

**PROJECT CONSTRUCTION PHASES, LEGAL ENVIRONMENT AND QUALITY OF
RESIDENTIAL BUILDING CONSTRUCTION PROJECTS IN NAIROBI COUNTY,
KENYA**

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**A Thesis Submitted in Partial Fulfilment of the Requirements for the Award of the Degree
of Doctor of Philosophy in Project Planning and Management of the University of Nairobi**

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DECLARATION

This thesis is my own original work and has not been presented or submitted for assessment or for the award of any degree in any university or any other institution of higher learning.

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DEDICATION

This study is dedicated to the National Building Inspectorate (NBI) to make positive contribution in the building construction industry in Kenya.

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LIST OF ABBREVIATIONS AND ACRONYMS

GOK:	Government of Kenya
M &E:	Monitoring and Evaluation
NBI:	National Building Inspectorate
NCA:	National Construction Authority
PMI:	Project Management Institute
SPSS:	Statistical Package of Social Sciences
UNDP:	United Nations Development Programme

ABSTRACT

Kenya has witnessed a surging number of constructed residential buildings whose quality dimension has been compromised. Despite the government of Kenya establishing the National Building Inspectorate, it is still perceived that the building construction industry is highly susceptible to ethical problems, resulting to collapse of buildings with disastrous consequences. The study investigated how project construction phases influence quality of residential building construction projects in Nairobi County. The study was guided by the following objectives: establish how feasibility assessment influences quality of residential building construction projects; examine how contract negotiation influences quality of residential building construction projects; assess how monitoring and evaluation influences quality of residential building construction projects; establish ways in which project closure influences quality of residential building construction projects; analyze how the combined project construction phases influence quality of residential building construction projects as well as analyse the influence of legal environment on the relationship between project construction phases and quality of residential building construction projects. The research design used was descriptive survey and correlational designs guided by the pragmatic paradigm. Contracting firms working on building construction projects in Nairobi County were considered through probability sampling while a census of engineering Consultants, NCA and NBI management teams was carried out. Questionnaires formed the data collection instruments. The data was analysed by use of both descriptive and inferential analysis using various descriptive statistics such as means, standard deviations, percentages, frequencies and the statistical tools of analysis that were used for inferential statistics are Pearson's Product Moment Correlation (r) and Stepwise Regression (R^2). The Fisher (F) test was used to test the hypotheses in the study. The analysed data was presented in frequency tables and percentages. Findings from the study were hoped to make positive contribution in the building construction industry in Kenya. The findings depicted that feasibility assessment leads to an increase in quality of residential building by factor of 0.654 with P value of 0.000. At 5% level of significance and 95% level of confidence this is statistically significant as the P-Value is lower than 0.05. The study therefore rejected the null hypothesis. The findings revealed that contract negotiation influences quality of residential building construction projects. The findings depicted that contract negotiation leads to an increase in quality of residential building construction projects by factor of 0.442 with P value of 0.000. At 5% level of significance and 95% level of confidence this is statistically significant and the null hypothesis was rejected. The findings depicted that monitoring and evaluation leads to an increase in quality of residential building construction projects by factor of 0.242 with P value of 0.000. At 5% level of significance and 95% level of confidence this is statistically significant and the null hypothesis was rejected. The findings depicted that project closure would lead to an increase in quality of residential buildings construction projects by factor of 0.216 with P value of 0.000. At 5% level of significance and 95% level of confidence this is statistically significant and the null hypothesis was rejected. The study recommended that existing laws in the building construction industry should be enforced and measures taken against the culprits. This will ensure professionalism in all phases of the project cycle and in turn lead to the realization of quality in the building construction projects. Other scholars should investigate how professional ethics impacts construction quality in Kenya.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Throughout history, it has been established that buildings and the provision of safe and affordable homes for mankind are major contributors to sustainable development, an important civilization aspect of a society. In this regard, the construction process in any building project should be carried out in the most efficient and ethical manner possible to complete construction projects according to the standards of quality as specified by the project owner or designer (Nadeem, Sohail and Muhammad, 2009). Projects also continue to get larger and more complex, requiring more specialized personnel, high-tech equipment, and better control systems. The success or failure of quality management is first of all in the hands of leaders (Mosadeghrad, 2013). Projects will require that future project leaders have ethical, and leadership savvy to complete their construction projects successfully (Sunil, Randolph and John, 2004). Project failure often results when such skills lack or are inadequate. Effort must be consciously made to ensure that quality is not compromised and that project beneficiaries get the best in terms of a reliable, complete and sustainable project. Quality should be the main consideration.

It has been established that the construction industry is more prone to unethical practices due to its heavy capital investment as well as providing a wide range of opportunities for rent extraction in the long-run (Transparency International, 2006). Furthermore, parties involved in construction projects are diverse and with different business goals – project owner, architects, engineers, contractor, subcontractors, suppliers, and so on (Vee and Skitmore, 2003). Often this complicated relation leads to claims and disputes arising from ethical dilemmas and conflicts of interests at certain stages in the project life cycle.

The recent past has witnessed an increase in international concern about the extent of ethical malpractices in the construction industry. The American Society of Civil Engineers, for instance, claims that corruption accounts for a value of approximately \$340,000,000,000 of costs annually. Examples of such corruption cases include bribery, embezzlement, kickbacks and fraud in construction projects which as a result undermine the benefits of infrastructural projects (Sohail and Cavil, 2006). Similarly, Baker (1999) postulates that professional ethics has

triggered great concern and pragmatic discussion in the world and there is growing demand by the current literature for, most importantly, public accountability for funds spent on public buildings and infrastructural projects. According to Hooker (2000), quality and safety in large projects can be regulated by professional standards, as set forth in handbooks and established by common practice. The threat of lawsuit may operate here as well to deter the unprofessional conduct.

In a study to examine factors affecting project performance in developing countries, Faridi and El-Sayegh (2006) reported that shortage of skills of manpower, poor supervision and poor site management, unsuitable leadership, shortage and breakdown of equipment among others contribute to substandard projects in the United Arab Emirates. Examined causes of client dissatisfaction in the South African building industry and Hanson et al. (2003) found that conflict, poor workmanship and incompetence of contractors were among the factors which would adversely affect project performance. Mbachu and Nkando (2007) established that quality and attitude to service was one of the key factors undermining successful project delivery in South Africa.

A study on performance of contractors in Zambia found that local projects did not meet quality standards, a situation that witnessed huge implications in terms of their competitiveness (Zulu and Chileshe, 2008). Olatunji (2007) noted that professional misconduct among quantity surveyors included exaggeration of services rendered or to be rendered to deceive the client to pay more than is necessary, concealing systematic errors, doctoring of professional opinions and saving other professionals whose roles are vivid and tantamount to causing failure. Chimpunde and Shakantu (2010) also noted conflict of interest, unfair conduct, political interference and bribery as some of the unethical practices among the small, medium and micro enterprise contractors in Malawi.

Effects of such unethical malpractices have been witnessed in many countries. Seemingly firm structures all over the world have cracked, split, and disintegrated right beneath people's feet. A case in point is that in New Delhi, India where on November 15, 2010, the rains pounded on a poorly constructed building and tragically claimed 67 lives. The building housed 400 low income

migrant labourers from rural sections of eastern India (Hutchinson, 2014). Similarly, on January 26, 2012, a 20-storey building in Rio de Janeiro, Brazil spontaneously collapsed. The gigantic high-rise crashed into another ten-storey building and a smaller three storey building, reducing all three structures to one huge pile of rubble, killing at least 17 people. Authorities suggested that illegal construction work had weakened the 20-storey building and caused it to collapse, which triggered a chain reaction and brought down the two smaller buildings (Karikari-apau, 2013). This catastrophe led Brazilian authorities to call for reforms and more vigilant building regulations.

On June 29, 1995, in the space of 20 seconds, the Sampoong Department Store in Seoul, South Korea fell to the ground, killing 502 people and injuring 937. Criminal negligence, blatant disregard for ethical engineering practices, and shoddy construction led to the largest peacetime disaster in South Korean history (Hutchinson, 2014). The disasters cited and the regular stream of sad news of building collapse tragedies in Ghana (Karikari-apau, 2012), Tanzania (Karikari-apau, 2013) and Bangladesh (Than, 2013) followed by accidents in Kenya, are a reflection of the way residential buildings in many countries suffer from poor quality due to negligence by the parties concerned.

The Kenyan case has not been much different. The ever increasing population of city dwellers in Nairobi, the capital city, has witnessed the mushrooming of residential structures around the city. Many of these structures are sub-standard leading to widespread collapse of building structures in Nairobi resulting in deaths and injuries as witnessed in the recent past. On various dates since 2006, cases of buildings collapsing have been reported in Nairobi. These incidences have resulted in several fatalities and scores injured, maimed or permanently disfigured (Kenya Accreditation Service, 2015-2016).

In one of its recent audits in 2015, the National Building Inspectorate (NBI, 2016) which audits buildings for conformity with land registration, planning, zoning, building standards and structural soundness gave a report of the status of buildings in Nairobi. In May of 2015, the NBI working in conjunction with the County Government and the NCA concluded an audit of 2,601 buildings in Nairobi. This exercise identified fifty five defective buildings in Huruma/Kiamaiko.

It proceeded in December 2015 to identify more defective buildings in Umoja (28), Dagoretti (16), Zimmerman (29), Thome Estate and Marurui (9), Githurai 44 (16), Garden Estate, Mirema (1), Roysambu (11), Ngei Estate (2), Kahawa west (3), Riruta, Dagoretti, Waithaka and Ruthimitu and Uthiru (16) (National Building Inspectorate, 2016).

Starting the year 2016, the exercise proceeded to Baba Dogo, Nairobi South B and then to Nairobi West. A total of 226 buildings have so far been found to be unsafe and are tagged for demolition but with a priori consensus of conclusive tests for structural soundness by the Materials Branch of the Ministry of Infrastructure releases. Notice of evacuation was issued by the Nairobi County Government as the audit progressed. Notice for demolition was also issued for all these faulty buildings and reinforced with follow up notices by the Nairobi County Government and the NBI jointly as witnessed in Huruma near the site of the collapsed structure in April 2016. A good number of buildings like the one that collapsed in Huruma have been erected illegally on Riparian land and all these are scheduled to be brought down. There are a considerable number of others that have taken up road reserves and land preserved for community facilities and these also ought to be demolished (National Building Inspectorate, 2016). This is a clear indication that important considerations were not adhered to during the feasibility and design processes of these buildings, thereby compromising quality.

These collapses were reportedly attributed to, among others, poor design and supervision, poor materials and substandard workmanship. Others are columns failure due to bending, concrete not meeting the minimum strength for structural elements, lack of proper and regular supervision, lack of maintenance, poor quality materials, non-approval of works and lack of professional input during supervision. The list is endless but points a finger at inadequate or lack of documented policies, systems, processes, and procedures that can help the county governments and other construction sector regulators to manage the way they operate, make compliance assessments, make decisions and manage risk. According to the Kenya Accreditation Service (2015-2016), the possible causes of collapsing building structures are inadequate geotechnical and materials investigations, use of inappropriate specifications, incompetent design, poor workmanship, lack of ethics, poor supervision, misunderstanding between parties to the contract, use of inappropriate materials and unskilled workers.

The above causes constitute some of the main activities that are part and parcel of the process of inspection of buildings from plan approval, inspection of materials, testing and construction activities. This means that embracing and entrenching building inspections as part of the construction, maintenance and statutory regulations of buildings will greatly reduce or eliminate altogether the occurrence of buildings collapsing thereby ensuring quality of residential buildings.

This study therefore aimed at investigating the influence of project construction phases on quality of residential buildings construction projects in Nairobi County. The research rested on the premise that project construction phases influence quality of residential buildings.

1.1.1 Quality of Residential Building Construction Projects

Clients, contractors and consultants in a project environment are confronted by ethical issues and dilemmas that have a significant bearing on project quality. Quality becomes compromised when a client for example fails to disclose any superior knowledge he has that the contractor will need in order to perform under the terms of the project documents. Failure to do so will result in a breach of contract (Alfred, 2008) hence affecting project quality specifications. In addition, late payments, unprocedural procurement and improper contract administration lead to poor quality projects arising from non-adherence to agreed quality specifications. Ethical issues that lead to poor project quality include conflict of interest, misrepresentation of material facts and inept/incompetent contractors and consultants. It is essential for the owner to be satisfied with the completed project, as it acts as an indicator on the team's performance. Owners usually are satisfied, if the quality of service provided exceeds or at least meets their expectations. The ability of a project team to complete the project to the owner's expectation may increase a team's reputation and result in more working relationships in the long run.

A common cause of poor project quality is giving deceiving information to stakeholders such as clients and contractors (Mukumbwa and Muya, 2012). When the truth is finally discovered, open confrontations arise among the project team members and the process of handling the issues at hand consumes valuable time hence denying the project the needed attention. All project

participants should uphold professionalism in performing their works and not engage in unethical behaviour or approve any sub-standard work.

1.1.2 Project Construction Phases

In Kenya, the construction process is executed by various professionals of diverse training and skills, namely land surveyors, project managers, architects and designers, quantity surveyors, engineers, contractors and builders (Buildafrique Consulting Limited, 2011). All these parties experience situations warranting moral reasoning with subsequent impact on the construction work. In this study the project construction phases have been unpacked under the key residential building construction phases impacting on quality and these include:

1.1.2.1 Feasibility Assessment

Feasibility studies are used as one of the first steps in examining a proposed business venture, and can be used for a new business or for an investment for an existing business (Kenkel, 2008). In other words, the feasibility study includes an analysis of the project's viability and focuses on helping answer the essential question of "should we proceed with the proposed project idea?" The end result of a feasibility study is therefore the 'go/no-go' decision. According to Kerzner (2006), the purpose of the feasibility phase is to plan the construction activities in order to facilitate an estimation of resource requirements and allocation. Gardiner (2005) adds that it also helps to identify the probable costs and consequences of investing in the new project and provides an accurate assessment of the factors that might affect the project. A feasibility study therefore enables a realistic evaluation of a residential building construction project, incorporating both the positive and negative aspects of the project undertaking.

1.1.2.2 Contract Negotiation

Projects are always conceived by the client or project promoter. After conception, consultants are engaged to undertake the designs and production of bills of quantities. The contract negotiation process is then undertaken. The client and the consultants are usually involved in the contract negotiation which includes selecting the general contractor without seeking bids (Muya and Mukumbwa, 2013). Because the vast majority of owners have to work within a limited budget, the negotiated contract is by far the most popular mode of contracting for private projects. This

method is used when the owner knows of one or more reputable, competent, and trusted general contractors. In this case, the owner simply negotiates with these contractors for the overall contract price, time required for completion, and other important details of the project. The negotiations are generally conducted with one contractor at a time.

Key among the critical project construction phases in the construction industry is the bidding process (Ameh and Odusami, 2010). Moylan (2008) also observed that within the construction industry, the practices of bid shopping, bid rigging, related cost reduction practices pose a range of ethical challenges. The potential effect these bidding practices can have on involved stakeholders such as the client, consultants, bidding contractors and ultimately the public can be considerable. The findings of a survey among procurement practitioners in central governments confirmed that transparency and accountability are key for enhancing integrity throughout the whole procurement cycle, including in needs assessment and contract management (OECD, 2007). The procurement process should be given due regard to ensure unethical practices do not creep in as these would compromise the quality of the project outcome.

Common problems in the procurement and management of works contracts include the use of non-standard forms of contracts leading to inequitable distribution of risks, insufficient contract documentation, lack of clarity on project scope and deliverables, harmful contract terms and conditions, insufficient price breakdown of payment terms sometimes not commensurate with deliverables, high advance payments not well secured, inappropriate securities and warranties, ill-defined specifications and poor sub-contracting arrangements (Kerry and Phoebe, 2006). All these problems inevitably have their direct or indirect influence on quality of construction projects.

1.1.2.3 Monitoring and Evaluation

In construction, some of the key participants involved in the monitoring and evaluation of projects include contractors, clients or project owners and consultants (Alsagour, 2014). Contractors are greatly responsible for implementing whatever works are within the contract agreement (Enshassi, 1996). They liaise with consultants in the monitoring and evaluation of projects to ensure that they are delivered within the parameters of time and cost and to the

required performance standards. If the work is of sound quality, then the contractor should be allowed to move on to the next phase. In case the project delays beyond the time limit provided in the work schedule, the contractor should devise a new work plan, but only if the delay is beyond the contractor's control (IUCN, 2000). However, if the contractor's fault causes the delay, then the contract will be dismissed and a new one is negotiated. Control should be conducted from phase to phase to ensure quality standards are attained. This is important in order to ascertain that quality and tasks performed throughout the project are according to specification and owner's expectations. The quality element is essential in every component of construction activities that acts as a guarantee to ensure the project achieves the highest standard specified by the owner.

1.1.2.4 Project Closure

Every project has a start and an end which means that project is carried out during a fixed amount of time with a distinctive purpose. The last phase of the project life cycle, that is, project closure phase is an important stage in the lifespan of a project and requires due diligence (De, 2001). De (2001) and Dvir (2005) stress that like all the other phases of project life cycle project closure should be properly planned and budgeted. Gardiner (2005) points out that the closure commences during the project planning phase and associated activities continue all through the project cycle to ensure that the project closes smoothly. All project stakeholders need to be part and parcel of the termination of the project to verify achievement of set objectives to the required standard.

The project closure combines two procedures which include handing over of the project deliverables and documenting lessons learned through the experiences in the project (Gardiner, 2005). The project closure is foreseeable but how it is handled and when it is handled have a huge impact on the success of the project (Hormozi, Minn and Nzeogwu, 2000). This calls for in-built strategies to ensure smooth termination and hand-over of the completed project to the owner. Alsagour (2014) outlines the contract closure procedure which involves confirmation of project scope, performing formal approval and handover of the final product or service to the customer, making project final documentation and presenting an overview of project performance to the customer. Other procedures also carried out involve making sure all other

processes are completed, communicating lessons learned, dissolving project organization and transferring responsibilities and other resources to other projects. De (2001) posits that improper handling of project closure can result in several unfavourable effects such as time over-run, cost over-run, tarnishing the image and credibility of the project team, locking up valuable human and other resources, that could have been gainfully utilized elsewhere and stress on the project personnel.

1.1.2.5 Legal Environment and Quality of Residential Building Construction Projects

Project stakeholders particularly clients and donors often develop a formal and legal relationship on payment modules and risks or damage that a third party may suffer if the structure built is defective (Lance and Little, 2007). Mason (2009) points out that the main aim is to create a strong sense of responsibility on all those involved in the construction work. In Kenya, the building construction industry is guided by several regulations and regulatory authorities. To regulate contractors, government created the National Construction Authority (NCA) through an Act of Parliament, the *NCA Act of 2012* with the aim of promoting and building the capacity of the Kenyan construction industry. The National Building Inspectorate (NBI) moreover audits buildings for conformity with land registration, planning, zoning, building standards and structural soundness. There is also the Manual of standard building specifications which sets out the technical performance and characteristics required of a building.

1.2 Statement of the Problem

In developing countries, poor quality construction has led to spontaneous buildings collapse and, during earthquakes, to major disasters. While reliable building codes are widely used in design, builders in developing countries often fail to meet acceptable standards. Structural defects are frequently identified too late, often after catastrophic collapse. Researchers attribute most of the 230 thousand deaths in Haiti during the 2010 earthquake to the low quality of Haitian construction. The catastrophe in Haiti and a series of sad news of building collapse tragedies in Ghana, Tanzania, Bangladesh, Mumbai, Medellin, Casablanca, Nigeria (Karikari-apau, 2013) and most recently Kenya, demonstrate that this problem is not unique to any one nation or region.

The growth of the construction industry in Kenya has given rise to a number of unethical practices that violate codes of conduct. For instance, Mukumbwa, and Muya, (2012) pointed out that when construction processes involving finances are not executed in a professional and ethical manner, then parties involved in the process may have a way to practice unethical and unprofessional acts, that hurts their profession, and most importantly, compromises project quality. Kenya has witnessed a surging number of constructed residential buildings whose quality dimension has been compromised. Despite the government of Kenya establishing the National Building Inspectorate, it is still perceived that the building construction industry is highly susceptible to ethical problems, resulting to collapse of buildings with disastrous consequences. In 2016, several cases of collapsed buildings were reported at Huruma, Nyali, Nairobi's Spring Valley estate and Nairobi's Westland area (Kenya Accreditation Service, 2015-2016).

The tragedies above come a few months after the county government and NCA spoke of a move to demolish all improperly constructed buildings within the city. Statistics indicate that 204 buildings labelled 'unsafe' are to be demolished, out of which 58 are in Huruma, 19 in Hazina estate and 28 in Zimmerman (NCA Interim Report, 2016). This raises concern about the quality of workmanship on several buildings in Kenya. It is against this background that this research studies the influence of project construction phases on quality of residential buildings in Kenya. Residential buildings in poor condition are associated with significant loss of lives and property, evictions as well as social inconveniences. These cases raise issues regarding professionalism and ethics in the building construction industry. Building structures that meet set standards are an asset to a country's economy as they are sustainable since they meet the needs of the present generation while also considering future needs.

This study therefore sought to analyse the most prevalent project construction phases influencing quality of residential buildings construction projects in Nairobi County. The research would have implications for effective and efficient project management in building construction projects in Kenya and other countries thus fostering dedication and freewill drives between project organizations and stakeholders.

1.3 Purpose of the Study

The purpose of the study was to assess the influence of project construction phases on quality of residential building construction projects and the moderating influence of legal environment on the relationship between project construction phases and quality of residential building construction projects in Nairobi County.

1.4 Objectives of the Study

The objectives of the study were:-

- i) To establish how feasibility assessment influences quality of residential building construction projects in Nairobi County.
- ii) To determine how contract negotiation process influences quality of residential building construction projects in Nairobi County.
- iii) To assess how monitoring and evaluation influences quality of residential building construction projects in Nairobi County.
- iv) To establish ways in which project closure influences quality of residential building construction projects in Nairobi County.
- v) To examine how the combined project construction phases influence quality of residential building construction projects in Nairobi County.
- vi) To analyse the influence of legal environment on the relationship between project construction phases and quality of residential building construction projects in Nairobi County.

1.5 Research Questions

This study sought to answer the following questions:-

- (i) How does feasibility assessment influence quality of residential building construction projects in Nairobi County?
- (ii) How does contract negotiation influence quality of residential building construction projects in Nairobi County?
- (iii) In what ways does monitoring and evaluation influence quality of residential building construction projects in Nairobi County?

