

**Assessments of Performance of Lowest Bid Awarding System on Public
Building Projects In Case of Adama City**



Muse Gezachew Abate

**A Thesis Submitted to the Department of Civil Engineering
School of Civil Engineering and Architecture**

**Presented in Partial Fulfillment of the Requirements of Masters of Science in
Civil Engineering (Specialization in Construction Engineering and
Management)**

**Office of Graduate Studies
Adama Science and Technology University**

**June 2023
Adama, Ethiopia**

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Advisor: Bahiru Bewket(Ph.D.)

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DECLARATION

I hereby declare that this master's thesis entitled "**Assessments of Performance of Lowest Bid Awarding System on Public Building Project In Case Of Adama City,**" is an independent work of mine that it has not been submitted for the award of any academic degree, diploma, or certificate in any other university. All sources of material used in this thesis are duly acknowledged through citation. I undersigned below checked that this thesis project is my sole work.

Muse Gezachew
Name of student

Signature

Date

RECOMMENDATION

I, the major advisor of this research, hereby certify that I have closely advised/supervised the student while developing this thesis and read the draft thesis entitled **Assessments of Performance of Lowest Bid Awarding System on Public Building Project In Case of Adama City** prepared under my guidance by Muse Gezachew Abate. Therefore, I recommend the submission of the thesis to the department for further review and evaluation.

Bahiru Bewkte (Ph.D.)

Major Advisor

Signature

Date

APPROVAL OF BOARD OF REVIEWERS

We, the undersigned, members of the Board of Reviewers of the thesis by Muse Gezachew Abate have read and evaluated the thesis entitled “**Assessments of Performance of Lowest Bid Awarding System on Public Building Project In Case of Adama City,**” and examined the candidate during open defense. This is, therefore, to certify that the thesis is accepted for partial fulfillment of the requirement of the degree of Master of Science in Civil Engineering (Specialization in Construction Engineering and Management).

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ABSTRACT

The lowest bid price award system is the typical method for project awarding procurement for public projects in Ethiopia. The key characteristics of public building construction projects awarded through lowest bid price now include determined issues with poor quality facilities, frequent cost and time overruns, and a high incidence of claims and litigation. This study aimed to analyses the assessment of the performance of public building projects awarded through the lowest bidder bidding selection and awarding system. For the collection of information on the necessary points, a literature review, document analysis, and desk study projects were used to carry out this study. A total of 31 projects were chosen purposefully, and data on the projects was gathered from public clients and consultants managing public construction projects in the city. All of the projects that were evaluated had contract sums that were exceeded, and the primary reasons for this were claims, changes made to the initial design, changes to the specification, and price fluctuations. The relative importance index of the parameters were evaluated for the study. The selection of ineffective contractors ($RII = 0.97$) was the study's top negative consequence, followed by time overruns ($RII = 0.95$), the suspension or cancellation of contracts for work ($RII = 0.94$), low quality ($RII = 0.92$), cost overruns ($RII = 0.91$). A rise in disputes and claims, a rise in operating and maintenance costs, and a rise in change requests are also significant impacts the lowest bid award system has on the project's performance. On the other hand, respondents gave the study's other alternative bidding procedures high scores for their favorable impacts on these traits. Many of the construction industry professionals who took part in the study supported the researcher's recommendation that the bid award method should depend on the type and complexity of the project and the average bid.

Key Words: Procurement System, Lowest Bid, Public Sector Construction, Project Performance

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LIST OF ACRONYMS

ALT	Abnormally Low Tender
EMAT.....	Economically Most Advantageous Tender
EU.....	European Union
ITB.....	Instruction to Bidders
NCB.....	Nationals Competitive Bidding
PPA.....	Public Procurement Agency
RFP.....	Request for Proposal
RFQ.....	Request for Quotation
SBD.....	Standard Bidding Document
RII.....	Relative importance index

1. INTRODUCTION

1.1 Background of the Study

The construction industry in both developed and developing countries may be viewed as that sector of the economy that, through planning, design, construction, maintenance and repair, and operation, transforms various resources into constructed facilities. The types of public and private facilities produced range from residential and nonresidential buildings to heavy construction, and these physical facilities play a critical and highly visible role in the process of development (Gudeta, 2020). One of the primary areas requiring significant financial and human resources is the construction industry (Mechegiaw, 2012). Despite the construction industry's vital role in the development of developing nations and its substantial economic contribution to those economies, the sector's performance is still largely low.

According to Gebru, (2018), In Ethiopia, public construction initiatives are an element of the country's development strategy. It contributed a large portion of the nation's limited financial resources. When it comes to government development programs, Ethiopia's construction industry receives the most government funding. Various stakeholders (clients, contractors, technical supervisors of construction, etc) are involved in the construction process. The selection of a qualified contractor is essential to the success of the construction endeavor. Quite often construction projects behind schedule, price changes and inappropriate quality are a direct outcome of the selection of an inadequate contractor(Banaitienė & Banaitis, 2006). It is in the best interests of the community and the construction industry to work to enhance the procurement of construction by the public sector in particular, because procurement issues are closely tied to the construction industry and its performers (Khan & Khan, 2015).

Currently, the public sector procurement of construction is largely based on the lowest bid award system. The usual procedure of awarding contracts to the lowest bidder was created to guarantee the project would be completed at the lowest possible cost; this technique is nearly universally adopted in public construction projects because it not only guarantees a low price but also offers a means of preventing fraud and corruption (Thomas, 2009).

This practice is designed to promote healthy competition and ensure the lowest contract price for the project is achieved. The common of public agencies are legally compelled to award the

project to the lowest bidder, despite the fact that private construction companies are free to choose from a variety of contracting methods (Enshassi et al., 2013). Moreover, the traditional low-bid approach tends to promote more adversarial relationships rather than collaboration or coordination, and the owner is typically more vulnerable to contractor claims regarding design and constructability difficulties (Rizwan, 2008).

As an alternative to the low bid process, other organizations employ various procurement strategies. Competitive average bidding, multi-parameter bidding, competitive negotiated bidding, and non-competitive negotiated bidding are the most frequently used procedures in many countries. The competitive average bidding method has become the favourite of many European countries. Competitive, negotiated bidding is used in Florida, USA, a minimum of three contractors are chosen only on the basis of their qualifications, and the top ranked team is then given the opportunity to negotiate an assured maximum rate or total amount (depending on the project). The EU passed rules allowing public sector clients to select the Economically Most Advantageous Tender (EMAT) method for awarding building projects. The average bid approach was recently adapted by other nations, including Taiwan and Italy. The least responsive bidder or price-based technique is the most popular way to award contracts; however, it has its own drawbacks of high competition and low performance. Therefore, it is crucial to determine how competitive low-bid awarding systems affect the execution of significant public works and public building projects (in terms of schedule, cost, quality, and safety), the performance of alternatives bid award systems. The study presented recommendations as well as thoughts for providing study findings for applying various methods of contract evaluations and awards.

1.2 Statement of the Problem

The lowest bid price award system or a competitive open bidding process are the typical methods for project award procurement for public projects in Ethiopia. It has been generally recognised that awarding contracts to the lowest-receiving bidder guarantees the project will be completed at the lowest possible cost. However, the low-bid award system has a poor effect on project performance despite having a long history of legal patterns that promote open competition and an equal playing field. The major reason for project delays, cost overruns, major quality defects in works and materials, and safety issues is the tendency of contractors to compromise their project price and attempt to use unreasonably low rates at the tender (Midekso, 2017). An owner takes a

big risk by choosing a contractor who files an excessively low bid, either accidentally or intentionally. According to Mosissa (2006), a survey carried out in the Oromiya regional state, the main issues with the current method of project delivery were the lack of honest competition during the selection of contractors, excessive time overruns, compromising quality, and an increase in the final project cost from the estimated cost. Public sector owners are under increasing pressure to enhance project performance, complete projects faster, and lower the cost of running their construction programmes in the current construction environment. In order to increase project quality and boost project performance, the researcher suggest alternative procurement and contracting approaches that take into account factors other than price alone throughout the selection process.

1.3 Objectives of the Study

1.3.1 General objective

The main objective of the study was assessment of the performance of lowest bid awarding system on public building projects in case of Adama city.

1.3.2 Specific objectives

The specific objectives of the study are:

- To assess the effectiveness of the projects performance that was selected under different alternatives methods of awarding and evaluation.
- To evaluate the performance of the contractors for public building project awarded through a competitive lowest bid award procedure.
- To analyze the impacts of lowest bid award method has on the project performance.
- To provide experts opinion on the alternative bidding systems performance.

1.4 Research Question

The research questions for the study are:

- What are the performance indicators to evaluate the performance of different alternative bid award system has on the public building project?
- How is the performance of contractors selected by competitive lowest bid award procedure for public building?

- What are the impacts of competitive lowest bid procurement system has on the public building project performance?
- What are the alternatives bid award system available in the construction industry?

1.5 Scope of the Study

This study is limited to assessing the performance of construction projects for publicly owned buildings in Adama City that are awarded based on lowest bidder selection methods. The legal system and governmental regulations governing the awarding of public construction contracts are covered in this paper. This study primarily focuses on ongoing and completed public building construction projects in the past five years in Adama City. This paper presents the findings-based data acquired from the literature review and the data gathered from the questionnaire surveys.

1.6 Significance of the Study

The research's importance is found in the assessment of the effectiveness of the lowest bid awarding procedure on public building projects and in the creation of a database on the performance of bidders on projects granted using the lowest evaluated tender, which will be used by academia, the construction industry, and decision-makers. In order to assure an improvement in project performance, this study will important to identify and offer a more appropriate and effective evaluation method for use during the bid review process. In order to help the Public Procurement and Property Administration Agency examine the current attitudes toward selection practices, which will ultimately lead to better decision-making and improved project performance, the study attempted to provide recommendations and suggestions for implementing the more advantageous practice for both the client and the contractor.

1.7 Limitation of the Study

The main problem the researcher encountered during study was delay of respondents to replies for the questioner and public agency fear of giving information on the completed project status. Due to time and financial constraints, the study was limited to public building projects in Adama City only.

1.8 Organization of the Paper

Five chapters make up the organisation of this research.

Chapter one includes The background of the study, the problem statement, the research questions, the objectives of the investigation, the significance of the study, and the scope of the study are all included in the first chapter.

The second chapter presents a literature review.

In the third chapter, the study's methodology is discussed, including the data type and source, research methodology, data gathering method, and data analysis method.

The fourth chapter shows the results of the study interview and questionnaire.

The fifth chapter presents concluding remarks, main conclusions, and recommendations drawn from the research work.

2. LITERATURE REVIEW

2.1 General

The construction process involves multi-organizational activity, Conflict and disputes can therefore exist at all levels in the contractual chain: between client and consultant, client and contractor, client and sub-contractor, and so on. Among many causes of disagreements in the construction project, the project delivery system selected is one of the significant elements (Abera, 2005). In the construction industry, the owner is faced with the challenge of selecting an adequate contractor that will ensure a successful project completion in terms of schedule, budget, and quality(Awwad & Ammourey, 2019).

Major clients working with construction companies can successfully integrate many of these developments to achieve appreciable improvement in the cost, time and quality of projects(Datta, 2005). Construction work is usually accomplished through a contractor who signs a contract with the owner(Hanák et al., 2021). This contract fully describes the nature of the construction to be accomplished. The contractor is entitled to payments as per the agreement. The owner may select the contractor either through competitive bidding, negotiation, or a combination of the two(Eriksson, 2007). The latest developments and desires in different aspects of human life, has led the professionals in construction industry to use alternative forms of project delivery systems. The insufficiency and inappropriateness of the awarded contractors has led to sub-standard work, delays, disputes, or even bankruptcy(Rabie & El-Sayegh, 2017).

Currently, the public sector procurement of construction is largely based on the lowest bid award system(Deep et al., 2017). The customary practice of awarding contracts to a lowest bidder was established to ensure the least 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(Khan and Khan, 2015). As per studies available efficiency of contract in lowest bidder award projects is comparatively low(Jaskowski et al., 2010). Major reasons being inflation, extension of duration and price escalation is due to the contractors that win the project through lowest bid award system. The major flow of lowest bid award method is work awards could be made because of submission of deliberate and unrealistic bid by a contractor. This practice has led to a series of disputes and caused several stereotypes in work

progress resulting in increased prices(Salem Hiyassat, 2001). Increasing complexity in design and the involvement of numerous stakeholders in modern construction projects are a huge challenge for both clients and contractors to meet criterion of skills and capabilities required to successfully deliver a project at the bidding stage. Selection of an inappropriate contractor for the job increases the chance of dispute and dissatisfaction amongst stakeholder(Deep et al., 2017).

In Ethiopia the most common procurement method is the competitive low-bid procedure in which contracts are awarded to a responsive contractor who offers the least price. The prequalification and bid evaluation processes requires the development of necessary and sufficient criteria. The last two decades have witnessed a huge development in project complexity and clients need, this has led to an increasing use of alternative forms of project delivery systems. In contrast, the prequalification and bid evaluation process, quantifying and assessment of criteria are still in its original form. Prequalification provides a client with a list of contractors that are invited to tender on a regular basis. This is the approach most currently used by most countries and in which many and different types of criteria are considered to evaluate the overall suitability of contractors(Mechegiaw, 2012).

The low-bid procurement system has a long-standing legal precedence, encouraged open competition, a fair playing field, but some of their industry partners is that a system based strictly on the lowest price provides contractors with an incentive to concentrate on cutting bid prices to the maximum extent possible (instead of concentrating on quality enhancing measures). even when a higher cost product would be in the owners best interest, which makes it less likely that contracts will be awarded to the best performing contractors who will deliver the highest quality projects. As a result, the low-bid system may not result in the best value for money expended or the best performance during and after construction(Midekso, 2017).

2.2 Procurement System

The term "procurement" refers to the act of buying, hiring, or getting products, works, and services by any other contractual means (Proc No. 624/2009). The process of selecting people or businesses to perform the desired services and/or works is known as procurement. The provisions provided during the contract-planning stage of the procurement and contract process are used to guide procurement management. It includes the creation of procurement

documentation, invitations to submit bids, opening of bids, and evaluation of bids. The procurement team will suggest the winner for the contract management phase based on the findings from the examination of the tenders. Understanding and ensuring compliance with national and international laws, rules, and regulations pertaining to procurement, following the terms agreed upon during the contract design phase, including any applicable change process that is accurate. A successful procurement management phase requires consideration of delivery systems, procurement methods, and contract types, as well as the creation of a flexible procurement team and adherence to the standards of proof of competition, impartiality, neutrality, accessibility, and formality(Reta & Alyew, 2022).

2.3 Applicable Laws, Rules, Regulations and Guidelines

According to (Proc No. 624/2009).The following are favorable for contract management and procurement Ethiopian Financial Laws and Ethiopian Procurement Regulations by MoFED.

- Federal Public Procurement Directive June 2010, Amendments of the PPA directive in 2015/6, Ethiopian civil and procedural codes.
- Public works related organizations establishment proclamations, their policies, strategies, duties and responsibilities, such as MWUD, ERA, MWR, by federal government.
- Project Formulation Guideline, Volume II, MoFED, ADB, WB, EC and Other Bilateral Donors Policies and IMF Regulations, INCOTERMS, UNICETRAL and other internationally acknowledged construction related laws and regulations.
- Ethiopian urban planning and building laws – draft labor, business, intellectual rights, environment protection, general and particular conditions of contract: MWUD, ERA, FIDIC, WB, ADB, EC.

2.4 Bidding Procedures and Laws (Legal Aspect)

Federal directions in Ethiopia mandate that open bidding be submitted for construction projects. According to this proclamation, public bodies must choose the "lowest responsive bidder" when awarding such contracts. The word "responsive" implies that a winning offer must also adequately address the project's needs as stated. While determining whether a bid is responsive is not particularly difficult because responsiveness evaluated based on the documentation submitted by contractors, determining whether a bid is responsible requires a significant amount of time

and effort. "Responsible" generally refers to the apparent low bidder's quality, fitness, and capacity to perform the proposed work satisfactorily. More than just being fiscally responsible is what is meant by "responsible". The bidder must also possess the required wisdom, talent, and ability, and integrity to perform the contract according to its terms (Ioannou & Awwad, 2010)

2.4.1 Regional Procurement Laws

With respect to the implementation of the Proclamation 624/2009, Regional States shall have the following powers and duties to:

1. Without prejudice that the rules could be rebutted on grounds of professional or scientific justifications, issue design and construction rules and standards applicable in their own urban centers based on local circumstances and without contradicting the provisions of this Proclamation;
2. Designate organs to enforce this Proclamation in areas outside urban centers where it is applicable;
3. Determine that a building officer of another urban center be delegated to enforce this Proclamation in urban centers which cannot appoint their own building officers due to lack of capacity;

Adama City is one of the Oromia Regional Cities, and the Oromia Regional Government follows the laws governing the procurement and property management of the Ethiopian Federal Government. So regarding Oromia Regional Government procurement and property administration (PPA) the researcher referred to Ethiopian Federal Government PPA Laws in this study. Six methods of procurement for public goods and services are listed in the Ethiopian Federal Government's procurement and property administration proclamation no 649/2009's article 33 (1): open bidding, request for proposal (RFP), two-stage tendering, restricted tendering, request for quotation, and direct procurement. However, unless the proclamation clearly indicates otherwise as per (article 33(2)), the proclamation restricts public institutions to operating open bidding as their preferred mode of procurement.

Restricted tendering allowed only when the required object of procurement is available only with limited suppliers and the cost of the procurement does not exceed the limit in the directive issued

by the Ministry. In addition, where a repeated advertisement of the invitation to bid fails to attract bidders in respect of procurement subject to the directive issued by the Ministry (article 49). The total contract value of procurement made by restricted bidding is limited by the federal public procurement directive to 2 million birr for works (article 23.3).

Direct procurement authorized when there are no contests due to technological issues and when just one candidate can deliver the required service. Or when a supplier must provide a similar service or repeat work, and the overall contract value does not exceed the upper maximum established in the instructions (article 51). The directive for direct bidding on projects sets a maximum contract amount that is comparable to the restricted bidding (article 9).

Requests for proposals (RFPs) are the third category of procurement for public organizations. Only when the public body wishes to acquire consulting services or contracts for which the component of consulting services equals more than 50% of the contract's total value is a request for proposals (RFP) permitted (article 53). The other two types of procurements are request for quotation and two stage bidding. Requests for quotations are acceptable where there is a market for the goods or services being purchased is well-established, as long as the expected contract value does not exceed the limit specified in the Ministry's procurement guidelines (article 55). Two stages bidding on the other hand is permitted when it is not feasible for the public body to formulate detailed specifications for the goods or works such as, contract for the purpose of research, experiment, study or development etc. (article 57). The maximum contract amount provided for works in the directive to use request for quotation is 250 thousand birr (article 24.2).

