ADDIS ABABA UNIVERSITY

COLLEGE OF BUSINESS AND ECONOMICS

SCHOOL OF COMMERCE

Challenges of Project Closure in Construction Projects: The Case of Ethiopian Grade One General Contractors.

By Mitiku Getachew

Advisor: Dr. Wubeshet B.

June 2022

Addis Ababa, Ethiopia

ADDIS ABABA UNIVERSITY

COLLEGE OF BUSINESS AND ECONOMICS

SCHOOL OF COMMERCE

DEPARTMENT OF PROJECT MANAGEMENT

Challenges of Project Closure in Construction Projects: The Case of Ethiopian Grade One General Contractors

Project Paper for the Partial Fulfillment of the Requirements for Master of Arts (MA) Degree in Project Management

By : Mitiku Getachew (GSD/3606/11)

Advisor: Wubeshet Bekalu, PHD

June 2022

Addis Ababa, Ethiopia

DECLARATION

I declare that this paper entitled **"CHALLENGES OF PROJECT CLOSURE IN CONSTRUCTION PROJECTS: THE CASE OF ETHIOPIAN GRADE ONE GENERAL CONTRACTORS"** is my original work. This paper has not been presented for any other university and is not concurrently submitted in candidature of any other degree, and that all sources of material used for the paper have been duly acknowledged.

Name – **Mitiku Getachew**

Signature _____

Place: Addis Ababa

Addis Ababa University
College of Business and economics
School of commerce
Department of Project Management

Date: June 2022

CHALLENGES OF PROJECT CLOSURE IN CONSTRUCTION PROJECTS: THE CASE OF ETHIOPIAN GRADE ONE GENERAL CONTRACTORS

Student Name and Signature_____ Date: _____

Approved By:

EXTERNAL EXAMINER	**Date**	**Signature**
EXTERNAL EXAMINER	**Date**	**Signature**
ADVISOR	**Date**	**Signature**

ACKNOWLEDGMENTS

I wish to express my deep appreciation to my advisor, Dr.Wubshet Bekalu, who has given me the guidance in conducting the paper. I would like to thank my families, my friends and all my co-workers in E.M.K.K.M Construction who provided me great moral and precious information for my paper and also their support and encouragement.

Finally, I would like to thank all of the construction company managers, project managers, and other construction workers who participated in my research as interviewees and responding my questionnaires. Without their help, I would never have completed this project.

TABLE OF CONTENT

List of Tables

List of Acronyms

AAUSC: Addis Ababa University School of Commerce

DCMC:Defense Contract Managemnt Command

FTA: Federal Transit Adminstration

GC: General Contractor

ITRM: Information Technology Resource Management

MSU:Michigan State University

PMBOK: Project Management Body of Knowledge

PMI: Project Management Institute

PMIS: Project Management Information System

ABSTRACT

This study is about project closure challenges faced by Ethiopian Grade One General Contractors in their construction projects. The purpose of this paper is to comprehensively survey the relevant literature on closeout, to assess the problems of the contractors during closure, and to identify recommendations for improving closeout. Both qualitative and quantitative research methods have been used in the study. The study adopted descriptive research design. Source of data collection used were both primary data (structured questionnaire and structured interview) and secondary data. 45 respondents from 15 grade one contractors were selected by purposive sampling. Systematic sampling was adopted to select the 15 general one contractors. Absence of a clear project closing strategy, inability to finish punch lists, design and documentation errors, insufficient capable staff during project close out, lack of agreements on remaining deliverables, resource shortage, loss of interest in documentation, lack of urgency and motivation, lack of preparedness and planning for closure, improper or untimely contractual closeout documentation, disagreement on the cost of additional works and late response on financial claims were found as the internal challenges the contractors are facing. Delay in providing utility service, changing priority by the government, political instability and security issues, and lack of acceptance by stakeholders were the external challenges identified by the study. Developing a clear close out strategy, standardizing the close out process, implementing post – close out analysis, keeping punch lists to a minimum, ensuring the participation of stakeholders at project commissioning and at setting the close out requirements , and developing the motivation of the close out team for timely documentation are the recommendations of the study. Moreover, the study recommends contractors should differentiate project closure from project handing over.

Keywords

Project closure, Project closure challenges, Construction projects closure, Project phases.

CHAPTER ONE

INTRODUCTION

1.1. Background of the Study

Project Closure is the last phase in a project life cycle where we formally close our project and then report its overall level of success to our sponsor. The project closing process group consists of those processes performed to conclude all activities to formally complete the project, phase, or contractual obligations. This process group, when completed, verifies that the defined processes are completed within all of the Process Groups to close the project of phase, as appropriate, and formally establishes that the project or project phase is complete (Project Management Institute, 2013).

In construction projects, closeout refers to the completion of all construction contract requirements following substantial completion, including punch list items, delivering documentation such as operations and maintenance manuals, as-built drawings, contractor's verification forms, resolution of change orders and claims, final inspections, final payment and owner's internal resolution of all accounts and reporting. The closeout phase is supposed to start when the contractor substantially completes the work on the project, and it can often extend long after completion of the work on site (Fisk and Rapp, 2004).

But many construction companies performing a project fail to conduct this proper project closure. The common challenges the project managers and the construction companies have in conducting such project closure are rushing to the next project, not considering project closure as a value-add activity, lack of accountability, lack of transition plan (Gregory, 2016).

The closeout phase is one aspect of the industry that has been a victim of negligence, for which the required approach of the involved party representatives has always been inadequate. Even projects which

were taking place as per schedule would pause towards the end of the project due to different administrative and contractual project closure challenges (Kual, 2014).

Failing in conducting a proper project closure will let an organization lose the benefits that could be grasped from a closure phase.

Construction companies that do not perform proper will not get confirmation of objectives being met. If we don't ask what we have accomplished and what was set out to do at the end of each engagement, there is no way to get a confirmation. Without the performing proper closure, there will not be improvement in the next projects. If we don't look back and reflect on each engagement, it is impossible to learn from it. During the project closure process, it is essential that a lesson learned meeting happen with the client and another with the internal team.

Moreover, failure in knowledge capturing is what contractors lose when project closure is missed or performed in improper way. As part of the lessons learned sessions, the project team should identify project assets, that can be re-used in future engagements. In failing assigning someone at the end of the closure meeting, issues will be forgotten, and knowledge will not be captured. Final tasks will not be done properly. There are a lot of administrative tasks that must happen at the end of a project to make sure the project is appropriately closed from a back-office perspective. Tasks like sending the final status report, asking for the final payment, approving all time sheets and re-assigning resources, should all be part of the closure process to make sure they are executed in a timely fashion. So, failing in conducting proper closure will let the organization fail in performing such crucial final tasks. Contractors will also be unable to get a ground to reward their team in the absence of proper project closure (New Signature, 2014).

The study refers to these project closure challenges on Ethiopian grade one general contractors. The contractors where the study is focusing have gained their grade by fulfilling the machinery and manpower requirement set by Ministry of Urban and Infrastructure formerly known as Ministry of Construction. These contractors are allowed to participate in the construction of roads and buildings because of their grade which is labeled as general. Despite the major role they are playing in the construction sector of the

country, these contractors are challenged by contractual and administrative issues that hinder project closure in a proper way. The researcher was motivated to assess these challenges faced by the contractors.

1.2. Statement of the Problem

Unfortunately, construction projects which have run smoothly and on schedule throughout most of the project can suddenly become bogged down at the project closeout phase (Carson, 2009). Most of the problems associated with project closure in the construction industry are inability to achieve final completion due to its lengthy and problem plagued phase of a construction project. 80% of a project all over the world gets delayed due to the closeout stage; this means each project phase has its own contribution to successfully complete the project objective and to celebrate its deliverables (Kual, 2014). A carefully structured project closure phase should ensure that the project is brought to a controlled end, which in practice means that all of the project deliverables are formally transferred to others, all of the lessons learned from the project are documented and archived and any contracts established by the project are formally closed. Despite the many benefits that can be obtained from this phase of a project, most organizations fail in fulfilling the formality in closing projects. Compared to other phases of construction, closeout phase is more difficult to successfully execute (Rogers, 2012).

This shows that Project closeout is the most important phase that should be managed properly as a project community, but most of them failed to give the same attention and commitment of this as they do during planning and execution.

The problems associated with project closure where the researcher has been experiencing in his construction carrier have inspired him to conduct this study. The researcher has witnessed when most contractors struggle to close their construction projects where most of them fail before getting their second retention money which is supposed to be released after conducting the final acceptance. Moreover, while reviewing literatures, the researcher has realized that problems associated with project closure in Ethiopian construction are not well addressed. Therefore, the researcher believed that there is a need to carry out a study regarding project closure challenges in construction projects.

1.3. Research Questions

The study aims at addressing the following basic research question.

1) What is the project close out practice in construction projects by Ethiopian Grade One contractors?
2) What are the challenges of project close out practice in construction projects by Ethiopian Grade One contractors?
3) What needs to be done to overcome the challenges of proper closure of projects?
4) What is the importance of proper project closure in construction projects?

1.4. Objectives of the Study

General objective:

- The general objective of the study is to explore the challenges that Ethiopian Construction Companies face in conducting proper project closure and to specify the needs to overcome those challenges.

Specific objectives:

The specific objectives of the study are: -

1. To show how project closure practice should be in the construction projects in Ethiopia.
2. To show the challenges of project close out practice in construction projects by Ethiopian Grade One contractors
3. To show what needs to be done to overcome the challenges of proper closure of projects.
4. To show the importance of proper project closure in construction projects.

1.5. Significance of the Study

- The study helps Ethiopian grade one general contractors to close construction projects in a proper way by exploring and overcoming the challenges associated with closure.
- The study encourages other researchers to conduct further study on related issue.
- The study also helps to show the importance of proper project closure and discuss its merits for our country construction industry during policy formulation.

1.6. Scope of the Study

There are several construction companies in Ethiopia which are registered under the Ministry of Urban Development and Infrastructure formerly known as the Federal Ministry of construction. The construction companies range from Grade 1 to Grade 7 based on the work they have engaged such as building, road, or general works. However, this study will address those companies with grade GC1 and their office is situated in Addis Ababa.

1.6. Limitations of the Study

There are three major limitations in this study that could be addressed in future studies.

1) The study focused on only 15 Grade One General Contractors with their office situated in Addis Ababa.
2) There was a bias while selecting the three respondents from the 15 contractors.
3) The researcher didn't set a time frame to respondents for the return of questionnaires so that there was a delay in the data collection.

1.7. Organization of the Study

The study is organized in to five chapters. Chapter one provides an introduction of the study by highlighting the background of the study, statement of the problem, objectives, research question, scope of

the study, limitation of the study and significance of the study. Chapter two reviews related literature on project closure in the construction project. Chapter three explains the research methodology. This chapter gives an overall view of research methodology for the research and includes the method of data collection and questionnaire type, while chapter four presents the result and discussion of the study. This chapter focuses on analyzing collected data and discussing the findings. It contains the analysis of the information gathered through the questionnaire, interview and document review survey, identifies the challenges of project closeout in construction projects. Chapter five concludes the study by summarizing the findings and providing recommendations.

CHAPTER TWO

LITERATURE REVIEW

2.1. Theoretical Literature Review

This part will present the combination of literatures related to project closure and challenges in proper closure of construction projects. It will have eight sections arranged according to the following thematic areas. Overview of the phases of construction project, Project Closure, Types and stages of Project closure, the relationship between project closure and the other Phases of Construction Projects, major issues, concepts and principles in closure, challenges in the closing phase of construction projects, Project closure in Ethiopian Construction Companies and finally, the elements and significance of proper closure in construction projects.

2.1.1. Phases of Construction Projects

The project manager and project team of any construction project have one shared goal: to carry out the work of the project for the purpose of meeting the project's objectives to the satisfaction of their client. Every project has a beginning, a middle period during which activities move the project toward completion, and an ending either successful or unsuccessful. A standard project typically has the following five major phases: initiation, planning, implementation, monitoring and closure. Taken together, these phases represent the path a project takes from the beginning to its end and are generally referred to as the project "life cycle" (Adrienne, 2014).

Initiation Phase

During the first of these phases, the initiation phase, the project objective or need is identified; this can be a business problem or opportunity. An appropriate response to the need is documented in a business case with recommended solution options. A feasibility study is conducted to investigate whether each option addresses the project objective, and a final recommended solution is determined. Issues of feasibility ("can

we do the project?") and justification ("should we do the project?") are addressed (Adrienne, 2014). Once the recommended solution is approved, a project is initiated to deliver the approved solution and a project manager is appointed. The major deliverables and the participating work groups are identified, and the project team begins to take shape. Approval is then sought by the project manager to move onto the detailed planning phase.