- (iv) In what ways does project closure influence quality of residential building construction projects in Nairobi County?
- (v) How do the combined project construction phases influence quality of residential building construction projects in Nairobi County?
- (vi) In what ways does the legal environment influence the relationship between project construction phases and quality of residential buildings construction projects in Nairobi County?

1.6 Hypotheses of the Study

The following were the null hypotheses tested in the study:

H₀₁: There is no significant influence of feasibility assessment on quality of residential building construction projects in Nairobi County.

H₀₂: There is no significant influence of contract negotiation on quality of residential building construction projects in Nairobi County.

H₀₃: There is no significant influence of monitoring and evaluation on quality of residential building construction projects in Nairobi County.

H₀₄: There is no significant influence of project closure on quality of residential building construction projects in Nairobi County.

H₀₅: There is no significant influence of the combined project construction phases on quality of residential building construction projects in Nairobi County.

H₀₆: The strength of the influence of project construction phases on quality of residential building construction projects in Nairobi County does not depend on the legal environment.

1.7 Significance of the Study

The study would contribute to the development of knowledge on handling questionable issues in project construction processes. This would serve as a longer-term safeguard against individuals with questionable business ethics. Project organizations would be enabled to strive to have a work ethics fundamental to their project and distance themselves from a project where the ethics are in question in order to ultimately protect their reputation. Findings from the study would also help to develop a framework for assessing the presence of integrity systems in construction organizations.

The framework would be developed from identified best practices from literature review and the questionnaire survey. The framework would provide construction organizations with a tool for assessing the presence of ethical principles, determining the weaknesses and put in place strategies to bridge identified gaps. The framework, if implemented by construction organizations, would contribute to minimizing incidences of unethical practices. Implementation of the framework would also be used as a reference point for external institutions to establish construction organizations' commitment to integrity.

1.8 Assumptions of the Study

One assumption is that the variables of the study would not be subject to change during the research period as this would affect the validity of results; secondly, that the sample chosen was adequate to help in drawing valid conclusions and lastly, that the respondents would be honest in giving the required information.

1.9 Delimitation of the Study

The primary focus of the study was on the influence of project construction phases on quality of residential building construction projects in Nairobi County. The unit of analysis was the building construction firms in Nairobi County. The respondents were therefore contractors and consulting engineering firms of buildings construction in Nairobi County because they were viewed to be in a position to provide data on building construction projects. The area was considered for the study due to various challenges facing building construction projects in the county as identified in the county's development reports.

1.10 Limitations of the Study

It was difficult to access certain respondents for them to participate in the study. This was common in public offices that have long processes of approval for an individual from such offices to participate in the study. It was therefore hoped that the response rate obtained would be adequate to proceed with data analysis. The study intended to draw responses from a diverse number of respondents, a process which would consume much time and this called for the use of research assistants to administer the questionnaires. In addition, it was to take time to secure appointments from those in the senior management levels because of their busy schedules and

therefore prior arrangements were made to counteract this setback. Thirdly, the findings of the study would be limited to residential building construction projects in Nairobi County and may not be easily generalized to other similar projects. There is need, therefore, to replicate the study in other counties to establish the universality of the findings from this study.

1.11 Definition of Significant Terms Used in the Study

Building Construction Project: Construction works carried out to provide housing to occupants and their property. In this study, this is any work in connection with construction of a residential building.

Contract Negotiation: The process of give and take that clients and contractors go through to reach an agreement on the terms of building construction and reflected through level of competence of selected contractor, adequacy of contract documents and adherence to procurement procedure.

Feasibility Assessment: The assessment of the practicality or viability of the proposed building construction project to determine whether to proceed with it especially with respect to evidence of assessment, level of qualification of assessment personnel and level of feasibility data use.

Monitoring and Evaluation: The process of making judgment about the progress and value of project milestones especially with respect to compliance with work plan, assessment of quality of building materials on site, availability of progress reports, application of Monitoring and Evaluation findings and level of application of Monitoring and Evaluation findings.

Project Closure: The process of project termination and consists of the processes that are performed to formally end and close all the activities in the project such as level of stakeholder involvement, availability of project inspection report and sustainability Plan.

Legal Environment: The set of rules and regulations surrounding construction firms; the system of rules and principles governing the conduct of and relationships between the government or regulatory bodies and construction firms reflected through codes of ethics and professional conduct, NCA Regulations, NBI Audits and manual of Standard Building Specifications.

Project Construction Phases: Refers to a series of activities in the building construction project cycle which are necessary to fulfil project goals or objectives and thy include feasibility assessment, contract negotiation, monitoring and evaluation and project closure processes.

Quality of Residential Buildings: This is the measure of excellence arising from adherence to building standards and being free from significant variations by virtue of meeting the requirements of building standards especially with respect to reliability of the built structure, suitability of the building project and completeness of the built structure.

Residential Building: This is any building constructed to provide housing to people, and usually designed to stand permanently in one place.

1.12 Organization of the Study

This section shows the organization of the study from chapter one to chapter five. Chapter one gives an overview of the background information of project construction phases and quality of building construction projects in various parts of the world especially Third World countries and statement of the problem which identifies the gap that the study is going to address. It also contains objectives, research questions, research hypothesis, limitations, delimitation and significance of the study and the definition of terms of the study. Chapter two highlights all the literature review cited about the independent variables and the dependent variables of the study. Chapter three gives an overview of the methodology that will be used that is it gives the philosophy, research method to be used, target population, sampling method, data collection techniques, data analysis and ethical considerations during the study. The fourth chapter deals with data presentation, analysis, interpretation and discussion. Chapter five of the study is on findings, conclusions, recommendations and suggestions for further research.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter reviews the relevant literature on project construction phases and quality of residential building construction projects. The chapter covers feasibility assessment and quality of residential building construction projects, contract negotiation and quality of residential building construction projects, monitoring and evaluation and quality of residential building construction projects, project closure and quality of residential building construction projects, as well as legal environment and quality of residential building construction projects, theoretical framework, a conceptual framework and knowledge gaps.

2.2 Quality of Building Construction Projects

There is no precise or single definition of ‘quality’, although many of the pioneers of the quality movement and gurus, such as Deming, Juran, Crosby, Feigenbaum, Taguchi and others, had their own individual definitions of ‘quality’. Edwards Deming referred to quality as a predictable degree of uniformity and dependability with a quality standard suited to the customer (Chandrupatla, 2014). According to Deming, the customer is the most valuable part of the production line and therefore quality should be aimed at the present and future needs of the customer. The underlying aspect in all definitions is the consistency of conformance and customer focus (Witzel, 2014).

The definition adopted in this study is one relevant to the construction industry, which is the totality of features and characteristics of an entity that bear on its ability to satisfy stated or implied needs (ISO 9000:2000), where an entity can be a product, a component, a service, or a process. The ultimate judge for quality in a construction project is the client, although how a client defines quality may be biased, but there are ways to make quality objective (PM4DEV, 2016) for instance, by counting errors and defects after the product is used.

The ISO approach to quality management stresses about customer satisfaction which connotes production of a good or service whose standard meets the customer’s needs, prevention other than inspection, continuous improvement using the Deming Cycle of Plan-Do-Check-Act which

continuously improves production systems (Newton, 2015). These principles act as a guide to a good quality management system. The myth that holding of an ISO 9001 certificate means that a construction firm has an effective QMS calls for a change in mind-set. A reasoning that one builds to the minimum level of quality and later repair any faulty work, should be countered by the rationale of producing 'right-first-time'(Tricker, 2008). Inarguably, if the construction company's culture is good, the quality system will be applied appropriately, with the resulting building structure also being good.

Recent publications on construction quality management highlight the important activities that should be performed in relation to the application of an effective quality management system. According to Ruman (2011), a construction company needs to demonstrate its ability to consistently provide products that meet or exceed customer expectations and satisfaction, while also adopting appropriate processes for the continued improvement of the QMS and related assurances of conformity to customer and applicable regulatory requirements.

Watson and Howarth (2011) also emphasize that for ISO 9001 to remain a process-based system with heavy emphasis on compliance, an organization is required to rigorously conduct an assessment of organizational performance, set against a standard and leading to accreditation. Clearly, the context of an effective QMS implementation is to ensure that work is performed according to specifications, throughout the design and development phases, manufacturing and construction, and servicing, and also ensure that customers are satisfied with the resulting products and services (Beaumont 2006). Building construction projects stand to benefit from such a quality management system.

A study by Cao (2010) showed that creating a good project environment will play an important role in guaranteeing the quality and safety of construction projects, achieving civilized construction, and setting social image of construction corporation. This is vital for efficiency of project operations. A project stands to benefit if stakeholders prioritize quality standards in all phases of the project life cycle.

2.3 Project Construction Phases and Quality of Building Construction Projects

Some key issues arising between contracting parties in the project construction phases include: ambiguous project status, poor quality and cost control, delays on certifications and approvals, unwarranted variations and cost overruns, disputes, conflicts and lack of trust (Government of the Republic of Kenya, 2009). Ethical standards according to Sambasivan and Soon (2007) are required in the various construction processes to ensure quality of a project such as in project definition, activity sequencing and determining of activity duration. Failure to adhere to ethical guidelines may therefore affect the project completion time.

Transparency International (2005a) argued that corruption if allowed to persist undermines the quality and quantity of services. It corrodes economic development and jeopardizes the provision of basic public goods and services especially in developing countries. A study by Cao (2010) conducted in China observed that the quality management of the whole process of project construction should be paid more attention, including the phase of pre-construction, construction and completion. The consciousness of quality control in the phase of project quality plan should be strengthened, and the focus on the inspection after completion should be transferred to the planning and process control of pre-construction.

In this study, project construction phases and their influence on quality of residential building construction projects have been discussed. These include feasibility assessment, contract negotiation, monitoring and evaluation and project closure. The influence of the legal environment on quality of residential building construction projects has also been considered.

2.3.1 Feasibility Assessment and Quality of Residential Buildings

Feasibility study in the conception of projects is the foundation of a comprehensive and transparent determination of the viability of investment proposals and focuses on minimizing uncertainty throughout the lifetime of the project. The project feasibility study involves the making of a project feasibility study that comprises an evaluation and analysis of the potential of a proposed project and is based on extensive investigation and research to support the process of decision-making. Munns and Bjeirmi (1996) state that project definition and early decision making is critical to overall success and suggest that the broader decisions in selecting a suitable

project in the first place are more likely to influence the overall success of the project. The project feasibility phase is the second phase in the lifecycle of a project but the first one is the conceptualization phase (Kerzner, 2006). According to Kerzner (2006) the conceptualization phase involves two critical factors: (1) Identify and define the problem, and (2) identify and define the potential solutions. Kerzner (2006) gives the following explanation of the feasibility study phase: “The feasibility study phase considers the technical aspects of the conceptual alternatives and provides a firmer basis on which to decide whether to undertake the project.”

Cost underestimation is a case of concern in some building construction projects and the reason is assumed to be the incentive to make a project look better and profitable in order to get the project started (Flyvbjerg et al., 2002). This procedure is known to affect decision making in the beginning of projects, and is called “strategic misrepresentation”, in addition to “optimism bias” which includes excessive optimism on the project’s outcome. Fridgeirsson (2014) states that “the consequences of these two phenomena are unrealistic expectations of projects’ benefits, costs and duration, which distort the real financial needs and benefits, stirs up controversy and unnecessary difficulties in the duration of the project.” Fridgeirsson (2014) mentions a problem in the decision making process in public projects, that is the people who make the project’s go/no-go decision are not financially responsible for the project. Where the decision makers are not risking their own funds, they might not act in the best interest of taxpayers. While the financial responsibility of the public projects is distributed among taxpayers, the private companies carry all financial responsibility themselves.

In order to prevent the use of the above mentioned procedures and to promote the efficient use of stakeholders’ money, feasibility studies should be conducted, whether the proposed construction project is within the public sector or the private sector. Owners, decision makers and financial institutions build their decisions to proceed with and/or finance any project based on the results of the feasibility study of that project (Hyari and Kandil, 2009). Hyari and Kandil (2009) state that ensuring the validity of economic feasibility studies of construction projects is a vital step in ascertaining that decisions related to the construction of facilities are based on consistent and standard procedures that avoid the use of misleading or inadequate information. They also

emphasize that decision makers exert every possible effort to ascertain that analyses presented in a feasibility study report are based on reasonable forecasts and reliable information.

To develop a successful project, its promoters should ascertain that the project is politically, socially, legally, environmentally, economically and financially viable and the project viability may only be determined following a detailed and accurate feasibility study (Salman et.al 2007). The conduct of a comprehensive feasibility analysis plays an important role regarding implementation and prioritization in the decision-making phase in the beginning of a project life cycle, which applies to public and private projects respectively. Yun and Caldas (2009) argue that this process leads decision makers to make a go/no-go decision, to determine investment priority between capital projects, and to provide optimal alternatives and investment timing. They state that preliminary feasibility studies are the basis for the go/no-go decision, which determines whether the capital project is to be recommended or not. Many funding agencies in the private sector also require satisfactory feasibility study reports before committing significant funds to projects seeking external finance (Gardiner, 2005).

Hyari and Kandil (2009) emphasize the importance of weighing massive expenditures on construction projects against the expected benefits resulting from the projects to stakeholders and therefore conducting feasibility studies prior to the construction of the facilities. The economic feasibility of a project is an estimate of the potential profitability of a project and a study that measures the expected benefits from a certain project relative to its cost (Hyari and Kandil, 2009). A study conducted by Yun and Caldas (2009) to discover knowledge from preliminary feasibility studies of large-scale projects in Korea using classification and prediction came to a similar conclusion. Their conclusion was that the dominant decision variables in determining the implementation of the project were the benefit - cost ratio, the economic feasibility and the financial feasibility, but these decision variables have in common that they are closely related to the financial aspects of a project (Yun and Caldas, 2009). Yun and Caldas (2009) state that in this case the benefit - cost ratio was the most important decision variable for determining the project implementation.

According to Yun and Caldas (2009) the preliminary feasibility studies include four processes that are used to analyze a capital project: project overview; economic feasibility; political viability; and total viability. Project overview examines the project's basic information such as its background, objectives, and procedure and planned content. Economic feasibility estimates demand and calculates economic and financial indices such as benefit-cost ratio (B/C), net present value (NPV) and internal rate of return (IRR) based on cost-benefit analysis to determine national economic impact and investment suitability. Political viability evaluates non-economic impact, attitudes toward the project, financial feasibility, and compliance with relevant governmental policies, environmental impact, as well as project-specific factors.

In a study carried out in the Gaza Strip (Palestine) by Adnan, Sherif and Saleh (2009) to identify the factors affecting the performance of local construction projects; and to elicit perceptions of their relative importance, survey findings indicated that all 3 groups of project participants; namely owners, consultants and contractors agreed that the most important factors affecting project performance are related to feasibility assessment and include: delays because of borders/roads closure leading to materials shortage; unavailability of resources; low level of project leadership skills; escalation of material prices; unavailability of highly experienced and qualified personnel; and poor quality of available equipment and raw materials.

Total viability leads decision makers to make a Go/No Go decision, determine investment priority between capital projects and provide optimal alternatives and investment timing. Yun and Caldas's (2009) results from analyzing decision variables that influence preliminary feasibility studies reveal that practitioners emphasize financial aspects in the project's planning phase. Although economic feasibility has the biggest influence on the Go decision it does not mean that other factors aren't important in the decision making process as well.

2.3.2 Contract Negotiation and Quality of Residential Buildings

One outstanding issue in the construction industry is subjectivity in procurement practices (Ameh and Odusami, 2010). Moylan (2008) also observed that within the construction industry, the practices of bid shopping, bid rigging, related cost reduction practices pose a range of ethical

challenges. The potential effect these bidding practices can have on involved stakeholders such as the client, consultants, bidding contractors and ultimately the public can be considerable.

In the design phase, the project architect/engineer prepares comprehensive plans and specifications sufficiently definitive to permit lump-sum price estimates. In the bid phase, the owner submits the plans and specifications to one or more prime contractors who either submit bids as part of a competitive award process or who submit proposals to the owner for negotiation. In the build phase, the prime contractor to whom the owner has awarded the job builds the project strictly in accordance with the plans and specifications. Often, the project contractor continues to provide services to the owner throughout the construction period. These services may include inspecting construction progress, reviewing contractor submittals that illustrate proposed execution of the design, processing change orders, approving contractor payment applications, resolving owner-contractor disputes, and interpreting design documents. As a result, the responsibilities covered by the owner-design professional agreement and the owner-prime contractor agreement overlap as to time and activities (Carl, 2005). This may trigger ethical issues such as negligence, if these overlaps are not sorted out before the construction work begins.

Transparency International (2006) stated that in order for the procurement process to check unethical practices, the competitive and bidding process should adhere to several common guidelines such as sound independent audits of procurement processes and requirement for third party monitoring of large procurements. In the public sector, the competitive bidding process has been used to ensure a fair profit for the risks assumed by the competent general contractor. Zhou (2006) stated that the uncompetitive tendering practices include inappropriateness of tender evaluation criteria, preferential treatment of tenderers, disclosure of baseline price of project and other confidential information and integrity of members of tender evaluation committees. Quantity surveyors always believed that contractors repeatedly over-claimed and that clients pressurized consultants to make savings on projects or cut their fees (Ray and Hornibrook, 1999).

Cronyism is a common form of unethical conduct in award of contracts. In much of the world, one routinely awards contracts to one's friends. The reason is that business is based on trust relationships with individuals (Jackson, 2001). They take different forms in different countries. In China one speaks of *guanxi* (the Putonghua word for "relationship"), which is a long-term association based on mutual obligation. In Mexico business relationships reflect bonds of friendship and affection. In Japan or Korea they are based on an old-boy network formed during college days. The West refers to this as cronyism and complains of lack of transparency (Hooker, 2000). Contracts under such circumstances may end up in the hands of unqualified contractors.

Among the highlights of dishonesty and unfair practices witnessed in South Africa, according to Bowen et al. (2007), were in terms of: materials – the contractor lies about materials used or uses inferior materials and loss of materials on site; professional dishonesty – poor practices by consultants; inexperience; blaming contractors for incompetence; deliberately increasing contractor cash flow through unmerited payment awards and recommending friends for tender awards. BSI Group (2008) highlighted bargain hunting after tender has been received, unfair processes of tender adjudication, secrecy of contract negotiations, tender disclosure to competitors and lowest tender not being selected in selective tendering.

Zhou (2006) stated that at tendering stage, contractors sometimes offer bribes to the client in order to win the project. Ameh and Odusami (2010) defined bribery as a form of corruption involving anything of value solicited, bestowed or offered to induce or influence the receiver's conduct in the discharge of public or legal duty. On the other hand, Vee and Skitmore (2003) defined bribery as the offering of some good or service or money to an appropriate person for the purpose of securing a privileged and favourable consideration of one's product or corporate project. They further stated that bribery occurs in many forms. These include cash inducements, gifts and favours and entertainment. This is usually provided by the contractor to either the client or the consultant.

Bribery in relation to the award of the contract is the most visible form of corruption in procurement of projects. Alger et al. (1965) stated that kick-backs or bribery is unethical. In Zambia, like in Kenya, the government has put in a measure where information relating to

examination, evaluation and comparison and post qualification of bids shall not be disclosed to bidders or any other persons not officially concerned with such process until publication of the contract award. Bidders who attempt to influence the evaluation committee in the selection process risk losing consideration (Amundsen, 2000). Bidders are further not allowed to contact the client from the time the bids are opened to the award of contract unless it is done so in writing. Bowen et al. (2007) on the other hand stated that unfair conduct may occur in competition (unfair competition), in contracts (unfair contract terms) and in business practice (unfair business practice). In their survey, Vee and Skitmore (2003) combine unfairness with dishonesty. They stated that dishonesty constituted illegal behavior and is thus more appropriately linked to fraud.

Alger et al. (1965) recommended that no reputable contracting engineer who had any concern for his reputation or his own peace of mind could possibly accept work under kickback conditions. However, a distinction needs to be made between a bribe and a token gift. A token gift, such as a branded calendar or a pen, is a goodwill and friendly gesture that can lubricate and produce a smooth working organization. Rejecting a token gift can cause insult and mistrust. However, Alger et al. (1965) suggested that when gifts begin to affect the exercise of free judgment by the engineer, the exercise may be regarded as a bribe. In extreme cases, this has led to extortion and fraud and other serious crimes. In a study in Pakistan by Ehsan, Anwar, and Talha ((2009), it was established that all persons associated with the construction process had been engaged in some form of malpractice such as bias and incompetence to carry out the work.

Ethical considerations are significant in the contract negotiation as well as in the subsequent procurement process. Procurement refers to the purchasing of goods and services in the right quality, from the right source and the right price all to meet a specific need (Kerry and Phoebe, 2006). Every developer has the obligation to provide essential services to the citizens. The close relationship between procurement and development demonstrates that there is need for transparency and accountability in the manner in which procurement is conducted. In Kenya, weak public procurement legislation and the lack of citizen oversight in procurement procedures have resulted in enormous waste of taxpayers' money (Mawenya, 2008). This is evident in the management of public funds. The main objectives of public procurement in Kenya according to

the Citizens Guide to Public Procurement (2005) are: to maximize economy and efficiency; to promote fair competition; to promote integrity; to increase transparency and accountability and promote local industry.

General procurement rules in Kenya are elaborate in the way procurement should be conducted. The government has established the Public Procurement and Disposal Act (2010) to ensure transparency and accountability in public procurement; and regulate and control practices relating to public procurement in order to promote the integrity of fairness and public confidence in, the procurement processes. They contain rules to do with choice of procurement procedure; Procurement not to be split or inflated; Qualifications to be awarded contract; Pre-qualification procedures; Limitation on contracts with employees, etc.; Specific requirements; Verification that not debarred; Termination of procurement proceedings; Form of communications; Inappropriate influence on evaluations, etc.; Participation in procurement; Corrupt practice; Fraudulent practice; Collusion; Conflicts of interest; Confidentiality; Procurement records; Publication of procurement contracts; Amendments to contracts; Interest on overdue amounts; and, Inspections and audits relating to contracts. Measures against adherence to the rules are clearly stated in the Act (The Public Procurement and Disposal Act, 2010).

Efficiency of purchases is of prime importance. This implies that contractors should ensure that purchases are not wasteful, are based on market prices, can generate savings and are devoid of wastage and over invoicing (Collier, 2005). The expectation is that suppliers will be developed, will grow and consequently, the citizens will see the benefits of public procurement through increased provision of quality goods and services. Public procurement has to be practiced based on ensuring value for money. Driven by considerations of value for money, governments have put increasing efforts into rationalizing and increasing efficiency of procurement (McDevit et al., 2007). There has been recognition that procurement officials need to be equipped with adequate tools for improving planning and management and that their decisions need to be well informed (OECD, 2007) so as to enhance efficiency in procurement. Good practices reduce costs and produce timely results, and poor practices lead to waste and delays.