A different procurement process other than open bidding cannot commonly be used for the majority of construction contracts for public entities because most of these contracts exceed the maximum limit allowed by the directive. In addition, the conditions set forth for the use of other alternatives are not usually fulfilled for construction work contracts except in rare cases. As this research focuses on construction works contract for public bodies under the government building projects, attention were given for the examination and evaluation of bids in the open tendering procedure.

2.4.2 Examination and Evaluation of Bids

The proclamation defines the successful bidder as follows: the bid that is found to be responsive to the technical requirements and with the lowest evaluated price (Article 43(8)). The responsiveness of bidders is determined by their technical evaluation. In order to participate in public procurement, candidates must qualify by meeting the following criteria and such other criteria as the public body considers appropriate under the circumstances: that they possess the necessary manpower, equipment, financial, and technical capabilities; that they have legal capacity to enter into the contract; that they are not insolvent; that they are registered in the suppliers list; that they are not suspended from participating in public procurement in that period; that they have a renewed trade licence and tax clearance; and that they have a bank account (article 28). The tender document for the procurement of works for public bodies in the regional government is The Federal Democratic Republic of Ethiopia Standard Bidding Document (SBD) for Procurement of Works for National Competitive Biddings (NCB) Public Procurement Agency (PPA), January 2006, Addis Ababa. Hence, the tender document to be referred to here in the research is this document.

2.4.3 Procurement of Works for National Competitive Biddings (NCB) Public Procurement Agency (PPA) January 2011

In addition to the basic requirements defined in proclamation article 28(1) and in accordance with ITB Sub-Clause 4.5, bidders are required to meet the minimum qualifying criteria set forth in the qualification criteria in the bid document (section 3: evaluation and qualification criteria). The public body shall compare all substantially responsive bids to determine the lowest evaluated bid, as specified in Section 3: Evaluation Methodology and Criteria. After identifying the successful bidder by evaluating the bid documents against the criteria set forth in this bid document, the public body shall conduct a post-qualification evaluation to establish the current qualification of the successful bidder where it feels that it has to be ascertained.

Such post-qualification evaluation of the successful bidder may relate to the submission of the documentary evidence specified in ITB Clause 37, unless satisfactory documents are already included in the bid, concerning its current legal, professional, technical, and financial standing

and conformity to the requirements stated in this Bidding Document. If the successful bidder fails to provide this documentary proof within 15 calendar days following the public body's request or if the successful bidder is found to have provided false information, its bid shall be disqualified, in which event the public body shall proceed to the next lowest evaluated bid to make a similar determination of that bidder's capabilities to perform satisfactorily.

Table 2. 1 Qualification criteria recommended by PPA 2011 user

Legal, Professional, Technical, and Financial Qualification Criteria

No.	Qualification Criteria	Minimum Requirements
1.	Average annual volume of construction work over the past <i>[For major contracts, it is normally 5 years, for smaller contracts 3 years would be sufficient]</i>	At least <i>[Ideally the minimum value of the annual turnover of construction work should be set at not less than 2.5 times the estimated annual cash flow for the Contract. For low risk works, this minimum could be reduced to 2 times or less]</i>
2.	Experience as a prime contractor in the construction of at least <i>[number of similar contracts, which should be in the range of one to three, depending on the size of contract, risk of contractor default and market conditions]</i>	Works of a nature and complexity equivalent to the Works over the last <i>[number of years, normally in the range of five to ten. For smaller contracts, low risk works or a newly established local industry, the number of years could be reduced to 3]</i> years (to comply with this requirement, works cited should be at least 70 percent complete).
3.	Proposal of the timely acquisition of equipment's(own, lease, hire, etc.) of the following essential equipment:	<i>[list of equipment, For smaller contracts, the list should be limited to specialised items that are critical to the execution of the contract and that may be difficult for the successful Bidder to obtain quickly]</i>

4.	Personnel with specific qualification and experience	<i>[Qualifications and experience required for key personnel e.g. “a Contract Manager with five years’ experience in works of an equivalent nature and volume, including no less than three years as Manager”]. Personnel requirements should be limited to key site management and technical personnel, who will be responsible for major components e.g. site superintendents, contract manager etc]</i>
5	Liquid assets and/or credit facilities net of other contractual commitments and exclusive of any advance payments which may be made under the Contract	Of no less than [amount]. [The successful Bidder must demonstrate that it has or has access to the financial means sufficient to meet the construction cash flow requirements for the contract. The minimum liquid assets and credit should normally be set as the estimated payment flow over approximately 3 months at the average (“straight lined”) construction rate.]

These are the major qualification criteria stipulated in the contract document. In addition, a consistent history of litigation or arbitration awards against the applicant or any partner of a joint venture may result in disqualification. The details, however, are determined by the nature of the construction project. According to proclamation article 43(3), the public body regards a bid as responsive only if it conforms to the salient requirements set forth in the bidding document. And any public body should not award a contract when the bid is not responsive (Article 43 (5-c)). It is also clearly stated in the PPA that the employer will evaluate and compare only the bids determined to be substantially responsive in accordance with Clause 26 (clause 28.1).

A substantially responsive bid is one that conforms to all the terms, conditions, and specifications of the bidding documents without material deviation or reservation. A material deviation or reservation is one (a) that affects in any substantial way the scope, quality, or performance of the works; (b) that limits in any substantial way, inconsistent with the bidding documents, the employer’s rights or the bidder’s obligations under the contract; or (c) whose

rectification would affect unfairly the competitive position of other bidders presenting substantially responsive bids (clause 26.2). Prior to the detailed evaluation of bids, the employer will determine whether each bid (a) meets the eligibility criteria defined in ITB Clause 3; (b) has been properly signed; (c) is accompanied by the required securities; and (d) is substantially responsive to the requirements of the bidding documents (clause 26.1). If a bid is not substantially responsive, it will be rejected by the employer and may not subsequently be made responsive by correction or withdrawal of the nonconforming deviation or reservation (clause 26.3). The employer will award the contract to the bidder whose bid has been determined to be substantially responsive to the bidding documents and who has offered the lowest evaluated bid price (clause 30.1). However, the employer reserves the right to accept or reject any bid and to cancel the bidding process and reject all bids at any time prior to the award of the contract without thereby incurring any liability to the affected bidder or bidders or any obligation to inform the affected bidder or bidders of the grounds for the employer's action (clause 31.1).

2.5 Alternative Contract-Award Procedures in Construction Industry

Most bidding processes involve negotiation and competition. The remaining techniques tend to fall between these two important types or are optional for them. If the lowest bidder is determined to be responsive, the work will be awarded using a competitive process. In the negotiated method of procurement, the cost is discussed and negotiated with the selected constructor (Khan and Khan, 2015). To reduce the concerns and implications of these two extreme categories, some adjustments have been proposed and tested in many different countries. The following contract award procedures are examined and taken into consideration in this study: Competitive Average Bidding Method (Price Basis), Competitive Lowest Bidding Method (Price Basis), Multi-Parameter Bidding Method (Based on Quality, Time, Price, and "Other" Factors), Negotiated Competitive Bidding Method, and Negotiated Noncompetitive Bidding Method.

2.5.1 Competitive Low Bidding

The most popular technique for finding and choosing contractors for building projects is through competitive bidding. Price-based competitive bidding's primary objective is often to get the cheapest price possible. Competitive bidding believes it gives everyone an equal chance to bid, eliminates collusion, and saves taxpayers money (Rizwan U., 2008). In order to get the best products and services at the most affordable prices, it encourages honest competition. Additionally, it is essential to avoid favouritism, ludicrous extravagance, fraud, and corruption. (Khan & Khan, 2015). Under the competitive low-bid method, the qualified (responsive) bidder who submits the lowest bid that meets the specifications must be awarded the contract. As stated earlier, pursuant to Article 33(2) According to Proclamation No. 649/2009, this method of competitive bidding is the standard method for awarding federally owned construction contracts in Ethiopia. It is widely acknowledged that the competitive lowest bid method saves the government money and serves the public interest; however, in the last few decades, this traditional approach has come under fire for its low or inferior quality, frequent changes and change orders, establishment of unfavourable relationships, schedule delays, and rising project costs (D. Singh & Tiong, 2006).

2.5.2 Competitive Average Bidding Method

One of the variations of the competitive lowest bidding approach for awarding construction projects is based on the idea that the bid that comes closest to the average of all the bids rather than the minimum or maximum is the best bid. In the average-bid method, the contract is awarded to the contractor whose price is closest to the average of all bids submitted. 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. Tenders that are bid far lower than the average are considered unrealistically underbid. The bids that are greatly higher than the mean are considered unrealistically overbid. On the basis of this principle, some methods have evolved, and these are generally known as European methods. According to the average-bidding method, the best contractor is often the bidder whose offer satisfies a specific connection with the mean of all the bids. When using the average bidding approach, the average is calculated using a variety of

metrics, or the best bid is judged using a variety of criteria. However, it's important to keep in mind that this strategy solely considers pricing.

Different average bid methods 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.

2.5.3 Multi Parameter Bid Method (Basing on quality, time, price and “other” factors)

This is a model-based competitive bidding procedure that not only satisfies cost but also considers other parameters as proposed by Herbsman and Ellis; they named it the multi-parameter bidding procedure (Abdollahipour, 2013). They suggest that the major parameters should be cost, time, and quality, with minor parameters depending on the preference of the client. Costs may be affected by the timeline suggested in the bid for finishing the project. For instance, an owner may save some extra rent money if a construction business can finish a project three months sooner than the next lowest bidder can (Rabie & El-Sayegh, 2017). This cost savings can be taken into account throughout the bidding process to provide a more accurate assessment of the overall costs. The decision to award the contract may also take into account the effects of higher quality. Repair and upkeep expenses are closely related to how well-built the facility is. (Wong et al., 2001). The type of equipment and materials suggested to be utilised, the past performance of the primary contractor, and the subcontractors that are proposed in the bid can all be used to estimate the quality of the multi-parameter bidding method. In the multi-parameter bidding method, time and quality parameters are assigned a maximum number of attainable points. The bids are then evaluated, and a ranking is made based on these points as well as the bid cost (Khan and Khan, 2015).

2.5.4 Negotiated Competitive Bid Method

Sometimes it becomes necessary to request bids from a predetermined group of contractors who are recognised to have the technical, managerial, and financial ability to finish a complicated,

difficult project. Only contractors who have the ability to work in a particular location may be needed for some secret projects. Open bidding with competitive prices may not be appropriate in many situations. However, the single-source negotiation approach is exceedingly challenging to implement in the public sector due to concerns about accusations of corruption and bias. (Mosissa, 2006). To stay away from these problems with single-source negotiated bidding, many organizations and clients are using variations that include features of both competitive and negotiated methods. To modify the pure negotiated method, an increase in the number of construction companies or contractors to negotiate with provides multiple options for selecting amongst the contractors. In a few cases, based on previous experience or references, some companies are well known to be professional and competent to complete a construction project (Huang, 2011).

2.5.5 Negotiated Non-Competitive Bid method

The non-competitive negotiated procedure is essentially the process of negotiating a bid with a single source, usually a preselected contractor(Huang, 2011). For this reason it is also known as sole-source negotiation. The cost to be paid, and the product or goods to be procured by the owner are normally the items of negotiation. The firm, that is known to be prequalified and having expertise, can be chosen without any notification or tendering advertisement. This saves additional effort, time and money but chances of favoritism and corruption are increased(Midekso, 2017).

2.6 Difficulties and Concerns about Different Bidding Procedures

2.6.1 Competitive low bidding

Although it's widely acknowledged that the competitive low bid method protects the public interest by saving taxpayers money, it has recently come under fire for encouraging subpar quality, leading to too many change orders, fostering adversarial relationships, running over schedule, and raising the project's overall cost. With this approach, the construction company that responds quickly and submits the lowest bid is granted the construction contract. Its key benefit is that it compels contractors to consistently seek cost-cutting management and technological advances (Hanák et al., 2021)

The competitive procedure then transfers these savings to the owner. It is challenging to figure out how a contractor could finish the project profitably if their bid is much lower than the client's estimate and those of the other bidders. According to Nguyen et al., (2018), the European Union classifies those offers as abnormally low tenders. A tender is deemed to be abnormally low if its price is much lower than the majority of other tenders in the same procurement procedure or the average of all tenders. In order to give public sector clients the choice between the conventional low bid and the Economically Most Advantageous Tender (EMAT), the EU established laws.

The following discussion goes over the basic presumptions that the competitive low bidding method is built upon. Prior to making award judgments, competitive low bidding first implies that goods or services can be impartially assessed or contrasted. This is not a simple job. It is typically specified in the bid invitation that for consideration, bids should be responsive and the bidders should be responsible in order to prevent the inherent issues with this assumption. Second, it makes the assumption that there is genuine competition and free bids. Antitrust laws are broken and competitive bidding cannot achieve its goal of getting the lowest price if bidders collude to take turns or submit false bids. Consequently, the integrity of the competitive low bidding procedure is crucial to its success. Thus the success of competitive low bidding system depends largely on the integrity and ability of the contractor, which are often difficult to measure since the tendency is to look only at price.

These bidders can then use this knowledge to submit a lower bid with the expectation of recouping the money later. In all cases the abnormally low is not reflective of the final contract cost or the hidden costs incurred by the client when dealing with numerous change orders and claims. Competitive low bid method has also been criticized to cause abuse of the change order procedure. It is alleged that change orders become too numerous and too expensive under this method. Thus according to its critics, the low bidder method does not guarantee the lowest cost because delays and cost-increases are very likely to occur with the procedure. Despite all these criticisms there are strong arguments in favor of using the traditional competitive low bidder system. The public sector seems to be more comfortable with this process because the bid evaluation is not complicated. The checks-and-balance system, and integral part of this competitive process, fosters confidence with the taxpayers. Its objectivity is ensured because price is the only criterion for evaluating bids. Its vulnerability to different sorts of political and social pressure is much less than other procedures that are based on some degree of subjectivity.

2.6.2 Competitive average bidding

In competitive average bidding procedures, as described in the previous section, all the features of open competitive systems are taken. The only difference is that the selected contractor is the one whose bid is near the average of all the bids submitted. The major drawbacks of the low-bid method is the possibility of awarding a construction contract to a contractor that submits, either accidentally or deliberately, an unrealistically low bid price. Often, such an occurrence works to the owner's and contractor's loss by promoting disputes, increased costs, and schedule delays. To address this problem, other countries have adopted the average-bid method and award the contract to the contractor whose price is closest to the average-bid method and explores its merits relative to the low-bid method (Shrestha, 2014). 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 & Awwad, 2010). 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 lower costs for the owner. A technological or managerial breakthrough that results in major cost savings will not necessarily be passed on to the owner in the form of lower prices, unless this breakthrough is known to be available to all bidders. Although it has been argued that average bidding method results in significantly higher profits for the contractors in projects won (Ioannou & Awwad, 2010). 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. Moreover, some of these benefits are of intangible nature. The success of this procedure also depends on the requirement that general contractors select their subcontractors on the average-bidding principle. Given the way bidding is practiced, accepting sub-bids till the last moment, this would be very difficult to enforce. In addition, currently the law does not require general contractors to submit and retain a preselected group of subcontractors.

2.6.3 Other Competitive Bidding Methods (Based on price and other factors)

Under this method factors other than price are considered before award decisions are made. This is done in a more severe 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 body, to encourage quality and innovations, while maintaining a fair profit for the contractor. For many years the time element 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. In the last few years, the construction industry of Ethiopia has involved in both building of new roads and construction of existing facilities. These reconstruction projects are mainly in urban areas and cause substantial problems to the public. The economic cost of these delays is also enormous. In U.S.A for instance, a few innovative procurement systems for buying time were introduced in order to minimize those delays (Chang et al., 2014). The common denominator of all those procurement system is the ability of the contractor to procure the time for completion of the project.

2.6.4 Competitive Negotiated Bidding

Request for proposals and/or request for qualification for a particular project are examples of typical competitive negotiated method. Proposals from more than one contractor are examined for factors such as technical capability, project schedule as well as cost. These methods are usually employed when the project is planned to be built under a design/build contract. Proponents of competitive negotiated bidding methods claim that these methods save time, improve quality and reduce number of claims (D. Singh & Tiong, 2006).

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(Alptekin & Alptekin, 2017).

2.7 Performances of Project and Contractor

2.7.1 Performances of Project

Performance commonly refers to the carrying out of works according to requirements set out in a contract. Performance requirements might include: Progressing the works in line with the program. Completing works by the completion date, Satisfying quality, health and safety, environmental and other standards(Kagioglou et al., 2001).

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(Kuprenas, 2005).

Huang (2011) 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. Shrestha (2014) stated that, an adequate understanding and knowledge of performance are desirable for achieving 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(El Wardani et al., 2006).

2.7.2 Performances of contractor

Performance has been described as "the degree of achievement of a certain effort or undertaking". It relates to the prescribed goals or objectives that form the project parameters (Ying et al., 2018). From a project management perspective, it is all about meeting or exceeding stakeholder needs and expectations from a project. It invariably involves placing consideration on three major project elements: time, cost, and quality. It has been pointed out that In today's highly competitive and uncertain business environment, the client, who is the major stakeholder,

wants speedier delivery of their project with an 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 (Folan & Browne, 2005). Although many tend to focus on the elements of cost, quality, and time, all others are also important parameters of project performance. Thus, performance measurement, as defined by Sibiya et al. (2015), is the set of metrics used to quantify both the efficiency and effectiveness of an action. Further, Ingle et al. (2021) indicated that performance measurement is a management tool that has the power to focus attention on desired behaviour 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) to focus on to measure their impact on project delivery.

2.8. Effect of Procurement on Project Performance

According to Jaskowski et al. (2010), simple regression analysis results show that bid invitation efforts and project performance are positively related. Which indicated that the bid invitation accounted for 6.66% of the change in project performance if all other factors were held constant. Also, bid evaluation criteria and project performance were positively correlated. Bid evaluation accounted for 58.5% of the change in project performance when all other factors were kept constant. Finally, contract negotiation and project performance are also positively related. Contract negotiation accounted for a 27.2% change in project performance when all other factors were held constant. In a survey conducted in the Oromiya regional state, the non-existence of real competition during contractor selection, excessive time overruns, compromising quality, and the escalation of the final project cost from the estimated cost were the major problems associated with the existing approach to delivering projects (Mosisa, 2006). Among the many causes of disagreements in the construction project, the project delivery system selected is one of the significant elements.