Planning Phase

The next phase, the planning phase, is where the project solution is further developed in as much detail as possible and the steps necessary to meet the project's objective are planned. In this step, the team identifies all of the work to be done. The project's tasks and resource requirements are identified, along with the strategy for producing them. This is also referred to as "scope management." A project plan is created outlining the activities, tasks, dependencies, and timeframes. The project manager coordinates the preparation of a project budget by providing cost estimates for the labor, equipment, and materials costs. The budget is used to monitor and control cost expenditures during construction. Once the project team has identified the work, prepared the schedule, and estimated the costs, the three fundamental components of the planning process are complete. This is an excellent time to identify and try to deal with anything that might pose a threat to the successful completion of the project. This is called risk management. In risk management, "high-threat" potential problems are identified along with the action that is to be taken on each high-threat potential problem, either to reduce the probability that the problem will occur or to reduce the impact on the project if it does occur. This is also a good time to identify all project stakeholders and establish a communication plan describing the information needed and the delivery method to be used to keep the stakeholders informed.

Finally, we will document a quality plan, providing quality targets, assurance, and control measures, along with an acceptance plan, listing the criteria to be met to gain customer acceptance. At this point, the project would have been planned in detail and is ready to be executed.

Execution Phase

During the third phase, the implementation phase, the project plan is put into motion and the work of the project is performed; construction is on progress. It is important to maintain control and communicate as needed during implementation. Progress is continuously monitored, and appropriate adjustments are made and recorded as variances from the original plan. In any project, a project manager spends most of the time in this step. During project implementation, people are carrying out the tasks, and progress information is being reported through regular team meetings. The project manager uses this information to maintain control over the direction of the project by comparing the progress reports with the project plan to measure the performance of the project activities and take corrective action as needed. The first course of action should always be to bring the project back on course (i.e., to return it to the original plan). If that cannot happen, the team should record variations from the original plan and record and publish modifications to the plan by the supervision of the project consultant. Throughout this step, project sponsors and other key stakeholders should be kept informed of the project's status according to the agreed-on frequency and format of communication. The plan should be updated and published on a regular basis. Status reports should always emphasize the anticipated end point in terms of cost, schedule, and quality of deliverables. Each project deliverable produced should be reviewed for quality and measured against the acceptance criteria. Once all of the deliverables have been produced and the customer has accepted the final solution, the project is ready for closure.

Monitoring Phase

This stage is all related to the measurement of progress and performance to make sure that items are tracking with the project management scheduling. This phase regularly happens at the same time as the execution phase.

Closing Phase

The closure phase is the phase where the emphasis is on releasing the final deliverables that could be a building, a bridge or any to the client, handing over project documentation to the business, terminating supplier contracts, releasing project resources, and communicating the closure of the project to all stakeholders. The last remaining step is to conduct lessons-learned studies to examine what went well and what didn't. Through this type of analysis, the wisdom of experience is transferred back to the project organization, which will help future project teams.

2.1.2. Project Closure

According to A Guide to The Project Management Body of Knowledge (PMBOK® Guide) – Fifth Edition, "The Project Closing Process Group consists of those processes performed to conclude all activities across all Project Management Process Groups to formally complete the project, phase, or contractual obligations. This process group, when completed, verifies that the defined processes are completed within all of the Process Groups to close the project of phase, as appropriate, and formally establishes that the project or project phase is complete" (Project Management Institute, 2013).

In other words, Project Closing is the combination of the following when applied to a project:

1. Assurance that all the work has been completed,
2. Assurance that all agreed upon project management processes have been executed, and
3. Formal recognition of the completion of a project—everyone agrees that it is completed.

Closeout is a concern to project managers across diverse industries and organizations. The contract closeout process is considered to be "one of the most important services to be provided and one with which customers are least satisfied" (Dinsmore, 1993). It is pointed out that even though contracts do not usually delineate a closeout phase, it is indeed a distinct phase requiring their own management. It is also noted that "The importance of the project closeout phase is often overlooked." In many construction companies the project closure phase is "frequently underfunded, understaffed, and (understandably) not well planned or performed'' (Pinto, 1998).

2.1.3. Types of project closure

The completion may not be as straightforward as planned on some projects. Although a definite ending for a project may be specified in the scope statement, the actual ending may or may not fit. Luckily, with a well-defined conclusion, most ventures are blessed. Regular project updates can recognize projects with different endings than plans. The different types of project closure are identified here (Gray and Larson, 2008). Gray and Larson identify five circumstances for project closure:

1. Normal closure: it is the common condition of project closure when the project is completed as planned or expected. This is when the project goals and objectives are achieved, the client accepts the project, and the normal project closure begins.

2. Premature closure: Most projects do not or are not given the opportunity to produce all their objectives or goals. Instead, they are prematurely closed by eliminating elements of the project that were initially defined in the scope of the project. This could be due to cost reasons, where the client is reducing the project funds, or the project has already consumed the budget. Premature closure often takes place when the project is of strategic importance and has to be completed earlier than expected, such as the launch of a new product. Delaying the product to the original completion date can result in a loss of opportunity for the consumer.

3. Perpetual projects: Some projects, on the other hand, never seem to end. These are projects that have encountered multiple delays, failures and problems. Perpetual projects also suffer from drift, add-ons and modifications of infinite variety. The problem with these types of projects is that due to the changes and consistent scope creep, they never achieve their goals or objectives. For the project manager and the project team, this becomes very frustrating. It will also be highly frustrating for the client because, despite the consistent request for changes, they do not see the project goals being achieved. The project manager has to set the scope and prepare for completion at some stage. This can be achieved by redefining the scope of the project in order to force project termination, restricting budget or resources, or setting a time limit. As a consequence, any new requests made by the client can be treated as a second phase of the project rather being perpetual.

4. Failed projects: Far too often projects close because they have failed. There are a number of grounds for project failure. It is not unusual for the client to run out of funds, thus permanently killing the project.

5. Changed Priority: The priorities of organizations often change and the direction of strategy shifts. For example, organizations shifted their focus from money-making projects to cost-saving projects during the 2008–10 financial crises. The supervisory board regularly updates project selection goals to reflect changes in the course of the company. Projects may need to be modified or cancelled in the process. A project can therefore start with a high priority, but see its rank erode or crash as conditions change during its project life cycle. As priorities change, it may be appropriate to modify or cancel projects in progress. Different types of termination of the project present unique problems. Some adjustments may be necessary to generic closure processes to accommodate the type of termination of the project that we face.

2.1.4. Stages of project closure

Project closure is the last stage of a project. This requires the activities that signify a project's expiration. This begins with the client approving the project production (deliverables) in the construction industry and finishes with the commissioning of the facility for use (Federal Transition Administration, 2006). The aim of the project closure is to assess or evaluate the project, i.e., whether the results or output are achieved or not, and to draw lessons learned for future purposes (ITRM Guideline-Project Management Guideline, 2006). Therefore, the project closure process involves project deliverables turnover, project progress reports and lessons learned, resource allocation, financial account closure, project record collection, and post implementation review preparation. According to the ITRM Project Management Guideline, the main key concern for project closure is administrative closure and logistics. The project closure has two basic components for a construction project, namely contract closure and administrative closure (Federal Transition Administration, 2006). Contractual closure involves the signing off the project by parties to the project. It involves parties observing the procedures and acts in the terms and conditions of each contract, the approving authority granting certificates of beneficial occupancy, and performing cost accuracy and contract audit verification. Administrative closure involves reassigning project personnel to other long-term or short-term projects, assessment of the project, compilation of files and documentation and closure of project financing.

i. Contractual closure: Contractual closure may be defined as the process of signing off a project under the terms and conditions specified. This will involve verifying the completed project scope, contract audit, and final payment and release of retention as stated above. According to the FTA Construction Project Management Handbook, the contractual closure for a construction project should ensure that the following activities are accomplished and accepted by all stakeholders. The tasks include planning a punch list, manuals and instruction, assurances and promises, advantageous occupancy, document drawings,

preliminary review, final inspection, receiving project approval from the key stakeholders, final payment and commissioning.

ii. Administrative closure: Administrative closures are actions performed by the contractor to ensure that project resources are allocated. The tasks conducted include demobilization of the project, closure of project funding and financing, collection of project documents, and assessment of the project and closure of stakeholders (Federal Transition Administration, 2006). These activities are project demobilization, Closure of project financing and funding, disposition of project records, project evaluation and stakeholder closure.

2.1.5. Project closure and its Relationship between the other Phases of a Project

The purpose of dividing a project into phases is to be able to have phase-gate reviews. Phase-gate reviews occur at the end of each phase and their main purpose is simply to review how the elapsed phase was performed and take an informed decision whether or not to proceed to the next phase, and if so, why and how. Project closing needs to be conducted at each and every phase-gate of a project (Aziz, 2015).

The closing process at a specific phase would help the project management team do the following by relating the close out phase with other phases:

1. Ensure all the required work in the elapsed phase has been done, and address deficiencies as applicable.
2. Obtain approval by the project's sponsor and customer (whether internal or external) for the work completed; therefore, eliminating any debate or scepticism, and addressing any future changes to the work performed. As such any changes would be managed as change requests or new projects, depending on their nature. This seemingly insignificant process is of great importance in the avoidance of scope creep.

3. Review whether or not all organizational governance processes have been executed: Have we obtained all the necessary approvals? Are all the appropriate policies implemented? Have we complied with all organizational procedures? The team can take corrective action as necessary should deficiencies be identified, as well as use findings to guide future phases of the project.

4. Help the project team address, in retrospect, whether or not the necessary project management processes have been applied.

5. Conduct administrative closure of any and all procurements in that specific phase. Assuming an external party was contracted to develop or contribute to the design of a specific product, the phase-gate review is an opportunity for the project team to work with that contractor on closing out the contract by:

    1. Reviewing that all work on the contract has been completed—and taking corrective actions as applicable.

    2. Reviewing that both parties have completed their contractual obligations toward each other, and if not, fulfilling all such obligations.

    3. Obtaining approval that the work of the contractor has been accepted, and like point 1 above, eliminating any future objections that can leave the contractor or the project team liable.

    4. Ensure that all payments have been made, and all products/services received, and avoid unnecessary delays or missing requirements.

6. Conduct formal recognition of the completion of a phase. As a result of all the activities above, all stakeholders will recognize, formally, that a phase has been completed. The project team is able to establish such consensus and hold the deliverables of the elapsed phase as part of the scope baseline.

7. Many projects continue to progress for months if not years expending organizational resources and efforts only to end up with a result that is different from what was projected in the initial business case. The project management team can avoid such failure by ensuring that the project is still in alignment with the organization's strategic objectives. This can be achieved through the periodic validation of the project and its business case, during a phase-gate review.
8. Validate all the assumptions and constraints that planning was based on. It is of great importance to the project team to understand whether their assumptions (elements of uncertainty that were considered to be true for the purpose of planning) are still valid or not, as well as to understand whether certain constraints (elements of uncertainty that were considered to be true in limiting the project management team's options for the purpose of planning) are still applicable. Assumptions and constraints are essential to every plan, and because they define the boundaries of the plan, it is important to periodically validate them. Project teams are often intertwined and mired in the details of their projects, and hence, stopping to validate assumptions and constraints can easily be overlooked, though unintentionally. The phase-gate review presents an opportunity for such validation.
9. Capture lessons learned is another activity of great value to an organization that is conducted as part of project closing, and the benefit of which is maximized if also conducted during project phase-gate reviews. Capturing lessons learned is a very simple exercise, and requires the project team to answer two questions:

    1. What was done well, and should be documented so it can be repeated in the future?
    2. What could have been done better? And if so, how could it have been done better?

10. Influence the management of the next phase. Once all the processes above are completed, the project management team will be in a position to comprehensively review its plans for the next

phase, or phases of the project. This is equivalent to getting a second chance at planning the remaining portions of the project.

All the points stated above address the necessity of conducting project closing at the end of each project phase.

2.1.6. Challenges in the closing phase of construction projects

In any construction project, the goal of the project manager is to obtain the stakeholders acceptance of the project result. This means that the consultants of the project, the client and other stakeholders if any agree that the quality specifications of the project parameters have been met. In order to make this go smoothly, the stakeholders and the contractor must have a well-documented criteria of performance in place from the beginning of the project. This information should be documented in the project management plan which should include all changes requested through the life of the project to ease the project closure phase.