Lack of efficient procurement highly affects development issues such as service delivery, economic growth, private sector development and decentralization (Kerry and Phoebe, 2006). In addition, inefficient procurement adversely affects professionalism and international trade and investment. Public procurement is challenged to make savings by improving efficiency. Standards can enable procuring entities and suppliers to work together so that they share the advantages of innovation and collaboration (BSI group, 2008). Efficiency and value for money is delivered through the whole procurement cycle, from planning stage to contract management stage.

According to Mawenya (2008), the level of efficiency in public procurement is basically measured by the proper application of complete written procedures and standards of procurement such as pre and post qualification procedures; pre and post bid conference procedures; bid evaluation procedures; and bid challenge procedures. In addition BSI Group, (2008) points out that professionalization of public procurement, institutional and professional capacity, extent of e- procurement, and the performance of procurement department indicate the level of efficiency. Insufficient professionalism of officials may translate into poor planning, budgeting and risk management for procurement (Kerry and Phoebe, 2006), leading to unnecessary delays and cost overruns for projects. In other words, public officials are not necessarily well prepared to keep up with professional standards. Furthermore, officials may not necessarily be aware that their acts are unethical or may bias the process which can lead to conflict-of -interest situations and sometimes corruption (OECD, 2007). Policy makers should prioritize the needs of stakeholders during procurement to ensure financial accountability (Mawenya, 2008). Governments have reinforced their control and accountability mechanisms on public procurement in recent years. A key challenge is to define a clear chain of approval and responsibility in the public procurement process in a context of devolved procurement (OECD, 2007).

The procurement processes should be capable of being questioned and everything be above reproach (Armstrong, 2005). Transparency is a key requirement of a modern public procurement system. It gives to the public information concerning, and access to the law, regulation, policies and practice of procurement by government agencies. Lack of transparency in public procurement is a major impediment to sustained economic growth through investment and trade.

Lack of transparency in procurement activities can be the source of unwholesome activities such as corruption, scandal and abuse of public resources (Shu, Othman, Omar and Husna, 2011).

Transparency is considered as one of the most effective deterrents to corruption and a precondition for ensuring public officials' accountability (OECD, 2007). How is transparency in public procurement measured? Procurement of goods through an Internet or information and communication technologies-based process (e-procurement) is taking root globally and begins with contract establishment, but can also cover publicity of tenders, ordering, invoicing and payment. Efficiency needs are a driving force for e-procurement, but so are increased transparency and competition among suppliers (Collier, 2005). Clear and comprehensive bidding documents, and contracts, are crucial to transparency in the procurement process.

A transparent procurement process requires legislative and administrative measures such as transparent proceedings, protection against corruption, fair prequalification procedures and transparent selection of the winning (ADB/ OECD, 2006) bidder. Publication of annual procurement plans of procuring entities is also an important transparency measure, as well as dissemination of information concerning lists and registries of suppliers, and procedures to apply for registration. Publication of notices concerning the award of procurement contracts (OECD, 2009) is another important transparency measure. Other transparency relevant measures include: open bidding procedures; prompt disclosure of the results of bids, i.e., prompt notification to successful as well as unsuccessful bidders; publication of annual procurement plan; bid challenges system; engaging the private sector in the procurement process; keeping a complete and an adequate records of procurement activities.

Many African countries have adopted procurement legislation and regulations that require public entities to commit to efficient, accountable and transparent procurement regimes (Shu, et al. 2011). The need to find best practices in government procurement in the public sector in developing countries is becoming more intense and the demand for transparency and accountability is increasing (Raymond, 2008). Public procurement has undoubtedly become an increasingly important issue in economic and business circles globally. This is evidenced by the

growing interest of donors, governments, civil society, professional organizations, the private sector and the general public on matters of public procurement (Odhiambo and Kamau, 2006).

Corruption thrives on non-disclosure (Stansbury, 2005). Transparency and accountability have been recognized as key conditions for promoting integrity and preventing corruption in public procurement. So many owners feel their responsibility, once the job starts, is to pay progress payments. It is much more. The owner has certain duties which he must undertake in an ethical manner. For example, the owner has the duty to disclose any superior knowledge he has that the contractor will need in order to perform under the terms of the construction documents. Failure to do so will result in a breach of contract and the owner will be liable for any impact the lack of knowledge imposes on the contractor (Alaghbari et al, 2007).

In addition, the owner has the duty to act in good faith and to deal fairly in all matters relating to the contract (Guyer, 2011). This includes, but is not limited to, the duty not to delay, interfere with or hinder the contractor's performance of the work under the contract. An example would be intentional late payments. The owner has the duty to provide timely access to the site, within the terms and conditions of the contract and the reasonable expectations of the contractor under the requirements of the contract. Also, the owner warrants that the construction documents are accurate, complete and buildable (Alfred, 2008). The contract documents define a constructed facility considered acceptable under the applicable regulatory codes and standards of professional practice, in terms of its reliability, the ease with which maintenance and repairs can be performed, the durability of its materials and operating systems, and the life safety provided to its users. The facility is constructed in accordance with those documents (Lakshmi, 2015). Failure to adhere to these expectations results to ethical issues such as delayed completion of projects.

2.3.3 Monitoring and Evaluation and Quality of Residential Buildings

Monitoring and evaluation of construction is an important process of the project life cycle. The need to observe or monitor construction processes to ensure quality work cannot be overemphasized. Enshassi (1996) stresses on the need to observe projects promptly and at regular intervals. IUCN (2000) pointed out that regular monitoring of project progress will

concentrate greater effort on the set output indicators and targets. This is of great significance in the attainment of quality and customer satisfaction. Where deviations from the expected results are noted, effort is made to correct them and this should be done on a regular basis.

Management Audits and Reviews of Projects are necessary. A project audit is a systematic and independent investigation to check if the project is performing correctly with respect to project and/ or project management standards. A project review is defined as a formal examination of the project by persons with authority in order to see whether improvement or correction is needed (Huemann, 2004). An accreditation is an external evaluation based on defined and public known standards. Accreditation was originally established to support customer protection. Consumers can be protected by certification, inspection, and testing of products and by manufacturing under certified quality systems. Consumers need confidence in the certification, inspection, and testing work carried out on their behalf, but that they cannot check for themselves (Huemann, 2004). Quality control should be continuous, commencing from the moment the project initiates to the final steps in the project closure phase (PM4DEV, 2016). There are many instances where a project can be progressing smoothly right up until the moment that a quality issue becomes apparent. The key to project success is identifying such issues well before they become obvious because once this happens it is virtually impossible to meet the original requirements (Newton, 2015).

Almost all of the processes that form part of project management will involve meetings between the project manager, the team and other stakeholders. How well these meetings are conducted will have a major impact on how smoothly the project runs. Collective decision-making is a very important area of project management that can make or break this part of the project (Newton, 2015). Collective decision-making allows the team members come up with performance evaluation measures to be utilized to gauge the level of project success. The evaluation of process performance can help find questions in the enforcement of construction projects, determining the reasons for the questions and correcting the errors in the practice in time to improve management's performance of construction project (Bai and Yang 2011).

Competence of monitoring consultants determines quality of construction work. Shakantu (2006) identified negligence in the form of poor quality works and also covering up poor workmanship during site operation as some of the unethical practices at construction stage. Bowen et al. (2007) defined negligence as lack of proper care and attention or carelessness. Vee and Skitmore (2003) on the other hand defined negligence as a failure to exercise that degree of care which, in the circumstances, the law requires for the protection of those interests of other persons which may be injuriously affected by the want of such care. Professionally, this would be the failure to exercise the degree of care considered reasonably warranted by the circumstances, resulting in an unintended injury to another party.

Lack of efficient procurement highly affects development issues such as service delivery, economic growth, private sector development and decentralization (Kerry and Phoebe, 2006). In addition, inefficient procurement adversely affects professionalism and international trade and investment. Public procurement is challenged to make savings by improving efficiency. Standards can enable procuring entities and suppliers to work together so that they share the advantages of innovation and collaboration (BSI group, 2008). Efficiency and value for money is delivered through the whole procurement cycle, from planning stage to contract management stage.

According to Mawenya (2008), the level of efficiency in public procurement is basically measured by the proper application of complete written procedures and standards of procurement such as pre and post qualification procedures; pre and post bid conference procedures; bid evaluation procedures; and bid challenge procedures. In addition BSI Group, (2008) points out that professionalization of public procurement, institutional and professional capacity, extent of e- procurement, and the performance of procurement department indicate the level of efficiency. Insufficient professionalism of designers may translate into poor planning, budgeting and risk management for procurement (Kerry and Phoebe, 2006), leading to unnecessary delays and cost overruns for projects. In other words, designers and contractors are not necessarily well prepared to keep up with professional standards. Furthermore, these professionals may not necessarily be aware that their acts are unethical or may bias the process which can lead to conflict-of-interest situations and sometimes corruption (OECD, 2007).

Efficiency in use of resources needs to be monitored well by the contractors. Efficiency is the productive use of resources, that is, the ability to do something well or to achieve a desired result without wasted energy or effort. This is about ensuring value for money (Stansbury, 2005). Inefficiency occurs when the contractor becomes obliged (say, by consulting engineers) to forfeit well prepared work plans for less efficient techniques which ultimately compromise on quality. United Nations Development Programme, (2009) states that efficiency measures the extent to which there is maximum utilization of available resources to achieve the intended results. In assessing efficiency, a project evaluation might explore the extent to which resources are being used to produce the intended outputs and how resources could be used more efficiently to achieve the intended results (IFAD, 2009).

Evaluating effectiveness of project activities deters cases of abandoned and incomplete construction projects. Effectiveness is a measure of the extent to which the initiative's intended results (outputs or outcomes) have been achieved or the extent to which progress toward outputs or outcomes has been achieved. Evaluating effectiveness in project evaluations involves an assessment of cause and effect—that is, attributing observed changes to project activities and outputs. Assessing effectiveness involves three basic steps: Measuring change in the observed output or outcome, attributing observed changes or progress toward changes to the initiative (project evaluation) and judging the value of the change (positive or negative) (UNDP, 2009). In his study of the construction industry in Swaziland, Leonard (2008) additionally observed that reduced subcontractor responsibility assists in improving quality among construction projects. He pointed out that poor on-site monitoring and feedback as well as poor planning and scheduling are major factors in project quality performance.

An evaluating of construction sustainability involves assessing the extent to which relevant social, economic, political, institutional and other conditions are present and, based on that assessment, making projections about the capacity to maintain, manage and ensure the development results in the future (UNDP, 2009). Sustainable construction implies that sustainable development strategies are applied to the entire construction process from planning, design and construction of buildings until project closure. This is because the aim of sustainable construction is to restore and maintain a balance between the natural and built environments, and

establish buildings that maintain and promote human dignity and enhance economic development (CIB and UNEP-IETC, 2002).

Public sector housing programs are characterized by doubtful quality, generally unimaginative planning and design, low market image, high client dissatisfaction, poor land management records, low land costs and low expectations of profit, offset by organizational inefficiency. In the rush to provide better housing and improved services, communities are sometimes relocated to remote sites that inhibit the social processes that facilitate cohesive communities and settlements. In Africa, single-purpose land use, low densities, long distances from work centres and inadequate public transport are some of the urban level unsustainability issues related to such interventions. In Asia and Latin America, issues such as a lack of formal low-income housing schemes in some countries, and the high population densities in housing schemes, create a different set of problems.

The question most often asked by service providers in the construction sector is whether there is a market for sustainability. It is the role of clients – from the individual buying a wood-treatment product to the government putting out tenders for infrastructure development – to demand products and services that support sustainable construction and thus create this market. For this, clients have to become informed customers, adopt mechanisms that will release funding for possible additional costs, form partnerships to leverage change, change their procurement systems and monitor the impact of their choices (CIB and UNEP-IETC, 2002).

There is evidence that highly sustainable buildings can be produced at little or no additional costs, provided sustainability is designed in from the outset (Borough, 2012). Therefore, from the foregoing, it is crucial for the construction project team, at some extent, to measure its performance on the activities or sub-processes performed throughout the construction project. Quality of a project can be considered as a result of the process as well as the presence of the process (Bai and Yang, 2011). For a project team to be effective, it is important for team members to understand and accept the quality measurement or indicators identified for the project.

2.3.4 Project Closure and Quality of Residential Buildings

Project closure refers to the process of formally ending the project activities (Sanghera, 2006). Although a lot has been written about starting and executing a project successfully, Havila, Medlin and Salmi (2013) point out that closing the project doesn't find a lot of presence in the project management literature and that fewer than 5% pages in a typical literature artefact discuss project closure requirements. Not all the projects undergo a smooth journey culminating in a successful end and some of the projects need to be terminated even before they have accomplished the planned goals and objectives (Havila, et al., 2013). Project completion inspection is important and should be planned for as part of the project closure processes.

The practice of project close-out finalizes all project activities completed across all phases of the project to formally close the project and transfer the completed or cancelled project as appropriate (Rohaniyati, 2009). Project closure involves verification by the client, contractor and consultant that all activities have been finalized, documentation has been done and storing relevant information (Rohaniyati, 2009). It also entails verifying that the project has addressed the terms and conditions of the contracts, finalizing of exit criteria for contract termination, validating exit criteria and formally closing out all contracts associated with the completed project (Guyer, 2011). The purpose of project close-out is to assess the project, ensure completion, and derive any lessons learned and best practices to be applied to future projects. The project closure is foreseeable but how it is handled and when it is handled have a huge impact on the success of the project (Hormozi, McMinn, and Nzeogwu, 2000). De (2001) writes that improper handling of project closure can result in several unfavorable effects such as time over run, cost over-run, tarnishing the image and credibility of the project team, locking up valuable human and other resources, that could have been gainfully utilized elsewhere, and stress on the project personnel.

Once the building construction project is sufficiently complete, the contractor will request the architect to conduct a substantial completion inspection to confirm that the work is complete in most respects. By doing so, the contractor implies that the work is complete enough for the owner to occupy the facility and start using it, notwithstanding the fact that there might be cosmetic and minor items yet to be completed. The contractor's request for substantial

completion inspection by the architect may include a list of incomplete corrective portions of the work, referred to as the punch list. The punch list, which is prepared by the contractor, is used by the architect as a checklist to review all work, not merely the incomplete portions of the work. If the architect's inspection discloses incomplete items not included in the contractor's punch list, they are added to the list by the architect. The substantial completion inspection is also conducted by the architect's consultants, either with the architect or separately. Incomplete items discovered by them are also added to the list. If the additional items are excessive, the architect may ask the contractor to complete the selected items before rescheduling substantial completion inspection.

The involvement of all stakeholders is very important in the last stage. Often the closure of a project is underestimated. There is not enough time invested in the actual closing of a project or it could be that the project is prematurely closed by a manager (Havila, Medlin, and Salmi, 2013). Availability of project documentation meets the criteria of project close-out process. Historic project data is an important source of information to help improve future projects. All records, both electronic and hard copy should be stored according to record retention guidelines (Parson, 2005). The technical records will be turned over to the personnel responsible for maintenance and operating of the system or program after it has been deployed. The project archive includes a description of the files being stored, the application used to create the archived materials, the location where they are stored, and point of contact for further information (Guyer, 2011). Key among the contractor-related documents archived include those of internal communication, minutes of meetings, progress reports and contract documents (Rohaniyati, 2009).

After the certificate of final completion, the contractor is no longer liable for the maintenance, utility costs, insurance, and security of the project. These responsibilities and liabilities transfer to the owner.

2.4 Legal Environment and Quality of Building Construction Projects

There are various laws and regulations with significant influence on quality of project undertakings.

2.4.1 Codes of Ethics

Ethics refers to moral standards of society and how these standards apply in life. Thus ethics in the context of building construction projects involves an assessment of the moral standards governing project management as well as the effects of these standards upon the lives of project beneficiaries. One of the factors that help to evaluate if an act is right or wrong is the element of the common good (Ross cited in Vee and Skitmore, 2003) which evaluates behaviour based on its effect on all other parties. This can be achieved by balancing ethical considerations with the three ethical principles of respect, beneficence and justice which are a useful guide on which to base judgments.

The first ethical principle is the Principle of respect. In building construction projects, respect for autonomy which protects clients' self-determination goes hand in hand with truth telling. Non-disclosure of construction errors to clients therefore ignores, insults and demeans their rights of autonomy (Armstrong, 2005). In addition, deceiving clients interferes with the doctrine of informed consent since clients may not understand the reason or need for additional interventions or a longer construction period that becomes necessary as a means of rectifying an undisclosed error. It is therefore important to disclose errors in order to respect autonomy and facilitate the giving of informed consent.

The second ethical principle is the Principle of Beneficence. Beneficence refers to an act of charity, mercy, and kindness arising from a moral obligation (Audi, 2004). In everyday language, beneficence is associated with acts of mercy, charity, and love benefiting other persons (Beauchamp and Childress, 1994). Some beneficent actions are morally required and others morally discretionary (Cullity, in Ashcroft, Dawson, Draper and McMillan, 2007). The principle of beneficence entails a moral obligation to help other persons (for example, obligations of project professionals to assist their clients) or to provide benefits to others. Beneficence involves both the protection of individual welfare and the promotion of the common welfare.

Although not all acts of beneficence are obligatory, this principle establishes an obligation for project professionals to help their clients further their important and legitimate interests. Such legitimate interests include the prevention and removal of harms (McKeever and Ridge, 2006).

Failing to disclose a structural error that has occurred to a project and letting the client assume that what they observe is due to force majeure is unkind and violates the principle of beneficence. On the other hand, Singh (2005) argues that the client's knowledge and understanding that a mistake or error has occurred may relieve anxiety about slowed progress or complications and will certainly bring benefits.

The third ethical principle is the Principle of Justice. The principle of *justice* is also important as it emphasizes a blend of criteria to maximize on public utility. This determines if a fair distribution of benefits from public programs has been realised (Beauchamp et al. (2001). Other theories of justice hold that society has an obligation to correct inequalities in the distribution of resources, and that those who are least well off should benefit most from available resources (Gostin and Powers, 2006).

The development of codes of good or ethical practice within organizations and professional associations stems from the ethical principles and deontological approach. Unethical behaviour by project practitioners has shown variations from their actual behaviour and the expected ethical responsibilities expected of them, as the professionals in the field. Society expects them to refrain from questionable practices and act professionally (Ayat, 2013).

Project Management Institute has therefore introduced a code of ethics that highlights a variety of unethical behaviours (Bouley, 2007). The introduction of PMI's Code of Ethics and Professional Conduct has created a useful resource which defines ethical responsibilities for project management practitioners to aid in making ethical judgments as the situation dictates (Mason, 2009). The code is based on four pillars which include responsibility, respect, fairness and honesty that were chosen based on their level of significance to project management globally (Jack, 2011). Ethical responsibilities for project management members have been well defined in the PMI Code of Ethics and Code of Professional Conduct (2006). However, in an informal survey, Baker (1999) found that many in project management profession are not aware of the presence and actual content of the Code of Ethics.

Despite Project Management Institute (PMI) publishing a Member Code of Ethics and Member Standards of Conduct, Kenyans continue to experience unethical conduct caused by their project managers and contractors. According to Bowen et al (2007), ethical codes of conduct, corruption and bribery, favouritism, unfair conduct, strict rules and overriding of the audit process have a negative implication on construction processes in any industry/profession and could thus result into project delay, decreased performance and service delivery. This can only be reduced by employing professional ethics (Githui, 2011) which form the basis and foundations of ethical organizations.

In a similar study, project managers/ contractors/ engineers/ consultants/ architects were sampled from different locations of Pakistan as the population of the study. The objective of the study was to investigate into the current status and practices of ethics in construction industry. The findings indicated that many (65%) did not know about the existence of code of ethics and code of conduct of Pakistan Engineering Council (PEC). Out of those who knew about it (35%), about 50% had never read these codes. Almost all the respondents (90%) admitted the importance of code of ethics in organization, the industry and the project itself. Good ethical practice is considered to be an important organizational goal (Vee and Skitmore, 2003).

The Code of Ethics can offer useful guidance to project practitioners by creating awareness on ethical behaviour and applying it in decision-making (Mason, 2009). Its aim is to help project practitioners to uphold and maintain high standards of integrity and professional conduct and become accountable of their own actions.(PMI Code of Ethics, 2006).The purpose of this Code is to establish an understanding of appropriate behaviour and make project management profession be one full of integrity (Robb, 1996). Practitioners from the global project management community were asked to identify the values that formed the basis of their decision making and guided their actions. PMI Code of Ethics (2006) enumerates the values that the global project management community defined as most important as follows: responsibility, respect, fairness, and honesty. This Code affirms these four values as its foundation for ethical conduct.

The National Society of Professional Engineers (2003) has also developed a code of ethics for the professionals in that field. Important canons therein state that engineering has a direct and vital impact on the quality of life for all people. Accordingly, the services provided by engineers require honesty, impartiality, fairness, and equity, and must be dedicated to the protection of the public health, safety, and welfare. Taking unfair advantage of anyone through manipulation, concealment, abuse of privileged information, misrepresentation of material facts, or any unfair dealing practice is a violation of the Code (Goldman Sachs, 2009). Engineers must perform under a standard of professional behaviour that requires adherence to the highest principles of ethical conduct.

Society of Petroleum Engineers (SPE) professionals similarly in line with their code of ethics are expected to manifest high standards of conduct such as competency, honesty and integrity in their professional actions and behaviour. These principles are a guide on the way these professionals ought to serve the interests of the public (Society of Petroleum Engineers, 2013). No single code of ethics is comprehensive enough to cover all aspects of project management, a situation that calls for triangulation by project professionals as well as use of their own discretion on situational basis. Codes of Ethics have however been criticized by Collier (2005) who stated that findings in many surveys tend to support the assertion that professional and organizational codes are toothless tigers, even risible, without the active adoption by individual members.

2.4.2 National Construction Authority (NCA)

Furthermore, to regulate contractors, government created the National Construction Authority (NCA) through an Act of Parliament, the *NCA Act of 2012*. The aim of the NCA is to promote and build the capacity of the Kenyan construction industry. The National Construction Authority Act was operationalized on 8th June 2012 with the Board being inaugurated on 4th July 2012. The role of the Authority is encapsulated in the functions and powers accorded to it through the *National Construction Authority Act*, Number 41 of 2011. The Authority has been given functions and powers to implement so as to carry out this responsibility effectively (National Construction Authority, 2015). The Authority has been enacted at a time when the construction industry is under great pressure to counter various challenges, especially those pertaining to

quality assurance. There is an urgent need to streamline construction in order to develop not just the industry but Kenya's economy (National Construction Authority Act, Rev. 2014).