2.9. Performances of Contactors and Project Selected Using Lowest Bid Award Method

The lowest bidder is one whose bid contains the lowest total amount when compared with other bids submitted for the same work. There are definite risks associated with the low bid award

system. A number of studies have shown that the lowest bid does not guarantee the lowest cost. Also, the lowest bidder is subject to the winner's curse; the contractor with the lowest bid is the one most likely to have underestimated the cost of the project (Honek et al., 2012). Lowest bidders are required to complete a construction project that no one else was willing to do at that price (Padhi & Mohapatra, 2010). It is known that many construction projects exceed the contract cost. Thus, using the bid price (lowest bid) solely for contractor selection cannot guarantee the lowest total construction cost. In addition, construction bid evaluation is one of the primary challenges for the public sector. Its purpose is to choose the best-qualified contractor who can accomplish the project on time, within budget, and with the quality specified in the contract documents (Eriksson & Westerberg, 2011). In finding a best qualified contractor, two terms, evaluation and selection, are commonly referred to in the literature.

If a contractor submits a bid that is lower than the client's estimate and the other bidders, it is difficult to understand how that contractor could complete the job profitably and efficiently. The European Union defines those bids as Abnormally Low Tenders (El Wardani et al., 2006). In that regard the EU introduced legislation to allow public sector clients the option of awarding a construction project using either the traditional low bid or 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 desire to reduce construction costs and predatory pricing and unfair competition that distorts the market, negatively affecting the other bidders (Huang, 2011).

The traditional low-bid approach has evidently contributed promoting adversarial relationships rather than cooperation or coordination among the contractor, the designer and the owner, and the owner generally faces increased exposure to contractor claims over design and constructability issues (Jaskowski et al., 2010). The competitive lowest bid system has the most highly identified causes of contractors' poor performance because of initial low project cost which eventually needs for additional money for . This creates dispute, the quality of the project is compromised, causes delays and failure of the project (Kagioglou et al., 2001).

2.10 Factors that Affect Contractor Performances

Factors that affect contractors' performance recognized by a number of researchers and are discussed below;

2.10.1 Prequalification of Contractors

According to Latham et al. (2015), the main method for shortlisting contractors is prequalification. This indicates that prequalification helps find bidders who are most qualified to complete the contract. Prequalification helps to lower the risks of contractor non-performance that construction clients are likely to encounter (Huang, 2011). Among others, it established several fundamental concepts or criteria that are taken into consideration when prequalifying building contractors. Technical ability, financial resources, quality management, occupational health and safety, experience, and licence or categorization are the principles that are listed here.

2.10.1.1 Technical Capacity

Technical capacity, according to Hancher & Lambert, (2002), is broadly defined as having recent prior experience and demonstrated skill relevant to a financial threshold in one or more of the designated field of work categories. van Helden & Reichard, (2019), asserted that the contractor(s) must provide information on the areas of work that includes expertise or specialisation, past experience, staffing levels, management and administration capabilities. including the use of subcontractors and consultants and plant and equipment resources, evidence of appropriate qualifications, including current licences to practise in a particular field, and more in order to meet the requirements of technical capability.

2.10.1.2 Financial Capacity

The financial capability of the contractor for funding of a project is very important and crucial to the success of a project. An indication from the Ghanaian Public Procurement Act 663 of 2003 seems to suggest that, the financial good standing of a contractor is an indication of good performance in terms of project delivery (Nguyen et al., 2018).

2. 10.1.3 Quality

Clients and customers have made several indications and complaints about the poor quality of work through the media and authorities, which has a negative impact on living quality in unwelcoming and unpleasant environments (Mensah et al., 2020). Poor quality control on the job site, frequent issues including project delays, and potential financial losses present the client with ongoing challenges. Late work delivery frequently leads to late building occupancy, which results in inadequate public facilities. Therefore, if the finished product does not satisfy their needs in terms of functionality and service quality, end users won't be pleased. In essence,

successful stakeholders" performance has to be measured and managed in order to ensure their continual participation and co-operation in a construction project (Takano et al., 2014).

2.10.1.4 Occupational health and safety

According to Helen et al., (2015), occupational health and safety (OHS) is thought to be concerned with an individual's physical and emotional wellbeing at their place of employment. The physical and emotional health of workers at construction sites seems to be impacted by accident in the construction business. According to Scheepbouwer et al., (2017), a construction accident is defined as any incident involving mild injuries up to fatalities. According to the literature that is currently accessible on the topic, accidents frequently occur in the global construction sector.

First-aid supplies, clean facilities, access to safe drinking water, personal protective equipment (PPE) availability, and training for construction workers in safety procedures are just a few of the factors that have been discussed and researched in an effort to determine the causes of this breach in occupational health and safety issues. These factors were necessary for addressing the occupational health and safety issues facing the industry. According to knowledge gained from other studies studying occupational health and safety issues, contractors who offer welfare amenities and safety gear to their employees on job sites are more likely to perform well and complete the project on schedule.

2.10.1.5 Experience

In order to accomplish the project's anticipated outcomes, the tenderer's prior experience must be evaluated in connection to the disciplines of competence required. The value of recent experience outweighs that of historical experience. It is important to take into account the company's prior experience in technical fields related to the project being tendered, the size of previous projects, and the roles played within those projects. The required information should contain a list of completed relevant projects, including information on each project's description, relevance to the requested project, role of the tenderer, project cost, duration, and contractor performance on the projects in question.

It is important to evaluate how well the organization submitting the tender has performed in completing previous projects to the appropriate quality standards, on schedule, and within budget. Claims for modifications and extensions to the contract's completion date also provide insight into performance capacity. Similar to this, the opinions of prior clients on how the project

was managed and how well it turned out offer useful, subjective insight into the tenderer's performance.

2.10.1.6 License/Classification

On a global scale, regulatory policies pertaining to land use control, technical requirements, building permits and inspections, registration of contractors and professionals, wages and remunerations, classification of contractors, foreign equity limitation, transfer offences between projects, and non-recognition of professional qualification have all had an impact on the performance of contractors operating abroad (Sureka et al., 2021). Politicians across the country have expressed their worries about the regulation of business and the economy in general. A small construction company that had to decline significant contracts because it couldn't obtain insurance coverage for accidents, which were very expensive, was described in a UK parliamentary debate. This had resulted in loss of employment for the workforce (Sureka et al., 2021). In many developing countries, after obtaining license and registering to operate as a construction business, contractors who wish to engage themselves on government sponsored projects are further required to register with appropriate government departments and then be categorized into financial groups.

2.10.1.7 Warning Letters

When a contractor's performance falls short of expectations or when they disobey instructions, they are typically penalized with warning letters. The quantity of warning letters sent out is a sign of how well the contractors are performing. According to Mensah et al. (2020), a contractor who is performing poorly is likely to get numerous warnings from the client or the consultant.

2.10.2 Programme of work

Allowing projects to be awarded based solely on one criterion as in lowest bid has inherent flaws. Criteria such as time and quality are negated. Also, the low bid award system encourages unqualified bidders (Padhi & Mohapatra, 2010). As part of requirements for engaging contractors, they are expected to submit programme of work indicating the various activities that would be performed and when they would be performed which cumulatively give the possible project completion date. An incompetent contractor is most likely to submit a more unreliable and unrealistic programme of work.

2.10.3 Project completion Time

According to MoWUD clause 48. Subject to any requirement in the Contract as to completion of any section of the Works before completion of the whole, the whole of the Works shall be completed, in accordance with the provisions of Clause 48 hereof, within the time stated in the Contract calculated from the last day of the period.

There are two critical, interrelated issues determining the success of a construction project keeping the completion date as scheduled and the lack of the cost overrun. The delayed completion date of construction contract makes contractor cost much higher than expected. The negative impact of this delay financial and non-financial is not limited to the contractor and the client. The community that the planned object will serve for suffers from the delay too (Anysz & Buczkowski, 2019).

2.10.4 Project final Cost

Lowest bid is normally used to ensure competitive bidding. Its purpose is to choose the best qualified contractor who can accomplish the project on time, within budget, and with the quality specified in the contract documents. However, one of the most concerning reasons is the practice of a contractor intentionally submitting an artificially low bid in anticipation of making their profit through variation orders and claims (El Wardani et al., 2006). Some bidders carefully review the bid documents searching for mistakes and ambiguity in areas that could lead to variation orders and claims during the project (Scheepbouwer et al., 2017). The project final cost can therefore be used to assess the performance of contractors when other factors that can lead to cost increase such as fluctuation, variations by client or consultant.

2.10.5 Client satisfaction

Clients' satisfaction is often associated with performance in the construction industry. This is defined as how satisfied the client was with the process and outcome of the project and the service received from contractors and professionals, using a client survey of satisfaction. Many authors propose the importance of customer satisfaction and its use for evaluating quality from the customers' perspective (Bavafa et al., 2018).

2.10.6 Specification

As it is company policy to continually improve products, methods and materials, changes of specification may be made from time to time without prior notice. The ability of the contractor to follow specification as contained in contract document is an indication of contractors' performance.

2.10.7 Warranty Period

There are currently two different kinds of warranties utilized in the construction industry: (i) warranties for materials and workmanship, and (ii) warranties for performance. The degree to which the contractor is accountable for product failure determines how these guarantee types differ (Sibiya et al., 2015). On the other hand, a contractor takes on more liability for the product under a performance warranty and is in charge of making sure it meets specific predetermined performance standards.

In either scenario, the contractor's culpability should be carefully weighed against their control over the structure's design, construction, and long-term upkeep throughout the guarantee period. The effort that is warranted is controllable, measurable, and quantitative. It is possible to write performance warranty standards that let the contractor contribute to the design and select the best option.

The contractor is in charge of performing any necessary routine or urgent maintenance on the finished product as well as any necessary corrective measures throughout the warranty term. For the duration of the warranty period, the contractor is also expected to carry out any necessary corrective measures, routine maintenance, and emergency maintenance (Bakhary et al., 2015). Contractors are obligated to complete the projects before the warranty expires (Takano et al., 2014). Early failure because of the contractors' bad performance will be corrected at the contractor's cost during the warranty period. An increase in contract disputes and litigation can also be expected due to the difficulty in identifying the real reason for a failure during the warranty period.

2.10.8 Cooperation

The lack of collaboration among project participants, the fact that construction companies and clients prioritize cost cutting over value creation, and the fact that the construction industry has historically been characterized by adversarial relationships are some of the factors causing poor

performance of construction projects. Client-contractor interactions in building projects are frequently contentious (Seabrooke & Sending, 2020).

Both traditional contracts and more integrated project delivery techniques like design-build exhibit low trust and poor communication. In an effort to improve construction efficiency and quality, many clients have promoted partnering agreements as a way to better cooperate with contractor organizations (Lines et al., 2022). Moreover, partners' expectations for future collaboration result in higher levels of trust. A contractor who produces great work is more likely to enjoy better customer collaboration. This suggests that the presence of cooperation between the client and the contractor is a sign of the contractor's successful performance

2.11 Summary of Literature Review and Research Gap

Experts in the construction industry have agreed on the significance of the method of bid evaluation and contract award procedure selected for the successful achievement of construction contracts. Many countries have also revised their construction procurement policies based on their own experiences and research findings. The least-bidder-bid awarding procedure has been widely accepted in many countries for decades. The customary practise of awarding contracts to the lowest bidder was established to ensure the lowest cost of completing a project. In public construction works, this practise is almost universally accepted since it not only guarantees a low price but also offers a way to avoid fraud and corruption (Rabie & El-Sayegh, 2017). However, allowing projects to be awarded based on the lowest price has become one of the major sources of construction project failures. Delays in meeting the contract duration, increments in the final project cost due to high variations, a tendency to compromise quality, and adversarial relationships among contracting parties are the major drawbacks associated with the responsive low-bid award procedure (Thomas, 2009). Moreover, the low-bid award system encourages unqualified bidders to participate in the competition, and on the contrary, it discourages qualified contractors from participating. Consequently, many countries, based on their previous experiences and research findings, have developed modified procedures to address these problems. Competitive average bidding, multi-parameter bidding, competitive negotiated bidding, and non-competitive negotiated bidding are the most frequently used procedures in many countries. The competitive average bidding method has become the favourite of many European countries. Some studies were conducted on the bid and procurement award system in Ethiopia. However, the studies are not sufficient to improve the existing bid-awarding procedure for public construction projects. According to Lema Mosisa's (2006) study on alternative project delivery methods for public construction: cases in Oromia Region, the study's important limitation is that, due to their tight schedules, it has not been easy to conduct interviews and have questionnaires filled out by most of the managing directors of consulting firms and those of construction contractors. Some of the findings of the study are based on fourteen sample projects only. It could be possible to assess many sample projects so that the entire analysis of the study would be more informative, exhaustive, and reliable.

In these studies, the researcher assessed more projects and conducted the interviews purposefully with expertise on procurement entities to have informative, in-depth, and reliable data for the findings.

Based on previous studies and a literature review, the researcher identified and categorized the summary of factors identified to assess the performance of the contractor awarded to the lowest evaluated bid and the impacts of the lowest bid on the work environment and team relationships. The literature is divided into two sections: section one, about some factors that can be used to assess the performance of construction contracts awarded to the lowest evaluated bid, and section two, about the impacts of the lowest bidding and contract awarding systems.

Project completion time, quality level, project final cost, health and safety on the job site, client satisfaction, adherence to specifications, adherence to instructions, client cooperation, rate of compliance with the work schedule (organization), and rate of warning letter issuance were the factors used to evaluate the performance of the contractor chosen based on the lowest evaluated bid. Lowest bidders' effects on the workplace and team dynamics have included poor quality, project time and cost overruns, an increase in claims and disputes, work suspensions and contract terminations, an increase in change requests and orders, and higher contract administration costs. Client satisfaction, contractor costs, completed job quality, project duration, and stakeholder corporation were the project's key performance indicators.

3. RESEARCH DESIGN AND METHODOLOGY

3.1 Introduction

Research is the process of critical inquiry used to examine different elements of the issue together, understand and formulate guiding principles to direct the research process, and generate and/or test theories to improve the current condition, state, or process (Wubishet, 2004). In order to accomplish the research objectives, this chapter discusses the methodology of the study and the methodological framework of the research design, specifically presenting the research design, type and source of data, sample design, sampling techniques, data gathering instruments, population, method of data analysis and presentation, and validity and reliability tests of the data.

3.2 Study Area

The study was conducted in the Oromia region in Adama City on public buildings. Adama is a large city located about 60 miles south-east of Addis Ababa, in the central part of Ethiopia. The city is large, with a population close to one-third of a million people.

Source: map data©2023

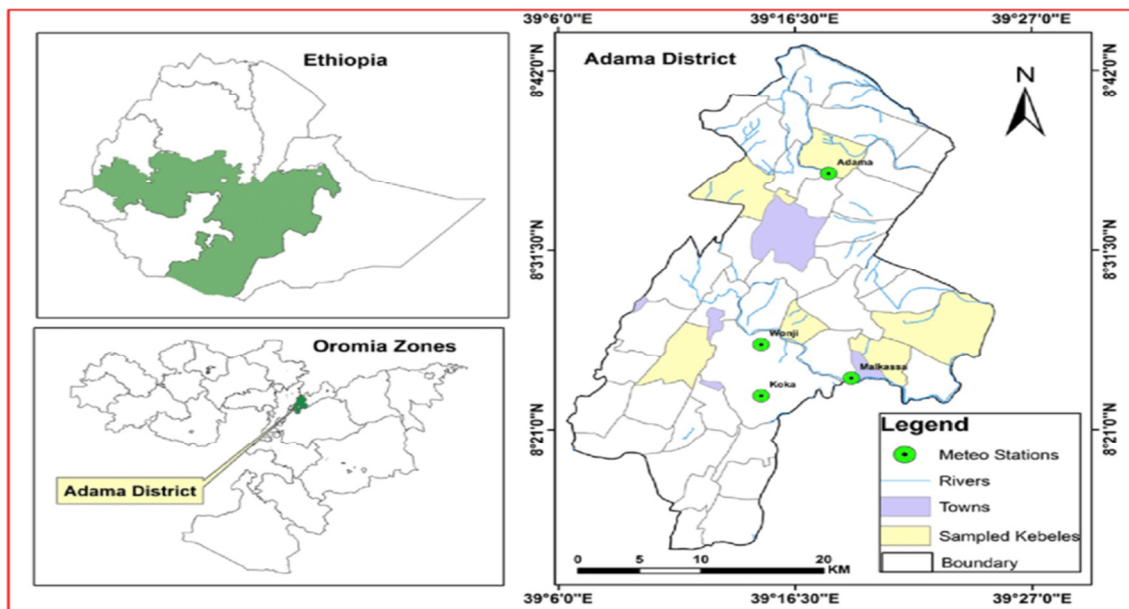


Figure 3.1 location of study area

3.3 Research Design

The research's overall activity plan is called the research design. It is the strategy for data gathering, measurement, and analysis. The arrangement of the conditions for data collection and analysis in a way that tries to combine relevance to the study objective with economy in method is known as research design (Ørngreen & Levinsen, 2017). There is more understanding to be gained from the combination of both qualitative and quantitative research approaches than from each form by itself (Y. K. Singh, 2006); hence, the researchers adopted a descriptive research design integrating both qualitative and quantitative research analysis. Their combined understanding provides an expanded understanding of research problems. Thus, with the intention of getting a general picture of the practice of the project bid award system for public construction, the researchers adopted both quantitative and qualitative research approaches (a mixed research approach) in conducting the study.

3.4 Population and Sample Design

3.4.1 Population

The whole amount considered for the study is referred to as the population, and sampling is the act of taking a sample from a population, which should accurately reflect the entire population. Public building infrastructures in Adama City that have been ongoing and finished in the last five years make up the population of the current study. Additionally, (Kundi & Unab, 2014.) defined a target population as those organizations or people that are qualified to respond to interview questions and to whom the survey's findings are applicable. The targeted respondents for this study were professionals from public clients, consultants, and private contractors.