But many organizations in the construction sector fail to do so. The contractor who is responsible for many of the tasks in the contract rarely understands the benefit of proper project closures. The challenge in construction project closure starts from the selection of the project manager who is responsible for the construction project. Many companies assign project managers for their construction projects based on their technical skill and on their physical accomplishment of previous projects. This project manager's excitement is on the delivery of the project to their clients. Team members who were excited by the project in its early stages may find it difficult to maintain their focus to complete the project. They might already be looking forward to the next project. Bringing a project to an end requires a different management style that focuses on details as well as an analysis of the decisions that were made (Russell and John, 2012). The absence of such project managers with the required project management style in the construction industry is a challenge in performing the proper closure of projects.

In addition to the assignment of inefficient project managers, the team consideration of project closure as a

task which doesn't add value, lack of accountability on missing this crucial phase, absence of transition plan and rushing into the next project are the challenges that prohibits the conduct of proper project closure (Gregory, 2006). The overall challenges of project closure arise from either internal or external to the project (Kaul, 2014). These internal and external challenges of project closeout that possibly affect the project are explained as follow:

a) Internal challenges: This type of challenges is under the control of the owners/clients, contractors, and consultants. It was identified internal related challenges of project closeout arises from the technical, financial, administration or psychological factors. The project closure challenges related with contractors, the focus of this study, are discussed as follow:

Contractor related challenges: Usually, contractors are driven to complete projects in the shortest reasonable time to save overhead costs and receive final contract payments (Rogers, 2012). Contractor-related challenges arise due to the contractor's mismanagement in handling key construction project activities. Therefore, the contractor is responsible for the successful execution of the construction design; they can be attributed to most of the delays (Archarya et al. 2006).The contractor, in their opinion, controls the construction finances, undertakes job planning, scheduling and site management, manages supplies and coordinates among other items between the workers. Consequently, if these are not well handled, it may result in delay and or failure of the project. Contractor-related project closing challenges may be due to technical, financial, administrative or psychological factors.

Technical: In order to ensure that the project delivers what has been promised, most of the technical issues and issues that could be addressed during the project's execution and control phases will arise during the final phase of closure (Heerkens, 2002). The technical challenges arise from contractors are, excessive/multiple punch lists, absence of a clear handover strategy , delay in performing testing of equipment and engineering systems after substantial completion, errors and discrepancies in design

documents, vague details in drawings, contractor (subcontractor personnel transferring to new projects) lack of sufficient staff in closeout stage, thorough/detailed/ identification and agreement on all remaining deliverables, shortage / late arrival of resources, i.e., manpower, materials and equipment in closeout stage / and inability to finish punch lists due to lack of appropriate technical manpower.

Psychological: Approaching the project's closure process, the performance of the team begins to falter. After finishing their research, some team members have disappeared; those who remain may be worried about "life after this project." Team members (or those remaining) are struggling to complete the last few tasks, which may not have been included in the original plan. This is a difficult time for the project manager to fight against the team‘s loss of interest or looking for the next assignment. The psychological challenges that face at the closer out stage identified are: loss of team functionality as some members complete their tasks, loss of interest in tasks such as documentation, attention is diverted as members transition into new projects or other work, lack of urgency in approach, enthusiasm and motivation of parties involved due to achieving substantial completion and fear of no future work.

Administrative: Administrative challenges such as inadequate planning of contractor and inadequate contractor experience were found to be the of causes delay in project closure. Examples of administration challenges are contractor lack of preparedness and planning for closeout, completing punch lists in occupied space, improper / untimely contractual closeout documentation, and lack of contractor commitment to meet contractual agreements /like providing spare parts (Murali et al. 2007).

Financial: Another study identified that the problems of subcontracting, unorganized structure of the contractors, financial problems of contractors and the low quality of work by contractors were found to be the causes of delays in settling financial issues (Essam, 2006). The dispute between Contractor and other parties can trigger project delay. For example, disagreement on the cost of additional work with clients

and contractor poor financial control system can be also the challenges of project closure (Sadi et al. 2006).

b) External challenges: This group of challenges are out of the control of owners/clients, contractors, and consultants. A study on external challenges concluded that the political environment affects the construction of a project and changes in government actions are a major external risk factor militating against the success of projects. An external challenge includes federal regulatory requirement (government interest in early completion of the project), weather effect on construction activities, and accidents during construction and delays in providing utility services (David, 2016).

2.1.7. Project closure in Ethiopian Construction Companies

Construction project closeout refers to completion of a construction contract and includes a number of administrative, contractual and technical activities such as: completion of listed items, furnishing documents, operations and maintenance information, final inspections, corrections, resolution of claims and change orders, submission of contractor's verification forms, final acceptance of the work, final payment applications, payment by the owner, commencement of the warranty period, as well as an owner's internal administrative processes. Formally, contract closeout is the process by which contracts are verified complete, administratively processed for official closure. In general, closeout is completed when all administrative actions have been finalized, all disputes settled, and final payment.
Due to absence of checklists and poor documentation, Ethiopian construction companies are seen confused during closing a project. This problem will cause dissatisfaction of clients and prohibits smoothly finishing of projects. Literatures written towards the Ethiopian Construction projects mainly focus on quality problems, delays and cost overrun. This implies that construction closure is overlooked in our construction projects.

2.1.8. The key elements and Significances of project closure in construction projects

The significance of effective construction closeout has been articulated by the City of Seattle as "an important part of the City's capital development process because it ensures fulfillment of contractual and legal obligations before releasing final payment to the contractor, and it facilitates commissioning the built infrastructure" (City of Seattle,2005). In the current era of tight budgets and scarce funding, the efficient and effective conclusion of project closeout is undoubtedly in the best interest of all project stakeholders. The importance of timely contract closeout goes beyond time and cost considerations (Pinto,1998).

It was also observed that good closeouts are necessary for "aesthetic," administrative, and customer-relations reasons. Aesthetics in relation to closeout means that the project terminates in a pleasing manner and that loose ends are tied-up.

Psychologically, stakeholders perceive that the project was in control until the end. An environment of efficient organizational operations exists administratively when good closeout practices are in place. Finally, customer relations are improved for the reason that "…good closeouts maximize customer satisfaction and increase customer confidence that the project has been implemented with care. Messy closeouts can cause customers to question the competence of the project team and may lead to delays in customer acceptance of the deliverable''(Pinto, 1998).

In project closeout the following key elements shall be addressed:

- Turnover of project deliverables to operations.
- Closing out financial accounts.
- Completing, collecting, and archiving project records.
- Documenting the successes of the project.
- Documenting lessons learned.
- Planning for Post Implementation Review

- Getting acceptance from the client of the project
- Assessment of team members
- Recognition of team members
- Release of resources

2.2. Empirical Literature Review

The aim of this empirical review is to explain about the importance of proper project closure and its challenges based on observed and measured prior research findings and derives knowledge from actual experience rather than from theory.

A study conducted on the Construction projects in universal electric access showed that identified owner interference, slow decision making, unrealistic contract duration and requirements imposed on the contractor by project owners contribute delays in closing construction projects (Meaza, 2015). Another study on construction project points out that there is a dichotomy between construction project product and service; a construction project can be built to a very high level of quality, but the owner may still feel dissatisfied with the contractor's performance, due to a poor level of client management on the contractor's part. Owner dissatisfaction can also result from their having unreasonable or unclear expectations of the construction project. This dissatisfaction will lead to refusal during the handing over of projects which in turn hinders project closure (Garnant, 2005).

A study by Busansky investigated contract closeout on federally funded projects and identified several closeout problems sources which include process friction, inadequate information technology, long-life contracts, personnel skill level, contract financial issues, management concerns, perceptions, timeliness, problem process steps, existing backlogs, inadequate manpower, and records and file documentation. In the study the author considered these problems to be "pathologies" that should be addressed (Busansky, 2003).

Closeout is a concern to project managers across diverse industries and organizations. For example, in a 1993 customer survey, the Defense Contract Management Command (DCMC) identified the contract closeout process to be "one of the most important services to be provided and one with which customers are least satisfied" (Dinsmore, 1993). Dinsmore points out that even though contracts do not usually delineate a closeout phase, it is indeed a distinct phase requiring its own management.

Research conducted by Michigan State University (MSU) Centre for Construction Project Performance Assessment and Improvement has showed that closeout of construction projects is an important and frequently painful step in delivering a project, and virtually all organizations interviewed expressed some dissatisfaction with this phase of a project. Consequences of slow closeout can include lost administrative time, perceptions by end-users of an inefficient operation, and increased project costs through extended general conditions or increased bids. Through this project the researchers have attempted to understand the closeout process, by considering any previous research, establishing a benchmarking perspective, determining causes of slow closeout, identifying effective strategies and making recommendations for improving closeout within organizations. While the focus has been on university systems, and utilized a case study of Michigan State University, it is believed by the researchers that many other types of owners who have active building programs with multiple projects can benefit by employing the recommendations.

Statistical study of 36 MSU projects shows that typical closeout times for larger projects may average approximately seven months from substantial completion to final payment of the contractor. Additionally, after the contractor has been paid, the owner may spend on average an additional seven months on final accounting, documentation and self-performing work. These average times are believed to be long but are not unusual for many large public organizations. While no published closeout data was found, the researchers considered interview data from contractors, architects, other universities as well as workshop participants and survey respondents, in concluding that these average times represent a fairly typical picture of the industry. The possible causes for this slow closeout vary from project to project. Each project has its own circumstances, project conditions and personnel which influence the time to closeout a

specific project. Study participants suggested over 100 different causes. None the less, there are many strategies which can potentially help to reduce closeout times for organizations who wish to do so. In the study 23 recommendations are made for Michigan State University which can lead to shortening closeout times. General themes of these recommendations include creating a strong organizational commitment to effective closeout and communicating it at all organizational and project levels, establishing clear standardized processes and forms, considering closeout early in a project, utilizing project management software to coordinate and track documents and their status, reducing layers of approval within the organization, coupling payment to closeout documents such as operations and maintenance manuals and as-built documents to the contractor's schedule of values, as well as, the use of retainage. Most importantly the researchers believe that, recognizing the importance of effective closeout and having a plan for its management are likely the two most important steps in improving this final phase of a project (Michigan State University, 2008).

Another research conducted on the importance of closure has provided a comprehensive and systematic analysis of the closure process for programs funded under the European Regional Development Fund and the Cohesion Fund in 2007-13, explaining that program closure is often seen as a purely technical process Ferry & Kah (2013). It involved shutting down the 22 operations of a program, finalizing the reporting and recording of results, and ensuring sound financial management. This included the preparation of a series of documents for each operational program that together forms the closure package- an application for payment of the final balance, a final implementation report and a closure declaration. The research showed that the quality of the closure process has been determined by the administrative capacity and governance approaches of program authorities. Closure should be perceived as an integral part of program implementation and this role is conditioned by financial absorption pressures, the type of operations included in programs and administrative capacities. Financial absorption pressures are prominent as closure approaches. As per this study, to communicate achievements it is important to strengthen linkage of closure more carefully to the reporting of program achievements and outputs. The European

Commission (EC)'s efforts to build capacity for closure found to be continue, closure is regarded as an issue for the lifetime of a program, not just for the final years, it should remain a priority for program authorities and project sponsors, and to ensure commitment from all those involved in closure, administrative tasks associated with closure are substantial, and program authorities must ensure that sufficient capacities are made available (training, recruitment, outsourcing etc.). The formal obligations associated with closure are important for the need to ensure that programs are fully committed and spent, while recognizing the tension between being able to spend for as long as possible and having enough time to organize closure. Settling of the final balance, which cleared all preceding expenditure to operations or the recovery of sums paid in excess by the EC, is the aspect of closure emphasized in the Financial Regulation. The process of terminating a program consist the submission of 'closure package' of documents (Ferry & Kah, 2013).

