageous Tender (EMAT) | | | | |

Please indicate any general comment about the topic

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THANK YOU VERY MUCH!!!