3.4.2 Sampling Techniques

Purposive sampling was used in the study to identify relevant respondents from contractors, client, and other civil engineering experts from consultants. This was chosen because purposive sampling enables the researcher to choose respondents with in-depth knowledge of the topic at issue. Fundamental theories or a predetermined number of informants are not necessary for a nonrandom technique. Simply put, the researcher decides what information is necessary to have and then searches for sources willing and able to supply it based on their knowledge or

experience (Y. K. Singh, 2006). The study seeks to gather information from a section of the population of contractors, clients, and consultants professionals who have experience in tender preparation, examination, and public building construction to assess the productivity and performance of the projects and contractors. Based on the justification, the most experienced civil engineers within the organization as well as contractors were purposively sampled as respondents for the study.

3.4.3 Sample Size

The researcher adopted the purposive sampling technique to sample twenty (20) professionals from the public sector, twenty (20) civil engineers from private contractors, and twenty (20) consultants. Men and women who are specialists or hold managerial positions in their workplaces made up the study's respondents. The professionals from contractors are purposively sampled; these respondents are well experienced, and they are allowed to handle any complexity of work as far as civil works are concerned. Therefore, the total sample size for the study was sixty (60). The numbers were decided on the basis of the time available for conducting the research work, the available funds for the study (project), and the reliability of the respondents so that the overall research work would indicate reality.

3.5 Source of Data

The study includes the use of both primary and secondary data sources to gather relevant information and achieve the study's objectives. Primary data is a category of information that is gathered by researchers directly from primary sources through desk studies, questionnaires, and interviews. Questionnaires with both open-ended and closed-ended questions were used to collect the majority of the information. Secondary data is gathered by looking at papers relevant to the bid awarding system, including contracts law, reports, registers, journals, and articles.

3.6 Data Collection Techniques

A questionnaire, an interview, and a desk study were utilized to gather actual data. Based on an assessment of related literature critical to the study's topic, questionnaires were developed and distributed. This study employed a review of current bid system documents and questionnaires as a tool to collect data. The reviewed project documents and literature were used as input

knowledge to develop an understanding of project bid awarding system practises for public construction projects in Adama City.

3.6.1 Questionnaire

Questionnaires were constructed for a survey exercise to collect expert opinion on the topic based on information obtained from literature reviews and desk study input from numerous local experts; however, the desk study is given more significance for this assessment to obtain more concrete actual data. Subject matter experts in the disciplines of construction work procurement, specialists who have participated in the preparation and evaluation of tenders, and professionals in construction from various agencies involved in public projects answered the questionnaire.

The questionnaire was both closed-ended and open-ended. The quantifiable data is gathered by the closed-ended questions of the questionnaire that were designed to keep the respondents within scope. There were also open-ended questions, providing unquantifiable data, which were designed to provide respondents with the freedom to express what they believe is important for the study.

3.6.2 Interview

The interview undertaken for this study was based on semi-structured styles; the semi-structured interview conducted for this thesis used a list of questions and subjects that needed to be covered during the interview. Respondents are given the freedom to express their opinions anyway, they like. This is advantageous because it enables the researcher to consider different points of view.

3.7 Method of Data Analysis

Both qualitative and quantitative approaches were used to analyze the data that had been compiled. Using the Statistical Package for Social Science (SPSS) 25 software, descriptive statistics, such as frequencies and percentages, are used to examine the data collected through questionnaires. For the purpose of promoting discussions on the issues, the respondents' responses were examined. Using descriptive statistics like frequencies and percentages, the questions on the respondents' general characteristics as well as all the other questions essential to accomplishing the study's objective were examined. Graphs, charts, and tables were also used to further present the data.

The questions were analyzed to determine the relative importance of the factors leading to the impacts of the lowest evaluated bid selection procedure on the project's performance for third specific objective. A Likert rating scale of 1 to 4 with 1 = 'very not Important', 2 = 'not 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. Formula for where

$$RII = \Sigma W / (A * N) \dots \dots \dots \text{eqt 1}$$

Where, W is the weighting given to each factor by the respondents (ranging from 1 to 4), A is the highest weight (i.e. 4 in this case), and N is the total number of respondents. Higher the value of RII, more important was the cause of delays.

3.8 Validity and Reliability of the research

3.8.1 Validity of the research

The validity of the research was evaluated early on, at the time when it was being decided how the data would be collected. Make sure that your method and measurement approach are outstanding and focused on gathering the precise data in which the researcher is interested. For the study's validity test, a pilot study was used. The questionnaire underwent pretesting through piloting among academia and industry experts in construction to increase its reliability and ensure its comprehensiveness.

3.8.2 Reliability of the research

The reliability analysis technique analyses a number of widely used scale reliability measures and offers details on the relations between the scale's components. When measuring the internal consistency of the survey using the SPSS 25 programme, the reliability of the data was examined using Cronbach's alpha. The internal consistency of the questionnaire used to achieve the objectives was indicated by the estimated value of SPSS 25, which was 0.71. As a result, the information gathered through the questionnaire was trustworthy.

4. RESULT AND DISCUSSION

The objective of this section is to analyses the issues presented by the construction project's competitive lowest bid award technique. Professionals that work for the client, consultants, and contractors involved in public building projects rank the data collected from field surveys through respondents on the procurement process and reasons for bad performance. The problem and suggestions were thoroughly interpreted, examined, and discussed. Tables and charts are used to present the data, and then interpretive descriptions are given.

4.1 Profiles of Respondents

Contractors, consultants, and clients (implementing agencies and financiers) make up the bulk of the three groups into which the respondents are divided. As a result, 60 questionnaires were distributed, 20 of which were sent to employees of the employers, 20 to consultants, and 20 to contractors working on public construction projects. Out of the 60 questionnaires that were provided, 47 professionals (78.33%) replied to the survey. According to table 4.1 below, the questionnaire survey response rates for contractors, consultants, and clients were 80%, 80%, and 75%, respectively.

Table 4.1 Respondent's response rate

No.	Participant	Distributed in number	Returned in number	Response rate in %
1	Public organization	20	16	80
2	Contractors	20	16	80
3	Consultants	20	15	75
	Total	60	47	78.33

4.1.1 Academic Qualifications

The respondents' academic backgrounds were evaluated. As a result, out of 47 participants, first-degree degrees account for 74.5%, followed by master's degrees (25.5%), PhDs (0%), and diplomas (0%). The respondents' educational backgrounds, which are displayed in figure 4.1

below, indicate that they have a sufficient level of education to render the information they acquired reliable.

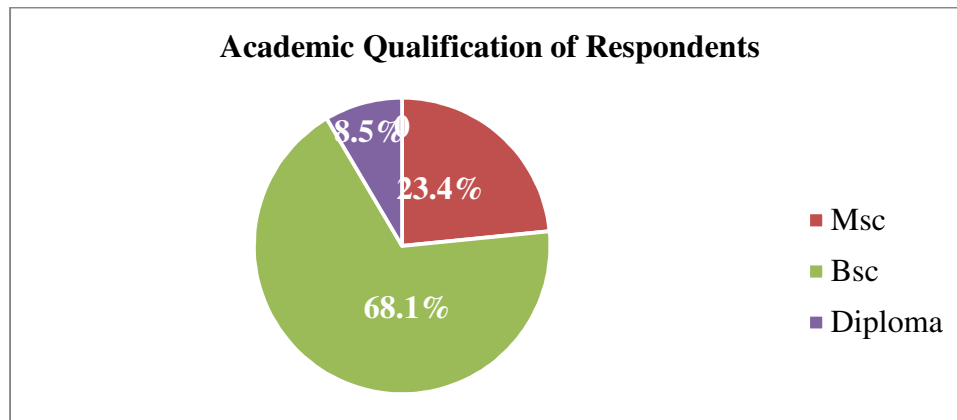


Figure 4. 1 Academic Qualification of Respondents

4.1.2 Experience of respondents

Regarding the respondents' work experience, the majority of them (51.1%) had over ten years of experience in the construction sector, followed by 38.3% who had five to ten years of experience and 10.6% who had less than five years. Table 4.2 below demonstrates these experiences. The fact that 89.4% of respondents have worked for more than five years suggests they have adequate job experience to trust the data they have collected and that it is reliable.

Table 4. 2 Experiences of Respondents

Variables	Frequency	Percentage
Experiences of the respondents		
2 to 5 years	5	10.6
5-10 years	18	38.3
Above 10 years	24	51.1
Total	47	100

4.1.3 Size and year of establishment of the firm

Regarding the size of the firm respondents surveyed, the table 4.3 below indicates, the majority of the respondents, about 74.5%, had 10 to 25 employees in the firm, and 25.5% of the respondents said the firm had fewer than 10 employees. None of the firms has more than 50 employees.

Table 4. 3 Size of the firm and establishment

Variables	Frequency	Percentage
Size of the firm		
Less than ten employees	12	25.5
10 to 25 employees	35	74.5
Over 50 employees	-	-
Total	47	100
Years of company Establishment		
2 to 5 years	4	10.6
5-10 years	8	38.3
Above 10 years	24	51.1
Total	47	100

4.1.4 Position of respondents in the organization

Figure 4.4 below shows that 2.13% (1) of respondents were director, 14.89 % (7) were Contract Administration Engineer, 42.55 % (20) were office engineers, 10.64 % (5) site supervisors and 2.13 % (1) was Senior tender department. It has been founded that 12.76 % (6) of the consultants companies respondents were resident engineers, 14.89% (7) was procurement technical support engineer. Totally out of 47 respondents from the three parties' contract administration engineer, office engineer, and procurement technical support engineer takes the higher place.

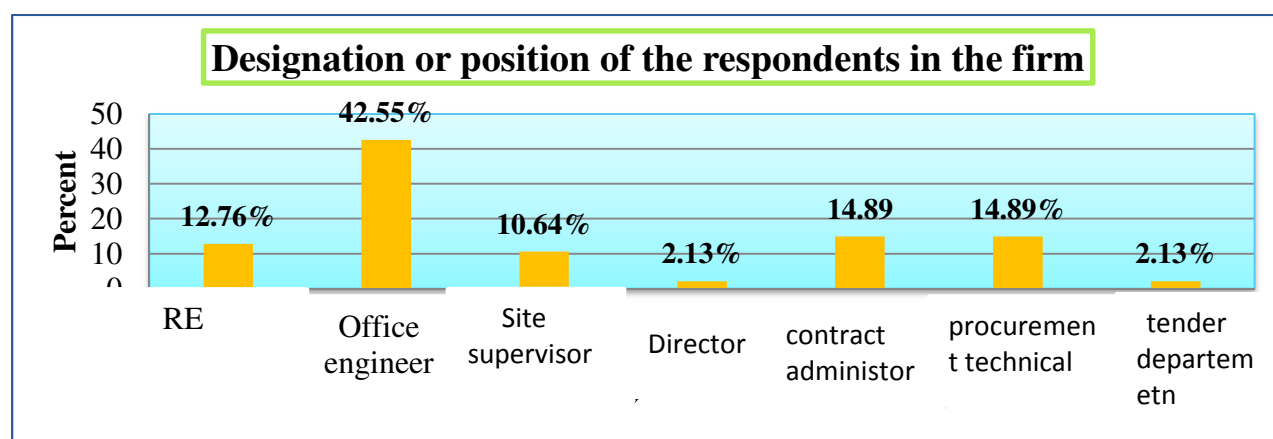


Figure 4. 2 Position of the respondents in the firm

4.1.5 Frequency of Project Bid-Award Methods

Respondents were asked to select the frequency, in percentage (%), of their organization's work awarded under each of three types of project delivery and bid awarding procedures: competitive, negotiated, and RFP/RFQ. Respondents were given the opportunity to mention any more procedures beyond these three that their company's work may have won.

Table 4.4. Frequency of project bid-award methods

No	Frequency In %	Competitive		Negotiated		RFP/RFQ		Multipara Meter		Others	
		No.	%	No.	%	No.	%	No.	%	No.	%
1	0% to 25%	0	0	21	44.7	31	66	47	100	0	0
2	25% to 50%	0	0	26	53.3	16	34	0	0	0	0
3	50% to 75%	16	34	0	0	0	0	0	0	0	0
4	75% to 100%	31	66	0	0	0	0	0	0	0	0

The normal competitive least bidder bid awarding system is the most popular type of bid bidding strategy chosen by respondents (31) and none of the respondents claimed that the organisation they worked for used this method infrequently (for 25% to 50% of the projects). 21 respondents who were asked how frequently their company used direct procurement for building projects said it ranged from 0% to 25% and rarely from 25% to 50%, showing that this practise is not frequently used. Respondents also asked to indicate the frequency of using RFP in the organization to award bid, 31 respondents said they use RFP for some projects (0% to 25%), and organization use this procedure rarely (25% to 50% of the projects). None of the respondents has said multi parameter is applied in their organization for the procurement of works.

4.2. Ratings on the Effectiveness of Different Bidding Methods

Specific ratings on different parameters for the chosen contract-award methods of both construction companies and public bodies were requested in this section of the survey. According to the contractor's profit, the owner's cost, disputes or claims, coordination, quality

control, and project time, they were asked to grade each approach. They were instructed to rate the potential impact of each strategy on the stated traits using a predetermined scale. The replies covered below.

I. Competitive Low Bid Method

Figures 4.3 to 4.8 display the results of the competitive low bid procedure. The majority of respondents, or 44.7%, believed that the current bidding procedure may sometimes have an adverse financial impact on the contractor. About 14% of respondents thought the competitive lowest bid award process had a positive impact on contractor profit, while 12% thought it would always have a negative impact. About 74.5 percent of those surveyed believed the strategy might sometimes have a negative impact or would occasionally increase owner costs, while the remaining 25% thought it usually did or believed that it always had a negative effect on owner costs.

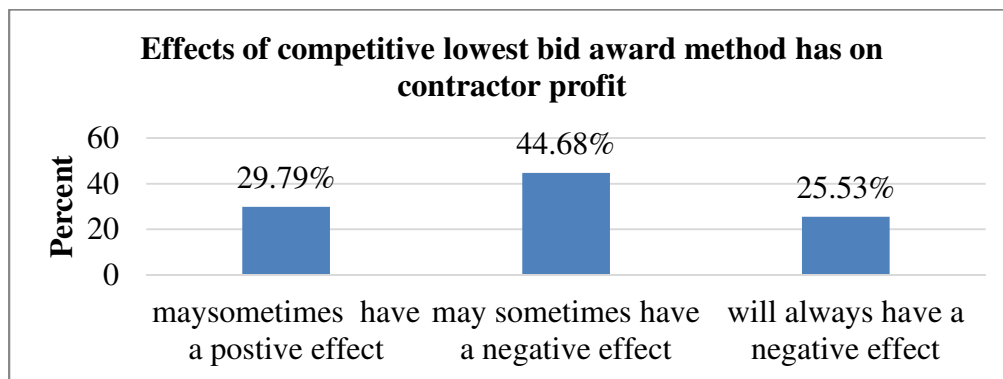


Figure 4. 3 Effects of competitive lowest bid award method has on contractor profit

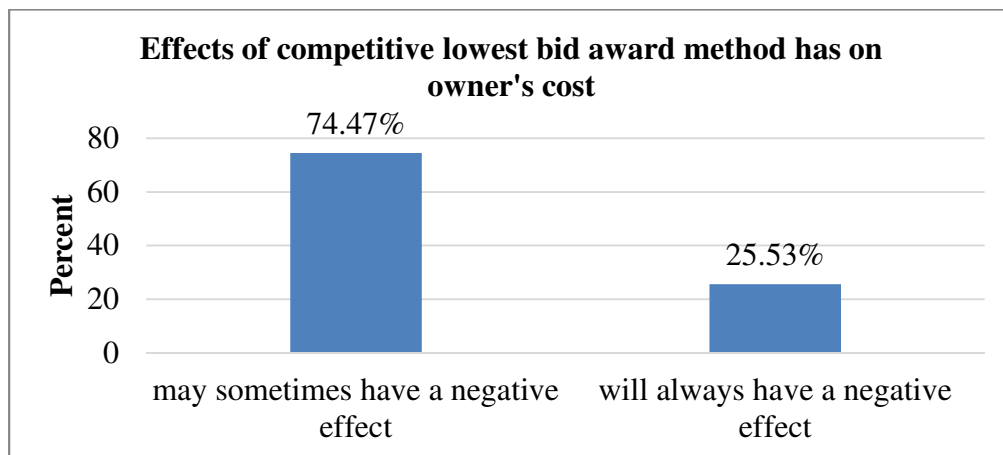


Figure 4. 4 Effects of competitive lowest bid award method has on owner's cost

A majority of respondents indicate that the competitive low bid method might sometimes have a negative effect on disputes or claims (59.6%), quality control (40.4%), and project duration (74.5%). On the project coordination issue, 59.6% of the respondents felt that it might have a negative impact, and about 40.4% of the respondents indicated that it will always have a negative effect on coordination among stakeholders.