Another study showed that less experienced professionals tend to underestimate the impact of the closeout phase (Kaul, 2014). This study can be a useful resource for such entry level project engineers or less experienced professionals. Based on the response of the participants of the research, these factors were listed in order of their impact on delaying the closeout phase. The degree of these impacts is categorized as high, medium and low depending on the observed mean values compared to the mean value of 3. As mentioned above, this list was prepared as a guide for entry level professionals who did not have experience with relation to the closeout phase. Even though a team member may not be directly responsible for a particular factor affecting the closeout phase, this template can be a useful resource to alert the concerned department, so that the impact of that factor can be mitigated. For example, in this case, multiple punch lists had the highest impact at the lowest mean of 1.38, which indicated that industry professionals on an average agreed that multiple punch lists is the leading reason for delayed project closeouts. By keeping this in mind from the beginning of the project, the team member can take steps or alert the concerned department to ensure that multiple punch lists are avoided. Some of the mitigation steps could be, to remind the contractor of small formalities they could complete to avoid multiple punch

lists, to ask the sub-contractor to follow only one punch list and submit all operation manuals on time, and to remind the client of the confusion multiple punch lists could create. This is maybe best assured by including a relevant contract clause for punch list procedures in the General Requirements of the contract, or, at least, with a less formal agreement between owner representative and contractor to manage the process that way. In this manner, if every factor on the template guide is taken care of, the closeout phase will be a smooth process with final completion being achieved without any delays. To provide an overview of the results, multiple punch lists and improper / untimely contractual closeout documentation from the administrative factors, owner directed change orders from the financial factors, and lack of urgency in approach enthusiasm and motivation of the involved parties from the psychological factors were found to be high impact factors. Some of the low impact factors were accidents on the job site, and technical knowledge of the project professionals responsible for closing out projects. These results conform to the findings based on the literature review and the author's experience in the construction industry where it has been noticed that multiple punch lists, changing scope and owner directed change orders are the most major causes of delayed project closeouts. On the other hand, accidents on site and technical knowledge of the professionals are something that would be more of a concern while achieving substantial completion. Of the four factors, technical factors showed a deviation from the expected response, which might be attributed to the fact that once substantial completion is achieved, there is very little technical knowhow required to achieve financial completion. Also, some interesting findings presented in the concluding section were useful to ascertain if the demographic factors, like geographical region and construction sub-sector, had any influence on the factors affecting project closeout. For the above-mentioned analysis, only the top four high-impact factors were considered, namely multiple punch list, owner directed change orders, lack of urgency in approach, and improper documentation. Statistical tests were done to test the dependence of each of the above-mentioned factors with the demographical attributes of the respondent. It was concluded that the respondent's attributes like sub-sector and geographical region, influence their response for the four factors mentioned above. While this compels to

infer that the factors affecting closeout are dependent on the demographic factors, a detailed study exploring the localized causes for these demographic factors would provide better insight. The factors considered are generic with respect to the sub-sectors and other demographic attributes, however, localized questions specific to the mentioned demographic attributes, like closeout activities followed in different regions, difference in closeout phase with respect to sub-sector, etc. could be explored based on which a detailed study could be conducted.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1. Introduction

The research methodology refers to the procedural framework within which the research will be conducted. This chapter presents how the current study is designed and provides a clear description of the specific steps that will be taken to address the research problem. For this thesis research methodology, description of the study area, the research approach, the research design, population and sample, data sources and types, data collection procedures, ethical consideration and methods of data analysis are described each in detail below.

3.2. Description of the Study Area

The study was conducted on selected Grade One General contractors with their office located in Addis Ababa. Construction experts working at the head offices of the contractors were included in the study. Project managers who are working on projects situated and contracted by GC 1 contractors were part of this study.

3.3. Research Approach

The study is intended to assess the challenges of project closeout in construction projects by Ethiopian Contractors. There are three research approaches: such as qualitative, quantitative and mixed methods in conducting research (Creswell, 2013). Based on the character of the research questions, here, in this study, a mixed approach has been used. In this regard, both qualitative approach and quantitative approach were incorporated to provide alternative insight and to identify major challenges of the project closeout process. Depending on the type of data that can be used in the research, the general research approaches was identified, qualitative or quantitative. In this study, both types of data that can and cannot be quantified were used. The quantifiable data was gathered by closed ended questions of the questionnaire which was

designed to keep the respondents in scope. There were also open-ended questions and face to face interviews providing unquantifiable data, which was designed to provide respondents with the freedom of expressing what they believe important for the study. This has led to the study to use a mixed research approach in which both qualitative and quantitative research methods were applied.

3.4. Research Design

Research design is the plan, structure, and strategy of examining conceived so as to obtain answers to research questions. Research Design stands for advance planning for the methods to be adopted for collecting the relevant data and the techniques to be used in their analysis, keeping in view the objective of the research and the availability of staff, time and money. Preparation of the research design should be done with great care as any error in it may upset the entire project (AAUSC, 2014). In this study, descriptive study design was employed.

3.4.Population and Sample

The target population is defined as the whole group a researcher is interested in to study. Population contains those group or individuals who are in a position to answer the questions and to whom results of the survey apply (Zikmund, 2003). The populations of this research were professional employees of GC 1 (Grade 1 General Contractors) Contractors where their head office or project is located in Addis Ababa. For the purpose of this research 15 construction companies of Grade One local contractors were selected from the 61 grade one general contractors labeled by the Ministry of Urban and Infrastructure. The grade of the contractors was identified according to the data obtained from this office formerly known as Ministry of Construction. The major reason for selecting this grade was in order to limit the population in to an affordable size for the study and the other basic reason is to control that the population of the research focused on those contractors which have various multimillion birr projects that play a major and vibrant role in Ethiopian construction industry. Both Purposive (non-probability) and Systematic (probability) sampling methods were used to determine the sample size. A homogeneous purposive sampling was used in determining the respondents from the fifteen

construction companies. Systematic sampling method was used to select the fifteen grade 1 general contractors.

3.5. Data Sources and Types

Both primary and secondary types of data were employed for this study. Primary data represents data obtained first- hand by the researcher on the variable through structured questionnaire and interview. This primary data was obtained from the employees of the selected grade one contractors for the specific purpose of this study. Secondary data was collected from already existing documents in the construction companies and other publications that are related to the study.

The primary data for this research was collected through questionnaire and interview from sample respondents of the contractors who are directly participated in the project closeout stage. The secondary data were collected or referred from different websites. For this research, structured questionnaire was designed, distributed and filled by the sampled respondents to collect primary data. Interviews were conducted with concerned management bodies and technical staffs of the contractors to gather the relevant primary data.

3.6. Data Collection Procedures

The data collection procedures used for this study were interview, questionnaire and document review method. The interview method was structured interview; interviews were conducted with 3 purposely selected interviewees, a project manager and 2 technical experts, from the grade one contractors to collect in depth information about their view about the efforts in addressing the challenges of project closeout. The other method used was self-administered questionnaires that were distributed to the respondents.

3.7. Methods of Data Analysis

As the term analysis implies, data analysis is a process and consists of numerous decisions and discrete tasks that can be unique to a particular research project. In particular, data analysis consists of a series of activities that can involve the application of several stastical techniques in a variety of different ways. These activities must be closely coordinated so that all the information necessary for decision making is extracted from a data

base. Therefore, for every data analysis to be effective, each analysis activity must be approached in a systematic fashion so that meaningful decision results (AAUSC, 2014).

The data analysis procedures used for quantitative data of this study were statistical analysis of descriptive statistics like frequency, mean and the Relative Importance Index (RII) that helps to describe and understand the features of specific data set by giving short summaries about the sample and measures of the data. The RII was measured using the formula as follows:

$RII = \sum W/(A*N)$,

where, $0 \leq RII \leq 1$ W:- is the weight given to each factor by the respondents and it will range from 1 to 5, (where ―1‖ is ―strongly disagree‖ and ―5‖ is ―strongly agree‖);

A: - is the highest weight (i.e. 5 in this case) and;

N: - is the total number of respondents.

3.8. Ethical Consideration

Ethics are norms or standards of behaviors that guide moral choices about our behavior and our relationships with others. The goal of ethics in research is to ensure no one is harmed or suffers adverse consequences of research activities. This objective is usually achieved. However, unethical activities are pervasive and include violating nondisclosure agreements, breaking respondent confidentiality, mispresenting results, deceiving people, invoicing irregularities, avoiding legal liability, and more (Zikmund, 2003).

This study respondents were informed the confidentiality of the study to ensure respect for the dignity of participants. Their confidential information was only be accessed by the researcher. The respondents were not required to write their names in the questionnaires or interview schedules. Respondents were not forced to participate except those who were voluntarily agreed to participate in the study. After the study has been completed and a final report written, the tools used to collect data were ruined. The study has arrived at conclusions based on objective inferences that were purely guided by the data to be collected. The analysis of data and interpretation of the results of data analysis were limited to what the data actually tell. But

triangulation was done among the findings obtained from documents reviewed, questionnaires and interview to show the validity and reliability of the result.

CHAPTER FOUR

RESULT AND DISCUSSION

4.1 Introduction

The data that were collected regarding project closure from the respondents who are in the construction sector are organized in a systematic format in this chapter to enable analysis. Kombo and Tromp stated that analysis refers to examining coded data critically and making inferences while presentation refers to ways of arranging data to make it clearly understood (Kombo and Tromp, 2006). In order to identify the challenges of project closure faced by the Ethiopian contractors, the researcher analyzed the data in line with the objectives of the study. The study analyze the data to categorize the factors such as technical, financial, psychological and administration factor as an internal challenge by the contractors in the project closure. The external challenges faced by the contractors are also analyzed.

A total of 45 questionnaires were distributed to respondents in different construction companies. 30 of the questionnaires were given directly to respondents in hard copy. The rest 15 questionnaires were sent electronically through telegram for the respondents. A total of 40 questionnaires, 12 from the electronically sent and 28 from what is given directly is collected responded by the respondents. This constitutes a response rate of 89%. A response rate of 50 percent is adequate for analysis and reporting (Mugenda and Mugenda, 2003).

4.1. Questionnaire Response Rate

Category	Frequency	Percentage
Responded and returned	40	89%
Not Returned	5	11%
Total	45	!00%

Table 4.1. Questionnaire response rate

4.2. Demographic variables

In this section, the researcher identified the demographical information of the respondents such as sex, work experience in the construction sector, education background or field of study, education level and the organization they are or were working for that was used for the analysis.

No		Demographic Variable	Frequency	Percentage
1	Sex	Male	28	70%
		Female	12	30%
		Total	40	100%
2	Age	20 – 30	9	22.5%
		31 – 40	23	57.5%
		41 – 51	8	20%
		> 51	0	0
		Total	40	100%
3	Educational Level	Undergraduate	2	5%
		Bachelor	23	57.5%
		Masters	15	37.5%
		Phd	0	0
		Total	40	100%
4	Length of Experience in the construction Sector in years	0 -2	0	0
		3 -5	3	7.5%
		6 – 10	9	22.5%
		10 – 14	15	37.5%
		>= 15	13	32.5%
		Total	40	100%
5	Job Title	Project Manager	6	15%
		Project Engineer	12	30%
		Department Manager	4	10%
		General Manager	5	12.5%
		Others	13	32.5%
		Total	40	100%
6	Construction Experience	Building	21	52.5%
		Road	2	5%
		Bridge	0	0%
		Railway	0	0%
		Irrigation	1	2.5%
		Dam	0	0%
		Others	16	40%
		Total	40	100%

Table: 4.2.Demographic variables

4.2.1. Sex

In the questionnaire, the respondents were asked by the researcher to give their sex as part of the moderating variable of the study. The data presented in the above table reveals that there was a difference in the representation of both male and female. From Table 4.2, male is the mode for gender which occur more times (28) than that of female (12). Putting this in percentage, the survey shows that (28) 70.0% of the respondents were male and (12)30.0% were female. The result indicates that there was gender inequality; this could be due to the fact that in a construction project it is common that the majority of the workers are male. From this data, it is found out that women have little involvement on construction projects.

4.2.2. Age

Age of the respondents was asked in the questionnaire in order to gather the age dispersion of the respondents in the construction work. The survey shows that 9 (22.5%) of the respondents were in the age between 20 – 30 years, 23 (57.5%) of the respondents were in the age between 31 – 40 and the rest 8 (20%) of the respondents were in the age between 41and 51. The result indicates that adults in the age between 31 – 40 years are the main actors in the Ethiopian construction industry.

The mean (35.23) calculated for this data, as shown on table 4.2.2.1 , also well represent the fact shown above by percentage analysis where 57% of the actors in the construction are between the age 31 and 40.

Age	Frequency (f)	Mid value (x)	Fx
20 -30	**9**	**25**	**225**
31 – 40	**23**	**35.5**	**816.5**
41 – 51	**8**	**46**	**368**
>51	**0**	**51**	**0**
Total	**40**		**1, 409.5**

Table.4.2.2.1

Mean $= \sum fx/\sum f = 1{,}409.5/40 = 35.23$

4.2.3. Educational Level

In order to allow the researcher whether construction projects in Ethiopia are deploying professional expertise to fulfill their human resource requirement by hiring qualified employees; the educational background of the respondents were collected and analyzed. Referring to table 4.1., 2 (5%) of the respondents were under graduates. This result shows that though their number is insignificant, there are construction employees that do not have first degree are responsible for managing construction projects. From the study it is found that most of the respondents, 23(57.5%) which is mode for the educational level, were bachelor degree holders. 15 (37.5%) of the respondents were Master's degree holders as it is indicated in table 4.1. There was no PhD holder from the respondents. The study showed that most of the professionals in the construction project management are bachelor's degree holders which indicate there is a gap in assigning staffs that have developed their carriers through education which enables them to understand how they can manage projects and conduct proper project closure.