According to the NCA Act (Rev. 2014), the government is giving great emphasis to the construction industry. In 2013, the construction sector expanded by 5.5 per cent up from a growth of 4.8 per cent registered in 2012. Section 5 of the Act provides the Authority with the function of promoting and stimulating the development and expansion of the construction industry in diverse ways clearly stipulated in the Act. The Act provides a suitable guide to contractors on the expected qualifications and registers those with competence and licenses them. Contractors of building construction projects in Kenya are therefore expected to adhere to the NCA regulations to ensure quality standards and professionalism in their work. According to a 2015 audit by the National Construction Authority many buildings in Nairobi are collapsing due to poor quality of concrete, lack of proper foundation and use of substandard building stones. Lack of skills is one of the scariest nightmares bedevilling the construction industry. Only 16 per cent of those undertaking construction have gone through training. Early this year NCA earmarked 204 unsafe buildings in Nairobi and its environs to be demolished and so far only four buildings deemed unfit to live in Huruma area have been brought down. This is blamed on lack of coordination among regulatory bodies that oversee different segments of the construction sector as the reason for delay. The ministry of housing has therefore come up with a special unit dubbed National Building Inspectorate mandated to re inspect and demolish buildings that are considered to be unsafe for human inhabitants (NCA Interim Report, 2015).

2.4.3 The National Building Inspectorate (NBI)

The National Building Inspectorate (NBI) moreover audits buildings for conformity with land registration, planning, zoning, building standards and structural soundness. NBI seeks to get involved early in the design phase so that it can manage the project more efficiently, provide effective building solutions, and identify challenges early on to mitigate design changes after construction commencement. This involves detailed pre-construction planning crucial to successful construction and on-time delivery, and allows the client and team a clear pathway to the bidding process, construction phase, and through to completion. NBI's Code Enforcement Outreach Program (CEOP) provides support to tenants, owners and NBI, so that the City and the

community can work together to bring rental housing into code compliance. To help ensure the success of this program, NBI works in cooperation with non-profit making organization which represent rental property owners and tenants throughout the country. The purpose of this program is to expedite the code enforcement process by setting out tenant and property owner's respective rights and responsibilities, mediate, and improve communication between the parties (National Building Inspectorate Housing Inspection Services, 2018).

2.4.4 Manual of Standard Building Specifications

The Manual of standard building specifications sets out the technical performance and characteristics required of a building. Each building does, however, have its own attributes. Carrying out a compliance test in the light of the standards laid down in the manual of standard building specifications enables a work programme to be established for each building to bring it up to the required standard (European Commission Office for Infrastructure and Logistics, 2011). All new buildings or buildings which have undergone large-scale renovations must have as high a compliance rating as possible with the manual of standard building specifications.

In this case, the architectural structure, the whole range of technical installations, the internal services and the management procedures are to be integrated in such a way as to give the occupants of the building a working atmosphere that meets the specific objectives of suitability, low cost, safety, comfort and efficiency, while minimizing the impact on the environment (European Commission Office for Infrastructure and Logistics, 2011). Such intervention helps reduce cases of misconduct and incompetence among project professionals.

2.5 Theoretical Framework

Four theories have been discussed that shed light on realization of quality in building construction projects. These are systems theory, virtue ethics, deontological approach and consequentialist approach.

2.5.1 Systems Theory

Systems theory was developed by a German scientist named Ludwig Von Bertalanffy in 1973 (Chikere and Nwoka, 2015). It was formulated to better comprehend the systems of the world

around us. By studying this theory people are able to better understand what makes up a system and how systems are supposed to operate. Systems can be closed or open, but only open systems can really be studied. Open systems are self-adapting through feedback loops and adaptation. Open systems have inputs and outputs; they are not self-sustaining (Heil, 2008).

Systems theory revolves around relationships; that is, the connections between individual pieces, rather than the pieces themselves. All systems have components in them that have interdependent relationships in them (Mullin, 2005). Systems are comprised of subsystems which are smaller entities that make up the larger system (Heil, 2008). In a construction project, these parts are the components of the project cycle, ranging from project initiation phase to the project closure phase. Systems theory suggests that when there is a problem with one component in the system people cannot isolate that component but take a holistic approach and view the whole system to understand what the problem could be. Problems are a sign of a malfunctioning process (Chikere and Nwoka, 2015). When a building cracks or collapses, it's a sign that a particular part of the project construction phase was not well managed. When a system fails it is because either a feedback channel is not working or the adaptation cycle is being ignored.

Systems theory has also been used in application to organizational communication. Organizations are systems that have many different members and relationships within those members. All of the relationships within the subsystems of an organization are interdependent on each other and can directly affect the operation of the system (Mullin, 2005). In a building construction project, contractors, consultants, project owners and architects are interdependent on each other. In this case, decisions and actions of one of the parties affects the entire work system. When an organizational system is functioning properly synergy is present. Synergy is the combined effect of a system working together where the combined result is greater or more powerful than that of the individual components. Systems theory allows for this synergy to be generated because of the communication channels that are open in a properly functioning system (Heil, 2008). When the stakeholders in a building construction project work well together, utilizing well the capacity within them, then synergy will be present and quality of the buildings will be high.

By utilizing systems theory in project construction phases, it's prudent to have a broader look at the project organization and see all the components of the system that are involved and also see what part they play in the system. Systems theory helps create an awareness of the system one is involved in and how it can be affected by changing one component of that system (Chikere and Nwoka, 2015). In a project organization communication has to be effective. Systems theory opens up the thought process about the feedback channels and adaptation process. For example, if the quality of a building construction project is low, simply wanting to improve it requires a look at the full system and see why quality is down and what component of the system is not functioning properly to cause the structural errors. Systems theory brings a holistic viewpoint to the project organization and removes the individualistic mindset or island mentality that everyone operates independently of each other (McShane and Von Glinow, 2003). Every relationship in the building construction project is interdependent on one another to keep the system functioning properly.

The work of Ludwing Von Bertalanffy (1973) recognized the need of any organization to interact with its external environment, unlike what was proposed by classical school theorists like Max Weber, F. Taylor and Fayol who viewed organization as closed system (Mullin, 2005). To him, for survival of an organization like the way living organism survives, should operate in open system and not closed system. This is what made his work to make system concepts become recognized worldwide as approach to be adapted by organization for their efficiency and effectiveness in the dynamic and changing environments. He was against reductionism, arguing that, real system are open and do interact with external environment, where he emphasized on holism while solving organization problems. Therefore, open system changed the way of thinking about organizational management from mechanical view of organization. It looks at management as an open-ended process. It emphasized detachment, objectivity and control (Weihrich, Cannice, and Koontz, 2008). Today organizations are perceived as an open ended process of coordinating purposeful individuals whose actions stem from applying their unique interpretations to the particular situations confronting them. For instance, in current situation, an organization which will not be sensitive to its environment will hardly survive. Things like technology, social and economic phenomena are not static but are always changing, hence organizations are needed to adopt in order to survive (Stoner, Freeman, and Gilbert, 2008). It is

also through interaction with its external environment the organization gets its inputs in term of raw material, labour and process them, and lastly emits as output to its environment for selling or capital investment (Heil, 2008). A building construction firm procures its raw materials from suppliers in the external environment and also sells its services to the same environment, and through feedback it adjusts itself in order to meet the requirement of its customers, and hence survival.

Project construction firms act as systems consisting of many internal subsystems such as feasibility study, contract negotiation, monitoring and evaluation and closure phases that need to be continually aligned with each other. As construction firms grow, they develop more and more complex subsystems that must coordinate with each other in the process of transforming inputs to outputs (McShane and Von Glinow, 2003). These interdependencies can easily become so complex that a minor event in one subsystem may amplify into serious unintended consequences elsewhere in the organization. This manifests itself in poor quality buildings characterized by catastrophes and poor structural designs. Every organized enterprise does not exist in a vacuum. It is rather known to depend on its external environment – which is a part of a larger system, such as the industry to which it belongs, the economic system and the society (Wehrich et al, 2008). Building construction firms do not exist in isolation but are part and parcel of the wider environment of regulatory bodies, suppliers, customers and professional bodies to which they belong, among others.

2.5.2 Virtue Ethics Theories

Virtue Ethics theories stress the importance of developing good habits of character such as wisdom, courage, temperance, justice, trustworthiness, respect, responsibility, caring, civic virtues, and so forth which were emphasized by Plato, the Greek philosopher (Josephson, 2002). These ethical values can be formulated for the foundation of codes of ethics. When the medieval philosophers discussed the virtue theory, it was in the context of Divine Law. The "theological virtues"-faith, hope, charity, and, of course, *obedience*- came to have a central place (Rachels, 2008).

Virtue ethics gained some popularity in the late 20th century and still has supporters to this day as an “alternative” way of thinking about moral problems and theory (Rachels, 2003). Virtue ethics, according to its authors, is not a new theory. Not only are its origins very old, and very various, but Aristotle is still widely held to be its finest exponent. The general strategy of virtue theorists is to appeal, in the way they say Aristotle did, to human happiness or flourishing. The virtues are those qualities of character the possession and exercise of which make human beings flourish. Flourishing is a good, perhaps the greatest good. These qualities of character will provide the key to determining good and bad action (Conly, 1998).

As seen, theories that emphasize right action seem incomplete because they neglect the question of character. Virtue theory solves this issue by focusing on character. Consequently, Rachels (2008) believes that while an account of virtues is needed if one is to have a complete picture of morality, the virtues approach cannot on its own explain why certain character traits are morally good or bad. By making the question of character its central concern, virtue theory supports the principles of respect, beneficence and justice in project undertakings. Character produces individuals who unreservedly esteem the moral values of respect for other persons, promotion of general welfare for the benefit of all and fairness in all of one’s deeds (Audi, 2004).

Building construction projects revolve around human personnel, who interact with one another in every phase of the project life cycle. Key among the personnel are project contractors, who network with consultants, clients, suppliers and other external stakeholders. Possession of virtues inherently triggers right actions of the principles of respect, beneficence and justice. Quality of building construction projects heavily depends on exercise of the necessary discipline by contractors and consultants and therefore in-built character that entrenches the work-related virtues.

2.5.3 Deontology/Duty Theories

Deontology, also known as duty theories or non-consequentialism, bases morality on specific foundational principles of obligation, irrespective of the consequences as argued by Immanuel Kant (1724–1804), a German Philosopher. When the medieval philosophers discussed the virtue theory, it was in the context of Divine Law. After the Renaissance, moral philosophy began to be

secularized once again, but philosophers did not return to the Greek way of thinking, but instead replaced Divine Law with its secular equivalent, the *Moral Law*. The Moral Law, which was said to spring from human reason rather than divine fiat, was conceived to be a system of rules specifying which actions are right. The human duty, it was said, is to follow its directives.

Other than virtue theories, Moral philosophers have developed theories of obligation and ‘what is right’ and argue that man’s duty is to follow rules that could consistently become universal laws—that is, rules that all would want to see being followed by all people in all circumstances. This came to be known as Kant’s theory (Rachels, 2008). The deontological philosophy of Immanuel Kant provides a powerful framework for the analysis of ethical dilemmas. Kant’s aim was to establish a set of absolute moral rules, developed through the application of *reason*. Deontological ideas can produce effective codes of conduct as they are very much related to duty and rights.

As opposed to utilitarianism’s emphasis on granting the greatest benefit for the majority, Kant on the other hand placed the greatest worth on performing in line with one’s moral duty, manifested through rational decision making. The consequences of a decision are put into account but are not the key motivators in decision-making (Audi, 2004). It is useful here to recall the distinction of professional obligations from other obligations (Smith, 2002). In the area of quality and safety, an engineer’s professional obligation is fairly well defined. It is to live up to the expectations the profession has created. The public expects a building, for example, to be totally safe from collapse except in the case of extraordinary disaster. A firm’s bid must cover the cost of this kind of safety (Hooker, 2000).

Moreover, the principle of justice requires that project practitioners act fairly and offer what is due or owed to project clients and other stakeholders. Construction errors should be revealed once detected in order to pave way for the necessary correction (Armstrong, 2005). Therefore, the principle of justice provides a norm of morality to assist the decision maker comprehend his or her duty in a given circumstance by enabling the agent to apply the moral principle in a universal manner (Bowen, 2005).

The deontological approach calls for exercise of the ethical principle of *beneficence*, which requires that potential benefits to individuals and to society be maximized and that potential harms be minimized (Beauchamp and Childress, 1994). The principles of respect, beneficence and justice when viewed through the lens of Kant's theory, should be exercised as a mandatory duty of every project practitioner. Universal moral principles should be considered as a guide in every stage of decision-making.

Pluralistic Deontology which is a description of the deontological ethics propounded by Sir William Ross (1877 - 1971) argues that there are seven prima facie duties which need to be taken into consideration when deciding which duty should be acted upon: duty of beneficence in order to help other people to increase their pleasure, improve their character, etc), duty of non-maleficence which helps to avoid harming other people, duty of justice that ensures people get what they deserve, duty of self-improvement which helps individuals to improve themselves, duty of reparation which helps to recompense someone if you have acted wrongly towards them, duty of gratitude that helps to benefit people who have benefited us, and finally, duty of promise-keeping that helps to act according to explicit and implicit promises, including the implicit promise to tell the truth (Ross, in Simpson, 2012). Contractors and consultants should as a duty, follow the code of Ethics and conduct for their profession as well as other moral laws such as respecting the autonomy of their clients and other project practitioners, minimizing risks, maximizing on benefits and treating all fairly. Only then, can project objectives be achieved within scope, time, specifications and budget.

2.5.4 Theory of Consequentialism

Consequentialism is probably the most commonly adopted ethical theory in construction projects. In consequentialism, an activity is morally right if the effects of that activity are more positive and desirable than undesirable. As long as an activity produces some desirable results, it is considered ethically right. One tool often used in engineering and construction projects in terms of consequential approach is a cost-benefit analysis which determines the feasibility of a project. Three divisions of consequentialism emerge (Internet Encyclopaedia of Philosophy, 2003). One is ethical egoism in which behaviour is morally right if its results are more desirable only to the party doing that action. The second is ethical altruism where behaviour is considered

morally right if it yields more favourable effects to everyone with the exception of the agent. Third is utilitarianism whereby an action is ethically right if its consequences are more favourable to all people. Additionally, an action is acceptable if it yields maximum total utility universally.

This study argues that ethical egoism is likely to greatly cause unethical practices in building construction projects as actions are self-centred and works against the principle of beneficence. Ethical Altruism on the other hand will be in the interest of everyone else except the agent (contractor/consultant), who as a result will act not out of will but to please everyone else. In a similar manner, Audi (2004) argues that this does not bring maximum benefit to the agent (contractor/consultant), who becomes the casualty as he acts to satisfy all other project practitioners at the expense of self and therefore works against the principles of beneficence and justice. In this regard, a consideration of utilitarianism that stems from consequentialism is in accordance with traditional norms in almost all societies and satisfies the principle of beneficence. This is so because when an action is favourable to everyone including the contractor, then there is no casualty and a balance is struck between behaviour and response. This upholds the principles of respect, beneficence and justice.

Similarly, Beauchamp (1996) states that virtue and deontological theories are geared towards appropriate ethical approaches to issues since good habits and obligation to do right both trigger favourable actions rooted in Utilitarianism. Such favourable actions are in harmony with the principles of beneficence and justice which require that no harm is done to a party (Beauchamp et al., 2001) and if this is inevitable, due compensation must be made (Andrews, 1989). In this regard, because the contractor is the party responsible for the construction of the residential building, it is the party that is ultimately liable to individual property owners for the harm that the operation of that building causes to them.

Key players in building construction projects include the project owner, contractor and the consultant engineer. To effectively examine quality in building projects, one has to look back to the principles guiding ethical behavior. The principles of respect, beneficence and justice require that objective decisions be made during project progress. This way their judgment will rule out risky situations and promote efficiency.

2.6 The Conceptual Framework

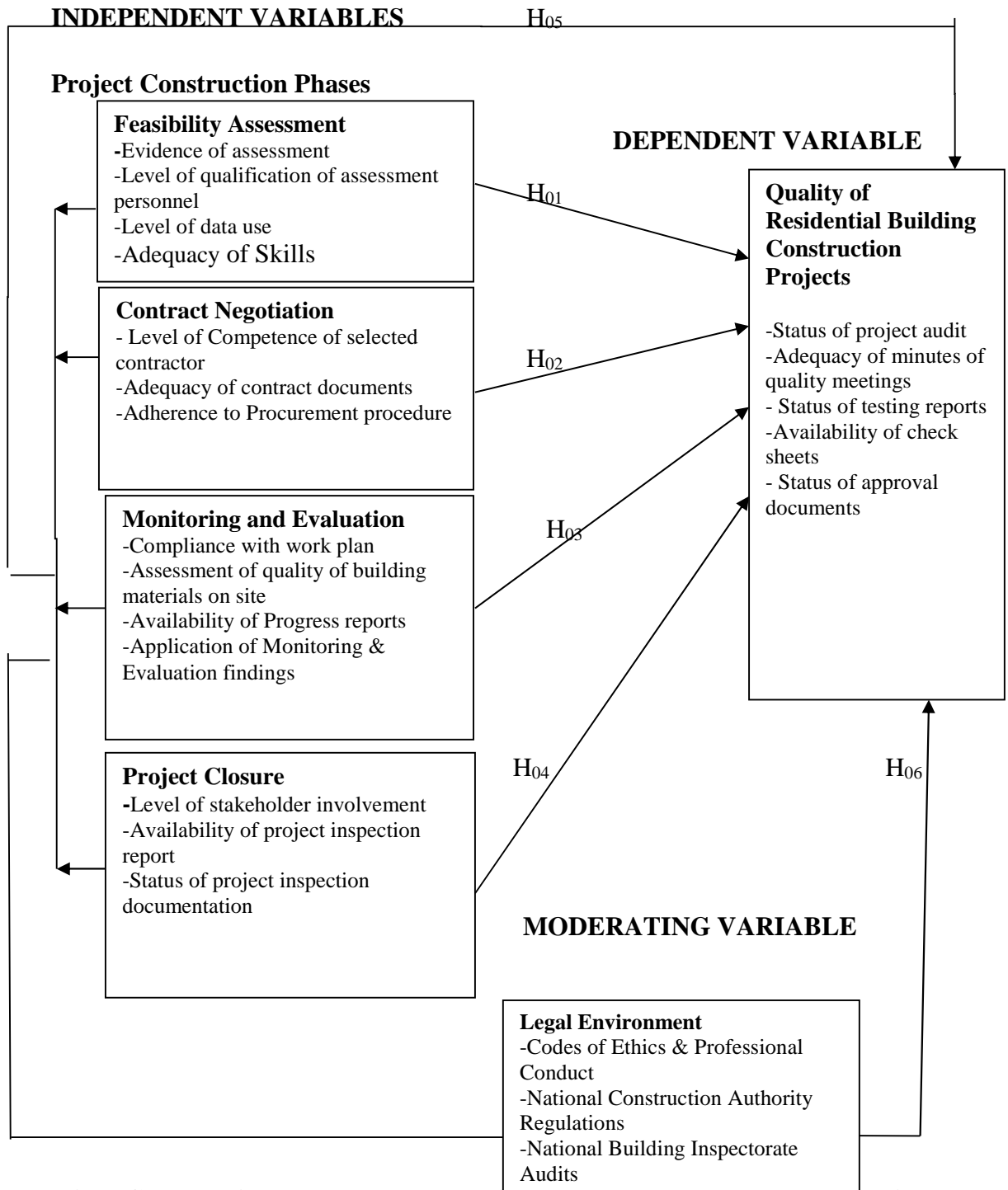


Figure 2.1: Project Construction Phases, Legal Environment and Quality of Residential Building Construction Projects

The dependent variable in this study is quality of residential building construction projects. The indicators that will be used to measure the quality are: status of project audit, adequacy of minutes of quality meetings, status of testing reports, availability of check sheets and status of approval documents. A significant purpose of this is to ensure the meeting of interests and expectations of project stakeholders.

The predictor variable in this study is project construction phases. The processes under study fall under feasibility assessment, contract negotiation, monitoring and evaluation and project closure. Legal environment forms the moderating variable in this study. The influence of the moderating variable on the relationship between the predictor variable and the dependent variable will be investigated. Legal environment entails the laws or values and morals of society that have the force of formal authority. The indicators of legal environment in this study are identified as codes of ethics and professional conduct, NCA Regulations, NBI Audits and Manual of Standard Building Specifications.

2.7 Summary of Literature Review

The literature review in this study comprised of the theoretical framework, empirical review and conceptual framework. Empirical review on the relationships in the study was carried out to identify the knowledge gaps from previous studies relevant to the current study. In the theoretical framework, organizational theories were examined. These are Systems theory, Virtue Ethics, Deontological and Consequentialist theories that act as a guide in realization of quality.

According to Systems theory, all systems have components in them that have interdependent relationships in them. Systems are comprised of subsystems which are smaller entities that make up the larger system. Systems theory suggests that when there is a problem with one component in the system we cannot isolate that component but take a holistic approach and view the whole system to understand what the problem could be. This is the case with project construction phases where each phase is interlinked with the others for attainment of quality products.

The general strategy of virtue theorists is to appeal to human happiness or flourishing. The virtues are those qualities of character the possession and exercise of which make human beings

flourish. Flourishing is a good, perhaps the greatest good. These qualities of character will provide the key to determining good and bad action (Conly, 1998). Deontological theorists on the other hand, instead of asking what traits of character make one a good person they began by asking what was the right thing to do (Rachels, 2008). In consequentialism, an activity is ethically right if the consequences of that activity are more favourable than unfavourable.

2.8 Summary of Literature using Matrix Format

The focus of study, methodology used, findings, and gaps in knowledge for the various research studies covered in the literature review are summarized in Table 2.1.