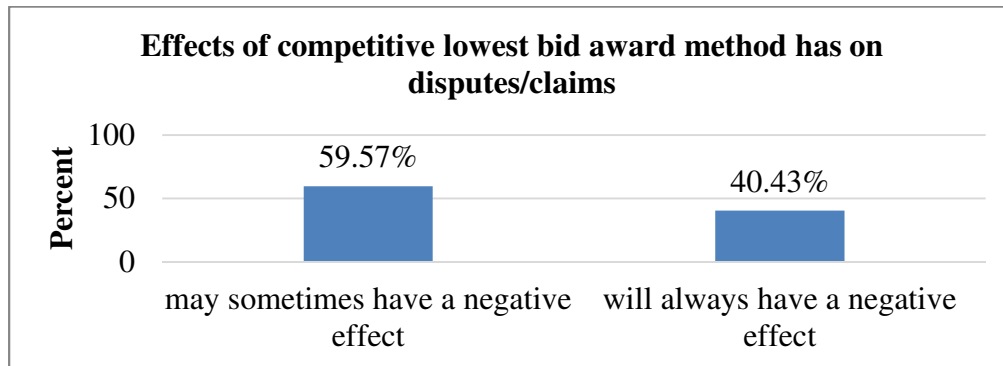


Figure 4.5 Effects of competitive lowest bid award method has on disputes/claims

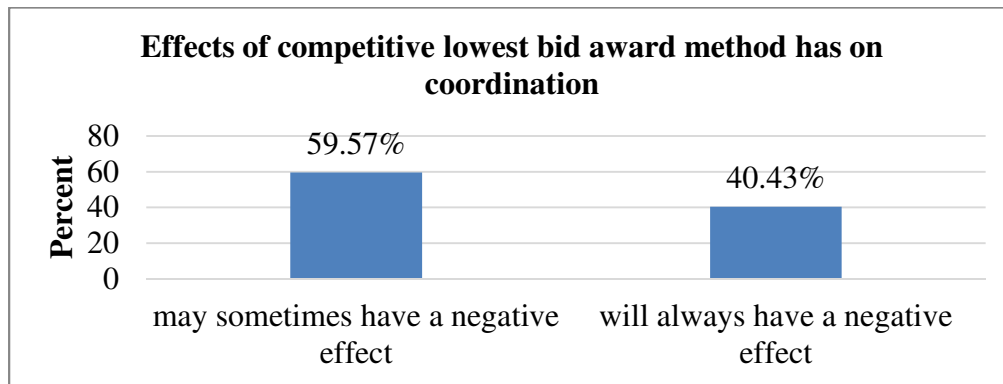


Figure 4. 6 Effects of competitive lowest bid award method has on coordination

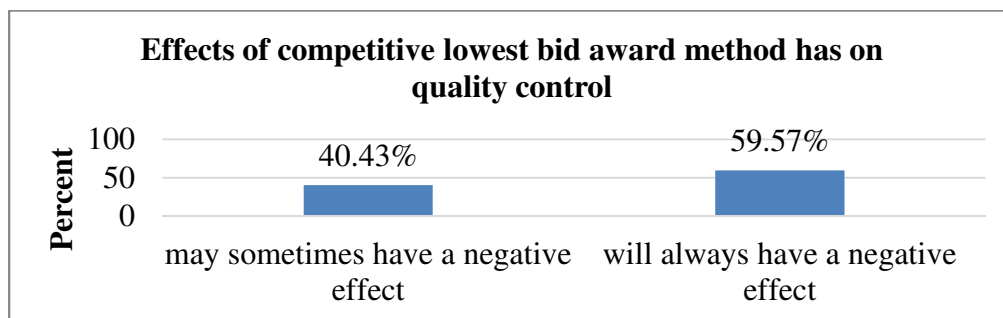


Figure 4. 7 Effects of competitive lowest bid award method has on quality control

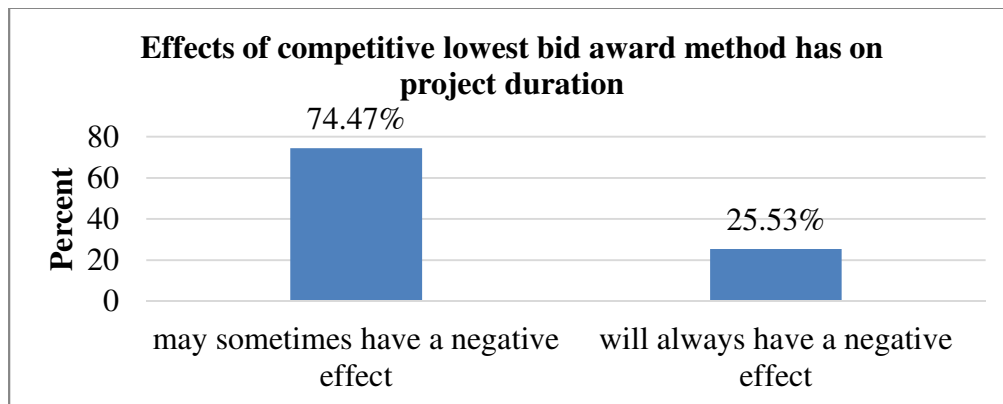


Figure 4. 8 Effect of competitive lowest bid award method has on project duration

As competitive low bid method is the major type of bid evaluation and contract award procedure for public projects, all construction projects included in this study were those which are awarded in this method. Interestingly, construction professionals from both groups (private and public) acknowledged the negative impact of this method on the contractor's profit. And hence the contractor will be forced to compromise quality of works to compensate the price. In addition, variations claims and other disputes are very common on construction projects awarded on least price procedure. Contracts awarded on least price procedure are also known for their unsatisfactory mobilization of resources, which leads to delays on project duration.

II. Competitive Average Bid Method

The results got for the competitive average bid method are displayed on *Figure 4.9 to 4.14* below. Majority of the respondents, about 59.6%, believed that the competitive average bid method occasionally or might sometimes have positive effect on contractor's profit.

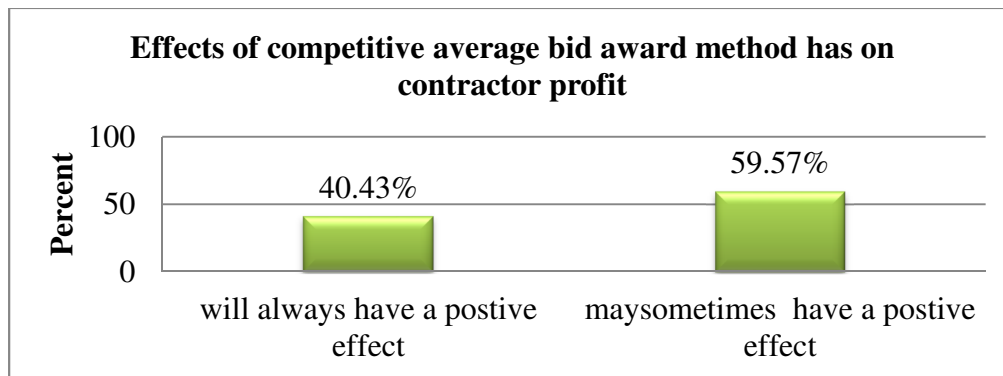


Figure 4. 9 Effects of competitive average bid award method has on contractor profit

About 40.4% of the respondents believed that competitive average bid award method will always have positive effect for contractor profit, and none of the respondents believe will always have a negative effect on the contractor profit.

About 61.7% of the respondents believed competitive average bid method might sometimes have a negative effect on the owner's cost, the other 6.4 % of respondents believed that it always have a negative effect on owner cost.

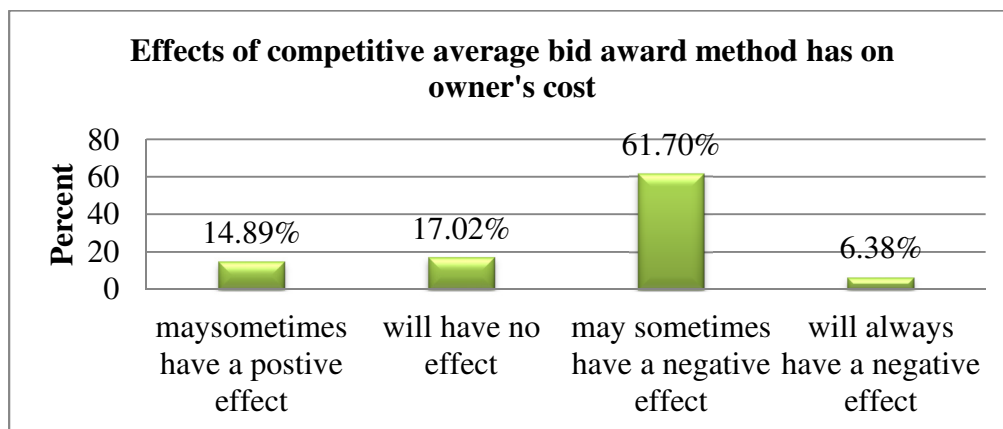


Figure 4. 10 Effects of competitive average bid award method has on owner cost

.A majority of respondents indicate that competitive average bid method will not have effect on dispute/claims (40.4%) and the other respondents believes may sometime have positive effect (25.5%) on disputes, project duration (89.4%) and (63.8%) on quality control. On the project coordination issue, 59.6% of the respondents felt that it might have a positive effect and about

29.8% of the respondents indicate that will always have a positive effect on coordination among stakeholders.

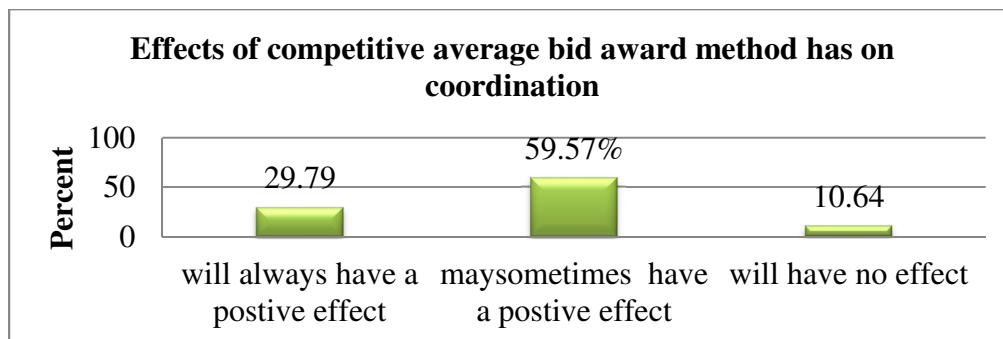


Figure 4. 11 Effects of competitive average bid award method has on coordination

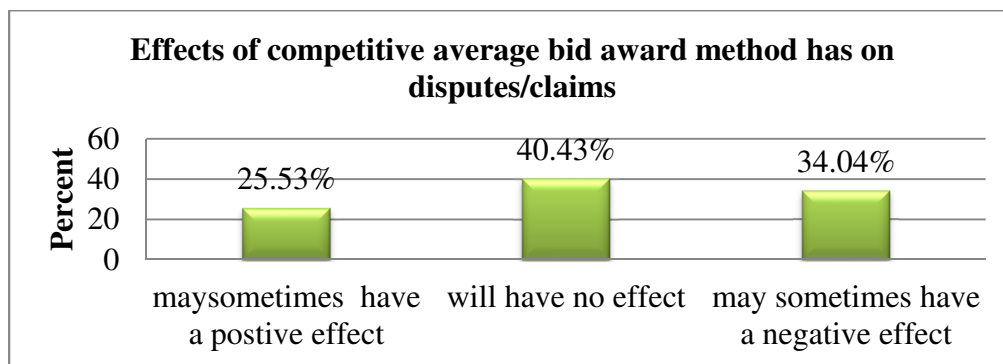


Figure 4. 12 Effects of competitive average bid award method has on dispute/claims

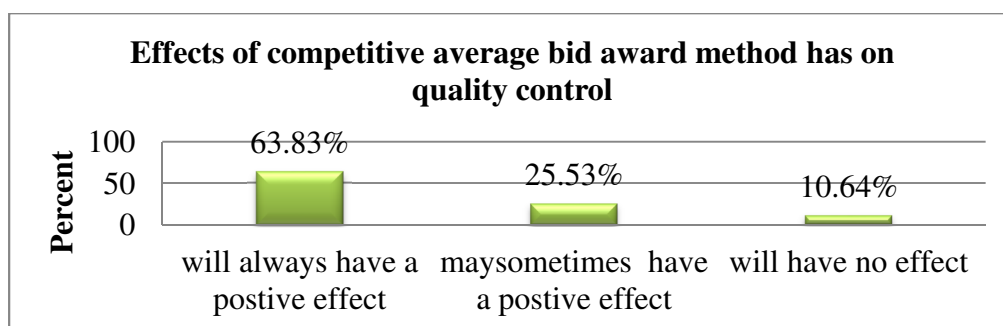


Figure 4. 13 Effects of competitive average bid award method has on quality control

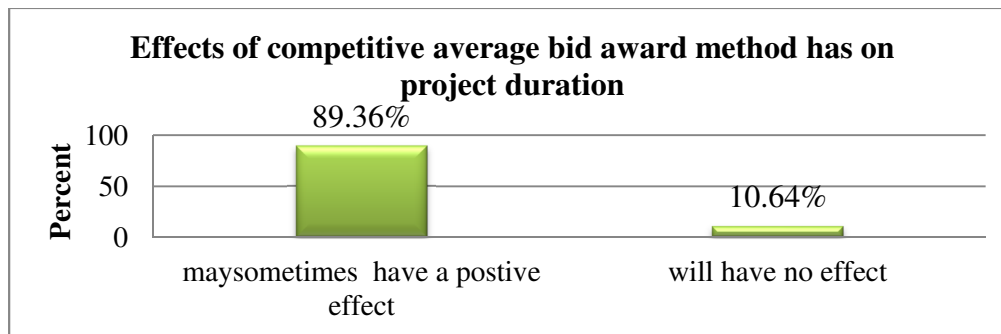


Figure 4. 14 Effects of competitive average bid award method has on project duration

Competitive average bid method is not included in the Federal Government procurement law. Therefore, no single project can be found to study the actual performance of such contracts. However, construction professionals have reflected their ideas on this procedure based on their personal knowledge and through discussions with the researcher. Most of the participants granted the merits associated with awarding contracts to the responsive bidder whose bid is closest to some average, not for the minimum. They believed that abnormally low bids become the major headache of the construction industry. However, professionals from the public sector reflected their worry on the negative impact it might have on the owner's cost

III. RFP/RFQ (Competitive Negotiated) Method

Most of the respondents in the construction organization group (74.47%) indicated that the RFP/RFQ method would positively affect contractor profit. The responses display in *Figures 4.15 to 4.20*. Some respondents (25.53%) said they were unsure whether the traits stated would be affected in any way.

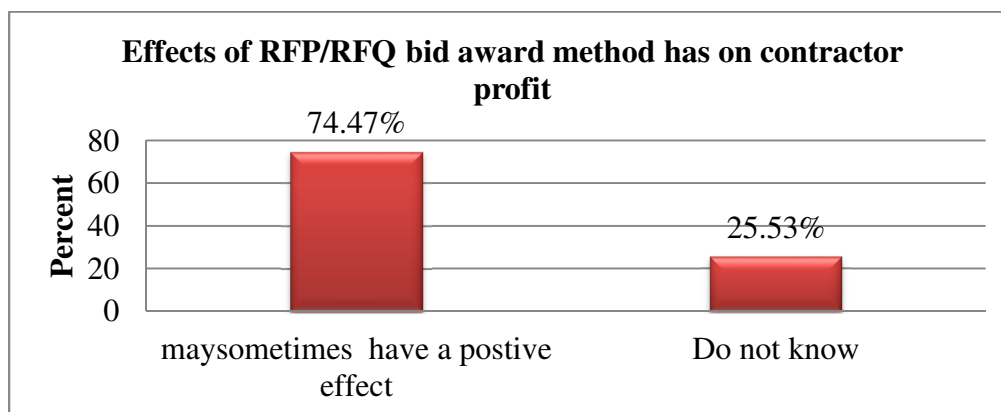


Figure 4. 15 Effects of RFP/RFQ bid award method has on contractor profit

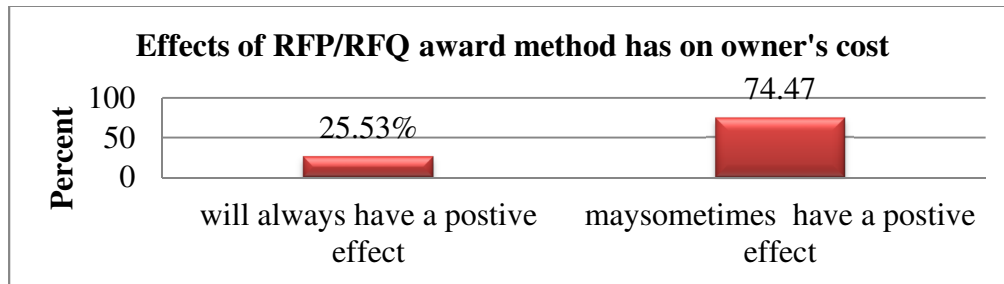


Figure 4. 16 Effects of RFP/RFQ bid award method has on owner cost

It is interesting to note that although most of the respondents felt that this method would positively affect most of the attributes, of them thought it might have positive effect to owner's cost.

A majority of respondents indicate that RFP/RFQ bid method will not have effect on dispute/claims (74.47%), while the remaining respondents reflect it might occasionally have a positive impact (25.53%) on disputes, project duration (63.83), and quality control (89.36%).

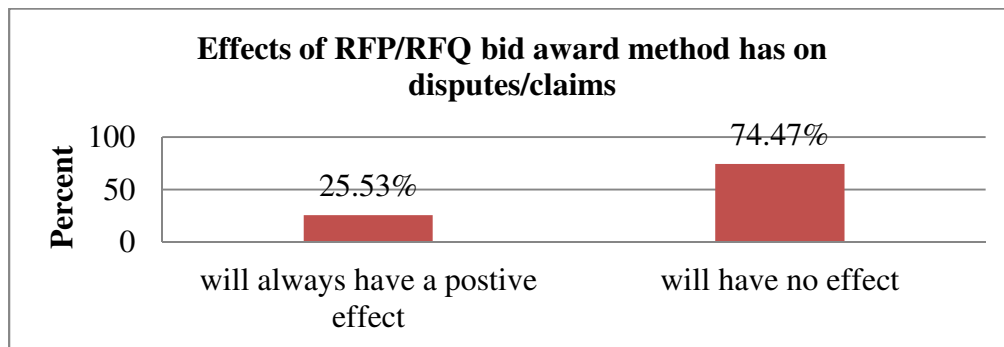


Figure 4. 17 Effects of RFP/RFQ bid award method has on dispute and claims

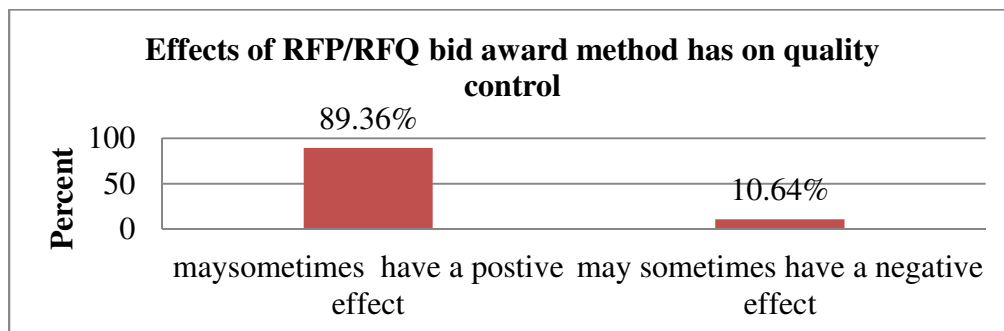


Figure 4. 18 Effects of RFP/RFQ bid award method has on quality control

On the project coordination issue, 63.83% of the respondents believe that it might have a positive effect and about 25.53% of the respondents indicate that will always have a positive effect on coordination among stakeholders.