4.2.4. Length of Experience in the construction sector in years

The respondents were asked in the questionnaire to respond how long they have been in the construction projects. 3 (7.5%) of the respondents have been engaged in construction projects for 3-5 years. 9 (22.5%) of the respondents have a construction project experience of 6 -10 years. Most of the respondents, 15(37.5%), have been in construction projects for 10-14 years. Those respondents who have been in construction project for more than 15 years were 13 (32.5%). From this analysis, it can be seen that most of the project management activities including the project closure is performed by those who have been in the construction project for 10 – 14 years. The experience is good enough to handle those project management activities including performing proper project closure. Calculating the mean for this grouped data, it is found to be 11.47 years supporting the result found by percentage analysis.

4.2.5. Job Title

The job title of the respondents was asked in order to relate their duty in the project management activities including project closure tasks. 6 (15%) of the respondents were project managers. Project engineers constitute 12 (30%) of the respondents making up the most responses in the study which shows project engineers

supposed to be mode of the job title. 4 (10%) of the respondents were department managers. General Managers of the contractors were 5(12.5%) of the respondents. Project coordinators, project follow up and support engineers, quantity surveyors, contract engineers and team leaders were other professional that constitute the rest 13(32.5%).

4.2.6. Construction Experience

The respondents were requested to answer their experience in the construction projects and the following result is obtained. Most of the respondents, 21 (52.5%), have construction experience in the building sector. This implies that experience in building is the mode in our analysis. 2 (5%) of the respondents have the experience of road construction projects. 1 (2.5%) 0f the respondents are engaged in irrigation projects where as the rest 16(40%) of the respondents were with construction experience in different trades.

4.3. Attitudes of respondents on Project Closure

The responses of the respondents regarding project closure were measured by a five-point Likert scale; 1. Strongly disagree 2. Disagree. 3. Neutral, 4. Agree, and 5. Strongly agree.

No.	Question	1 Strongly Disagree	2 Disagree	3 Neutral	4 Agree	5 Strongly Agree	Mean
1	The objectives for the projects under your organization are clearly defined.	0	1	4	15	20	4.98
2	The role and responsibility of project workers clearly defined.	0	2	5	23	10	4.03
3	Exit champion is assigned on any of your projects.	7	10	19	4	0	2.5
4	Your company has a proper recording culture of site book, site diary, and minutes of meeting and site correspondences.	0	7	5	23	5	3.65
5	Your company refers these documents during project closure.	1	8	7	21	3	3.43

No.	Question	1 Strongly Disagree	2 Disagree	3 Neutral	4 Agree	5 Strongly Agree	Mean
6	The entire team in your organization is committed to the project Closeout.	2	5	11	18	4	3.43
7	Your organization document the lessons learned when projects are completed.	3	10	10	15	2	3.01
8	Compared to other phases of construction, the closeout phase is not difficult to successfully execute.	5	10	17	7	1	2.73
9	On typical projects where the work progresses according to schedule, the closeout phase usually is executed according to schedule, as well.	4	13	8	11	4	2.95
10	To the extent that there are delays in project closeout, they are usually due to another party‘s actions/inactions, rather than my firm.	1	10	15	11	3	3.13
11	The construction company where I am working at has formal system for managing/implementing project closeout.	1	9	10	16	4	3.33

Table 4.3. Respondents’ attitudes on project closure

The result represented above in table 4.3. is used to analyze the attitude of respondents about project close out in construction projects. From the result, most of the respondents, 35 (87.5%), agreed that the objectives for the projects under their organization are clearly defined. 4 (10%) of the respondents are neutral and only 1 (2.5%) of the respondents disagree with the statement “The objectives for the projects under your organization are clearly defined”. This result shows that most organization have not problems in defining their objectives. The mean value, 4.98, also supports that most of the respondents are agreed with the capacity of their organization in clearly defining project objectives. Participants on a study conducted on the impact of goal setting on employee effectiveness shared and articulated the various goals

of the organization and their departments. In the study, it was noted that 80% of the participants were aware of their organizational goals but may not interpret it in the same way (Teo and Low, 2016). The result finding aligned with this study conducted by Teo and Low.

33 (82.5%) of the respondents agree that the role and responsibility of project workers is clearly defined in their organization. 5 (12.5%) of the respondents were neutral and 2 (5%) of respondents disagree with the statement "The role and responsibility of project workers clearly defined." This result also shows us most construction companies are good at in defining the role and responsibility of their workers. The mean value, 4.03, for this statement also shows us the role and responsibility of project workers clearly defined in the respondents' opinion.

4 (10%) of the respondents agree that there was exit champion assigned on their previous projects. 19 (47.5) of the respondents were neutral. 17 (42.5%) of the respondents disagree with the statement "Exit champion is assigned on any of your projects". The result shows that most of the Ethiopian construction contractors are not aware of about assigning exit champions on their projects. The mean value which is 2.5 supports this result.

With the statement "Your company has a proper recording culture of site book, site diary, and minutes of meeting and site correspondences." 28(70%) of the respondents were agreed. 5(12.5%) of the respondents were neutral and 7 (17.5%) of the respondents disagree with the statement. The result shows that there is a culture of a proper recording of site book, site diary, and minutes of meeting and site correspondences in most Ethiopian contractors in the construction projects. The mean value for this statement is 3.65 which shows most of the respondents have agreed with in a proper recording culture of site book, site diary, and minutes of meeting and site correspondences in their respective organizations.

24 (60%) of the respondents agree with the statement "Your company refer these documents during project closure." 7(17.5%) of the respondents were neutral and 9(22.5%) of the respondents disagreed with the statement. This result shows us most of the contractors use site book, site diary, and minutes of

meeting and site correspondences during project closure. The mean calculated (3.43) for the statement confirms this too.

22 (55%) of the respondents agreed that the entire team in their organization is committed to the project Closeout. 11 (27.5%) of the respondents were neutral and 7(17.5%) of the respondents did not agree with the statement. From the result it is noted that most of the Ethiopian contractor workers are committed to project close out as a team. The mean value, 3.43, also confirms the result found by the percentage analysis.

Most of the respondents, 17(42.5%), agreed that their organization document the lessons learned when projects are completed. 10(25%) of the respondents were neutral and 13(32.5%) of the respondents disagreed with the statement. This result shows there are Ethiopian Contractors that documents the lesson learned when projects are completed. The mean value for this statement is 3.01 as shown on the table supporting the result by the percentage analysis.

8 (20%) of the respondents agreed that compared to other phases of construction, the closeout phase is not difficult to successfully execute. 17 (42.5%) of the respondents were neutral and 15 (37.5%) of the respondents disagree with the statement. The result shows that there are more Ethiopian contractor workers who believe that the project close out phase is difficult to successfully execute than those who don't with a mean value of 2.73 for the statement.

The statement "On typical projects where the work progresses according to schedule, the closeout phase usually is executed according to schedule, as well." is agreed by 15(37.5%) of the respondents. 8 (20%) of the respondents were neutral and the rest 17 (42.5%) disagreed in their responses with the statement. The result indicates that most of the construction workers in managing projects do not believe that running the work progress as per the schedule will result in the execution of the close out phase as per the schedule. The mean value, 2.95, shows this opinion of the respondents.

14 (35%) of the respondents agreed that to the extent that there are delays in project closeout, they are usually due to another party‘s actions/inactions, rather than my firm. 15 (37.5%) of the respondents were neutral and 11 (27.5%) of the respondents disagreed with the statement. From the respondents who agreed with the statement it can be recognized that most Ethiopian contractors blame other parties for the delays of the close out phase in their construction projects. The mean value for this statement is 3.13 as shown on the table supporting the result by the percentage analysis for the agreement of the statement by the respondents.

Most of the respondents, 20 (50%), replied that the construction company where they are working at has formal system for managing/implementing project closeout. 10 (25%) of the respondents were neutral and 10 (25 %) of the respondents disagreed with the statement. From the result, it is recognized that most of the contractors have a formal system for managing the project close out. In addition, the mean value (3.33) for the statement supports this opinion for most of the respondents.

Since Likert method assumes equal weights for all items, respondent’s responses to each item are summed to create a composite score for that respondent. So, the single summed value for the questions from table 4.3 and the mean for the entire table which is 3.38 shows that the respondent’s attitude towards proper closure is in the neutral range in regard to defining project objectives in their organization, in defining the role and responsibility of employees, in proper recording and using of documents during project closure along with the commitments of the project team.

4.4. Respondents Attitude on Internal challenges on project closure by Ethiopian Contractors

A five-point Likert scale; 1. Strongly disagree 2. Disagree. 3. Neutral, 4. Agree, and 5. Strongly agree is used to measure the response of the respondents regarding the internal challenges on project closure.

No.	Challenges	1 Strongly Disagree	2 Disagree	3 Neutral	4 Agree	5 Strongly Agree	Mean	RII
1	Absence of a clear project closing strategy.	0	7	6	22	5	3.63	0.73
2	Delay in Performing testing of equipment and engineering systems after substantial completion.	1	6	13	17	3	3.38	0.68
3	Excessive/Multiple punch lists.	1	5	18	14	2	3.28	0.66
4	Errors and discrepancies in design documents, vague details in drawings.	0	5	10	21	4	3.6	0.72
5	Contractor/subcontractor personnel transferring to new projects /lack of sufficient staff in closeout stage.	0	4	11	16	9	3.75	0.75
6	Lack in thorough/detailed/ identification and agreement on all remaining Deliverables/	0	2	12	22	4	3.70	0.74
7	Shortage / Late-arrival of resources, i.e., manpower, materials and equipment in closeout stage.	1	4	8	22	5	3.65	0.73
8	Inability to finish punch lists due to lack of appropriate technical manpower.	0	8	10	20	2	3.4	0.68
9	Loss of interest in tasks such as documentation	1	6	5	25	3	3.58	0.72
10	Fear of no future work	12	13	5	8	2	2.34	0.48
11	Unavailability of key personnel i.e. the project manager	1	12	5	20	2	3.25	0.65
12	Lack of urgency in approach, enthusiasm and motivation of parties involved due to achieving substantial completion	0	4	6	18	12	3.95	0.79
13	Contractor lack of preparedness and planning for closure	1	5	3	18	13	3.8	0.76
14	Completing punch lists in occupied space	2	5	17	15	1	3.2	0.64
15	Lack of Contractor commitment to meet contractual agreements /like providing spare parts /	1	8	7	18	6	3.5	0.70
16	Improper / Untimely contractual closeout documentation	0	1	8	26	5	3.88	0.78

No.	Challenges	1 Strongly Disagree	2 Disagree	3 Neutral	4 Agree	5 Strongly Agree	Mean	RII
17	Poor financial control system	4	7	9	13	7	3.30	0.66
18	Disagreement on the cost of additional work	1	7	7	19	6	3.55	0.71
19	Late response on financial claims	0	3	8	18	11	3.93	0.79

Table 4.4. Attitude of the respondents on internal challenges for project closure

From the above table the study found out that the contractor internal challenge such as Lack of urgency in approach, enthusiasm and motivation of parties involved due to achieving substantial completion had great impact on project closure compared to other contractor related challenges with the mean score of 3.95 and RII of 0.79 that ranks 1st and late response on financial claims score as the second with 3.93 mean value with the same RII as the first. Improper or untimely contractual closeout documentation is the third internal challenge by Ethiopian contractors with 3.88 mean value and RII of 0.78. The fourth ranked internal challenge faced by Ethiopian contractors for conducting proper project closure is Contractors' lack of preparedness and planning for closure with mean value of 3.8 and RII of 0.76.

Contractor personnel transferring to new projects /lack of sufficient staff in closeout stage, lack in thorough/detailed/ identification and agreement on all remaining deliverables, shortage / Late-arrival/ of resources, i.e., manpower, materials and equipment in closeout stage, absence of a clear project closing strategy, errors and discrepancies in design documents, vague details in drawings, loss of interest in tasks such as documentation, disagreement on the cost of additional work, lack of contractor commitment to meet contractual agreements, inability to finish punch lists due to lack of appropriate technical manpower, delay in performing testing of equipment and engineering systems after substantial completion, excessive punch lists, unavailability of key personnel i.e. the project manager, poor financial control system and completing punch lists in occupied space are the other internal challenges in the project closure for Ethiopian contractors with mean value from 3.75 to 3.2. But the result found for multiple punch list, with

a mean value of 3.28, is against the result found by Kaul's study. From the respondent's response about the internal challenge in the project closure is fear of no future work with a mean value of 2.34 indicating this factor has very little effect on project closure by Ethiopian contractors.