Table 2.1: Knowledge Gaps

Author (Year)	Focus of Study	Methodology Used	Findings	Gap in Knowledge
Faridi and El-Sayegh (2006)	Factors impacting on project performance in the UAE		Shortage of skills of manpower, poor supervision and poor site management, unsuitable leadership, shortage and breakdown of equipment among others contribute to construction delays in the United Arab Emirates.	The study dealt with general factors affecting construction projects but did not narrow down to specific processes affecting quality of building construction projects. Issues of moral judgment involve conscious effort and are key in affecting project performance. The study was also conducted in the United Arab Emirates. The study can also be carried out in a different geographical location such as Kenya.
Adnan Enshassi, Sherif Mohamed and Saleh Abushaban (2009)	Factors affecting the performance of construction projects in the Gaza Strip.	A comprehensive literature review was deployed to generate a set of factors believed to affect project performance. A total of 120 questionnaires were distributed to 3 key groups of project participants; namely owners, consultants and contractors.	Findings indicate that all 3 groups (project owners, contractors and consultants) agreed that the most important factors affecting project performance are: delays because of borders/roads closure leading to materials shortage; Unavailability of resources; low level of project leadership skills; escalation of material prices; unavailability of highly experienced and qualified	The study did not focus on issues involving moral reasoning such as management of information, contract, resources, finances and quality that play a role in project performance.

Author (Year)	Focus of Study	Methodology Used	Findings	Gap in Knowledge
			personnel; and poor quality of available equipment and raw materials.	
Hanson, D.; Mbachu, J.; Nkando, R. (2003)	Causes of client dissatisfaction in the South African building industry and ways of improvement: the contractors' perspectives, in CIDB, South Africa.		Conflict, poor workmanship and incompetence of contractors were found to be some of the factors which negatively impact on project performance	The study had a focus on contractors' perspectives only. Perspectives of consultants and other project participants are significant to allow an unbiased view.
Abdul-Rahman H, Wang C, Saimon M. A. (2011).	Causes of unethical conduct, as well as ways for Mitigation in the Malaysian construction industry	Structured interviews were conducted to obtain a consistent response from the interviewees. In the structured interview, questions were presented in the same order and with the same wording so that the interviewer could be in full control of the interview all the time. The researcher approached 55	In the ranking of the causes, "insufficient ethical education in schools" was at the top, followed by "economic downturn", "insufficient ethical education from professional institution", "demand from authority", "lack of training to handle non-compliance", "fierce competition", and "insufficient legislative enforcement". In the ways to mitigate unethical conduct in the construction industry, the	The study did not assess the influence of the legal environment on the relationship between project construction phases and quality of construction projects. Some of the processes have an external source beyond the project environment. In methodology, use of structured interviews alone is not adequate in data collection. Open-ended questions enable in-depth probing. Similarly, questionnaires enable coverage of a wider population of respondents which improves the accuracy of findings. Findings from the 55 respondents used may not be used to generalize to the entire country.

Author (Year)	Focus of Study	Methodology Used	Findings	Gap in Knowledge
		developers from both the public and the private sectors for interviews.	highest ranking was for “making the unethical act a criminal activity”.	
Figueroa F.R.(2014)	Strategies to reduce the risk of building collapse in Developing countries.	A literature review was done and a questionnaire administered to building contractors in Kenya. The study elicited the opinions of experts in Kenyan construction. The experts accurately predicted low strength of concrete in Kenyan construction, and listed and ranked probable causes and plausible solutions to the problem of unsafe construction practices in Kenya.	Structural defects are frequently identified too late, often after catastrophic collapse. Study proposed a strategy which entails the simultaneous development and implementation of an open-access reporting system and a risk communication program.	The study was narrow in its focus. Other than strategies to reduce the stated risks, root causes of such risks need to be determined within the feasibility assessment, contract negotiation, monitoring and evaluation and project closure processes and there is need to study how they influence quality of building construction projects.
Mohamed M. Marzouk and Tarek I. El-Rasas.(2014).	Causes of construction delays in Egypt	The feedback of construction experts was obtained through interviews and questionnaire as the tools of data collection.	The important causes are; a poor planning framework, challenges in financing project by the contractor, poor contract negotiation procedure, errors and defects in design documents,	General causes of delay in construction projects were discussed without a perspective of other project parameters such as sustainability and quality. Of greater importance is the need to study the influence of project construction phases which include feasibility assessment, contract negotiation, monitoring and evaluation

Author (Year)	Focus of Study	Methodology Used	Findings	Gap in Knowledge
		Data analysis was done using ANOVA.	inadequate supply of construction resources in the market and alterations of project scope by the owner during construction.	and project closure.
Muya M. and Mukumbwa B. (2013)	Integrity systems in construction organisations in Zambia.	A questionnaire survey was used for primary data collection while structured, non-structured, closed form and open-ended were used as the tools for measuring perceptions on unethical conduct. A binary regression was run using dependent factors against independent factors. Both nominal and ordinal data collected was analysed using SPSS version 10.	It was established in this study that corruption was one of main unethical practices in all the phases of the construction project. Dealing with corruption in the construction sector should be accorded utmost attention by construction organisations, government and other interest groups	Various unethical practices other than corruption are prevalent in the construction industry in any geographical region, including Kenya, hence the need to focus on them. The study did not delve into the influence of the legal environment on the relationship between project construction phases and quality of building construction projects. Some of the unethical actions may be moderated by existing regulations and these have an effect on quality of a construction project.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter outlines the methodological approach in the study, that is, research paradigm, research design, the target population, sampling procedure and sample size, data collection instruments, piloting of research instruments, data collection procedure, data analysis techniques and ethical considerations.

3.2 Research Paradigm

Pragmatic paradigm was used as it fits well in mixed methods research. Johnson and Onwuegbuzie (2004) formally define mixed methods research as the class of research where the researcher mixes or combines quantitative and qualitative research techniques, methods, approaches, concepts or language into a single study. Philosophically, it is the "third wave" or third research movement, a movement that moves past the paradigm wars by offering a logical and practical alternative. Philosophically, mixed research makes use of the pragmatic method and system of philosophy. Its logic of inquiry includes the use of induction (or discovery of patterns), deduction (testing of theories and hypotheses), and abduction (uncovering and relying on the best of a set of explanations for understanding one's results) (de Waal, 2001).

Mixed methods research also is an attempt to legitimate the use of multiple approaches in answering research questions, rather than restricting or constraining researchers' choices (that is., it rejects dogmatism). It is an expansive and creative form of research, not a limiting form of research. It is inclusive, pluralistic, and complementary, and it suggests that researchers take an eclectic approach to method selection and the thinking about and conduct of research (Johnson and Onwuegbuzie, 2004). It is oriented "toward solving practical problems in the "real world" (Feilzer, 2010) rather than on assumptions about the nature of knowledge.

3.2.1 Research Design

The research designs used in this study were descriptive survey design and correlational research design. The choice of these two research designs was informed by the fact that descriptive and inferential data analysis are required in this study. Shield and Rangarjan (2013) indicate that descriptive survey is used to describe characteristics of a population or a phenomenon being studied. According to Key (1997) the descriptive design is used to obtain

information concerning the current status of the phenomena to describe “what exists” with respect to variables or conditions in a situation. Wiersma (1985) asserts that descriptive survey will enable the researcher to determine the current status and is therefore suitable since the researcher will establish the facts as they are and obtain a cross section of information with regard to the project construction phases facing building construction projects. Creswell (2012) indicates that correlational research design is the measurement of two or more factors to determine or estimate the extent to which the values for the factors are related or change in an identifiable pattern. Since in this study both the causal effects of predictor variables and influence of a moderated combination of predictor variables on the dependent variable is desired, then both descriptive research design and correlational research design were found to be the most suitable for the study.

3.3 Target Population

Target population comprised all of the participants in the study (Kothari, 2004). The unit of analysis was the building construction firms in Nairobi County. The target population was therefore all the 228 NCA1, 170 NCA2, 188 NCA3, 497 NCA4, 421 NCA5, 632 NCA6, 682 NCA7 and 561 NCA8 registered contractors, giving a total of 3379 contractors as shown on Table 3.2. Others under consideration were 67 engineering consultants of building construction projects in Nairobi County, 17 officers in NCA top management and as well as 12 officers of the National Building Inspectorate (NBI) management, yielding a total target population of 3475. They were considered due to their role in general building construction projects.

Table 3.1: Target Population of Registered Contractors

Category	Contract Value (Kshs)	Registered Contractors
NCA1	Unlimited	228
NCA2	500 Million	170
NCA3	300 Million	188
NCA4	200 Million	497
NCA5	100 Million	421
NCA6	50 Million	632
NCA 7	20 Million	682
NCA8	10 Million	561
Total		3379

Source: National Construction Authority, 2017: NCA Registered Contractors Based on Contract Value

3.4 Sampling Procedure and Sample Size

In this section, sampling technique and sampling procedures as well as derivation of the sample size were examined.

3.4.1 Sample Size

Calculation of the sample size was done after employing the following sampling formula advanced by Yamane (1967) to obtain a representative sample size from the population size of registered contractors:

$$n = \frac{N}{1+N(e)^2}$$

Where:

n- Sample Size

N-Population Size

e- Level of Precision at 93% Confidence Level.

Employing the above formula, the sample size was:

$$n = \frac{3379}{1+3379(0.07)^2} = 192 \text{ respondents.}$$

The sampling frame therefore consisted of 192 respondents selected from the target population of 3379.

For each stratum, an appropriate sample size was obtained and the researcher used the following proportionate stratification formula provided by Stattrek (2012):

$$n_h = (N_h/N) * n$$

Where:

n_h -Sample Size(stratum h)

N_h - Population Size (stratum h)

N -Total Population Size

n -Total Sample Size

Hence, sample size for NCA1 Contractors was:

$$n_h = (N_h/N) * n$$

$$N_h = (228/3379) * 192 = 12.95, \text{ hence } 13 \text{ respondents}$$

Applying the formula to the other strata, the sample size was as shown in the table 3.3 below.

Table 3.2: Sample Size of Contractors

Category/Strata	No. in Category	$n_h = (N_h/N) * n$	Sample Size
NCA1	228	12.96	13
NCA2	170	9.66	9
NCA3	188	10.68	11
NCA4	497	28.24	28
NCA5	421	23.92	24
NCA6	632	35.91	36
NCA7	682	38.75	39
NCA8	561	31.88	32
Total	3379		192

The sample size consisted of 192 contractors selected from the target population of 3379 contractors as shown in table 3.3 above.

Systematic random sampling was thereafter employed to obtain individual respondents for the study. To determine the sampling interval, 'k', the units of study were first arranged alphabetically after which the respondents were selected systematically as the 'kth' unit.

The skip or sampling interval, $k = N/n$, was calculated as follows:

For NCA1 category, $K = N/n$, hence, $228/13 = 17$. Every 17th respondent was selected for the study.

For NCA2 category, $K=N/n$, hence, $170/10=17$. Every 17th respondent was selected for the study.

For NCA3 category, $K=N/n$, hence, $188/11=17$. Every 17th respondent was selected for the study.

For NCA4 category, $K=N/n$, hence, $497/28=17$. Every 17th respondent was selected for the study.

For NCA5 category, $K=N/n$, hence, $421/24=17$. Every 17th respondent was selected for the study.

For NCA6 category, $K=N/n$, hence, $632/36=17$. Every 17th respondent was selected for the study.

For NCA7 category, $K=N/n$, hence, $682/39=17$. Every 17th respondent was selected for the study.

For NCA8 category, $K=N/n$, hence, $561/32=17$. Every 17th respondent was selected for the study.

A census was used for the other categories of respondents who included 67 consultants, 17 NCA and 12 NBI officers in the management teams.

3.4.2 Sampling Procedure

Identification of sampling technique and procedures helped this research discourse to remain objective and devoid of subjective biasness in selection of the research sample that would have potentially compromised statistical generalizations. For the purpose of this study a census was used in three categories of the target population, namely, the NCA management, NBI management and the consultants, hence 100% of the target population will be used. This aided the researcher in collecting the desired information under study from every individual member of the population. A census survey is a unique way of obtaining precise data, particularly when the population is small (Salant, Dillman, 1994; Fowler, 2009).

The registered contractors selected in this study were all those in NCA1 to NCA8. Stratified random sampling was thereafter employed to obtain individual respondents for the study. Sekaran (2003) argues that random sampling respondents from each homogeneous research category (stratified sampling) reduces sampling error and gives a sample size that is more representative than applying simple random sampling technique uniformly across the entire research population.

3.5 Research Instruments

The researcher used questionnaires for all the contractors and consultants and interview guides for representatives of NCA and NBI management.

3.5.1 Interview Schedules

Interviews are oral questionnaires. The purpose of interviewing was to find out what is in or on someone else's mind. Qualitative research uses interviews as one of the data collection techniques. The interviewer must understand his/her own role and should not express any opinions and should advise the participants that he/she is not going to be judgmental in any way. Individual interviews target one person or participant to provide the needed information. Individual interviews can take different forms such as face-to-face, one-on-one, in person interview or telephone conversations (Creswell, 2009). The interviewer identifies one individual referred to as key informant who has the competence the researcher is interested in. In this study, the researcher used the interview guide approach. The topics and issues covered were specified in advance in outline form and the researcher decided the sequence and working of questions in the course of the interview. Face-to-face interviews were carried out with the representatives of NCA and NBI management.

3.5.2 Questionnaires

According to Key (1997) the questionnaire is the most frequently used data collection instrument. It is a concise, pre-planned set of questions designed to yield specific information to meet a particular need for research information about a pertinent topic. The research information is attained from respondents normally from a related interest area. The questionnaires were administered to the contractors and consultants in the building construction industry in Nairobi County. The questionnaires sought information on the diverse project construction phases influencing quality of residential building construction projects.

3.5.3 Piloting of Research Instruments

In order to test the degree of reliability, the instruments were piloted in two contracting firms not involved in the study specifically in the neighbouring Kiambu County, Thika Sub-County, which is an area of similar characteristics as the study area. Piloting helped to test both the instructions and questions before disseminating to the chosen sample. It was done with respondents of similar characteristics as those in the sample. The pilot test gave an

estimate of the amount of time it takes to complete the survey and also provided an initial idea of the pattern of responses that are likely and whether revisions needed to be done. Pilot testing was done before the actual data collection in order to assist the researcher in reviewing the questions and framing them in a clearer way for the respondents. It also helped in estimating the time needed to fill the questionnaires. This then gave the researcher confidence to use the research instruments after reviewing the questions and making them clearer to the respondents.

3.5.4 Validity of Research Instruments

Best and Kahn (2009) define validity as that quality of a data-gathering instrument or procedure that enables it to measure what it is supposed to measure. Henn, Weinstein and Foard (2009) posits that validity refers to the extent to which data collected corresponds closely to the truth of a particular matter. Both construct and content validity of the research instruments were ensured.

Validity of the instruments was determined by a panel of three experts competent in the area being investigated. The content validity of the data collection instruments was determined through discussing the stated questions in the instruments with 2 civil engineers and 1 respondent from NCA and NBI, respectively, to test the validity of the research instrument. These are deemed to have vast knowledge on construction projects. This was done in consultation with my two supervisors. Validity was determined by the use of Content validity Index (C.V.I) which yielded a value of 0.785. Content validity Index of between 0.7 and 1 showed the instruments to be valid for the study (Orodho, 2003).

3.5.5 Reliability of Research Instruments

Testing reliability of research instruments helps check for internal consistency of scores obtained by a research instrument. Reliability refers to whether scores to items on an instrument are internally consistent, stable overtime (test-retest correlations) and whether there was consistency in test administration and scoring (Creswell, 2009). Best and Kahn (2009) say that a test is reliable to the extent that it measures whatever it is measuring consistently. Reliable tests are stable in whatever they measure and yield comparable scores on repeated administration. To test reliability the split-half method was applied in two contracting firms in the neighbouring Kiambu County in Thika Sub-county which is not part of the intended study but has a similar environment as the area of study. Split-half method

was used to treat the two halves of the measure as alternate forms. It involved administering the test to a group of individuals, splitting the test in half and correlating scores on one half of the test with scores on the other half of the test.

The correlation between these two split halves was then used in estimating the reliability of the test. Coefficient of at least 0.7 is an indication of high reliability of the research instrument (Mugenda and Mugenda, 2003). If < 0 , the research instruments would have been revised before going for field work in order to obtain acceptable levels. The halves reliability estimate was then stepped up to the full test length using the Spearman–Brown prediction formula. In splitting the test, the two halves were made to be as similar as possible, both in terms of their content and in terms of the probable state of the respondent. The researcher adopted an odd-even split, in which the odd-numbered items form one half of the test and the even-numbered items form the other. This arrangement guaranteed that each half contained an equal number of items from the beginning, middle, and end of the original test.

In advanced statistics, Larry (2013) indicates that Cronbach Coefficient is used to test internal consistencies of samples of a given population when research instruments with Likert type scales where multiple responses are used for data collection. Larry (2013) further indicates that the limiting factor in the use of the Cronbach's (alpha) Coefficient is when the data analysis involves missing data due to varying reasons like poor return of research instruments. Due to the literacy nature and of the respondents in this study, significant data losses were hoped to be minimal. This was attributed to the fact that the target population from which respondents were sampled were professionals who had vast knowledge on the area under study and were also expected to appreciate the significance of the study. The reliability of the instrument was estimated using Cronbach's Alpha Coefficient which is a measure of internal consistency. This is shown on Table 3.3.

Table 3.3: Cronbach's Alpha Values

Variable	Cronbach's Alpha
Feasibility analysis	0.848
Contract negotiation	0.797
Monitoring and evaluation	0.824
Project closure	0.786
Combined Project construction phases	0.796
Composite Alpha Value	0.804

A reliability of at least 0.804 at $\alpha=0.05$ significance level of confidence was obtained which is acceptable (Gable and Wolf, 2003). This implies that there was internal consistency in the items of the research instrument and hence the instruments were sufficiently reliable for the measurement.

3.6 Data Collection Procedure

In this study, primary sources of data were used. A self-administered structured questionnaire and an interview guide were utilized. The primary data was collected from contractors of construction companies and consulting engineering firms and representatives of NCA and NBI management. The data collection methods selected in this study was informed by the research objectives. While collecting data from representatives of NCA and NBI management, interviews were conducted. Prior to conducting the interviews, letters expressing the desire to undertake research from them were dispensed. Follow up was done through telephone calls to book appointments for the interviews. During the interviews, the researcher introduced the purpose of the research and its significance in respect to regulations governing construction work. The interviews helped clarify various aspects of contractors and building construction regulations that may not be obtained through a close ended questionnaire.

Data collection from the contracting and consulting firms was done with the aid of research assistants. This approach was hoped to improve the rate of return of the questionnaires. Four research assistants were engaged. Each of the research assistants were assigned several engineering firms. Prior to deploying the research assistants for field work, the researcher trained the research assistants on research ethics as well as on the items in the research

instruments to the extent that they can comfortably and independently clarify queries raised by respondents. A follow up time schedule was agreed upon and drawn between the researcher and the research assistants to guide supervision of the research progress. The research assistants were also equipped with a copy of the cover letter permitting them to collect data on behalf of the researcher.

The respondents were asked to rate, based on their local experience the degree of prevalence of each one of the identified project construction phases influencing the quality of residential building construction projects in Nairobi County on a five-point Likert scale as: Strongly agree, agree, neutral, disagree and strongly disagree. A five point scale was preferred because it would be readily comprehensible to respondents and likely to be less confusing hence would increase response quality. Data collected was then submitted for analysis and a report written.

3.7 Data Analysis Techniques

A mixed methods approach to data analysis was employed. This entailed the use of both descriptive and inferential data analysis techniques. Descriptive analysis involved use of measures of central tendency, that is, arithmetic mean and use of measures of dispersion, that is, standard deviation. Data was also analysed using Pearson's Product Moment Correlation, F test and Stepwise Regression analysis.

3.7.1 Analysis of Quantitative Data

The source of the quantitative data was mainly the questionnaires. The researcher first reviewed the completeness of all the questionnaires and thereafter developed a data entry template in SPSS. The data entry template was used to enter the data by the researcher. After, the data has been entered; the researcher used the same software to do data cleaning. Data cleaning was done using univariate, bivariate and multivariate analysis. The clean set of data was used for analysis using SPSS. The data was analyzed by use of both descriptive and inferential analysis. Pearson's correlation coefficient was used to determine the magnitude and direction of the relationship between the dependent and the independent variable. The researcher conducted a multiple regression analysis in order to establish the influence of project construction phases on the quality of residential building construction projects. Regression analysis was used to predict the value of the dependent variable on the basis of the independent variables. Regression analysis is concerned with the study of the dependence

of one variable, the dependent variable, on one or more other variables, the explanatory variables, with a view to estimating and/ or predicting the population mean.

3.7.2 Analysis of Qualitative Data

Data from the various instruments was sorted out to remove any incomplete questionnaires. Since the primary data was verbatim accounts of what was recorded in the questionnaires, the researcher will later transcribe the handwritten records. The typed draft was edited for transcriber/typist error and put into a final form. The data was then organized according to given responses and analysed thematically using a research matrix display.

According to Miles et al (2014) credible and trustworthy analysis of qualitative data requires and is driven by displays that are focused enough to permit a viewing of a full data set in the same location and are arranged systematically to answer the research questions at hand. However the authors do not prescribe a format but rather a display that is helpful to capture required data. The researcher therefore developed a matrix that captured the themes emerging from the respondents.

Assigning codes to the main themes was then done. The researcher enumerated the frequency of a given theme in the questionnaire. This was done by picking a few responses to an open ended question and identifying the main theme. The researcher identified these themes from the same question until a saturation point was reached. These themes were written and assigned a code to each of them. Responses were then classified under the themes. The researcher recorded the themes in the research matrix display and then integrate themes and responses before analysing by use of Descriptive Statistics using frequencies, percentiles; median, mode and mean presented using tables.

3.7.3 Correlation and Regression Models

The indicators of the variables of the study are denoted as indicated in Table 3.4. The models have been adapted from Kinyanjui (2014).

Table 3.4: Variables and Indicators

Variable		Indicator
Dependent Variable	Quality of Residential Buildings Construction Projects (y)	Project audit Quality meetings Testing reports Check sheets Approval documents
Independent Variable	Project construction phases (X ₅)	Feasibility assessment (X ₁); Contract negotiation (X ₂); Monitoring and evaluation(X ₃); Project closure (X ₄);
Moderating Variable	Legal environment (X ₆)	(X ₇); Codes of Ethics and Professional Conduct (X ₈); NCA Regulations (X ₉); NBI Audits (X ₁₀);Manual of Standard Building Specifications

The following correlation and regression models guided the data analysis where:

Y – Dependent Variable

a – Constant Term

– Beta Coefficient

X₁, X₂, X₃, ...X_n – Predictor Variables

– Error Term

3.7.4 Regression Model for Research Objective One

For research objective one, a hypothesis was formulated and corresponding correlation model was developed since the relationship to be tested is linear.

Model 1

H₁: There is no significant influence of project construction phases on quality of residential building construction projects.