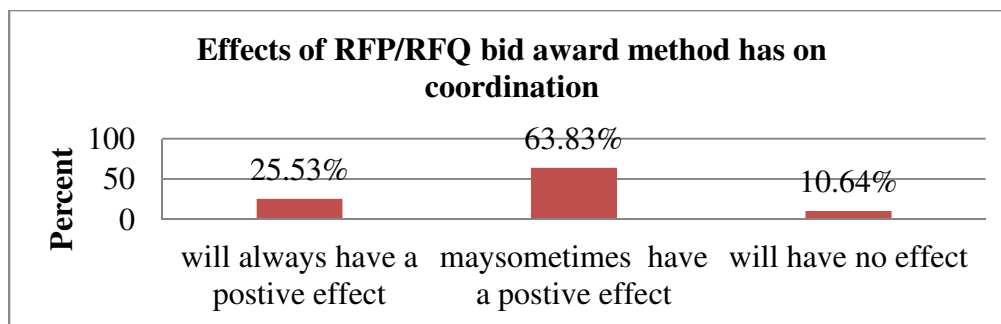


Figure 4. 19 Effects of RFP/RFQ bid award method has on coordination

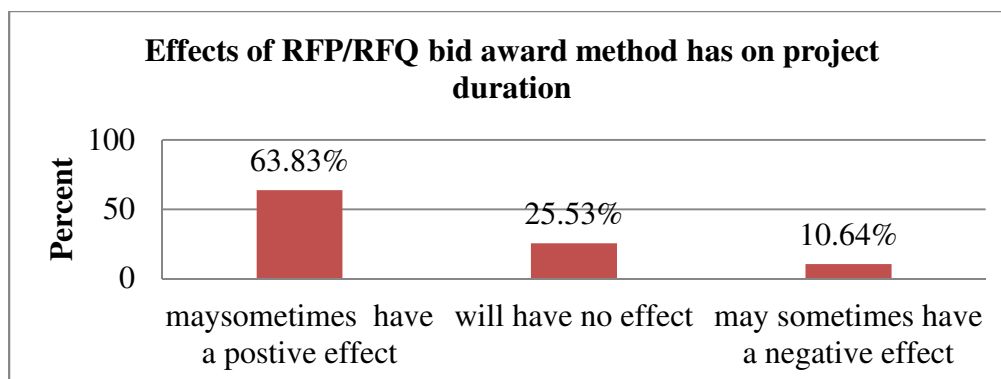


Figure 4. 20 Effects of RFP/RFQ bid award method has on project duration

Despite being stated in the procurement law, the RFP/RFQ technique only is applicable to consulting services. This procedure's vulnerability to fraud and corruption is one of the main issues brought up. The majority of experts thought that this approach could only be utilized for small or unique projects that required particular consideration due to the public's interest.

This approach is discouraged in order to prevent corruption in the selection of contractors for negotiations and potential ring formation among selected contractors, which would eventually raise the cost to the owner.

IV. Negotiated Bid Method

All of respondents, or 100%, believed that the Negotiated Bid Method procedure may sometimes have an positive effect on the contractor profit and owner cost. About 74.5 percent of those surveyed believed the strategy might sometimes have a negative impact or would occasionally increase owner costs, while the remaining 25% thought it usually did or believed that it always had a negative effect on owner costs. On the project coordination issue, 89.4% of the respondents believe that it might have a positive effect and about 10.6% of the respondents indicate that will no have effect on coordination among stakeholders. A majority of respondents indicate that Negotiated Bid method will not have effect on dispute/claims (74.45%), while the remaining respondents reflect it might occasionally have a positive impact (25.5%) on disputes, project duration (63.8), and quality control (89.4%). The use of the negotiated bid approach is only permitted for public procurement of variation works. Its susceptibility to fraud and corruption during the selection of contractors and during price negotiations with the chosen contractor is the primary cause of its disfavor. Additionally, the system does not ensure equitable access for contractors who can meet the minimal technical standards, hence it is discouraged.

V. Multi criteria/parameter (Subjective) Method

Majority of respondents (63.83%), believed that the Subjective Bid Method procedure may sometimes have will no effect on the contractor profit and 74.56% where believed may sometimes have a positive effect on owner cost. About 25.53 percent of those surveyed believed the strategy might sometimes have a negative impact or would occasionally have negative effect on the owner costs, while the remaining 10.64% thought it usually did or believed that it sometimes had a positive effect on contractor profit.

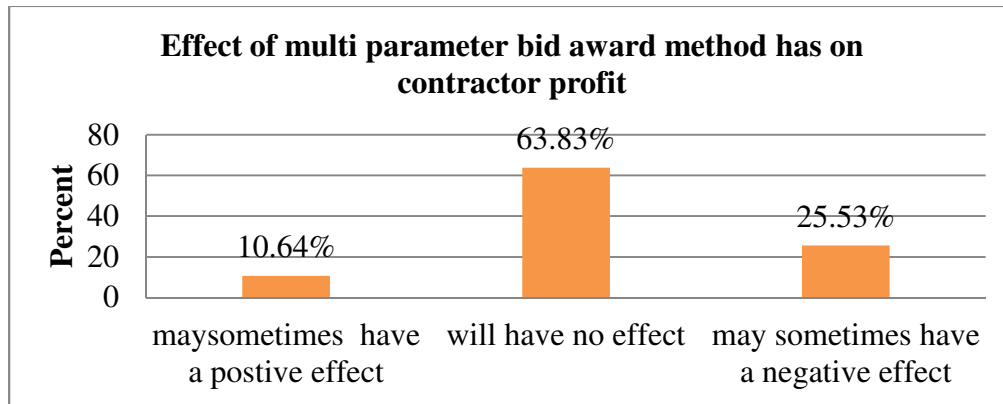


Figure 4. 21 Effect of multi parameter bid award method has on contractor profit

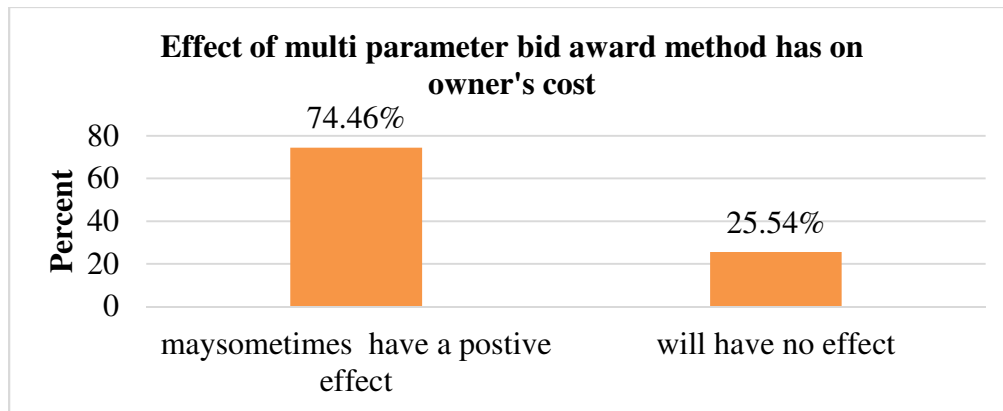


Figure 4. 22 Effect of multi parameter bid award method has on owner cost

On the project coordination issue, 63.83% of the respondents believe that it might have a positive effect and about 10.64% of the respondents indicate that will no have effect on coordination among stakeholders. A majority of respondents indicate that multi parameter Bid method will not have effect on dispute/claims (10.6%), while the remaining respondents reflect it might always have a positive impact (25.53%) on disputes, and quality control (89.4%), and may sometimes have a positive effect on the duration of the project (89.36%).

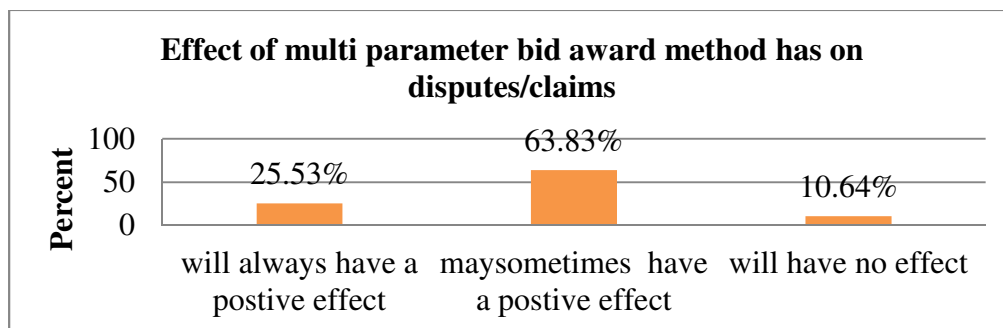


Figure 4. 23 Effect of multi parameter bid award method has on dispute/claims

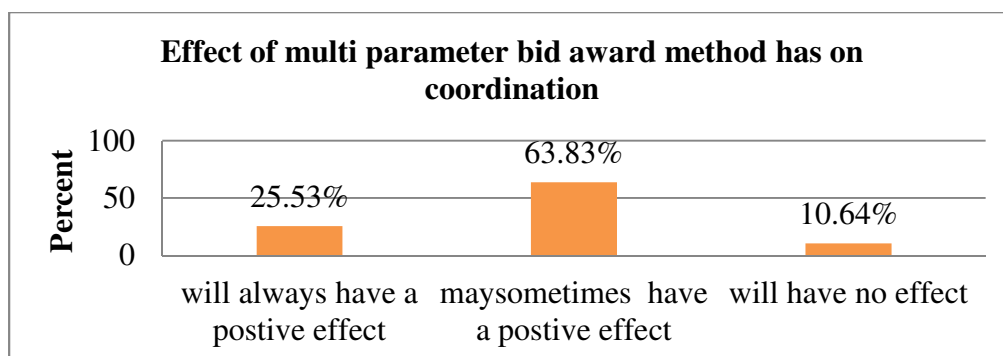


Figure 4. 24 Effect of multi parameter bid award method has on coordination

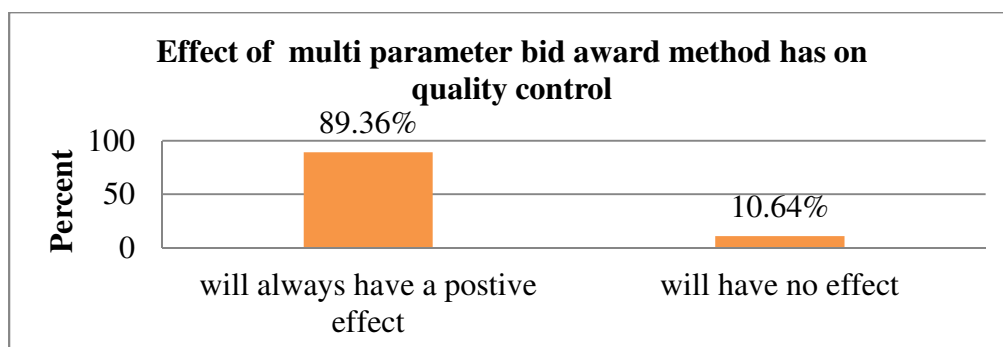


Figure 4. 25 Effects of multi parameter bid ward method has on the quality control

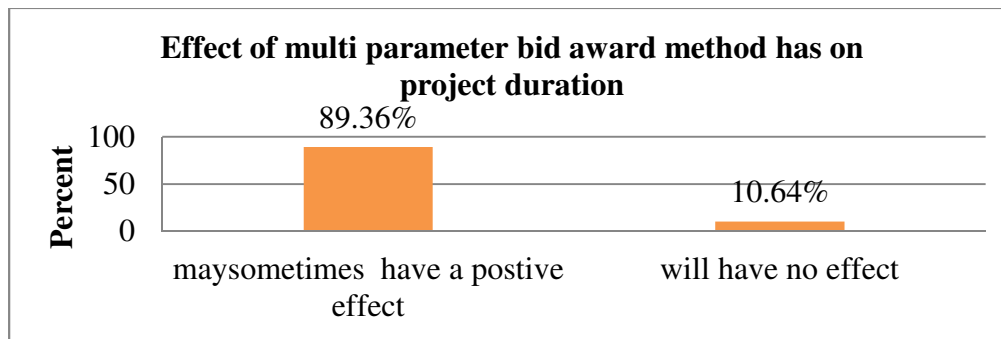


Figure 4. 26 Effects of multi parameter bid ward method has on the project duration

The Federal Government procurement law does not allow subjective rating method for procurement of works. People in favor of this procedure strongly argue that this method would encourage competent contractors to participate in the tender process. And hence, the possibility of selecting responsive and responsible contractor will be higher. In addition, inexperienced contractor's which might offer abnormally low bids will have little chance of winning the tender because the winner is identified by the cumulative result of the technical and financial offers. However, most professionals believe that this procedure might positively affect the owner's cost. Moreover, highly qualified professionals for the bid document preparation and evaluation of bids will be important if subjective rating bid method is used.

4.3 Evaluation of Contractors Performance under Lowest Bid Award Method

The researcher utilized to assess the performance of contractors based on factors obtained from the literature review. The performance of the project and contractor was evaluated in this area only by consultants and professionals of public clients.

4.3.1 Overall quality of the work completed by lowest bid award method

The degree of satisfaction with overall quality of the work completed by lowest bid award method were surveyed, respondents, the result of the replies were presented in table 4.5 below. The respondents Agreed on the procurement lead to poor quality of the work completed the result for degree of agreement was presented in table below.

Table 4. 5 Satisfaction with overall quality of the work completed by lowest bid award method

Variables	Frequency	Percent (%)
Very good	1	3.2
Fair	9	29
Poor	21	67.7
Total	31	100

From Table 4.5 above, about 67.7% of respondents said the projects were poor quality of work, and some of the projects around 29% of the project has fair quality and only 3.2% were very good. The majority of respondents were not happy with the level of work quality produced by the lowest bid award procedure. This is a strong indication that the projects that awarded using LEB were not completed with very high quality. This indicates that the industry is performing poorly in terms of project quality, which has a significant impact on the government's economy.

4.3.2 Issue of warning letters to the contractor who won contracts by the lowest bidder system

Issue of warning letters to the contractor who won contracts by the lowest bidder system were asked the experts, about (67.7%) of the Contractors in Table 4.6 below got warning letters. This is substantial evidence that warning letters were issued for the projects that were funded through LEB. A Contractor with a good performance is unlikely that a contractor will get warning letters. The frequency of warning letters sent to contractors provides understanding into their performance.

Table 4. 6. Issue warning letters to the contractor who won contracts by the lowest bidder system

Variables	Frequency	Percent (%)
Very often	21	67.7
Often	-	-
Sometimes	10	32.3
Total	31	100

4.3.3 To what extent do you think awarding the contract to the lowest bidder affected the project execution?

The respondents were asked extent of awarding the contract to the lowest bidder affected the project execution, majority of the respondents above 90% were not executed well, and only 3.2% affect sometimes.

Table 4. 7 The effect of contract awarded to lowest bidder on project execution

Variables	Frequency	Percent (%)
Very often	21	67.7
Often	9	29
Sometimes	1	3.2
Total	31	100

4.3.4 Project Final Cost

No fixed sum contracts were found among all 31 projects that were chosen and studied; instead, all 31 projects, or 100% of them, did not have them, as can be shown in Table 4.8 below. Table 4.8 shows that, of the 31 projects identified as not being under a fixed-sum contract, 100% exceeded the amount that had been agreed upon. Modifications to the initial design (3.2%), claims (67.7%), and changes in specifications (29%), among other reasons, contributed to the large percentage increases in the contract amount.

Therefore, the first incidence of contract payments being exceeded was due to claims made by contractors, and the second was due to changes in specifications. From the aforementioned, it can be inferred that some of the cost overruns in the construction industry are due to claims made by contractors in an effort to make up for losses brought on by the excessively low rates utilized during the tendering process.

The implication of this on the construction project selected is that, contractors on these projects can make claims for additional money that according to (Hanák et al., 2021) was said one of the

strategies that contractors selected using LEB use to make up losses from the unreasonably low rates used during bidding.

Table 4. 8 The effect of lowest bid award system has on the project final cost

Variables	Frequency	Percentage
Fixed sum contract project		
No	31	100
Yes	-	
Contract sum exceeded		
No	-	
Yes	31	100
Total	31	
Contract sum exceeded through		
Claims	21	67.7
Modification of the original design	1	3.2
Change in specification	9	29
Total	31	100

4.3.5 Disputes

The frequency of conflicts on a project can be utilized to evaluate how well the contractors performed. A contractor who is not performing properly is likely to receive the Client and Consultant's displeasure, which can result in a number of conflicts and disputes. Table 4.9 shows that, of the 31 projects that were chosen, all (100%) had conflicts between the Contractors and the Clients. This has a significant impact on the construction sector since it makes it hard for any project involving several disagreements between the parties to be completed on time and under budget because the parties are unlikely to receive the support they require from each other.

Claims (67.7%), frequent variations (29%) and payment delays (3.2%) were found to be the main contributors to conflicts respectively. This information supports the observation and claim stated in the literature that projects awarded using LEB encounter a number of conflicts, which

are primarily brought on by claims made by the contractors in an effort to make up for losses driven on by the low bid prices.

Table 4. 9 Disputes between Contractor and Client

Disputes between Contractor and Client	Frequency	Percentage
No	-	
Yes	31	100
Total	31	100
Causes of dispute		
Frequent variations	9	29
Claims	21	67.7
Delay in payments	1	3.2
Total	31	100

4.3.6 Project Completion Time

As shown in Table 4.10 below, just 12.9% of the projects were completed on time, while approximately 87.09% were not finished within the agreed-upon period. This is significant evidence that the projects given out using LEB were not finished on schedule. This indicates that the sector is underperforming in terms of completion time, which has a significant negative impact on the local economy. The questionnaire examined all of these factors to determine the reasons behind project delays. As shown in Table 4.10 below, the most common reasons for delays in the projects that were chosen were frequent variations (29.03%), lack of financial capacity by the contractors (54.84%), and delays in receiving instructions and approvals from clients. No project experienced delays due to a lack of supervision on the job site. The lack of financial capacity by the Contractor (54.84%) was one of the primary reasons among the ones chosen. This indicates that contractor financial inability to perform successfully is one of the main causes of the delays. According to Gransberg, (2020), the contractor reduced the bid price just to win the project, and contractors work to compensate or make up for any damages caused on by the use of cheap rates during bidding. This implies that the performance of Contractors will have a negative impact on project performance and cause projects to be delayed.