From table 4.4, the internal challenges faced by the contractors in proper project closure can also be organized as technical, psychological, administrative and financial challenges. Those internal challenges from 1 to 8 are technical challenges faced by the Ethiopian contractors. The psychological challenges that are internal challenges for the contractors are those from 9 – 12 stated on table 4.4. The administrative and financial challenges faced by the contractors are those stated from 13 – 16 and 17 – 19 on table 4.4 respectively. The opinion of the respondents towards these internal challenges is analyzed below.

Respondents	Technical										Psychological						Administrative						Financial				
	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Sum (Tech)	Mean	Q9	Q10	Q11	Sum (Psy)	Mean	Q12	Q13	Q14	Q15	Q16	Sum (Ad)	Mean	Q17	Q18	Q19	Sum (Fin)	Mean
1	3	3	3	4	4	4	4	4	29	3.63	4	1	4	9	3.00	5	5	3	5	4	22	4.4	3	4	4	11	3.67
2	4	4	3	3	4	4	4	3	29	3.63	3	2	4	9	3.00	5	5	3	2	4	19	3.8	2	5	5	12	4.00
3	3	3	3	4	4	3	4	2	26	3.25	3	4	2	9	3.00	2	3	2	3	3	13	2.6	4	2	3	9	3.00
4	4	3	3	3	4	4	4	3	28	3.50	4	1	4	9	3.00	5	5	2	4	4	20	4	3	4	4	11	3.67
5	2	4	4	3	3	3	3	4	26	3.25	4	1	4	9	3.00	4	4	4	4	4	20	4	4	3	4	11	3.67
6	4	4	3	4	4	4	4	3	30	3.75	3	2	4	9	3.00	5	4	4	4	4	21	4.2	3	4	4	11	3.67
7	4	4	3	4	3	4	4	3	29	3.63	4	4	2	10	3.33	3	4	4	3	4	18	3.6	4	4	4	12	4.00
8	4	4	4	5	4	4	5	3	33	4.13	3	3	4	10	3.33	3	3	4	2	3	15	3	4	4	5	13	4.33
9	4	3	3	4	3	3	4	3	27	3.38	4	2	4	10	3.33	5	5	3	5	4	22	4.4	3	3	4	10	3.33
10	4	3	3	3	3	3	3	4	26	3.25	4	1	4	9	3.00	5	5	3	4	4	21	4.2	2	3	4	9	3.00
11	4	4	4	4	4	2	2	4	28	3.50	4	2	2	8	2.67	4	4	2	2	4	16	3.2	2	4	4	10	3.33
12	4	4	3	2	3	4	4	4	28	3.50	4	2	2	8	2.67	2	2	3	2	4	13	2.6	2	2	2	6	2.00
13	4	4	4	5	4	5	5	4	35	4.38	2	2	2	6	2.00	2	5	2	4	4	17	3.4	4	2	4	10	3.33
14	3	2	3	3	5	5	3	5	29	3.63	5	3	4	12	4.00	4	5	4	3	5	21	4.2	5	4	3	12	4.00
15	5	5	3	4	5	5	4	4	35	4.38	4	5	4	13	4.33	3	4	5	4	4	20	4	5	5	5	15	5.00
16	2	4	4	2	4	4	4	4	28	3.50	4	2	4	10	3.33	4	4	4	4	4	20	4	5	4	4	13	4.33
17	5	3	4	4	5	3	4	4	32	4.00	2	2	2	6	2.00	5	5	3	5	5	23	4.6	2	3	3	8	2.67
18	4	3	3	2	3	3	3	3	24	3.00	4	1	4	9	3.00	4	4	3	4	4	19	3.8	3	4	3	10	3.33
19	4	5	4	4	4	4	4	3	32	4.00	3	2	2	7	2.33	4	4	4	4	4	20	4	4	4	4	12	4.00
20	3	3	3	4	5	4	4	4	30	3.75	4	4	4	12	4.00	5	4	1	4	5	19	3.8	1	1	5	7	2.33
21	5	5	4	5	5	5	5	4	38	4.75	5	4	5	14	4.67	5	5	3	4	4	21	4.2	4	4	4	12	4.00
22	4	3	4	3	3	4	3	2	26	3.25	3	3	1	7	2.33	3	2	3	3	3	14	2.8	2	2	2	6	2.00
23	3	2	3	3	4	4	3	4	26	3.25	4	3	4	11	3.67	4	4	4	3	4	19	3.8	4	4	3	11	3.67
24	3	4	3	4	3	3	3	3	26	3.25	4	4	2	10	3.33	4	2	3	2	3	14	2.8	4	3	3	10	3.33
25	4	3	3	4	5	4	4	4	31	3.88	4	3	3	10	3.33	3	4	3	3	4	17	3.4	5	4	4	13	4.33
26	3	3	5	4	5	3	4	4	31	3.88	4	2	4	10	3.33	4	3	4	2	4	17	3.4	1	3	5	9	3.00
27	4	3	3	3	3	3	4	3	26	3.25	4	1	3	8	2.67	4	4	3	4	4	19	3.8	3	4	3	10	3.33
28	5	4	4	3	5	3	5	4	33	4.13	4	1	4	9	3.00	3	5	4	3	4	19	3.8	5	3	4	12	4.00
29	4	2	2	2	2	4	4	4	24	3.00	4	1	2	7	2.33	4	4	4	2	4	18	3.6	4	4	5	13	4.33
30	2	4	3	4	3	3	2	2	23	2.88	2	1	2	5	1.67	4	1	1	1	3	10	2	1	4	5	10	3.33
31	2	2	2	2	2	4	2	5	21	2.63	5	2	2	9	3.00	5	5	2	5	5	22	4.4	2	2	2	6	2.00
32	4	2	3	4	2	2	2	2	21	2.63	2	1	2	5	1.67	5	2	3	3	3	16	3.2	1	2	4	7	2.33
33	2	4	2	4	4	4	5	4	29	3.63	4	4	3	11	3.67	4	4	4	4	5	21	4.2	5	5	5	15	5.00
34	2	1	4	5	4	4	5	2	27	3.38	4	5	3	12	4.00	4	5	3	5	3	20	4	4	4	4	12	4.00

Res	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Sum (Tech)	Mean	Q9	Q10	Q11	Sum (Psy)	Mean	Q12	Q13	Q14	Q15	Q16	Sum (Ad)	Mean	Q17	Q18	Q19	Sum (Fin)	Mean
35	4	3	4	4	4	3	5	4	31	3.88	4	3	4	11	3.67	4	4	3	4	3	18	3.6	4	5	4	13	4.33
36	2	3	2	4	5	4	4	2	26	3.25	2	4	4	10	3.33	4	4	4	2	4	18	3.6	4	2	5	11	3.67
37	5	4	4	4	4	4	3	4	32	4.00	4	1	5	10	3.33	5	5	4	5	4	23	4.6	3	4	3	10	3.33
38	4	4	3	4	4	4	4	3	30	3.75	4	3	3	10	3.33	4	4	3	4	4	19	3.8	3	5	5	13	4.33
39	4	2	3	4	4	4	4	4	29	3.63	4	2	2	8	2.67	4	2	4	4	4	18	3.6	4	4	4	12	4.00
40	4	2	5	3	2	4	4	4	28	3.50	2	2	3	7	2.33	2	4	4	4	4	18	3.6	5	5	5	15	5.00
Technical AVG										3.57	Psychological AVG				3.07	Administrative AVG						3.7	Financial AVG				3.60

Table 4.5. Mean for internal challenges of Project closure.

Table 4.5. was developed to present the responses of all respondents towards each question on internal challenges of project closure. The questions were divided into four categories such as technical, psychological, administrative, and financial based on their contents related to the specific internal challenge. The result described in the table enabled to get the aggregated mean for each internal challenge.

In order to interpret and discuss the result in table 4.5 for the respective internal challenges, scoring range shown below in Table 4.6. is used.

S/No	Description	Score	Range
1	Strongly Disagree	1	1.00 – 1.80
2	Disagree	2	1.81 – 2.60
3	Neutral	3	2.61 – 3.40
4	Agree	4	3.41 – 4.20
5	Strongly Agree	5	4.21 – 5.00

Table 4.6. Scoring range of Likert Scale (Source: Internet/Research gate)

Administrative challenge with a mean of 3.7 which is in the range of 3.41 – 4.20, is seen in the analysis as the first challenge where most of the respondents agreed in hindering proper project closure in the construction projects.

The second internal challenge where the respondents agreed with is financial challenge with a mean score of 3.6 which is in the range of 3.41- 4.20.

The technical challenges with a mean of 3.57 is found to be in the analysis the third internal challenges where the respondents agreed with as a challenge in closing construction projects.

Most of the respondents are neutral in responding for psychological challenges. This challenge is with a mean score of 3.07 as shown in Table 4.5. So, the internal challenges such as administrative, financial and technical are the challenges that Ethiopian contractors should work on in the stated order in order to conduct proper project closure in the construction projects.

4.5. Response of Respondents on the External challenges on project closure by Ethiopian Contractors.

The responses of the respondents regarding external challenges on project closure were measured by a five-point Likert scale; 1. Strongly disagree 2. Disagree. 3. Neutral, 4. Agree, and 5. Strongly agree.

No.	Challenges	1 Strongly Disagree	2 Disagree	3 Neutral	4 Agree	5 Strongly Agree	Mean	RII	Rank
1	Weather condition of the project site	1	13	6	15	5	3.25	0.65	5
2	Political instability and security issues	1	8	11	12	8	3.45	0.69	3
3	Delay in providing utility service	0	3	10	23	4	3.7	0.74	1
4	Government interest on the project or changing priority	0	6	9	21	4	3.58	0.72	2
5	Lack of acceptance by stakeholders for the project	1	9	4	24	2	3.43	0.69	4
							3.48		

Table 4.7. Respondent attitude on external challenge of project closure

Delay in providing utility service has been stated as the most external challenge by 27(67.5%) of the respondents. From the result this challenge can be considered as the main external challenge faced by the contractors with a mean value of 3.7 and RII of 0.74. The second external challenge is changing priority on projects by the government where 25 (62.5%) of the respondents agreed with this challenge. This challenge has a mean value of 3.58 and RII of 0.72. The third external challenge faced by the contractors in project closure is political instability and security issues. 20 (50%) of the respondents agreed with this challenge and it has a mean value of 3.45 and RII of 0.69. Lack of acceptance by stakeholders for the

project is the fourth external challenge in project closure where 26 (65%) of the respondents were agreed. This challenge has a mean value of 3.43 and RII of 0.69. The last external challenge where 20 (50%) of the respondents were agreed is weather condition of the project site with a mean value of 3.25 and RII of 0.65.

As it has been seen for the internal challenges, the same opinion is observed for the external challenges by the respondents. The cumulative mean value of 3.48 for table 4.7, which in the range of 3.41 – 4.20 indicates that respondents in the construction projects agreed on weather condition, political instability and security issues, delay in providing utility service, government interest on the project or changing priority and lack of acceptance by stakeholders for the project as external challenge in proper project closure in the Ethiopian Construction projects.

4.6. Responses for Interview Questions

The respondents were requested to give their opinions about project closing by open ended interview questions. Their responses are presented below.

Respondent A Said, "In project management life cycle, planning and execution are the most important stages''. And added, "Termination or project closure is formally taken up in our project and we prepare for this at the end of the project". Respondent A continued, "All works have to be completed according to the project plan and scope as well as we have to get approval from the client to determine the time of the project closure". The respondent also said , "We start the closure by getting confirmation from the client and by reviewing contact documents, by checking retention money, by checking the advance payment paid and repaid, by preparing handover documents, and by inviting project stakeholders for the project handover. But lack of documentation is our challenge". For the question whether the organization the respondent is working has benefitted from project closure, the respondent answer was, "no we don't". Respondent B replied that "Project execution and monitoring are the most important cycles in a project. We don't perform terminations formally because of various reasons". The respondent added that "we prepare for closure when we get approval from our client. We determine project closure start time when

the project gives the final result". Respondent B said, "We start the project closing activity when the planned activities of the project are completed. Lack of budget, project delay, and lack of required resources are the challenges during closure". "Our organization has benefited from closure in a few projects", respondent B concluded.

Respondent C said that, "Execution stage is the most important stage and we formally close projects or termination is formally taken up. We prepare for closing when the physical work is about 95% where the major works are found completed". Respondent C added, "We start the project by submitting letter to the client. We don't have many challenges during closure, and we didn't get benefit from conducting project closure till now."