Quality of residential buildings construction projects = f (feasibility assessment)

$$Y = a + X_1 +$$

3.7.5 Regression Models for Research Objective Two

For research objective two, a hypothesis was formulated and corresponding correlation model was developed since the relationship to be tested is linear.

Model 2

H₁: There is no significant influence of contract negotiation on quality of residential building construction projects.

Quality of residential buildings construction projects = f (Contract negotiation)

$$Y = a + X_2 +$$

3.7.6 Regression Models for Research Objective Three

For research objective three, a hypothesis was formulated and corresponding correlation model was developed since the relationship to be tested is linear.

Model 3

H₃: There is no significant influence of monitoring and evaluation on quality of residential building construction projects.

Quality of residential buildings construction projects = f (monitoring and evaluation)

$$Y = a + X_3 +$$

3.7.7 Regression Models for Research Objective Four

For research objective four, a hypothesis was formulated and corresponding correlation model was developed since the relationship to be tested is linear.

Model 4

H₄: There is no significant influence of project closure on quality of residential buildings construction projects.

Quality of residential buildings construction projects = f (Project closure)

$$Y = a + X_4 +$$

3.7.8 Regression Models for Research Objective Five

For research objective five, a hypothesis was formulated and corresponding correlation model was developed since the relationship to be tested is linear.

Model 5

H₅: There is no significant influence of the combined project construction phases on quality of residential building construction projects.

Quality of residential buildings construction projects = f (Combined project construction phases)

$$Y = a + (X_1 + X_2 + X_3 + X_4) +$$

Summarized as:

$$Y = a + (X_5) +$$

3.7.9 Regression Model for Research Objective Six

For research objective six, a hypothesis was formulated and corresponding correlation models was developed since the relationship to be tested is non-linear.

Model 6

H₆: The strength of the relationship between project construction phases and quality of building construction projects does not depend on the legal environment

$$Y = a + (X_1 + X_2 + X_3 + X_4) + X_6 +$$

Summarized as:

$$Y = a + X_5 + X_6 +$$

3.7.10 Tests of Hypotheses

For empirical conclusions to be arrived at, tests of various hypotheses were done. Table 3.5 indicates the summary of the research objectives, research hypotheses and type of analysis to be carried out.

Table 3.5: Statistical Tests of Hypotheses

Research Objective	Hypothesis	Type of Analysis
To establish how feasibility assessment influences quality of residential building construction projects in Nairobi County.	H ₀₁ : There is no significant influence of feasibility assessment on quality of residential building construction projects in Nairobi County.	Pearson's Correlation F Test Regression Analysis Model
To determine how contract negotiation influences quality of residential building construction projects in Nairobi County.	H ₀₂ : There is no significant influence of contract negotiation on quality of residential building construction projects in Nairobi County.	Pearson's Correlation F Test Regression Analysis Model
To assess the influence of monitoring and evaluation on quality of residential building construction projects in Nairobi County.	H ₀₃ : There is no significant influence of monitoring and evaluation on quality of residential building construction projects in Nairobi County.	Pearson's Correlation F Test Regression Analysis Model
To establish ways in which project closure influences quality of residential building construction projects in Nairobi County.	H ₀₄ : There is no significant influence of project closure and quality of residential building construction projects in Nairobi County.	Pearson's Correlation F Test Regression Analysis
To examine ways in which the combined project construction phases influence quality of residential building construction projects in Nairobi County.	H ₀₅ : There is no significant influence of the combined project construction phases on quality of residential building construction projects in Nairobi County.	Pearson's Correlation F Test Regression Analysis Model
To analyse the moderating influence of legal environment on the relationship between project construction phases and quality of residential building construction projects in Nairobi County.	H ₀₆ : The strength of the influence of project construction phases on quality of residential buildings construction projects in Nairobi County does not depend on the moderating influence of the legal environment.	Pearson's Correlation F Test Stepwise Regression Model

3.8 Ethical Considerations

According to Trochim (2006) the researcher should consider all relevant ethical considerations in formulating the research plans. Participants were not coerced into participating in research but gave their consent to participate. Closely related to the notion of voluntary participation is the requirement of informed consent. The researcher ensured that respondents understood the purpose of the study. Most studies require the investigator to secure informed consent from the subjects before they participate in the research. Informed consent was achieved by providing subjects with an explanation about the research and an opportunity to terminate their participation at any time with no penalty. This implies that the subjects had a choice about whether to participate or not.

The researcher ensured that the participants were adequately made aware of the type of information required from them, why the information is being sought, for what purpose and how they were expected to participate in the study and how it would directly or indirectly affect them. Confidentiality was ensured whereby the data collected from the participants was kept secure and only for the purpose of the research. Anonymity, which refers to concealing the identities of participants in all documents resulting from the research, including the research instruments, was ensured. The construction firms and the respondents were coded in order to maintain confidentiality. This helped to protect the privacy of research participants. The researchers safeguarded the interests of individual respondents, report the findings accurately and truthfully and ensure that the research being undertaken is worthwhile.

Finally, the researcher sought permission to carry out the research from the University of Nairobi and the National Council of Science, Technology and Innovation.

Table 3.6: Operationalization of Variables

Objective	Variables	Indicators	Measurement	Measuring Scale	Research Approach	Type of Statistical Analysis	Tool of Analysis
To establish how feasibility assessment influences quality of residential building construction projects in Nairobi County	Dependent Variable: Quality of residential building construction projects	Project audit	Status of Project audit	Ordinal	Quantitative	Non-Parametric	Arithmetic Mean and Standard Deviation
		Quality meetings	Adequacy of Minutes of Quality meetings	Ordinal	Quantitative	Non-Parametric	Mean and Standard Deviation
		Testing reports	Status of Testing reports	Ordinal	Quantitative	Non-Parametric	Arithmetic Mean and Standard Deviation
		Check sheets	Availability of Check sheets	Ordinal	Quantitative	Non-Parametric	Arithmetic Mean and Standard Deviation
		Approval documents	Status of Approval documents	Ordinal	Quantitative	Non-Parametric	Arithmetic Mean and Standard Deviation
		Evidence of Assessment	Status of records of assessment	Ordinal	Quantitative	Non-Parametric	Arithmetic Mean and Standard Deviation

Objective	Variables	Indicators	Measurement	Measuring Scale	Research Approach	Type of Statistical Analysis	Tool of Analysis
	Independent Variable: Feasibility Assessment	Qualification of personnel	Level of qualification of personnel	Ordinal	Quantitative	Non-Parametric	Arithmetic Mean Standard Deviation
		Feasibility data use	Rate of feasibility data use	Ratio	Quantitative	Parametric	Pearson's Correlation
To establish how contract negotiation influences quality of residential building construction projects in Nairobi County	Independent Variable: Contract negotiation	Competence of selected contractor	Level of Competence of selected contractor	Ordinal	Quantitative	Non-Parametric	Arithmetic Mean Standard Deviation
		Contract negotiation documents	Adequacy of contract negotiation documents	Ordinal	Quantitative	Non-Parametric	Arithmetic Mean and Standard Deviation
		Procurement Procedure	Adherence to Procurement Procedure	Nominal	Quantitative	Non-Parametric	Arithmetic Mean and Standard Deviation
To assess the influence of monitoring and evaluation on quality of residential buildings construction projects	Independent Variable: Monitoring and Evaluation	Compliance with work plan	Level of compliance to work plan	Ordinal	Quantitative	Non-Parametric	Arithmetic Mean and Standard Deviation
		Assessment of quality of building materials on	Level of assessment of quality of building materials	Ordinal	Quantitative	Non-Parametric	Arithmetic Mean and Standard Deviation

Objective	Variables	Indicators	Measurement	Measuring Scale	Research Approach	Type of Statistical Analysis	Tool of Analysis
in Nairobi County.		site					
		Adequacy of progress reports	Degree of comprehensiveness of progress reports	Ratio	Quantitative	Parametric	Pearson's Correlation
		Application of M and E findings	Level of Application of M and E findings	Ordinal	Quantitative	Non-Parametric	Arithmetic Mean and Standard Deviation
To establish ways in which project closure influences quality of residential building construction projects in Nairobi County.	Independent Variable: Project closure	Stakeholder involvement	Level of Stakeholder involvement	Ordinal	Quantitative	Non-Parametric	Arithmetic Mean and Standard Deviation
		Project inspection report	Status of project inspection report	Ordinal	Quantitative	Non-Parametric	Correlation Arithmetic Mean and Standard Deviation
		Sustainability plan	Status of Sustainability plan	Ordinal	Quantitative	Non-Parametric	Arithmetic Mean and Standard Deviation

Objective	Variables	Indicators	Measurement	Measuring Scale	Research Approach	Type of Statistical Analysis	Tool of Analysis
To examine how the combined project construction phases influence quality of residential building construction projects in Nairobi County.	Independent Variable: Project construction phases	Type of project construction phases	The strength of the relationship	Ratio	Quantitative	Parametric	Pearson's Correlation
To analyze the moderating influence of legal environment on the relationship between project construction phases and quality of residential building construction projects in Nairobi County.	Moderating Variable: Legal Environment	Code of ethics and professional conduct	Existence and level of knowledge of code of ethics and professional conduct	Ordinal	Quantitative	Non-Parametric	Arithmetic Mean and Standard Deviation
		National Construction Authority Regulations	Level of adherence to National Construction Authority regulations	Ordinal	Quantitative	Non-Parametric	Arithmetic Mean and Standard Deviation
		National Building Inspectorate Audits	Status of National Building Inspectorate Audits	Ordinal	Quantitative	Non-Parametric	Arithmetic Mean and Standard Deviation

CHAPTER FOUR

DATA ANALYSIS, PRESENTATION, INTERPRETATION AND DISCUSSION

4.1 Introduction

This chapter presents the data that was found on project construction phases, legal environment and quality of residential building construction projects in Nairobi County, Kenya. The research was conducted on a sample of 288 respondents to which questionnaires were administered and interviews conducted. The chapter introduces with analysis of respondents' personal information, and then looks into the analysis of themes: feasibility assessment, contract negotiation, monitoring and evaluation, project closure, project construction phases and legal environment. Findings from open-ended questions were presented in prose. The data analyzed were obtained through a structured questionnaire along various operational indicators of the study variables. The details of descriptive analysis using frequency distribution tables, descriptive statistics using means and F-tests was used for testing hypotheses. The descriptive and inferential statistics, interpretation of findings and discussions are presented.

4.2 Suitability of the Data

The study established the suitability of the data by examining the response rate for the respondents. The findings are discussed in the subsequent sections.

4.2.1 Questionnaire Return Rate

The population for the study was all the registered contractors, giving a total of 3379 contractors. Others under consideration were 67 engineering consultants of building construction projects in Nairobi County, 17 officers in NCA top management and 12 officers of the National Building Inspectorate (NBI) management, yielding a total target population of 3475. The researcher sampled a total of 288 respondents which consisted of 17 NCA and 12 NBI officers in the management teams and 192 contractors and 67 consultants registered by NCA. Questionnaires were issued to all the 192 contractors and 67 consultants. 198 out of 259 questionnaires were filled and returned, 139 from contractors and 59 from consultants, yielding a response rate of 76.4%. Interviews were conducted among 24 out of 29 members of the management teams, 14 out of 17 with NCA officers and 10 out of 12 with NBI officers in the management teams, yielding a response rate of 82.7%. These response rates were considered adequate for analysis.

According to Awino (2011), a response rate of 65 percent is acceptable for such studies. Similarly, Mugenda and Mugenda (2003) and Saunders, et al., (2007), a response rate of 50 percent is adequate, 60 percent is good, and 70 percent is very good. Therefore, the response rates of 76.4% percent for questionnaires and 82.7% for interviews conducted, were very good and hence acceptable for drawing conclusions on the current study.

4.2.2 Tests of Regression Assumptions

Various assumptions are made about variables during statistical tests. This is to ensure that the findings are worth using in decision-making. Failure to meet these assumptions may lead to Type I and Type II errors. Testing for assumptions is beneficial because it ensures that analysis meets associated assumptions and helps avoid Type I and Type II errors (Osborne et al, 2001). This study carried out tests of normality and multicollinearity.

4.2.3 Tests for Normality

The use of inferential parametric statistical processes necessitates that the rules of such tests of normality are put to test. This helps in graphical tests to be performed about the normality of the data to plaid for skewness and kurtosis coefficients. These tests help to confirm whether the data follows a normal distribution or not. If the normality is not achieved, the results may not depict the true picture relationship amongst the variables. In this study, normality was tested using Kolmogorov-Smirnov Test and the Shapiro-Wilk Test. The Shapiro-Wilk Test is more appropriate for small sample sizes (< 50 samples), but can also handle sample sizes as large as 2000. For this reason, this study used the Shapiro-Wilk test as our numerical means of assessing normality. If the Sig. value of the Shapiro-Wilk Test is greater than 0.05, (P-value test statistic) the data is normal. If it is below 0.05, the data significantly deviates from a normal distribution.

Table 4.1: Shapiro-Wilk Test of Normality

Variables	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Feasibility assessment	.364	222	.331	.656	222	.401
Contract negotiation	.309	222	.331	.742	222	.401
Monitoring and evaluation	.329	222	.331	.703	222	.401
Project closure	.289	222	.331	.730	222	.401
Project construction phases	.285	222	.331	.678	222	.401
Legal Environment	.316	222	.331	.632	222	.401
Quality of Building Construction Projects	.349	222	.331	.616	222	.401

a. Lilliefors Significance Correction

The findings depict that the significance values for the Shapiro-Wilk tests were 0.401 for feasibility assessment, contract negotiation, monitoring and evaluation, project closure, project construction phases, legal environment and quality of building construction projects. For the Kolmogorov-Smirnov tests, the significance values were 0.331 for feasibility assessment, contract negotiation, monitoring and evaluation, project closure, project construction phases, legal environment and quality of building construction projects. This implies that since the p-value is greater than the chosen alpha level of 0.05 then we fail to reject the hypothesis based on the fact that the data came from a normally distributed population. The results of the tests are therefore of normally distributed population.

4.2.4 Test for Multicollinearity

When there is a perfect linear relationship among the predictors, the estimates for a regression model cannot be uniquely computed. The term collinearity implies that two variables are near perfect linear combinations of one another. When more than two variables are involved it is often called multicollinearity, although the two terms are often used interchangeably. Multicollinearity is a test that evaluates whether the independent variables are highly correlated. The primary concern is that as the degree of multicollinearity increases, the regression model estimates of the coefficients become unstable and the standard errors for the coefficients can get wildly inflated.

The variance inflation factor (VIF) was used to evaluate the level of correlation between variables and to estimate how much the variance of a coefficient was inflated because of linear dependence with other predictors. As a rule of thumb if any of the VIF are greater than 10 (greater than 5 when conservative) then there is a probability of a problem with multicollinearity and is harmful to the study (Newbert, 2008). Tolerance, defined as 1/VIF, is used by many researchers to check on the degree of collinearity. A tolerance value lower than 0.1 is comparable to a VIF of 10. It means that the variable could be considered as a linear combination of other independent variables (Newbert, 2008). The results for tests of multicollinearity were as presented in Table 4.2.

Table 4.2: Test for Multicollinearity

Coefficients^a							
Model	Unstandardized Coefficients		Standardized t Coefficients	Sig.	Collinearity Statistics		
	B	Std. Error	Beta		Tolerance	VIF	
(Constant)	1.272	.350	3.636	.000			
Feasibility assessment	.198	.063	.188	3.126	.002	.780	1.281
Contract negotiation	.096	.066	.107	1.451	.148	.512	1.954
Monitoring and evaluation	.325	.073	.349	4.481	.000	.463	2.162
Project closure	.174	.070	.145	2.463	.014	.815	1.228
Project construction phases	.123	.054	.161	2.272	.024	.558	1.793
Legal Environment	.108	.051	.137	2.115	.035	.672	1.489

b. Dependent Variable: Quality of Building Construction

The results in Table 4.2 revealed that there was no problem of multicollinearity. Tolerance levels for all the variables were greater than the recommended minimum of 0.1 (Cooper and Schindler, 2014). Similarly, variance inflation factors for the variables were all below 5 meaning that the variables were not highly correlated.

4.2.5 Heteroscedasticity

Heteroscedasticity occurs when the variance of the error terms differ across observations. Heteroscedasticity is useful to examine whether there is difference in residual variance of the observation period to another period of observation (Godfrey, 1996). The study utilized Glejser test (1969) conducted by regression residual value of the independent variable. In the case there is an assumption that if the Sig. value >0.05 , then there is no problem of heteroscedasticity. The results for tests of Heteroscedasticity were as presented in Table 4.3.

Table 4.3: Test for Heteroscedasticity

Coefficients^a					
Model	Unstandardized		Standardized	t	Sig.
	Coefficients	Coefficients	Coefficients		
	B	Std. Error	Beta		
(Constant)	1.125	.012		3.856	.000
Feasibility assessment	.198	.045	.186	0.156	.269
Contract negotiation	.096	.056	.112	0.258	.148
Monitoring and evaluation	.256	.089	.349	0.481	.86
Project closure	.174	.070	.145	0.463	.089
Project construction phases	.125	.064	.151	0.256	.059
Phases					
Legal Environment	.118	.068	.148	0.165	.063

c. Dependent Variable: Quality of Building Construction

Based on the output coefficients, the obtained Sig. values are >0.05 , thus there is no problem of Heteroscedasticity. Hence, there is no difference in residual variance of independent to dependent variables tested.

4.2.6 Control of Type I Error and Type II Error

For statistical findings to be valid, a researcher has to control Type I and Type II errors which occur due to the wrong interpretation of results during tests of various statistics. Type I error occurs when the null hypothesis is rejected when it was supposed to be accepted while Type II error occurs when the null hypothesis is accepted when it was supposed to be rejected (Larry, 2013). In this study, Type I error was minimized by using a confidence level of 95% implying that the standard variate was 1.96 and the sample proportion (p) was less than or equal to 0.05 as recommended by Larry (2013). Type II error was minimized by taking a large enough sample of 310 respondents as recommended by Sekaran's (2003) sample size criterion.

4.2.7 Analysis of Likert-Type Data

The interpretation of research findings by use of Likert Scale determines the accuracy of results. In the self-administered questionnaire in this study, the nine sections comprised of items in a Likert type scale format using a scale of SD – Strongly Disagree; D – Disagree; N – Neutral; A – Agree; and SA – Strongly Agree as recommended by Alan (2001). Each of the nine sections of Likert type scale format had ten items. Items were limited to ten so as to increase the response rate. Frauke et al. (2008) argue that when a questionnaire is too lengthy, the response rate is low and the quality of the responses is compromised. In addition, Frauke et al. (2008) propose that ten objectively constructed items for each research variable in a Likert type scale are sufficient to measure a desired construct where mathematical modelling is involved in data analysis.

4.3 Demographic Data

4.3.1 Distribution of Respondents by Gender vs. Level of Education

The table below shows how the respondent's gender was cross tabulated against the level of education. This was important as it showed which gender had the highest level of education. The findings are as shown in the table 4.4.

Table 4.4: Gender vs. Level of Education Cross Tabulation

	Highest level of education				
	Certificate	Diploma	Bachelor degree	Postgraduate degree	Total
Gender-Male	1	31	67	33	132
Female	1	16	39	10	66
Total	2	47	106	43	198

From the findings in the table above it was found that majority (67) of the males had bachelor's degree level of education, compared to the females who had similar level of education (39). This was followed by 33 males who had postgraduate level of education compared to 10 females who had similar level of education. In addition 31 males had diploma level of education compared to 16 females who had the same level education. Finally the findings established that the both male and females had equal number of those who had certificate level of education.

4.3.2 Respondents Gender vs. Age Group

The table below shows how the respondent's gender was cross tabulated against the age group. This was important as it showed which gender had the highest age group. The findings are as shown in the table 4.5.

Table 4.5: Distribution of Respondents by Gender vs. Age Group Cross Tabulation

	Age group								Total
	21-25 yrs	26-30 yrs	31-35 yrs	36-40 yrs	41-45 yrs	46-50 yrs	51-55 yrs	Over 55yrs	
Gender-Male	11	13	24	29	10	36	7	2	132
Female	1	10	23	15	6	7	4	0	66
Total	12	23	47	44	16	43	11	2	198

From the findings in the table above it was found that most (36) of the males were aged between 46-50 years, as compared to 23 females who were aged between 31-35 years. In addition most (29) of males were aged between 36-40 years as compared to 15 females who were under the

same age bracket. This depicts that most of the males were middle aged as compared to the females working in the organization. This further implies that there is greater zeal among middle-aged males in the construction industry. Gender bias against construction works is still prevalent.

4.3.3 Distribution of Respondents by Gender vs. Length of Time Working in the Organization

The table below shows how the respondent’s gender was cross tabulated against the length of time working in the organization. This was important as it showed which gender had worked in the organization for the longest time. The findings are as shown in the table 4.6.

Table 4.6: Distribution of Respondents by Gender vs. Length of Time Working in the Organization Cross Tabulation

	Length of time working in the organization					Total
	1-5 yrs	6-10 yrs	11-15 yrs	16-20 yrs	Above 20 yrs	
Gender-Male	50	37	30	9	6	132
Female	26	22	11	3	4	66
Total	76	59	41	12	10	198

From the findings in the table above it was found that majority (50) of the males had worked in the organization for a duration of 1-5 years as compared to 26 females who had worked in the organization for the same period of time. Additionally it was found that males (37) had worked for a duration between 6-10 years as compared to 22 females who had worked for the same duration. This depicts that most of the males had worked in the organization for a sizeable duration of time to gain experience in relation to construction and building quality structures.

4.4 Quality of Residential Building Construction Projects

Quality of residential building construction projects was identified in this study as the dependent variable. Theoretical and empirical review in this study indicated that status of project audit, adequacy of minutes of quality meetings, status of testing reports, availability of check sheets

and status of approval documents are pointers of quality of residential buildings. Data was therefore collected to measure these aspects of quality.

To measure quality in residential building construction projects, research questions were developed in a self-administered questionnaire. The researcher sought to establish the extent to which the respondent agreed that project audit was an important aspect in quality management. The mean score was 4.6717 while the standard deviation was 0.2279. This result indicates that the majority of the respondents strongly agreed that project audit was an important aspect in quality management. This suggests that project audit is regarded by majority of contractors and consultants as important to affirm quality. A project audit is of utmost importance as it protects project beneficiaries from possible harm and threat. The ethical principle of beneficence involves the protection of individual welfare and the promotion of common welfare. Project audit is aimed at the realization of this common good. According to the virtual ethics theory, professionals involved in project audit should display the virtues of wisdom, courage, respect, honesty and so forth. Their work should focus on the general welfare for the benefit of all.