Table 4. 10 Project Completion Time of the project awarded by the lowest bid award system

Project completed on time	Frequency	Percentage
No	27	87.09
Yes	4	12.90
Total	31	100
Causes of delay		
Frequent variations	9	29.03
Delay in payments	5	16.13
Delay in receiving instructions and approvals from client	-	
Delay in receiving instructions and approvals from consultant	-	
Lack of supervision on site	-	
Lack of financial capability by the contractor	17	54.84
Total	31	100

4.3.7 Contractor corporation with other parties

The respondents were asked extent of awarding the contract to the lowest bidder affected the Contractor corporation with other parties, majority of the respondents above 71% were not believed that awarding the project for lowest bid system were affect the corporation or poor corporation with the other parties.

Table 4. 11. Contractor Corporation with other parties

Variables	Frequency	Percentage
What extent did the contractor cooperate with other parties		
Sometimes	22	71
Not much	9	29

The lack of cooperation among project participants and the fact that construction companies and clients focus mainly on the reduction of project costs and neglect the value are some reasons for

the poor performance of construction projects. Relationships between clients and contractors on construction projects are often adversarial. Traditional contracts, as well as more integrated forms of project delivery such as design-build, are characterized by low trust and poor communication (Ingle et al., 2021). A contractor who performs satisfactorily is likely to receive better cooperation from the client. This means that existence of cooperation between the client and the contractor is an indication of good performance by the contractor.

4.3.8. Warranty Calls

The respondents were asked extent attend to warranty calls on projects awarded by lowest bid award system. majority of the respondents about 95% were called during warranty period for correction of defect happen due to poor project quality. The table 4.12 below shows the extent of warranty calls to contractor.

Table 4. 12 Warranty calls on projects awarded by lowest bid award system

Attend to warranty calls	Frequency	Percentage
Very Often	18	58.1
Often	12	38.7
Sometimes	1	3.2
Total	31	100

This indicated that the project was not efficiently and satisfactorily carried out because projects with excellent workmanship, quality materials, and defect liability periods received few, if any, warranty calls. Only 3.2% of projects received no warranty calls throughout the defect liability period, whereas around 96.8% of projects were called to correct defects within the span of the defect responsibility. Contractors on projects awarded through LEB usually receive a number of calls to attend to defect within the warranty period, as the researcher determined from the literature review. This suggests that more money will be spent on maintaining old buildings, which will likely have a negative impact on the economy and obstruct the government's efforts to build up the country's infrastructure.

4.3.9. Quality of Work

The examination of quality is subjective and challenging. But quality of work in terms of materials and workmanship can be equated with compliance to specifications and standards. Quality in the construction industry emphasizes the competence to discover requirements with conformance to a quality standard (Leong et al., 2014). It can be observed from table 4.13 and table 4.14 that the Contractors compliance to specifications and compliance to instruction.

4.3.9.1. Compliance to Specifications

Contractors have to comply with the requirements stated in the tender documents and subsequently in the contract's conditions in order to deliver the required performance in terms of work quality. The table 4.13 below shows the contractor Compliance to the specification of the contract.

Table 4. 13. Compliance to the specification of the contract

Compliance to Specifications	Frequency	Percentage
Very Often	-	
Often	-	
Sometimes	15	48.4
Not much	16	51.6
Total	31	100

As indicated in Table 4.13 above, more than 51.6% of contractors failed to consistently abide to the specifications controlling the contracts, which is not a suitable level of compliance. This indicates that more than 80% of the contractors did not completely adhere to the specifications. The effort made by Contractors on these projects to lower costs in order to make up for losses that may arise from inappropriately low rates used in their bids is the cause of this. As a result, poor products (infrastructure) are produced, which ultimately raises government expenditures on infrastructure maintenance.

4.3.10. Compliance to Instructions

In contrast to Table 4.14 below, 58.1% of Contractors did not follow directions from Consultants diligently, and only 41.9% of Contractors occasionally accepted instructions. This indicates that more than 58.1% of the Contractors departed from the Consultants' instructions, leading to the poor performance of the projects that were awarded through LEB because a Contractor's compliance with the Consultant's instructions is likely to provide good performance.

Table 4. 14 Compliance of the contractor to the instructions given by consultant

Compliance to Instructions	Frequency	Percentage
Very Often	-	-
Often	-	-
Sometimes	13	41.9
Not much	18	58.1
Total	31	100

In order to ensure that the projects were successfully completed, Consultants were required to give Contractors instructions in compliance with the contract's conditions. This means that the products (infrastructure) may not fulfill the required requirements if Contractors do not follow these directions, and their output would not be considered satisfactory.

4.3.11 Safety at Site

The level at which safety measures instituted and complied with at site is an indicator of good performance of Contractors. From Table 4.16, Contractors not complied fully with safety requirements at their sites. This means that 78.05% of the Contractors selected did not comply with safety requirements at site.

It can be inferred that there was high (78%) indication of poor performance of Contractors who were involved in the execution of the projects selected in terms of safety measures. As a result of Contractors' desire for financial gain to cover up for losses sustained from lower rates offered in their bids, safety precautions have been disregarded, leading to incidences of multiple accidents at the site. Due to the cost of insurance, compensation, and other expenses, these financial losses to contractors ultimately raise the cost of construction.

Table 4. 15. Safety compromised on the site by contractor

Compromised Safety at Site	Frequency	Percentage
very often	12	38.7
Often	18	58.1
Sometimes	1	3.2
Total	31	100

4.2 Impacts of Lowest-Evaluated Bid Procedures on performance of project

Table 4.16 below shows, in descending order of Ranking RII value, the effects that lowest bid had on the work environment and team relationships from the perspective of respondents.

Table 4. 16 Impacts of Lowest-Evaluated Bid Procedures on performance of project

Impact of LEB	Rating							
	1	2	3	4	Total	ΣW	RII	Rank
Selection of incompetent contractors	0	0	5	42	47	183	0.97	1
Time overrun for projects	0	0	10	37	47	178	0.95	2
Termination of contract	0	0	12	35	47	176	0.94	3
Low quality projects	0	0	15	32	47	173	0.92	4
Cost overrun for projects	0	0	17	30	47	171	0.91	5
Increase in maintenance and operational costs	0	5	12	30	47	166	0.88	6
Increased no. of disputes and claims	0	0	6	41	47	164	0.87	7
Financial loss for owner	0	7	12	28	47	162	0.86	8
Financial loss for contractor	0	12	5	30	47	159	0.85	9
Increased No. of Change Requests/ Orders	0	7	14	26	47	160	0.65	10

According to Table 4.16, the most significant direct effect of the lowest evaluated bid selection technique on the execution of projects was "Selection of inefficient contractors." According

(Rabie & El-Sayegh, 2017), The inefficiency and inappropriateness of the awarded contractors has led to sub-standard work, delays, disputes, or even bankruptcy, and also As per studies available efficiency of contract in lowest bidder award projects is comparatively low(Jaskowski et al., 2010). Therefore, selection of inefficient contractors has impact that is more negative on the projects performance.

Time overrun for projects" was identified as the second most detrimental effect. Due of their low bid, the contractors have a very high risk of working beyond their due date. The contractor would probably not employ the proper supplies, tools, and personnel as required by the contract's terms and conditions. These would eventually have an impact on performance and extend out the due date for the contract.

Work Suspensions/Termination of Contract, which was the main direct effect of the lowest evaluated bid selection process on the execution of projects, was the third-ranked negative impact. Because of their extremely cheap rates, there was a possibility that there would be occurrences of non-performance, which could result in the suspension of work or termination of the contract. One of the factors was a lack of capital, and another was a lack of supervision of the contractors that were chosen based on the lowest evaluated proposal. The fourth ranked impact was "Low quality "this is due to awarding projects to incompetent contractors. Cost overrun, which is just the result of claims made by contractors in an effort to make up for losses arising from the unreasonable low rates utilized during the bidding stage, was identified as the fifth most significant negative impact. It was stated that the contract's overall cost would increase if attention was not exercised and any of the risks occurred.

The sixth important negative impact they ranked was 'the cost of operation and maintenance' which will be affected negatively due to the low quality of project implementation. The seventh important negative impact they ranked was "disputes and claims". The reason was that contractors intentionally submit an artificially low bid in anticipation of making their profit through change orders and claims (Thomas, 2009) and also Selection of an inappropriate contractor for the job increases the chance of dispute and dissatisfaction amongst stakeholder(Deep et al., 2017). Most of the respondents stated that the financial loss brought on by unsuccessful projects ultimately affects the cycle of the national economy. This has resulted

in a number of disagreements and claims between contractors and clients, many of which require legal action to resolve. This exposure supports the observation and assertion made in the literature that projects awarded using LEB encounter a number of disputes, which are mostly the consequence of claims presented by Contractors in an effort to recover losses due to the use of low rates in bidding. Additionally, respondents placed "Financial loss for contractor" as having the least negative impact of the lowest competitive bid ward usage. It states that there is a low likelihood of it happening and, if it happens, its impact is not significant as well as "Financial loss for owner".

4.3 Opinions on Stated Effects and Alternative Bidding Practices

In questionnaire, respondents were asked to provide a score to each of the statements based on their degree of agreement or disagreement. The replies gained are shown in *Tables 4.17a to 4.28*

a. Competitive bidding system has worked well in the past and therefore will work well in the future. No change is necessary

The majority of respondents as indicated in the table 4.17 below, more than 90% strongly disagree with the statement that the competitive bidding system has worked well in the past and will continue to operate well going future. According to the researcher's assessment of the literature Competitive bidding systems are well-known for poor project performance.

Table 4. 17 Competitive bidding system has worked well in the past and therefore will work well in the future. No change is necessary

Respondents	Degree of agreement				
	Strongly agree	Agree	Disagree	Strongly disagree	Total
Frequency	-	4	9	34	47
Percent		8.5	19.1	72.3	100

b) Competitive system with provision to award contracts to bidders closest to the average of all bidders should be adopted

According to table 4.18 below, above 70% of respondents, believe that a competitive system with the provision to award contracts to bidders closest to the average of all bidders should be adopted, and only some respondents (about 4.3%) were in contradiction of this awareness.

The primary purposes of these competitive price-based average bidding techniques are to assure contractor accountability, prevent contractor failure, and minimize disputes and claims.

Table 4. 18 Award contracts to bidders closest to the average of all bidders should be adopted

Respondents	Degree of agreement				
	Strongly agree	Agree	Disagree	Strongly disagree	Total
Frequency	33	12	2	-	47
Percent	70.2	25.5	4.3	-	100

The basic principle is that the contractors should be reimbursed fairly and realistically for their services. It is expected that if they were paid fairly, they would stick to the project's quality criteria, complete it on schedule, and not have an adversarial connection with the employer's consultant.

c) A competitive system with the provision to award contracts to the lowest bidder that is within some predefined range of the engineer's estimate should be adopted.

The majority of respondents, or 85%, agreed that a competitive method should be used, with the option to award contracts to the lowest bidder who falls within a certain range of the engineer's estimate. Because the value of the bid is not reduced as the contractor desires, it protects the project from contractors who submit prices that are unreasonably high or deliberately cheap in order to win the project without taking the project's quality, timeline, or budget into account.

Table 4. 19 Awarding contracts to the lowest bidder that is within some predefined range of the engineer's estimate should be adopted.

Respondents	Degree of agreement				
	Strongly agree	Agree	Disagree	Strongly disagree	Total
Frequency	12	30	5	-	
Percent	25.5	63.8	10.6	-	

d) Competitive system with provision to award contracts to bidders closest to the average of all bidders and the engineer's estimate should be adopted

The respondents were asked the degree of agreement on Competitive system with provision to award contracts to bidders closest to the average of all bidders and the engineer's estimate should be adopted. Only 10.3% of professionals in the public and construction sectors disagree that a competitive system should be used with the option to award contracts to those who submit bids that are closest to the average of all submitted bids and the engineer's estimate. 80% of these professionals would approve or strongly agree that this method of contract awarding should be used.

Table 4. 20 Bid should be awarded to closest to average of all bidder and engineer estimate

Respondents	Degree of agreement				
	Strongly agree	Agree	Disagree	Strongly disagree	Total
Frequency	29	13	5	-	47
Percent	61.7	27.7	10.3	-	100

e) A combination of competitive and negotiated procedures should be used

The respondents were asked the degree of agreement on a combination of competitive and negotiated procedures should be used, the replies of respondents shown below in table 4.21. Only 12.8% of professionals agreed that a combination of competitive and negotiated procedures

should be employed; the majority of respondents about 61.7%, disagree, with 25.5% strongly disagreeing on the usage of combination of competitive and negotiated procedures.

Table 4. 21 Combination of competitive and negotiated procedures should be used

Respondents	Degree of agreement				
	Strongly agree	Agree	Disagree	Strongly disagree	Total
Frequency	-	6	29	12	47
Percent	-	12.8	61.7	25.5	100

Open bidding with competitive prices may not be appropriate in many situations. However, the single-source negotiation approach is exceedingly challenging to implement in the public sector due to concerns about accusations of corruption and bias (Mosissa, 2006). To stay away from these problems with single-source negotiated bidding many organizations and clients are using variations that include features of both competitive and negotiated methods.

f) Bidding procedure should depend on type and complexity of the project

The respondents were asked the degree of agreement on bidding procedure should depend on type and complexity of the project, the replies of respondents shown below in table 4.22. All of the respondents(100%) agreed on Bidding procedure should depend on type and complexity of the project It was fascinating to see that irrespective of the type and complexity of the projects, every respondent supported the idea of using this alternative bidding techniques.

Table 4. 22 Bidding procedure should depend on type and complexity of the project

Respondents	Degree of agreement				
	Strongly agree	Agree	Disagree	Strongly disagree	Total
Frequency	30	17	-	-	47
Percent	63.83	36.17	-	-	100

g) Prequalification of contractors should be used instead of changing the traditional bidding procedure

The respondents were asked the degree of agreement on Prequalification of contractors should be used instead of changing the traditional bidding procedure, the replies of respondents as shown below in table 4.23. Only 29.79% of professionals agreed that prequalification of contractors should be used instead of modifying the traditional bidding system, due one of the main functions of prequalification is to reduce the risks of non-performance from contractors that construction clients are likely to experience. Some key principles or factors that are used for prequalifying building contractors are technical capability, financial capacity, quality management, occupational health safety, experience, and licensing or classification, and the majority of respondents (70.15%) disagree that prequalification should be used instead of changing the traditional bidding procedure.

Table 4. 23 Prequalification of contractors should be used instead of changing the traditional bidding procedure

Respondents	Degree of agreement				
	Strongly agree	Agree	Disagree	Strongly disagree	Total
Frequency	-	14	15	18	47
Percent	-	29.79	31.92	38.23	100

H) Subjective Evaluation factors (such as, schedule, organization, and qualification of personnel) other than cost should be reflected in contract award

The respondents were asked the degree of agreement on Subjective Evaluation factors (such as, schedule, organization, and qualification of personnel) other than cost should be reflected in contract award , the replies of respondents as shown below in table 4.24. The reflection of subjective evaluation factors other than cost in contract award was highly favored by respondents. Majority of the repliers above (85%) also gave their support for this issue. A considerable portion of respondents about (12.7%) disagree on the subjective evaluation factors (multi parameter system).

Table 4. 24 Degree of agreement on Subjective Evaluation

Respondents	Degree of agreement				
	Strongly agree	Agree	Disagree	Strongly disagree	Total
Frequency	21	20	6	-	47
Percent	44.7	42.6	12.7	-	100

I) Traditional bidding procedure (Competitive low-bid) encourages contractors to be innovative

The respondents were asked the degree of agreement on Traditional bidding procedure (Competitive low-bid) encourages contractors to be innovative, the replies of respondents as shown below in table 4.25. Most respondents (almost 60%) agreed that the competitive low-bid method of traditional bidding encourages contractors to be creative, while just about 29.8% and 6.4% of respondents disagreed and strongly disagreed with this choice.

Table 4. 25 Degree of agreement Competitive low-bid encourages contractors to be innovative

Respondents	Degree of agreement				
	Strongly agree	Agree	Disagree	Strongly disagree	Total
Frequency	3	18	14	12	47
Percent	25.5	38.3	29.8	6.4	100

J) Traditional bidding procedure guarantees the lowest cost project, but not necessarily the best

The respondents were asked the degree of agreement on Traditional bidding procedure guarantees the lowest cost project, but not necessarily the best, the replies of respondents as shown below in table 4.26. All respondents (100%) agreed that the traditional bidding procedure guarantees the lowest cost project, but not necessarily the best for the project objectives

Table 4. 26 Degree of agreement on traditional bidding system lowest cost, but not the best for the project

Respondents	Degree of agreement				
	Strongly agree	Agree	Disagree	Strongly disagree	Total
Frequency	33	14	-	-	47
Percent	70.21	29.79	-	-	100

The lowest price does not guarantee the overall lowest project cost upon project completion (Padhi & Mohapatra, 2010). Further, such a philosophy poses a high risk to the client because there is an increased possibility of financial collapse of the contractor, bad performance, delay in completion time, cost overruns, and so on.

K) Favoritism and corruption cannot be avoided if negotiated bid procedure is used

The majority opinion among all respondents (100%) was that using the negotiated bid system makes it impossible to avoid favoritism and corruption. It may occasionally be required to request bids from a limited group of contractors known to have the appropriate technical, financial, and managerial skills to finish a challenging project. In these circumstances, competitive price-based bidding may not be acceptable, but the negotiated offer process has come under fire for being prone to corruption and favoritism.

Table 4. 27 Favoritism and corruption cannot be avoided if negotiated bid procedure is used.

Respondents	Degree of agreement				
	Strongly agree	Agree	Disagree	Strongly disagree	Total
Frequency	12	35	-	-	47
Percent	25.5	74.5	-	-	100

L) Bid evaluation method should depend on the type of contract delivery system (design-build, turn-key, fixed-price, cost-reimbursable) selected

The respondents were asked the degree of agreement on Bid evaluation method should depend on the type of contract delivery system, the replies of respondents as shown below in table 4.28. all of the respondents were agreed the issue.

Table 4. 28 Bid evaluation method should depend on the type of contract

Respondents	Degree of agreement				
	Strongly agree	Agree	Disagree	Strongly disagree	Total
Frequency	12	35	-	-	47
Percent	25.5	74.5	-	-	100

5. CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

In this study, the effectiveness of publicly funded construction projects selected using a system of contract selection based on the lowest bidder was evaluated. The researcher also made an effort to find out what other options there might be for the current manner of bid award procedure from the organization's building experts. On the basis of the evaluation done using questionnaires from construction experts, the following findings are drawn: Questionnaires were used to get opinions from construction experts about the existing bid evaluation and contract award process and alternative methods.