The fourth respondent, Respondent D, said, "Planning is the most important stage of project cycle. We do closures formally after provisional acceptance of projects. And we determine the time of closure in the defect liability period." Respondent D added "Documentation is our first task though we face challenges such as quality, time and commitment." The respondent concluded that "we have got benefit by conducting project closures like collecting retention money."

Respondent E replied that "Project planning is the most important part of project closure. We prepare for closure when the project work is around 95% and we formally take care of the closure part. The closure part starts when all the activities are finalized." "Since there will be some defects because of environmental issues, we start the project closure activities by maintaining the defects." Respondent E added, "We face challenges by clients when we request the handover of the project. Clients will not be ready on time. But after conducting the handover, our organization has got benefit by accepting recognition letter from the client."

Respondent F said, "Definition and planning, performance control and project closure are the most important stages in a project life cycle. We start preparing for closure at the completion stage and it is done in a formal way." Respondent F added, "When I am sure that all project deliverables are completed with the acceptable standard, I decide to start the project closure using checklists and we begin from

ensuring the project scope is fulfilled." Respondent F concluded "Less commitment to finalize works, misuse of finance, poor planning and management, failure in assigning sufficient resources and inability to rectify remarks are the challenges we face during closure. But in the circumstances, we overcame the challenges and managed the closure, we could avoid extra costs that may be incurred due to inflation". The following points are summarized from their replies.

1. Most respondents believe that the planning and execution phases are the most important stages in the project management life cycle. This shows that little attention is given by most of the respondents for project closing as they consider it is the least significant compared to the other phases.
2. Termination or closure of projects is taken formally as per the response of most respondents. Completing the project as per the contractor timeline even if the project is behind the original time schedule, submission of request for handover, transfer of the constructed facility and signing of documents are considered as the formal procedure for project closure. From this, it can be seen that there is a gap in conducting proper project closure.
3. Most of the respondents stated that preparation for project closure should be started when part or whole of works stated in the construction contract are executed as per the agreement. There are also respondents who believe the project closure shall be started from the planning stage.
4. Getting the works stated in the construction contract fully or getting the project completed more than 95% will give a green light to the workers to determine the time of the project closure as per most of the respondents.
5. Reviewing contract documents, checking contract amount and executed amount, checking retention, checking the advance payment paid and repaid, preparing handover documents, inviting project stakeholders for the project handover, checking whether all the deliverables are completed, ensuring the client has accepted the final work, transferring the project to the client, rectification of remarks, submitting letter to the client and compiling files are the activities listed by respondents that are necessary to start the project closure.

6. Difficulties in completing minor remaining works, disputes and claims, lack of budget, lack of construction quality, lack of willingness by project teams to complete and handover projects, lack of readiness by the client to take over completed projects, documentation, lack of time and commitment, poor planning and poor project management, contractor failure in assigning resources even if the client has paid, less attention, loss of documents, variation orders, change of key personnel at critical point of the project, unavailability of key personnel, absence of clear design for the projects, lack of experienced and capable professionals that can accept and sign off during handover, disagreement on what remains despite a clearly defined scope and lack of cooperation from the consulting firms were the challenges stated by the respondents.

7. Most of the respondents replied that their companies have got benefit from project closure when it is conducted. Having the history of the project, documenting the lessons learned, getting recognition letter from the client, revision of designs for further adaptations, release of resources for other projects, identifying the missing activities from the original scope, reducing overhead cost, getting the retention money, allows celebration and good staff relationship, enabling the client in the project operation and letting the contractor free and saving the contractor from extra costs are the benefits that has been obtained by contractors when projects are properly closed.

While summarizing the responses for the interview questions, it is seen that most of the respondents look project closure as the same as handing over of projects.

CHAPTER FIVE

SUMMARY, CONCLUSSION AND RECOMMENDATION

5.1. Summary of Findings

Related to the demographic characteristics, Table 4.2 specifies that majority of the project's workers, 28 or (70.0%), were male. The age of most of the respondents, 23 (57.5%), were between 31 and 40. Regarding educational level, majority of the construction project workers were bachelor's degree holders 23 (57.5%) and also majority of the respondents, 15 (37.5%), were with construction experience for 10 to 14years in different responsibilities. The majority of the respondents 21(70%) have 6 -10 years of working experience. Most of the respondents, 21(52.5%), were engaged in building construction projects.

Table 4.3 showed that most of the respondents agreed that objectives of projects (with a mean value of 4.98) and the role of project workers (with a mean value of 4.03) are clearly defined by their organization. The majority of the respondents agreed that their respective companies have a proper recording culture of site book, site diary, and minutes of meeting and site correspondences (Mean = 3.65). The respondents also agreed that there is a culture of referring those documents and there is a team commitment during close out (each with a mean value of 3.43).

Regarding the internal challenges of the project closure, Table 4.4 and 4.5, most of the respondents agreed that contractors are mainly challenged by administrative challenges with aggregated mean value of 3.70. Financial and technical challenges were the second and the third internal challenges with a mean score of 3.6 and 3.57 respectively.

Table 4.7 showed that most of the respondents agreed that delay in utility service is the first external challenge with a mean score of 3.7. Government interest on projects, political instability and security issues and lack of acceptance by stakeholders were the second, third and fourth challenges agreed by the respondents with mean values of 3.58, 3.45 and 3.43 respectively.

5.2. Conclusions

Closeout of construction projects is an important and frequently painful step in delivering a project, and most of the construction companies interviewed expressed their dissatisfaction with this phase of a project. Consequences of slow closeout can include lost administrative time, perceptions by end-users of an inefficient operation, and increased project costs through extended general conditions or increased bids. Through this project it is attempted to understand the closeout process, by considering any previous research, establishing a benchmarking perspective, determining causes of slow closeout, identifying effective strategies and making recommendations for improving closeout within organizations. Most Ethiopian contractors consider project closure as only completing the physical work in the contract and delivering it to the client. Because of this perception by the contractors, critical tasks that should be addressed during closure are missed. In project close out the key elements such closing of final accounting, Compiling and archiving project records, documenting the successes of the project, documenting lessons learned, planning for post implementation review, assessment of team members, recognition of team members, release of resources shall be addressed in addition to delivering what is signed on the contract. While no published closeout data was found, the study considered interview data from employees of Ethiopian contractors in concluding that there is a gap in project closing as it is considered as project handing over by most contractors.

The possible challenges for the closeout vary from project to project. For instance, road projects are more affected than building projects by external challenges like political instability and weather condition. Building projects are more affected than road project by insufficient utility. Each project has its own circumstances, project conditions and personnel which influence the closeout stage. There are many strategies which can potentially help to conduct project closeout for construction companies who wish to do so. General themes of these recommendations include creating a strong organizational commitment to effective closeout and communicating it at all organizational and project levels, establishing clear

standardized processes and forms, considering closeout early in a project, utilizing project management software to coordinate and track documents and their status, reducing layers of approval within the organization, coupling payment to closeout documents such as operations and maintenance manual. Most importantly the researcher believes that, recognizing the importance of effective closeout and having a plan for its management and increase the project management team commitment for the task are likely the most important steps in improving this crucial phase of a project.

Based on the literature reviews in the study, the results of questionnaire and interview responses, it is found that little attention is given for project closure as compared to the other phases of construction projects. Difficulties in managing disputes and claims, technical delay after substantial completion, multiple punch lists, design and documentation errors, insufficient capable staff during project close out, lack of agreements on remaining deliverables, resource shortage, lack of appropriate personnel, loss of interest in documentation, lack of motivation, lack of preparedness and planning for closure, improper or untimely contractual closeout documentation, disagreement on the cost of additional works and lack of cooperation from other parties are the challenges stated in the literature and responded as challenges in the respondents questionnaire and interviews.

5.3.Recommendations

1. The construction companies in Ethiopia should develop and agree on organizational goals for closeout and establish a corporate commitment to meeting them at all levels.

If management emphasis on the project closeout is given and clearly communicated to the whole team, there will be a major improvement in closeout performance.

2. The contractors should work to standardize the closeout process as much as possible.

Checklists must be used as part of the standardization. Every project representative should have the same organizational system. This includes all aspects of closeout i.e. administrative and fieldwork.

Standards are the foundation upon which improvement is based. Project specific checklists will aid in clearing confusion among project stakeholders and can act as a roadmap, along with the process maps, to smoothly finishing the project.

3. A formal post-construction closeout analysis has to be implemented by the contractors to document the lesson learned. The literature suggests that a formal post hoc analysis of project performance is a vital, yet often neglected step in improving project performance in general and closeout in particular. The analysis should include project stakeholders internal and external to project. The database should highlight both best practices and areas for improvement. This continuity of institutional information will help construction companies avoid repeating costly mistakes.

4. Contractors must keep the punch lists to a minimum especially near the end of substantial completion. Creating a list which enables the tracking of construction deficiency helps to correct the observed problems as soon as possible. The practice of taking care of deficiencies in workmanship was suggested by contractors who have a reputation for having smooth and timely closeouts. Tackling a lengthy punch list is difficult, key personnel may have moved to the next project or forgot about past problems. Maintaining and tracking a work deficiency list is a proactive way to manage potential punch list items.

5. Contractors must work on their employees to develop the sense of urgency in the close out, their enthusiasm and motivation to achieve what is required during the close out stage.

6. Ensuring the closeout requirements in advance in consultation with the stakeholders is another valuable point Ethiopian contractors should practice.

7. Work orders must be processed more efficiently, and contractors must insist until they get approval.

In the study contractors complained that change orders were batched and not handled individually. This frustrates contractors because they cannot bill for work completed as a change until the change order is approved. Furthermore, if the change orders accumulate near closeout more confusion is created because of the rush to complete the job. Contractors must also work on early settlement of financial claims that have arisen due to additional works or other disputes.

8. Contractors have to avoid improper or untimely contractual closeout documentation by developing the culture of preparedness and planning for closure in advance.

9. Allowing the participation of stakeholders during the commissioning of the project helps to avoid dissatisfaction of the project owners at the time of handing over.

Differentiating project handover with project closure and applying the above recommendation can help Ethiopian contractors to conduct proper and timely project closure.

5.4. Limitations and Future study

This study only focused on the challenges of project closeout from the perspective of Grade one general contractors. Since construction projects are vast and are of different in nature, the respective challenges are also different for each specific project. Therefore, for future study, the researcher recommends that:

1. Future researchers should focus on project closeout challenge from the perspectives of the client, consultant, and contractor.
2. Future studies should focus on closure challenges in specific projects by classifying the projects as road projects, building projects, or any other project.

REFERENCES

3. AAUSC, 2014, Research Methods module for Supported Distance Learning programme.

4. Adrienne Watt, 2014, Project Management.

5. Archarya, N. K., Lee, Y. D. and Im, H. M., 2006. Investigating delay factors in construction industry: A Korean Perspective. Korean Journal of Construction Engineering.

6. Aziz, E. E., 2015, Project closing: the small process group with big impact.

7. Busansky, Michael D. (2003), "Contract Closeout Pathologies and Recovery Strategies" Master's Thesis Report, Naval Postgraduate School, Monterey, California.

8. Carson, C. W., Potter, J. C., Saunders, M. C. and Stauffer, J. J., (20090. The Great Debate: Planning and Scheduling from Substantial to Final Completion. AACE International Transactions.

9. City of Seattle, Washington (2005), "Improving the City's Construction Closeout Process" Office of City Auditor, http://www.seattle.gov/audit/report_files/2005-02_Drainage_Project_Closeout_Review.pdf

10. Creswell, J. W. 2013, Research Design: Qualitative, Quantitative, and Mixed Methods Approaches. United States of America: SAGE Publications

11. Dinsmore, Paul C., 1993, The AMA handbook of Project Management, New York AMACOM.

12. Dr. Abimbola Windapo, 2013, Fundamental of Construction Management

13. Essam T., M.A., Amin, O., EI Tayeb, & B., Mattiasson (2006). Biological treatment of industrial wastes in a photo bio reactor, Water Sci Technol.

14. Erik. W. Larson and Clifford. F. Gray (2011) (2008). Project Management: The Managerial Process, 11th Edition, McGraw-Hill Hills Companies, Inc., New York.

15. Federal Transition Administration, 2006. Construction Project Management Handbook.

16. Ferry and Kah, 2017, Research for REGI Committee - Lessons learnt from the Closure of the 2007-13 Programming Period.