Respondents were also asked to indicate whether project audit was often ignored. The mean score was 3.6313 while the standard deviation was 0.9508. This result indicates that the majority of the respondents moderately agreed that project audit was often ignored. Respondents indicated that on several occasions, project audit is ignored and work progresses without approval of milestones attained. Consciously proceeding with an unaudited project is unethical and against the ethical principle of justice. According to Government of the Republic of Kenya (2009), unethical practices such as ambiguous project status, poor quality and cost control, delays on certifications and approvals, unwarranted variations and cost overruns, disputes, conflicts and lack of trust can greatly affect quality of building construction projects. The ethical principle of justice emphasizes on the need to maximize on public utility. Project audit when ignored goes against the principle of justice and this has far reaching consequences on project beneficiaries, seen where structures built fail to attain required standards. According to the signal detection theory, correctly identifying a construction defect and responding positively to its presence corresponds to responding correctly in the presence of noise. Project audit enables the recording of such defects when observed.

The researcher sought to determine whether minutes of meetings were often inadequate in covering quality aspects. The mean score was 3.5303 while the standard deviation was 0.9751. This result indicates that the majority of the respondents agreed that minutes of meetings are often inadequate in covering quality aspects. This suggests a weakness in having adequate minutes of meetings. Meetings to discuss quality specifications are a crucial part of the monitoring process. The project owner should hold such meetings with the contractor, sub-contractors and consultants to deliberate on quality aspects of the project. The involvement would help deliver quality service to the customers. According to Rumané (2011), a construction company needs to demonstrate its ability to consistently provide products that meet or exceed customer expectations and satisfaction through involvement of construction partners, while also adopting appropriate processes for the continued improvement of the QMS and related assurances of conformity to customer and applicable regulatory requirements. The principle of respect for autonomy that focuses on the right of self-determination is violated when project owners fail to exercise their decision making capacity required for such meetings to take effect.

Respondents were further asked to indicate the extent to which results of testing of materials for quality are often not documented. The mean score was 3.7071 while the standard deviation was 1.0201. This result indicates that the majority of the respondents agreed that results of testing of materials for quality are often not documented. This points to an omission in documenting results of testing of materials for quality. A record showing the results of such tests is necessary to safeguard oneself in cases of faulty buildings. It also instils greater responsibility on the part of the contractor to secure quality materials for the project. The findings concur with those of a study carried out in the Gaza strip by Adrian, et al (2009) where survey findings indicated that poor quality of available equipment and raw materials were one of the most important factors affecting project performance. The principle of justice is undermined when such results are not documented. Testing of materials is considered a fair and necessary action that guarantees the project owner of quality materials in building operations.

The researcher, in addition, sought to determine the extent to which the respondent agreed that check sheets on quality were often available. The mean score was 3.6465 while the standard deviation was 1.0006. This result indicates that the majority of the respondents agreed that check

sheets on quality are often available. This suggests that many consulting engineers had check sheets that they use to assess the project milestones vis-a-vis quality throughout the project implementation phase. This enhances realization of quality on several aspects. Where such check sheets are ignored, quality largely is usually at stake. In line with the signal detection theory, any signal acting as a pointer to a defect should be recorded on such check sheets. Availability of check sheets is an affirmation of adherence to the ethical principle of beneficence that promotes the common good. This also concurs with Beaumont (2006) who pointed out that a quality management system should ensure that work is performed according to specifications, throughout the design and implementation phases to ensure that customers are satisfied with the resulting products.

The researcher in addition sought to establish whether project approval documents were available. The mean score was 3.6414 while the standard deviation was 0.9963. This result indicates that the majority of the respondents agreed that project approval documents in most cases were not available. Included in the project approval documents are the “as-built” drawings. In this case, respondents were asked to indicate the extent to which the “as-built” drawings are included in the approval documents. The mean score was 3.8283 while the standard deviation was 1.0762. This result indicates that the majority of the respondents agreed that the “as-built” drawings are not always included in the approval documents. “As built” drawings capture the status of the completed project which largely offers evidence of work done to completion. The omission by contractors and consultants to provide project approval documents may be regarded as unethical as it could reflect dissatisfaction on their part with the work done. Approval documents offer evidence of works having been accepted and certified by the consultants and client. Approval by consultants builds confidence in the client that the building structure is of required standard. The client also approves that the work done is as initially designed. It is therefore against the ethical principle of justice to close the project without evidence of project approval documents.

The overall aggregate mean score for this section stands at 3.7727, the standard deviation at 0.8996 and the coefficient of variation at 0.3739. This discloses that on average the respondents agreed with quality of residential building construction projects. This concurs with the assertion

of Edwards Deming, one of the pioneers of the quality movement, that quality should be aimed at producing a predictable degree of uniformity and dependability suited to the customer (Chandrupatla, 2014). The customer, according to Deming, is the most valuable part of production. Quality should therefore be aimed the present and future needs of the customer. The study findings are as illustrated in the table 4.7.

Table 4.7: Quality of Residential Building Construction Projects

	n	Mean	S.D	CV
a. As a project professional, I am quite often satisfied with the standards of work done in construction of residential buildings	198	3.1667	0.6510	0.3005
b. Project audit is an important aspect in quality management	198	4.6717	0.2279	0.3756
c. Project audit is often ignored (R)	198	3.6313	0.9508	0.3613
d. Project approval documents in most cases are not available (R)	198	3.6414	0.9963	0.3772
e. The “as-built” drawings are not always included in the approval documents (R)	198	3.8283	1.0762	0.3805
f. Minutes of meetings are often inadequate in covering quality aspects(R)	198	3.5303	0.9751	0.3854
g. Results of testing of materials for quality are often not documented(R)	198	3.7071	1.0201	0.3768
h. Check sheets on quality are often available	198	3.6465	1.0006	0.3781
i. Check sheets do not always cover all aspects of quality (R)	198	3.4596	0.9212	0.3745
j. Failure to meet quality standards in one stage affects work progress in the next stage	198	3.8081	0.7763	0.4293
Composite Results	198	3.7727	0.8996	0.3739

R: The scale of the item was reversed during analysis

From the decision level measurement scale used in this study, a composite mean of 3.7727 of the dependent variable indicates that on the overall, respondents agreed that quality of residential building construction projects was an important consideration. This finding is supported by other findings in this study. For instance respondents indicated that the quality of residential building has great significance in Kenya. In addition, results from this study indicated that project construction phases in the project cycle influence quality of residential building construction projects.

The findings above depict that on average the respondents agreed with quality of residential building construction projects. Quality standards in one stage affects work progress in the next stage in building construction projects. This concurs with the findings by Tricker, (2008) that if the construction company’s culture is good, the quality system will be applied appropriately, with the resulting building structure also being good and vice versa. Recent publications on construction quality management highlight the important activities that should be performed in relation to the application of an effective quality management system.

Within the regulatory bodies, respondents interviewed were requested to indicate the extent of their involvement in quality of residential buildings construction. The findings are as shown in the table 4.8.

Table 4.8: Level of Involvement in Quality of Residential Buildings Construction

	Frequency	Percent (%)
To a very small extent	1	4.2
Moderately	16	66.7
To a large extent	4	16.7
To a very large extent	3	12.5
Total	24	100.0

According to the findings majority (66.7%) of the respondents interviewed indicated that to a moderate extent they were involved in quality of residential buildings construction, 16.7% indicated to a large extent, 12.5% indicated to a very large extent, while 4.2% indicated to a very

small extent. This depicts that to a moderate extent the respondents were involved in quality of residential buildings construction. Virtue ethics theory stresses the importance of qualities of character. Building construction authorities have the responsibility of promoting quality standards and ensure general welfare for the benefit of all and fairness in all of one's deeds. According to this theory, construction authorities are expected to uphold the virtues of justice, trustworthiness, respect and responsibility among others. Exercise of these virtues will propel them to be actively involved in ensuring quality standards.

Respondents interviewed indicated that performance of the residential buildings construction projects in Nairobi County was satisfactory and attributed this to appropriate planning, organizing and controlling on management. Planning as a management tool has minimized delays and poor planning among clients, contractors and consultants to meet project criteria of cost, time and quality. Delay has been seen to hinder smooth progress of works, thus planning has been seen as a direct effect on time performance. The respondents interviewed also indicated that the project managers in the construction projects usually generate required activities, analyze the implication and choice of alternative means of performance activities in the construction projects. The overall planning process of mission, goals, and plans has played a vital role in making construction activities in Nairobi County more efficient and promote innovation. The planning process outlines target dates and budgets for a project and addresses general areas which have encouraged innovation and motivation to construction players in observing time schedules.

The respondents interviewed further stated that the projects have been satisfactory due to the fact that project owners have had strict timelines for delivery, failure to which have led to withdrawal of contracts or discontinuation of projects. Contract management with parameters such as the main contractor, subcontractors, and contractor's superintendent on site, management style and experience in handling projects have affected completion of projects in time and cost, which has impacted on project delivery. Environmental issues such as cultural disparity, differences and their effects on work ethics, performance and perception of work affect delivery of projects within parameters of time, cost, scope and specifications.

Respondents interviewed indicated that performance indicators are one of the factors that constitute construction project success criteria which is the reason while performance measurement on construction projects are usually carried out by establishing indicators which offer objective criteria to measure project success. Those interviewed stated that when a project is completed on time, within the agreed budget and set quality, also referred to as the golden/iron triangle, then the project is deemed successful. Evidence suggests that this is far from the truth. Hence, the construction industry needs to pay attention to critical success factors, besides the golden/iron triangle of time, cost and quality. These findings concur with the views of Watson and Howarth (2011) who emphasized that for a quality management system to remain effective, an organization should rigorously conduct an assessment of its performance, set against a standard. This will ensure that customers are satisfied with the resulting products and services (Beaumont, 2006) and consequently the ethical principles of respect, beneficence and justice will be upheld.

The key informants further indicated the indicators of project performance to include construction time, profitability, project management, material ordering, handling and management, risk management, quality assurance, client satisfaction, safety, time predictability and productivity. The respondents interviewed further indicated that to ensure that the indicators facilitated project success; complete teams of professional consultants were engaged from onset, which ensured that the projects were better managed, and especially with out-sourced teams of consultants.

The respondents interviewed further indicated that most projects were started in the years 2010 and 2012. This was attributed to the economic stimulus programs and donor injection into the economy. Most of the studied projects were completed between 2014 and 2015. On the opinion of the respondents interviewed on time allocation, majority agreed that projects could not have been fast tracked to finish with less than the initial contract period given due to prevailing factors beyond their control.

According to Ruman (2011), a construction company needs to demonstrate its ability to consistently provide products that meet or exceed customer expectations and satisfaction, while

also adopting appropriate processes for the continued improvement of the QMS and related assurances of conformity to customer and applicable regulatory requirements. Watson and Howarth (2011) also emphasize that for ISO 9001 to remain a process-based system with heavy emphasis on compliance, an organization is required to rigorously conduct an assessment of organisational performance, set against a standard and leading to accreditation. Clearly, the context of an effective QMS implementation is to ensure that work is performed according to specifications, throughout the design and development phases, manufacturing and construction, and servicing, and also ensure that customers are satisfied with the resulting products and services (Beaumont 2006). Building construction projects stand to benefit from such a quality management system.

4.5 Influence of Project Construction Phases on Quality of Residential Building Construction Projects

In this section, descriptive and inferential statistics on the influence of project construction phases on quality of residential buildings construction projects were analysed. In addition, discussions on the influence of project construction phases on quality of residential buildings construction projects were done based on the research analysis.

4.5.1 Influence of Feasibility Assessment on Quality of Residential Buildings Construction Projects

Research objective one was on the influence of feasibility assessment on quality of residential buildings construction projects.

4.5.1.1 Descriptive Analysis of Influence of Feasibility Assessment on Quality of Residential Buildings Construction Projects

Both theoretical and empirical review indicated that feasibility assessment influence quality of residential buildings construction projects. Respondents were asked to indicate the extent to which they were in agreement with statements regarding feasibility assessment of residential buildings construction projects in Nairobi County. Several questions were developed to measure the extent of this relationship.

Respondents were asked to indicate the extent to which feasibility assessment was important before the start of a building construction project. The mean score was 4.5505 while the standard deviation was 0.2231. This result indicates that the majority of the respondents strongly agreed that feasibility assessment was important before the start of a building construction project suggesting that majority of the contractors and consultants held that professionals who fail to conduct a feasibility assessment were being unethical in their approach to duty. This agrees with the findings of Kenkel, (2008) who stated that feasibility study in the conception of projects is the foundation of a comprehensive and transparent determination of the viability of investment proposals and focuses on minimizing uncertainty throughout the lifetime of the project. Feasibility studies are used as one of the first steps in examining a proposed business venture, and can be used for a new business or for an investment for an existing business.

The researcher sought to establish the extent to which level of qualification of feasibility personnel is an important consideration before the start of a building construction project. The mean score was 3.4091 while the standard deviation was 1.2088. This result indicates that the majority of the respondents agreed that level of qualification of feasibility personnel was an important consideration before the start of a building construction project. This suggests that feasibility study should be done by an expert in that field. This concurs with the findings of a study carried out in the Gaza strip by Adrian, Sherif and Saleh (2009) to identify the factors affecting the performance of local construction projects. Survey findings indicated that one of the most important factors affecting project performance and related to feasibility assessment was unavailability of highly experienced and qualified personnel. Engaging unqualified personnel would be professionally unethical as it would compromise the basic elements underlying quality of construction work.

Respondents were asked to indicate the extent to which a feasibility report was necessary before the start of a building construction project. The mean score was 4.9899 while the standard deviation was 0.0539. This result indicates that the majority of the respondents strongly agreed that a feasibility report is necessary before the start of building construction project. An assessment report should be available to guide the project developers and it would be deemed unethical for work to commence without such a report.

The researcher further sought to determine the extent to which use of feasibility data had an influence on quality of residential buildings project. The mean score was 3.8838 while the standard deviation was 0.7347. This result indicates that the majority of the respondents strongly agreed that use of feasibility data had an influence on quality of residential buildings project. This suggests strongly that the contents of a feasibility report should be used to make the go/no-go decision. This agrees with the views of Yun and Calda (2009) that total viability leads decision-makers to make a Go/No-Go decision and provide optimal alternatives. If project practitioners fail to honour any feasibility data pointing to a no-go decision, this will be unethical in context.

The study findings are as illustrated in table 4.9.

Table 4.9: Descriptive Analysis of Feasibility Assessment

	n	Mean	S.D	CV
a. Feasibility assessment is important before the start of building construction	198	4.5505	0.2231	0.4663
b. Evidence of feasibility assessment is an important consideration before the start of building construction	198	4.7424	0.1400	0.4247
c. Level of qualification of feasibility personnel is an important consideration before the start of building construction	198	3.4091	1.2088	0.3548
d. Selection of feasibility expert is best done by the project owner	198	3.9141	1.3128	0.4505
e. A feasibility report is necessary before the start of building construction	198	4.8899	0.0539	0.3789
f. A meeting to discuss feasibility report is an important consideration	198	3.7475	1.0211	0.4636
g. Level of use of feasibility data has an influence on quality of residential buildings	198	3.8838	0.7347	0.3900
h. Technical feasibility has the greatest influence on quality of construction work	198	4.1222	0.7326	0.4254
i. Go /No-Go decision should be made by all key stakeholders in a meeting	198	4.0121	0.7560	0.4416
j. Choice of site has an influence on quality of residential buildings	198	3.778	0.8556	0.4813
Composite Results				
	198	4.2449	0.1839	0.4542

The composite mean score for this section stands at 4.2449, the standard deviation at 0.1839 and the coefficient of variation at 0.4542. This indicates that the respondents strongly agreed with items of feasibility assessment of residential buildings construction projects.

Interviews conducted with the top management of regulatory bodies to assess the significance of feasibility assessment agreed with the findings above. They mentioned cases where a formal feasibility assessment is not at all conducted and in some cases where it is conducted an expert in the field is not engaged. This reveals that poor quality of building projects is largely due to failure to undertake a formal feasibility assessment.

When asked to cite other feasibility assessment that influence quality of the residential building industry in Nairobi County, one consultant indicated the following:

There is failure by the owner of the building to consult experts to get technical advice on how to best fit the project on the chosen site. (Respondent 1)

This reveals a level of reluctance by clients to incur the cost of technical feasibility, a situation that may compromise the quality of the building constructed particularly if the site chosen manifests a possible challenge.

Majority of those interviewed at top level of management agreed that feasibility assessment is a significant factor in determining quality of buildings.

4.5.1.2 Inferential Analysis of Influence of Feasibility Assessment on Quality of Residential Buildings Construction Projects

Objective one of the study was designed to establish the relationship that exists between feasibility assessment and quality of residential building construction projects. The literature that was reviewed in this study as well as theoretical reasoning associated feasibility assessment with quality of residential buildings. Indicators of feasibility assessment in the study were evidence of assessment, level of qualification of assessment personnel and level of data use. Quality of residential building construction projects on the other hand was indicated by the status of project audit, adequacy of minutes of quality meetings, status of testing reports, availability of check sheets and status of approval documents.

Indications from both the theoretical and empirical literature pointed to a positive significant relationship between feasibility assessment and quality of residential buildings construction projects.

Correlation Analysis

Pearson Product Moment correlation coefficient was used to assess the strength and direction of the relationship between feasibility assessment and quality of residential buildings construction projects.

The Pearson’s Product Moment Correlation coefficients showed the value of $r = 0.769$. Shirley et al. (2005) indicates that for a weak correlation, “r” ranges from + 0.10 to + 0.29; in a moderate correlation, “r” ranges between + 0.30 and + 0.49; while in a strong correlation, “r” ranges from +0.5 and + 1.0. The positive or negative sign points to the direction of the relationship. It can therefore be argued that for $r > 0.5$, there was a strong correlation between the two variables under investigation. The results are shown in Table 4.10.

Table 4.10: Correlation Results for Feasibility Assessment

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
	.769 ^a	.591	.589	.26709

a. Predictors: (Constant), Feasibility assessment

Since $r = 0.769$ in this case, then there was a strong positive significant correlation between feasibility assessment and quality of residential buildings construction projects. In this case, the adjusted R-squared is 0.589. This means that feasibility assessment variable explains 58.9% variations in the dependent variable (quality of residential buildings). This means that there might be many factors that can explain variations in quality. Hence, 41.1% of the variation in quality cannot be explained by feasibility assessment. Therefore other variables could be having more influence on quality. Such variables include material prices, availability of resources as planned through project duration, average delay because of closures leading to materials shortage,

availability of personnel with a high experience and qualifications, quality of equipment and raw materials in project and leadership skills for project managers (Adnan, et al, 2009).

These findings concurred with those of Salman et.al (2007) who argue that a successful project requires its promoters to ascertain that the project is politically, socially, legally, environmentally, economically and financially viable and the project viability may only be determined following a detailed and accurate feasibility study. The conduct of a comprehensive feasibility analysis plays an important role regarding implementation and prioritization in the decision-making phase in the beginning of a project life cycle, which applies to public and private projects respectively.

Test of Hypothesis

Analysis of Variance (ANOVA) was used to test the hypothesis. The study calculated the ANOVA coefficient between the independent variable, feasibility assessment and the dependent variable, quality of residential building projects. The significant level of testing the hypothesis was 0.05.

Hypothesis one that the study tested was:

H₀: There is no significant influence of feasibility assessment on quality of residential buildings construction projects

Table 4.11 shows results of the relationship between feasibility assessment and quality of residential buildings construction projects

Table 4.11: ANOVA^a Results for Feasibility Assessment

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	25.524	1	25.524	357.791	.000 ^b
Residual	15.691	221	.071		
Total	41.215	222			

a. Dependent Variable: Quality of Residential Building

b. Predictors: (Constant), Feasibility assessment

From the table F value is 357.791 and P value is 0.000. At 0.05 level of significance and 95% level of confidence this is statistically significant as the P-Value is lower than 0.05. The study therefore rejected the null hypothesis meaning that there was a significant relationship between feasibility assessment and quality of residential building construction projects in Nairobi County. These findings concurred with the findings of Erhardt and Bringham (2011) that feasibility yields a reasonably high probability of success and profitable future operations. Similarly, the findings agree with those of Hyari and Kandil (2009) who point out that owners, decision makers and financial institutions build their decisions to proceed with and/or finance any project based on the results of the feasibility study of that project. The underscores the importance of feasibility study before proceeding with a project.

Regression Modelling

Linear regression was used for modelling the relationship between feasibility assessment and quality of residential buildings.

Regression model was represented as

$$Y = a + X_1 +$$

Quality of residential buildings construction projects = f (Feasibility assessment)

Table 4.12 shows the regression model summary of analysis of feasibility assessment and quality of residential buildings.

Table 4.12: Coefficients for Feasibility Assessment

Model	Unstandardized Coefficients		Standardized T Coefficients	Sig.
	B	Std. Error		
(Constant)	1.552	.156	9.965	.000
Feasibility assessment	.654	.035	.769	.000

a. Dependent Variable: Quality of Residential Building

Based on the analysis, Y intercept was 1.552 while coefficient of the independent variable (feasibility assessment) was 0.654. Therefore, by substituting the beta value and the constant

term, the proceeding regression model was:

$$Y = 1.552 + 0.654X_1 +$$

The coefficient of feasibility assessment (X_1) of 0.654 refers to the elasticity of quality of residential buildings due to changes in feasibility assessment. The coefficient of 0.654 implies that if feasibility assessment increase by 100 percent, quality will improve by 65.4 percent.

The findings agree with a study by Hyari and Kandil (2009) who emphasized the importance of weighing massive expenditures on construction projects against the expected benefits resulting from the projects to stakeholders and therefore conducting feasibility studies prior to the construction of the facilities. The economic feasibility of a project is an estimate of the potential profitability of a project and a study that measures the expected benefits from a certain project relative to its cost (Hyari and Kandil, 2009). A study conducted by Yun and Caldas (2009) to discover knowledge from preliminary feasibility studies of large-scale projects in Korea using classification and prediction came to a similar conclusion. Their conclusion was that the dominant decision variables in determining the implementation of the project were the benefit - cost ratio, the economic feasibility and the financial feasibility, but these decision variables have in common that they are closely related to the financial aspects of a project (Yun and Caldas, 2009). Yun and Caldas (2009) state that in this case the benefit - cost ratio was the most important decision variable for determining the project implementation.