The research leads to the conclusion that Ethiopia's primary method for awarding public building construction projects is the lowest bidder procurement system. There is a significant relationship between the lowest bidder bid awarding system and project performance; significant advancement in this area can play a significant role in the success of the project. In accordance to the research, the lowest-priced bidder procurement system is a major source of issues that contractors face during the construction phase. These difficulties include quality problems, cost overruns, delays in completion, and other failures, which force contractors to pay for additional operational expenses and time.

The main cause of these projects' underperformance has been contractors' tendency to lower their costs upon winning the tender with low bids. More than 85% of the projects evaluated not finished by the deadline. This delay was caused by a number of factors, chief among them being the contractor's lack of financial resources, frequent variations, payment delays, a delay in obtaining instructions and approvals from the client, a lack of supervision, and a delay in receiving instructions and approvals from the consultant.

All of the projects that were assessed exceeded the contract sum and the causes were mainly due claims, modification in the original design, change in specification and price fluctuation. Contractor claims to make up for losses resulting from the abnormally low rates utilized during the tendering process were a major cause of project cost overruns. The vast majority of the contractors reviewed failed to achieve the quality requirements of the projects they performed.

The main source of these quality flaws and safety concerns is also the tendency of contractors to reduce their pricing because they were awarded the tender with cheap bids. According to Aitah (1988), a worse project performance is thought to be the predicted result of the lowest offer price. The study also found that the competitive low bid approach has received severe criticism for its detrimental effects on the contractor's profit, disputes and claims, coordination, quality assurance, and project duration. There was no engineers estimate for majority of the projects under the study. Because the current Federal procurement law does not incorporate the engineer's estimate in the bid evaluation and contract award procedure, most employers are discouraged to prepare the estimate.

Moreover, the major negative impacts of the low bid method observed from the study were: selection of inefficient contractors as the first top impact, followed by work suspensions or termination of contracts; time overruns (lengthy delays) for projects; Increased the overall cost of the contract; low quality; increased number of disputes and claims; increase in maintenance and operational costs; and increased number of change requests.

Through the researcher's observation and in detailed discussion with construction professionals, major quality defects of works and materials has been observed in most of the projects under the study, due to the tendency of contractors to compromise their price because they had won the tender with abnormally low bids. It is discovered in the research that the progress as per the schedule of most projects awarded on the responsive least bidder bid award procedure was poor.

The majority of the alternatives included in the study were highly valued by respondents for their favorable effects on these qualities, according to the respondents' agreement on other alternative bidding procedures.

All respondents agreed that the type and complexity of the project should determine the bidding process. Majority of the respondents supported the idea of adopting competitive system with provision to award contracts to bidders closest to the average of all bidders.

The majority of those surveyed agreed to use a competitive system with the provision of awarding contracts to those who submitted bids that were closest to the average of all submitted

bids and the engineer's estimate. The idea of adopting different bid evaluation and contract award methods depend on the type of contract selected were also supported by majority of the participants. Negotiated bid method is highly discouraged in the procurement of public construction works because it may foster fraud and corruption.

Majority of the participants in the study have not accepted the use of combined competitive and negotiated bid method. Most people included in the study were interesting about the use of prequalification of contractors instead of changing the traditional bidding procedure. Majority of the participants have the idea that subjective or multi parameter evaluation factors (such as, schedule, organization, and personnel) other than cost to be reflected in contract award.

5.2 Recommendations

The research's findings demonstrate the substandard performance of public building work contracts. The study suggested that, depending on the type and complexity of the project, various bid examination and contract award techniques should be used.

Most of the construction-engineering experts who participated in the study prefer using the average bid technique of contract awarding among responsive bidders in addition to applying bid examination and contract award procedures based on the nature and complexity of the project. This approach is much superior because it is not completely dependent on the contractor's bid or the engineer's estimate. On the one hand, the engineer's assessment might reduce the possibility that contractors will form a ring. On the other hand, because the contractors believed they had a thorough analysis of the market and therefore current costs, the average of their bids might accurately reflect the cost of building. Before creating, modifying, or changing the entire country's bid evaluation and contract award system, legislators are advised to consult with higher education institutions and other stakeholders. At a minimum, the concerned government body should engage experts in this field to determine whether it is necessary to modify or change the current legislation for job procurement. Additionally, each adjustment or change should be supported by study findings.

In this research, it is discovered that public project performances are low in terms of quality and meeting schedule. In addition, it has also been discovered that there is a higher appeal from construction professionals for adopting other alternative bid evaluation and contract award procedures. Therefore, the researcher highly recommends accompanying researchers to study the magnitude of the effect of the current bid evaluation and contract award system on the performance of public construction works. This study found that the government projects performed poorly in terms of quality and fulfilling deadlines. Additionally, it is found that the requirement for adopting alternative bid evaluation and selection methods is receiving a greater level of appeal from constructing professionals for methods of awarding contracts. The researcher strongly advises other academics to investigate the extent to which Ethiopia's public construction projects are affected by the system that is in place for evaluating bids and awarding contracts.

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APPENDIX 1

Questionnaires *On*

Assessments of Performance of Lowest Bid Awarding System on Public Building Project

My name is Muse Gizachew, Construction Engineering Management Student from school of Civil Engineering at Adama University of Science and Technology, researching on the topic Assessments of performance of lowest bid awarding system on public building project in case of Adama city.

The Objectives of The Study Are:

- To assess the effectiveness of the projects performance that was selected under different methods of awarding and evaluation of public building projects.
- To evaluate the performance of the contractors for public building project awarded through a competitive bid ward procedure.
- To analyze the impacts of lowest bid ward method has on the contractor's performance.
- To provide experts opinion on the alternative bidding systems performance.

The questionnaires are in four sections; the first section where Background of the respondent and the organization , the second section where evaluate the performance of the contractors. third section where assessment of Impacts of Lowest Bidding System has on the performance of project and the fourth section where on comparison between different alternatives to Adopting Alternative Methods to Lowest Bidder Bid Awarding System in public construction projects.

Questionnaire-Public Respondents

Section 1. Back ground information of the respondents and organization.

1. Please tick [√] to indicate your educational level
 - a. PhD
 - b. MSc
 - c. BSc
 - d. advanced diploma
2. For how long have you been in professional practice?
 - a. Less than 5 years
 - b. 6-10
 - c. 11-15
 - d. 16 and above
3. How would you describe your organization's bid evaluation procedure?
 - a. Based on bid price only
 - b. Based on bid price and responsiveness
 - c. Based on bid price, responsiveness, and other factors,
 - d.others (Please Specify): _____
4. Are you satisfied with competitive lowest bid award method?
 - a. Yes
 - b. No
 - c. Unknown

5. Please indicate the Frequency, in percent (%), of your organization's award the project under the following project bid-award methods.

5.1 Competitive (Conventional method of awarding contract to the lowest responsive bidder)

A. 0% to 25% C. 50% to 75%

B. 25% to 50% D. 75% to 100%

5.2 Negotiated (Negotiation with one or more preselected contractors).

A. 0% to 25% C. 50% to 75%

B. 25% to 50% D. 75% to 100%

5.3 RFP/RFQ (Request for Proposal/Request for Qualification- Inviting proposals from contractors for prequalification and/or negotiation. Schedule, Quality Control and Cost Control techniques are considered in addition to the cost.)

A. 0% to 25% C. 50% to 75%

B. 25% to 50% D. 75% to 100%

5.4 Multi parameter system (Bidders' proposed project-duration and past performance on quality of finished projects, safety records, etc.)

A. 0% to 25% C. 50% to 75%

B. 25% to 50% D. 75% to 100%

5.5 Other. Please specify _____

A. 0% to 25% C. 50% to 75%

B. 25% to 50% D. 75% to 100%

SECTION II: Evaluation of effectiveness the Performance of alternative bid award method

6. Use the following grading scale to indicate your ratings of each method on the basis of the attributes listed:

1. Will **always** have a **positive** effect
2. May **sometimes** have a **positive** effect
3. Will have **no** effect
4. May **sometimes** have a **negative** effect
5. Will **always** have a **negative** effect
6. Do not know/No opinion

Example: if you select 5 for the attribute “coordination” against competitive low bid method, you are indicating that under this method coordination of project operation would always be adversely affected.

Attributes							
Bid Evaluation and Contract Award Methods	Contractor Profit	Owner's Cost	Disputes /Claims	Coordination	Quality Control	Project Duration	Other, please specify
a. Competitive Low Bid							
b. Competitive Average Bid							
c. RFP/RFQ							
d. Negotiated							
e. Multipara meter method							
f. Other							

- a. Conventional Federal practice of awarding contracts to responsive low bidder.
- b. Competitive, but the bid selected is nearest to the average of all bid offers.
- c. Contractors are invited to submit proposals for prequalification. Factors, other than cost, are considered to screen contractors. Contract is awarded or negotiated on the basis of sealed bids obtained from the selected contractors.
- d. Negotiation with preselected or prequalified contractors.
- e. In the Multi- Parameter Bid 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.
- f. Please specify:_____

SECTION III: Evaluation of contractor performance under lowest bid award system

7. What was the degree of satisfaction with the overall quality of the work completed?
 - a. Excellent
 - b. Good
 - c. Very good
 - d. Fair
 - e. Poor
8. How often did you issue warning letters to the contractor who won contracts by the lowest bidder system?
 - a. Very often
 - b. Sometimes
 - c. Often
 - d. Not much
 - e. Never
9. To what extent do you think awarding the contract to the lowest bidder affected the project execution?
 - a. Very often
 - b. Sometimes
 - c. Often
 - d. Not much
 - e. Never
10. Please was the project a fixed sum contract?
 - a. Yes
 - b. No
11. If no, was the contract sum exceeded?
 - a. Yes
 - b. No
12. The contract sum exceeded through;
 - a. Claims.
 - b. Change in specification.
 - c. Modification of the original design.
 - d. Others please specify
13. Please, was there any dispute between the contractor and any of the parties?
 - a. Yes
 - b. No
14. If yes, what was the cause of the dispute?
 - a. Frequent variations
 - b. Claims
 - c. Delay in payments
 - d. Others please specify
15. Was the project completed on time?
 - a. Yes
 - b. No

16. If no, what was the cause of the delay?
- a. Frequent variations
 - b. Delay in payment
 - c. Delay in receiving instructions and approvals from client
 - d. Delay in receiving instructions and approvals from consultant
 - e. Lack of supervision on site
 - f. Lack of financial capability by the contractor
 - Others please specify.....
17. Please tick, to what extent did the contractor cooperate with other parties?
- a. Very often c. sometimes.
 - b. Often d. Not much e. Never.
18. To what extent do you think the contractor was asked to attend to warranty calls during the warranty period?
- a. Very often c. Sometimes
 - b. Often d. Not much e. Never
19. How often did you face major problem after the warranty period?
- a. Very often c. Sometimes
 - b. Often d. Not much e. never
20. To what extent do you think the contractor complied with the specification?
- a. Very often c. Sometime
 - b. Often d. Not much e. never
21. To what extent do you think the contractor complied with instructions?
- a. Very often c. sometimes
 - b. Often d. Not much e. Never
22. To what extent was the safety at the site compromised?
- a. Very often c. sometimes
 - b. Often d. Not much e. Never

Section IV: Impacts of Low-Bid Award System on Project

23. What was your experience regarding the impacts of lowest bidding system had on the work environment and team relationships? Please rank in order of importance, the impacts of Lowest-Bidding system has on performance of construction projects in your organization.

1 = ‘very not Important’, 2 =’not Important’, 3 =’Important’, and 4 = ‘very Important’.

No.	Impacts Of Lowest Bidding System	Level Of Importance Of Impact On Projects			
		1	2	3	4
1	Low quality of the work				
2	Work suspension				
3	Select of incompetent contractors				
4	Extended delays of the projects				
5	Claims and disputes between contracting parties				
6	Low or underachievement of project performance				
7	Financial loss of client				
8	Financial loss of the contractor				
9	Change in project scope				
10	Scarcity of resources				
11	Increased No. of Change Requests/ Orders				
12	Increase in maintenance and operational costs				
13	If others please specify				

Section V: Opinions on Existing/Stated bidding Effects and Alternative Bidding

24. With respect to the current bidding practices as you know them please indicate the degree to which you agree or disagree with the following statements using the following scale.

4- Strongly Agree; 3-Agree; 2-Disagree; 1-Strongly Disagree; 0-No Opinion

Description	4	3	2	1	0
1 Competitive bidding system has worked well in the past and therefore will work well in the future. No change is necessary.					
2 Competitive system with provision to award contracts to lowest bidder which is within some predefined range of the engineer's estimate should be adopted.					
3 Competitive system with provision to award contracts to bidders closest to the average of all bidders should be adopted					
4 Competitive system with provision to award contracts to bidders closest to the average of all bidders and the engineer's estimate should be adopted					
5 A combination of competitive and negotiated procedures should be used					
6 A combination of competitive and negotiated procedures should be used					
7 Prequalification of contractors should be used instead of changing the traditional bidding procedure.					
8 Traditional bidding procedure (Competitive low-bid) encourages contractors to be innovative					
9 Traditional bidding procedure guarantees the lowest cost project, but not necessarily the best					
10 Favoritism and corruption cannot be avoided if negotiated bid procedure is used					

25. If you have any comment regarding the above question related issues please -----

Thank you for your time answering and corporation

QUESTIONNAIRE FOR PRIVATE RESPONDENTS

Section I. Back ground information of the respondents and organization.

1. Primary area of business:
 - a. General Contractor
 - b. Building Contractor
 - c. Water works contractor
 - d. Other (Please Specify): _____
2. Size of Firm/Organization
 - a. Less than ten employees
 - b. 10 to 25 employees
 - c. 26-50 employees
 - d. Over 50 employees
3. How long is it since your company established?
 - a. Less than 2 years
 - b. 2 to 5 years
 - c. 5 to 10 years
 - d. More than 10 years
4. For how long have you been in professional practice (Year)
 - a. >5
 - b. 6-10
 - c. <10 years
5. Are you satisfied with competitive lowest bid award method
 - a. Yes
 - b. No
 - c. Unknown
6. Please indicate the Frequency, in percent (%), of your organization's award the project under the following project bid-award methods.

6.1 **Competitive** (Conventional method of awarding contract to the lowest responsive bidder)

A. 0% to 25% C. 50% to 75%

B. 25% to 50% D. 75% to 100%

6.2 **Negotiated** (Negotiation with one or more preselected contractors).

A. 0% to 25% C. 50% to 75%

B. 25% to 50% D. 75% to 100%

6.3 **RFP/RFQ** (Request for Proposal/Request for Qualification- Inviting proposals from contractors for prequalification and/or negotiation. Schedule, Quality Control and Cost Control techniques are considered in addition to the cost.)

A. 0% to 25% C. 50% to 75%

B. 25% to 50% D. 75% to 100%

6.4 **Multi parameter system** (Bidders' proposed project-duration and past performance on quality of finished projects, safety records, etc.)

A. 0% to 25% C. 50% to 75%

B. 25% to 50% D. 75% to 100%

6.5 Other. Please specify _____

A. 0% to 25% C. 50% to 75%

B. 25% to 50% D. 75% to 100%

SECTION II: Evaluation of effectiveness the Performance of alternative bid award method

7. Use the following grading scale to indicate your ratings of each method on the basis of the attributes listed:

1. Will always have a positive effect
2. May sometimes have a positive effect
3. Will have no effect
4. May sometimes have a negative effect
5. Will always have a negative effect
6. Do not know/No opinion

Example: if you select 5 for the attribute “coordination” against competitive low bid method, you are indicating that under this method coordination of project operation would always be adversely affected.

		Attributes						
Bid Evaluation and Contract Award Methods	Contract or Profit	Owner’s	Disputes	Coordination	Quality	Project	Other,	
		Cost	/Claims		Control	Duration	please specify	
1. Competitive Low Bid								
2. Competitive Average Bid								
3. RFP/RFQ								
4. Negotiated								
5. Multipara meter method								
6. Other								

1. Conventional Federal practice of awarding contracts to responsive low bidder.
2. Competitive, but the bid selected is nearest to the average of all bid offers.
3. Contractors are invited to submit proposals for prequalification. Factors, other than cost, are considered to screen contractors. Contract is awarded or negotiated on the basis of sealed bids obtained from the selected contractors.
4. Negotiation with preselected or prequalified contractors.
5. In the Multi- Parameter Bid 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.
6. Please specify:_____

Section III: Impacts of Low-Bid System on project

8. What was your experience regarding the impacts of lowest bidding system had on the work environment and team relationships? Please rank in order of importance, the impacts of Lowest-Bidding system has on performance of construction projects in your organization.

1 = ‘very not Important’, 2 =’not Important’, 3 =’Important’, and 4 = ‘very Important’.

No.	Impacts Of Lowest Bidding System	Level Of Importance Of Impact On Projects			
		1	2	3	4
1	Low quality of the work				
2	Work suspension				
3	Select of incompetent contractors				
4	Extended delays of the projects				
5	Claims and disputes between contracting parties				
6	Low or underachievement of project performance				
7	Financial loss of client				
8	Financial loss of the contractor				
9	Change in project scope				
10	Scarcity of resources				
11	Increased No. of Change Requests/ Orders				
12	Increase in maintenance and operational costs				
13	If others please specify				

Section IV Opinions on Existing/Stated bidding Effects and Alternative Bidding

9. With respect to the current bidding practices as you know them please indicate the degree to which you agree or disagree with the following statements using the following scale.

4- Strongly Agree; 3-Agree; 2-Disagree; 1-Strongly Disagree; 0-No Opinion

	Description	4	3	2	1	0
1	Competitive bidding system has worked well in the past and therefore will work well in the future. No change is necessary.					
2	Competitive system with provision to award contracts to lowest bidder which is within some predefined range of the engineer's estimate should be adopted.					
3	Competitive system with provision to award contracts to bidders closest to the average of all bidders should be adopted					
4	Competitive system with provision to award contracts to bidders closest to the average of all bidders and the engineer's estimate should be adopted					
5	A combination of competitive and negotiated procedures should be used					
6	A combination of competitive and negotiated procedures should be used					
7	Prequalification of contractors should be used instead of changing the traditional bidding procedure.					
8	Traditional bidding procedure (Competitive low-bid) encourages contractors to be innovative					
9	Traditional bidding procedure guarantees the lowest cost project, but not necessarily the best					
10	Favoritism and corruption cannot be avoided if negotiated bid procedure is used					

10. If you have any comment regarding the above question related issues please -----

Thank you for your time for answering and corporation