17. Fikir Asaminew, 2019, Assessment on the challenges of project closeout: The case of Addis Ababa light rail project phase 1.
18. Fisk, Edward R., & Rapp, Randy R. (June 2004). Introduction to Engineering Construction Inspection, Jhon Willy and Sons inc. USA.
19. Florence Wairimu Kamau, 2dr. Samson Nyang'au Paul, 2018, Effect of project management practices on performance of construction projects in Laikipia county, Kenya.
20. Gregory M. Horine, 2006, Project Management: Absolute beginners guide.
21. Heerkens, G. R. (2002). Project Management. New York, USA: McGraw-Hill
22. ITRM Guideline, 2006, Project Management Guideline; Project closeout
23. MSU Center for Construction Project Performance Assessment and Improvement, 2008, Assessment and Improvement of Construction Closeout at Michigan State University
24. Mugenda, Olive M and Mugenda, A.G , 2003, Research Methods: Quantitative and Qualitative Approaches. African Center for Technology Studies (ACT) press. Nairobi, Kenya.
25. Murali, S. & Y.W., Soon (2007). Causes and effects of delays in Malaysian construction industry, Graduate School of Management, University Putra, Malaysia, Serdang Selangor, Malaysia.
26. Ogeno David Owour (2016).Factors influencing completion of construction projects in Kenya: a case of government buildings construction projects in Nairobi County, Kenya,University of Nairobi, Keneya.
27. Pinto, J. K. (1998). The Project Management Institute: Project Management Handbook, 1st ed., San Francisco: Jossey-Bass Publishers
28. Project Management Institute, 2013, A guide to the project management body of knowledge (PMBOK ® guide), Fifth edition.
29. Rogers, J. 2012, Opportunity Lost: Mismanagement of the closeout. College of technology
30. Russell W. Darnall and John M. Preston, 2012, Beginning project management.
31. Sadi et al (2006).Causes of delay in large construction projects, International Journal of Project Management

32. Teo TC. and Low KCP, 2016, The impact of goal setting on Employee Effectiveness to improve organization Effectiveness: Emperical study of a high Tech Company in Singapore.
33. Vasudha Kaul, 2014, Excessive delays in closeouts can be removed with the adaptation of better practices, Purdue University, Master's Thesis.
34. Zikmund, W.G. ,2003, Business Research Methods. 7th Edition, Thomson South Western: Ohio.

APPENDIXS

Appendix 1: Questionnaire

Dear Respondents,

As part of my Master's Degree in Project Management at Addis Ababa University School of Commerce, I am undertaking research on the title "**Assessment of Project Closure Challenges in Construction Projects: For the case of Ethiopian Contractors**."

The main objectives of the study are:

- To assess the closing phase of construction project in Ethiopian construction companies.
- To consider the state of project closeout in construction, as well as consider its relevance to Ethiopia.
- To discuss ways and means of developing project closing benchmark for the construction industries in Ethiopian.
- To present a research agenda on the closing phase of a project in Ethiopian construction companies.
- To generate good professional awareness for regarding closing of projects for contractors, consultants and project clients.
- To improve the current close out trend with the best international experiences
- To identify the internal and external challenges of the industry which creates complication to proper project close out.

I have developed this questionnaire to collect views of professionals working for contractors. It is my belief that the research, in addition to its academic significance, will have a practical significance for the development of the construction sector in Ethiopia and initiates further research on the topic.

Your response, in this regard, is highly valuable and contributory to the outcome of the research. All feedback will be kept strictly confidential and utilized for this academic research only.

Best Regards,

Mitiku Getachew
Post Graduate Student in Master's of Project Management
Addis Ababa University, School of Commerce
Tel:+251 911 02-59-52
E-mail: mitegetaw@gmail.com
Addis Ababa, Ethiopia

SECTION- A: General Background Information

The questions below are related to your organization and yourself. Please indicate your response by ticking (X or √) the appropriate box (es) or by filling the blank spaces provided, as appropriate.

1. Gender.....: Male ☐ Female ☐

2. Age .....:

Years 20-30 ☐ 31-40 ☐ 41-51 ☐ >51 ☐

3. Educational level.....: Under Graduate ☐ Bachelor ☐ Masters ☐ PhD ☐

4. Your length of experience in the construction sector is ….....Years

0-2 ☐ 3-5 ☐ 6-10 ☐ 10-14 ☐ ≥15 ☐

5. Nationality ……: ETHIOPIAN ☐ Other ……

6. Your Job Title ….....…...

Project Manager ☐ Project Engineer ☐ Department Manager ☐

General Manager ☐ Other (Please specify) ……

7.Your Experience of Construction

Building ☐ Road ☐ Bridge ☐ Railway ☐

Irrigation ☐ Dam ☐ Other……

SECTION- B: Project Closing Questionnaire

PURPOSE: The purpose of this questionnaire is to gather your feedback on what aspects of your project closure were performed well, what are the challenges in project closure and what areas of improvement we need to consider to close construction projects.

Please indicate whether you agree or disagree with each statement using the scale shown below as a guide by putting X or √:

1. Not at all true= strongly Disagree
2. Rarely true = Disagree
3. Neither Agree nor Disagree /Neutral
4. Mostly true = Agree
5. Almost always true = strongly agree

No.	Question	1	2	3	4	5
1	The objectives for the projects under your organization are clearly defined.					
2	The role and responsibility of project workers clearly defined.					
3	Exit champion is assigned on any of your projects.					
4	Your company has a proper recording culture of site book, site diary, minutes of meeting and site correspondences.					
5	Your company refer these documents during project closure.					
6	The entire team in your organization is committed to the project Closeout.					
7	Your organization document the lessons learned when projects are completed.					
8	Compared to other phases of construction, the closeout phase is not difficult to successfully execute.					
	On typical projects where the work progresses according to schedule, the closeout phase usually is executed according to schedule, as well.					
10	To the extent that there are delays in project closeout, they are usually due to another party ‘s actions/inactions, rather than my firm.					
11	The construction company where I am working at has formal system for managing/implementing project closeout.					

Table 1: Respondents ‘Attitudes about Closeout

SECTION- C: Questionnaire on Internal challenges on project closure by Ethiopian Contractors.

Please indicate whether you agree or disagree with each statement using the scale shown below as a Guide by putting X or √ :

1. Not at all true= strongly Disagree
2. Rarely true = Disagree
3. Neither Agree nor Disagree /Neutral
4. Mostly true = Agree
5. Almost always true = strongly agree

No.	Challenges	1	2	3	4	5
1	Absence of a clear project closing strategy.					
2	Delay in Performing testing of equipment and engineering systems after substantial completion.					
3	Excessive/Multiple punch lists.					
4	Errors and discrepancies in design documents, vague details in drawings.					
5	Contractor/subcontractor personnel transferring to new projects /lack of sufficient staff in closeout stage.					
6	Lack in thorough/detailed/ identification and agreement on all remaining Deliverables/					
7	Shortage / Late-arrival of resources, i.e., manpower, materials and equipment in closeout stage.					
8	Inability to finish punch lists due to lack of appropriate technical manpower.					
9	Loss of interest in tasks such as documentation					
10	Fear of no future work					
11	Unavailability of key personnel i.e. the project manager					
12	Lack of urgency in approach, enthusiasm and motivation of parties involved due to achieving substantial completion					
13	Contractor lack of preparedness and planning for closure					
14	Completing punch lists in occupied space					
15	Lack of Contractor commitment to meet contractual agreements /like providing spare parts /					
16	Improper / Untimely contractual closeout documentation					
17	Poor financial control system					
18	Disagreement on the cost of additional work					
19	Late response on financial claims					

Table 2: Respondents‘ Attitudes on internal challenges for proper Closeout (From Kaul and Modified)

SECTION- D: Questionnaire on External challenges on project closure by Ethiopian Contractors.

Please indicate whether you agree or disagree with each statement using the scale shown below as a guide by putting X or √:

1. Not at all true= strongly Disagree
2. Rarely true = Disagree
3. Neither Agree nor Disagree Neutral
4. Mostly true = Agree
5. Almost always true = strongly agree

No.	External Challenges	1	2	3	4	5
1	Weather condition of the project site					
2	Political instability and security issues					
3	Delay in providing utility service					
4	Government interest on the project or changing priority					
5	Lack of acceptance by stakeholders for the project					

Table 3: Respondents 'Attitudes on external challenges for proper Closeout (From Kaul and Modified)

SECTION- E: Project Closing Interview Questions

1. Which stages of project management life cycle is the most important?

2. Is project closure/termination formally taken up?

3. When do you start preparing for project closure?

4. How do you determine that it is time to start the project closure task?

5. With which activities do you start with the project closure?

6. What are the challenges you face during project closure?

7. Is there any benefits your organization has got by conducting project close out?

Appendix 2: Project Handing Over Document

PROJECT PROVISIONAL HANDOVER

Project ----------
Location ----------
Client ----------
Counterpart ----------
Contractor ----------

CONTRACT BASIS		NO	DATE	AMOUNT (BIRR)
a)	Main Contract	-------	----------	----------
b)	Variation Order No.1	--------	----------	----------
c)	Variation Order No.2	--------	----------	----------
d)	Variation Order No.3	--------	----------	----------
e)	Variation Order No.4	--------	----------	----------

This ----------day of---------- by the order of our respected department and after due notification to all concerned parties, we the under signed

No.	Name	Representing Organization
1.	----------	----------
2.	----------	----------
3.	----------	----------
4.	----------	----------
5.	----------	----------
6.	----------	----------
7.	----------	----------
8.	----------	----------

Have examined.

a. Contracts, Specifications and drawings and under listed works
b. ----------
c. ----------
d. ----------
e. ----------
f.----------

and have proceeded with a ascertainment of completion and temporary acceptance of the project on the basis of the following facts.

a. Day when the contractor possession of the site ----------
b. Agreed length of completion time ----------calendar days.
c. Commencing date----------
d. Completion date according to contract agreement----------
e. Actual completion date----------
f. Total number of delays ----------
g. Number of justified delays----------
h. Number of unjustified delays ----------
i. Penalty of------- days Eth. Birr---------- per day of total Birr----------

Total of value of work executed and material supplied Birr----------

DEDUCTION:-

1. Previous payments----------
2. Penalty----------
3. Rebate----------

Total deduction ----------

Total amount due to contractor----------

Retention amount----------% of the total value of work executed payable on the final acceptance Birr----------

Net sum payable to the contractor----------

Performance bond----------

Remarks:----------

CONCLUSION:

The date of final acceptance will be----------after thorough investigation of the works in all its parts expecting invisible latest defects; we declare that it was executed in accordance with the drawings and the specification in an acceptable manner.

We witness thereof, we have written and signed the temporary acceptance of which one copy is to be issued to the contractor for all practical purposes after due approval.

ON BEHALF OF CLIENT ON BEHALF OF CONTRACTOR ON BEHALF OF COUNTERPART

---------- ---------- ----------
---------- ---------- ----------

WITNESSES

1. ----------
2. ----------
3. ----------
4. ----------
5. ----------
6. ----------
7. ----------

Appendix 3: Project Final Handing Over Document

PROJECT FINAL HANDOVER

Project ----------
Location ----------
Client ----------
Counter Part Engineer----------
Contractor ----------

	CONTRACT	NO	DATE	AMOUNT (BIRR)	BASIS
f)	Main Contract	-------	----------	----------	----------
g)	Variation Order No.1	--------	----------	----------	----------
h)	Variation Order No.2	--------	----------	----------	----------
i)	Variation Order No.3	--------	----------	----------	----------
j)	Variation Order No.4	--------	----------	----------	----------

This ----------day of---------- by the order of our respected department and after due notification to all concerned parties, we the under signed

No.	Name	Representing Organization
1.	----------	----------
2.	----------	----------
3.	----------	----------
4.	----------	----------
5.	----------	----------
6.	----------	----------
7.	----------	----------
8.	----------	----------

have examined.

g. Contracts, Specifications and drawings.

h. The final certificate of measurement and report of the temporary acceptance and have proceeded with a ascertainment of good executing and final acceptance of the project on the basis of the following facts.

j. Date of temporary acceptance ----------

k. Proposed date of final acceptance ----------

l. Remarks made during the temporary acceptance of the work.

1. ----------
2. ----------
3. ----------

FINAL EXAMINATION OF THE WORKS

A. Signs of visible defects : The general examination of the works as checks and tastes at the different location of the project has

Shown----------

B. General Remarks: The comparison of the report of the temporary acceptance of the work with the present condition of the project the contract and other justification documents have brought up the following remarks.

1. ----------
2. ----------
3. ----------

Total value of work executed and material supplied Birr----------

DEDUCTION:-

1. Previous payments ----------
2. Penalty ----------
3. Rebate ----------

Total deduction ----------
Net sum payable to the contractor ----------
Amount in words ----------

ON BEHALF OF CLIENT ON BEHAF OF CONTRACTOR ON BEHALF OF COUNTERPART

--- --- ---

---------- ---------- ----------

WITNESSES

1. ----------

2. ----------