According to Yun and Caldas (2009) the preliminary feasibility studies include four processes that are used to analyze a capital project: project overview; economic feasibility; political viability; and total viability. Project overview examines the project's basic information such as its background, objectives, and procedure and planned content. Economic feasibility estimates demand and calculates economic and financial indices such as benefit-cost ratio (B/C), net present value (NPV) and internal rate of return (IRR) based on cost-benefit analysis to determine national economic impact and investment suitability. Political viability evaluates non-economic impact, attitudes toward the project, financial feasibility, and compliance with relevant governmental policies, environmental impact, as well as project-specific factors.

4.6 Influence of Contract Negotiation on Quality of Residential Buildings Construction Projects

Research objective 2 was on the influence of contract negotiation on quality of residential buildings construction projects.

4.6.1 Descriptive Analysis of Influence of Contract Negotiation on Quality of Residential Buildings Construction Projects

This section presents findings on contract negotiation of residential buildings construction projects. Both theoretical and empirical review indicated that contract negotiation influence quality of residential buildings construction projects. Respondents were asked to indicate the extent to which they were in agreement with statements regarding contract negotiation of residential buildings construction projects.

Respondents were asked to indicate the extent to which competitors overstated their competence and qualifications to secure work. The mean score was 3.0505 while the standard deviation was 0.7788. This result indicates that the majority of the respondents were neutral on whether competitors overstated their competence and qualifications to secure work. This lack of strength in this response suggests that many contractors and consultants competing to gain contracts do not have the required expertise and qualifications to undertake the work. It is unethical to falsify one's competence and qualifications for the sake of securing a contract, as this undermines realization of quality. In some instance, project owner selects contractor and consultants based on personal ties rather than competence. The findings concur with those of a study in South Africa by Bowen et al (2007), where unfair practices were witnessed in the construction industry and those included inexperience, blaming contractors for incompetence, recommending friends for tender awards, among others. Awarding lucrative contracts to a person in order to sustain the client-contractor relationship is not justifiable as it may compromise expected work standards. The ethical principle of justice emphasizes fairness. There should be a level playing ground in the ward of contracts to the competitors.

The researcher further sought to determine the extent to which contract documents are adequate in content. The mean score was 3.4091 while the standard deviation was 0.8424. This result

indicates that majority of the respondents moderately agreed that the contract documents are adequate in content. Contract documents should be comprehensive enough to cover capacity to undertake the work in terms of among others, human and financial resources, and technology available and cost estimates. The response suggests that some contract documents are not comprehensive enough. Contract documents of this nature are a likely cause of poor workmanship and hence a compromise on quality. According to Mawenya (2008), the level of efficiency in public procurement is basically measured by the proper application of complete written procedures of procurement.

Respondents were asked to indicate the extent to which procurement procedure was keenly followed. The mean score was 3.4444 while the standard deviation was 0.8752. This result indicates that the majority of the respondents moderately agreed that procurement procedure was keenly followed. Procurement procedure as stipulated in the Procurement and Disposal Act should be well known and keenly followed to avoid ambiguous contract awards. This suggests a weakness in adherence to the laid down procurement procedure. The findings concur with an observation by Moylan (2008) that within the construction industry, the practices of bid shopping, bid rigging, related cost reduction practices pose a range of ethical challenges. The potential effect these bidding practices can have on involved stakeholders such as the client, consultants, bidding contractors and ultimately the public can be considerable.

Transparency International (2006) stated that in order for the procurement process to check unethical practices, the competitive and bidding process should adhere to several common guidelines such as sound independent audits of procurement processes and requirement for third party monitoring of large procurements. In the public sector, the competitive bidding process has been used to ensure a fair profit for the risks assumed by the competent general contractor. Zhou (2006) stated that the uncompetitive tendering practices include inappropriateness of tender evaluation criteria, preferential treatment of tenderers, disclosure of baseline price of project and other confidential information and integrity of members of tender evaluation committees.

In addition BSI Group, (2008) points out that professionalization of public procurement, institutional and professional capacity, extent of e- procurement, and the performance of

procurement department indicate the level of efficiency. Project owners should prioritize the contract negotiation and follow the procurement procedure keenly to ensure accountability and efficiency.

In addition, the owner has the duty to act in good faith and to deal fairly in all matters relating to the contract (Guyer, 2011). This includes, but is not limited to, the duty not to delay, interfere with or hinder the contractor's performance of the work under the contract. An example would be intentional late payments. The owner has the duty to provide timely access to the site, within the terms and conditions of the contract and the reasonable expectations of the contractor under the requirements of the contract. Also, the owner warrants that the construction documents are accurate, complete and buildable (Alfred, 2008). Failure to adhere to these expectations results to ethical issues such as delayed completion of projects.

The study findings are as illustrated in the table 4.13.

Table 4.13: Descriptive Analysis of Contract Negotiation

	n	Mean	S.D	CV
a. Competitors overstating their competence and qualifications to secure work	198	3.0505	0.7788	0.3798
b. Competitors overstating their experience and capabilities and falsification of qualifications	198	3.1364	0.7172	0.3357
c. Project owner selecting contractor and consultant based on personal ties	198	3.1717	1.0378	0.4779
d. Contract documents are adequate in content	198	3.4091	0.8426	0.3498
e. Procurement procedure not keenly followed	198	3.4444	0.8752	0.3580
f. Main Consultant cutting other consultants fees	198	3.5404	0.8760	0.3448
g. Consultant withholding information from the client which results in variations	198	3.5253	0.9272	0.3672
h. Loading sub-contractors prices to conceal other costs within the project	198	3.5152	1.0112	0.4021
i. Main contractors sometimes not paying and deducting subcontractors fees without proper justification (R)	198	3.5051	1.0887	0.4346
j. Competition to get projects is high	198	3.9192	0.8976	0.4677
Composite Results	198	3.5217	0.9052	0.3918

The overall aggregate mean score for this section stands at 3.5217, the standard deviation at 0.9052 and the coefficient of variation at 0.3918. This reveals that on average the respondents agreed with contract negotiation of residential building construction projects.

4.6.2 Inferential Analysis of Influence of Contract Negotiation on Quality of Residential Buildings Construction Projects

Objective 2 of the study was designed to establish the relationship that exists between contract negotiation and quality of residential building construction projects. The literature that was reviewed in this study as well as theoretical reasoning associated contract negotiation with quality of residential buildings. Indicators of contract negotiation in the study were level of competence of selected contractor, adequacy of contract documents and adherence to procurement procedure. Quality of residential building construction projects on the other hand was indicated by status of project audit, adequacy of minutes of quality meetings, status of testing reports, availability of check sheets and status of approval documents. Indications from both the theoretical and empirical literature pointed to a positive significant influence between contract negotiation and quality of residential buildings construction projects.

Correlation Analysis

Pearson Product Moment correlation coefficient was used to assess the strength and direction of the relationship between contract negotiation and quality of residential buildings construction projects.

The Pearson's Product Moment Correlation coefficients showed the value of $r = 0.629$. Shirley et al. (2005) indicates that for a weak correlation, "r" ranges from + 0.10 to + 0.29; in a moderate correlation, "r" ranges between + 0.30 and + 0.49; while in a strong correlation, "r" ranges from +0.5 and + 1.0. The positive or negative sign points to the direction of the relationship. It can therefore be argued that for $r > 0.5$, there was a moderate correlation between the two variables under investigation. The results are shown in Table 4.14.

Table 4.14: Correlation Results for Contract Negotiation

Model	R	R Square	Adjusted R Square
	.629 ^a	.396	.393
a. Predictors: (Constant), Contract negotiation			

Since $r = 0.629$ in this case, then there was a moderate positive significant correlation between contract negotiation and quality of residential buildings. In this case, the adjusted R-squared is 0.393. This means that contract negotiation variable explains 39.3% variations in the dependent variable (quality of residential buildings). This means that there might be many factors that can explain variations in quality. Hence, 60.7% of the variation in quality cannot be explained by contract negotiation. Therefore other variables could be having more influence on quality.

These findings concurred with those of Kerry and Phoebe (2006) who posited that ethical considerations are significant in the contract negotiation as well as in the subsequent procurement process. Procurement should be characterized by the purchase of goods and services in the right quality, from the right source and the right price all to meet a specific need.

Test of Hypothesis

Analysis of Variance (ANOVA) was used to test the hypothesis. The study calculated the ANOVA coefficient between the independent variable, contract negotiation and the dependent variable, quality of residential building projects. The significant level of testing the hypothesis was 0.05.

Hypothesis two that the study tested was:

H₀: There is no significant influence of contract negotiation on quality of residential buildings

Table 4.15 shows results of the relationship between contract negotiation on quality of residential buildings

Table 4.15: ANOVA^a Results for Contract Negotiation

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	17.102	1	17.102	162.422	.000 ^b
Residual	23.205	221	.105		
Total	40.307	222			

a. Dependent Variable: Quality of residential building construction projects

b. Predictors: (Constant), Contract negotiation

From the table, F value is 162.422 and P value is 0.000. At 0.05 level of significance and 95% level of confidence this is statistically significant as the P-Value is lower than 0.05. The study therefore rejected the null hypothesis meaning that there was a significant relationship between contract negotiation and quality of residential buildings in Nairobi County.

These findings concurred with the views of Lakshmi (2015) who indicated that contract negotiation documents should define a constructed facility considered acceptable under the applicable regulatory codes and standards of professional practice, in terms of its reliability, the ease with which maintenance and repairs can be performed, the durability of its materials and operating systems, and the life safety provided to its users. The facility is constructed in accordance with the contract negotiation documents.

Regression Modelling

Linear regression was used for modelling the relationship between contract negotiation on quality of residential buildings

Regression model was represented as

$$Y = a + X_2 +$$

Quality of residential buildings construction projects = f (Contract negotiation)

Table 4.16 shows the regression model summary of analysis of contract negotiation on quality of residential buildings.

Table 4.16: Coefficients for Contract negotiation

Model	Unstandardized		Standardized	T	Sig.
	Coefficients				
	B	Std. Error	Beta		
(Constant)	2.509	.156		16.066	.000
Contract Negotiation	.442	.035	.629	12.744	.000

a. Dependent Variable: quality of residential building construction projects

Based on the analysis, Y intercept was 2.509 while coefficient of the independent variable (Contract negotiation) was 0.442. Therefore, by substituting the beta value and the constant term, the proceeding regression model was:

$$Y = 2.509 + 0.442X_2 +$$

The coefficient of contract negotiation (X_2) of 0.442 refers to the elasticity of quality of residential buildings due to changes in contract negotiation. The coefficient of 0.442 implies that if contract negotiation increase by 100 percent, quality will improve by 44.2 percent.

The findings agree with a study conducted in South Africa by Bowen et al. (2007), where among the ethical issues found to compromise efficiency of construction projects included, dishonesty and unfair practices, cases where the contractor lies about materials used or uses inferior materials and loss of materials on site; professional dishonesty such as poor practices by consultants; inexperience; blaming contractors for incompetence; deliberately increasing contractor cash flow through unmerited payment awards and recommending friends for tender awards. If such unethical conduct is minimized, efficiency of operations will subsequently increase.

4.7 Analysis of Project Construction Phases in Project Monitoring and Evaluation on Quality of Residential Buildings Construction Projects

Research objective 3 was on the influence of project construction phases in project monitoring and evaluation on quality of residential buildings construction projects.

4.7.1 Descriptive Analysis of Influence of Project construction phases in Project Monitoring and Evaluation on Quality of Residential Buildings Construction Projects

This section presents findings on project construction phases in project monitoring and evaluation of residential buildings construction projects. Both theoretical and empirical review indicated that project construction phases in project monitoring and evaluation influence quality of residential buildings construction projects. Respondents were asked to indicate the extent to which they were in agreement with statements regarding project construction phases in project monitoring and evaluation of residential buildings construction projects.

Respondents were asked to indicate the extent to which compliance with work plan was assessed on site. The mean score was 3.6061 while the standard deviation was 1.1949. This result indicates that the majority of the respondents agreed that compliance with work plan was assessed on site. This suggests that in several instances, a consulting engineer visits the site to assess compliance with work plan. Monitoring and evaluation is a continuous process throughout the project cycle and the consulting engineer should frequent the site to assess progress. Engaging an independent professional to monitor and evaluate the work plan promotes efficiency and effectiveness of the operations thereby ensuring quality standards. This agrees with the views of Enshassi (1996) who stressed on the need to observe projects promptly and at regular intervals. This is of great significance in the attainment of quality and customer satisfaction.

The researcher sought to establish the frequency of site visits to assess conformity to the work plan. The mean score was 3.101 while the standard deviation was 0.9068. This result indicates that the majority of the respondents were neutral on whether site visits were done frequently to assess conformity to the work plan. This suggests that site visits by the consulting engineers were not frequent during project implementation. Site visits help to monitor and control work in progress and where such visits are not frequent, deviations from set standards may not be realized in time early enough to correct them. Enshassi (1996) stresses on the need to observe projects promptly and at regular intervals. IUCN (2000) pointed out that regular monitoring of project progress will concentrate greater effort on the set output indicators and targets. This is of great significance in the attainment of quality and customer satisfaction. Where deviations from the expected results are noted, effort is made to correct them and this should be done on a regular

basis. However, all effort should be made to produce ‘right–first-time’ which counters the reasoning that one builds to the minimum level of quality and later repair any faulty work (Tricker, 2008). Such reasoning works against Virtue theory which places emphasis on good character that would witness consistency in pursuit of quality in project undertakings.

Respondents were asked to indicate the extent to which quality of building materials was frequently tested on site. The mean score was 3.434 while the standard deviation was 1.3034. This result indicates that the majority of the respondents agreed that quality of building materials was frequently tested on site. Failure to test the materials for quality may tempt the contractor to buy cheap, substandard materials to save on cost and increase his profit. Bai and Yang (2011) expressed a similar opinion that the evaluation of process performance can help find questions in the enforcement of construction projects, determining the reasons for the questions and correcting the errors in the practice in time to improve management’s performance of construction project. Failure to test the materials for quality would therefore be unethical and would culminate in compromise of quality buildings.

The researcher sought to determine the extent to which findings of assessment done during site visits were documented in progress reports. The mean score was 3.070 while the standard deviation was 0.9533. This result indicates that the majority of the respondents were neutral that assessment done during site visits were documented in progress reports. Such a report includes a track of milestones attained in construction work. Findings of assessment done by consulting engineers should be documented in progress reports to enable the contractor and his team correct any deviations observed. Deviations noted in project performance should be corrected immediately. It’s against such documented reports that a law suit can be initiated against the contractor if errors documented are ignored and cause a risky situation such as cracks and collapse of buildings. This agrees with the views of Armstrong (2005) who pointed out that construction errors once detected should be noted down and revealed to the concerned parties in order to pave way for the necessary correction. The ethical principles of respect and justice should be upheld during this phase with an aim of ensuring customer satisfaction.

The study findings are as illustrated in the table 4.17.

Table 4.17: Descriptive Analysis of Monitoring and Evaluation

	n	Mean	SD	CV
a. Monitoring and evaluation of building construction projects is important	198	4.2556	0.5739	0.3689
b. I am satisfied with the level of monitoring and evaluation done on our building construction projects	198	3.4040	1.2126	0.5044
c. A sustainability champion is often found on site	198	2.6111	1.1442	1.7015
d. Compliance with work plan is assessed on site	198	3.6061	1.1949	0.4585
e. Site visits are done frequently to assess conformity to the work plan	198	3.1010	0.9068	0.4316
f. Quality of building materials is frequently tested on site	198	3.4343	1.3034	0.5354
g. Quality of building materials is sometimes found to have been compromised	198	3.2929	0.9533	0.4157
h. Findings of assessment done during site visits are documented in progress reports	198	3.0707	0.9533	0.4604
i. A report on milestones attained in construction work is captured in the progress reports	198	3.0657	0.5145	0.2491
j. Deviations noted in project performance are corrected immediately	198	3.2323	0.9855	0.4415
Composite Results	198	3.337	1.472	0.5567

The composite mean score for this section stands at 3.3374, the standard deviation at 1.4742 and the coefficient of variation at 0.5567. This reveals that on average the respondents moderately agreed with project construction phases in project monitoring and evaluation of residential building construction projects. Monitoring and evaluation of building construction projects are important. Huemann (2004) stated that an accreditation is an external evaluation based on

defined and public known standards. Accreditation was originally established to support customer protection. Clients can be protected by certification, inspection, and testing of products and by manufacturing under certified quality systems. Clients need confidence in the certification, inspection, and testing work carried out on their behalf, but that they cannot check for themselves.

4.7.2 Inferential Analysis of Influence of Project Construction Phases in Project

Monitoring and Evaluation on Quality of Residential Buildings Construction Projects

Objective 3 of the study was designed to establish the relationship that exists between project construction phases in project monitoring and evaluation and quality of residential building construction projects. The literature that was reviewed in this study as well as theoretical reasoning associated project construction phases in project monitoring and evaluation with quality of residential buildings. Indicators of project monitoring and evaluation in the study were compliance with work plan, assessment of quality of building materials on site availability of progress reports and application of M and E findings. Quality of residential building construction projects on the other hand was indicated by status of project audit, adequacy of minutes of quality meetings, status of testing reports, availability of check sheets and status of approval documents. Indications from both the theoretical and empirical literature pointed to a positive significant influence between project construction phases in project monitoring and evaluation and quality of residential buildings construction projects.

Correlation Analysis

Pearson Product Moment correlation coefficient was used to assess the strength and direction of the relationship between monitoring and evaluation and quality of residential buildings construction projects.

The Pearson's Product Moment Correlation coefficients showed the value of $r = 0.409$. Shirley et al. (2005) indicates that for a weak correlation, "r" ranges from + 0.10 to + 0.29; in a moderate correlation, "r" ranges between + 0.30 and + 0.49; while in a strong correlation, "r" ranges from +0.5 and + 1.0. The positive or negative sign points to the direction of the relationship. It can therefore be argued that for $r < 0.5$, there was a moderate correlation between the two variables under investigation. The results are shown in Table 4.18.

Table 4.18: Correlation Results for Monitoring and Evaluation

Model	R	R Square	Adjusted R Square	Standard Error of the Estimate
	.409 ^a	.167	.164	.38096
a. Predictors: (Constant), Monitoring and evaluation				

Since $r = 0.409$ in this case, then there was a moderate positive significant correlation between monitoring and evaluation and quality of residential buildings. In this case, the adjusted R-squared is 0.164. This means that monitoring and evaluation variable explains 16.4% variations in the dependent variable (quality of residential buildings). This means that there might be many factors that can explain variations in quality. Hence, 83.7% of the variation in quality cannot be explained by monitoring and evaluation. Therefore other variables could be having more influence on quality.

Test of Hypothesis

Analysis of Variance (ANOVA) was used to test the hypothesis. The study calculated the ANOVA coefficient between the independent variable, monitoring and evaluation and the dependent variable, quality of residential building projects. The significant level of testing the hypothesis was 0.05.

Hypothesis three that the study tested was:

H_0 : There is no significant influence of monitoring and evaluation on quality of residential buildings

Table 4.19 shows results of the relationship between monitoring and evaluation and quality of residential buildings.

Table 4.19: ANOVA^a Results for Monitoring and Evaluation

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	7.223	1	7.223	49.770	.000 ^b
Residual	32.045	221	.145		
Total	39.268	222			

a. Dependent Variable: quality of residential building construction projects

b. Predictors: (Constant), Monitoring and evaluation

From the table F value is 49.770 and P value is 0.000. At 0.05 level of significance and 95% level of confidence this is statistically significant as the P-Value is lower than 0.05. The study therefore rejected the null hypothesis meaning that there was a significant relationship between monitoring and evaluation and quality of residential buildings in Nairobi County.

These findings concurred with the study of Leonard (2008) who observed that reduced subcontractor responsibility assists in improving quality among construction projects. He pointed out that poor on-site monitoring and feedback as well as poor planning and scheduling are major factors in project quality performance.

Regression Modelling

Linear regression was used for modelling the relationship between monitoring and evaluation on quality of residential buildings

Regression model was represented as

$$Y = a + X_3 +$$

Quality of residential buildings construction projects = f (Monitoring and evaluation).

Table 4.20 shows the regression model summary of analysis of monitoring and evaluation on quality of residential buildings

Table 4.20: Coefficients for Monitoring and Evaluation

Model	Unstandardized		Standardized T	
	Coefficients		Coefficients	
	B	Std. Error	Beta	
(Constant)	3.414	.153		22.279
Monitoring and evaluation	.242	.034	.409	7.055

a. Dependent Variable: Quality of residential building construction projects

Based on the analysis, Y intercept was 3.414 while coefficient of the independent variable (Monitoring and evaluation) was 0.242. Therefore, by substituting the beta value and the constant term, the proceeding regression model was:

$$Y = 3.414 + 0.242X_3 +$$

The coefficient of monitoring and evaluation (X_3) of 0.242 refers to the elasticity of quality of residential buildings due to changes in monitoring and evaluation. The coefficient of 0.242 implies that if monitoring and evaluation increase by 100 percent, quality will improve by 24.2 percent. This agrees with a study by Mawenya (2008), who stated there exist a relationship between quality of construction project with management and evaluation in that the level of efficiency in public procurement is basically measured by the proper application of complete written procedures and standards of procurement such as pre and post qualification procedures; pre and post bid conference procedures; bid evaluation procedures; and bid challenge procedures. Borough (2012) observes that it is crucial for the construction project team, at some extent, to measure its performance on the activities or sub-processes performed throughout the construction project.

In addition BSI Group, (2008) points out that professionalization of public procurement, institutional and professional capacity, extent of e- procurement, and the performance of procurement department indicate the level of efficiency. Insufficient professionalism of designers may translate into poor planning, budgeting and risk management for procurement (Kerry and Phoebe, 2006), leading to unnecessary delays and cost overruns for projects. In other words, designers and contractors are not necessarily well prepared to keep up with professional standards. Furthermore, these professionals may not necessarily be aware that their acts are unethical or may bias the process which can lead to conflict-of -interest situations and sometimes corruption (OECD, 2007).

4.8 Influence of Project closure on Quality of Residential Buildings Construction Projects

Research objective 4 was on the influence of project closure on quality of residential buildings construction projects.

4.8.1 Descriptive Analysis of Influence of Project Closure on Quality of Residential Buildings Construction Projects

This section presents findings on project closure of residential buildings construction projects. Both theoretical and empirical review indicated that project closure influence quality of residential buildings construction projects. Respondents were asked to indicate the extent to

which they were in agreement with statements regarding project closure of residential buildings construction projects. Several questions were developed to measure the extent of this relationship.

The researcher sought to establish the extent to which all key stakeholders give their approval for project closure to occur. The mean score was 4.5818 while the standard deviation was 0.2943. This result indicates that the majority of the respondents strongly agreed that all key stakeholders give their approval for project closure to occur. This suggests that project closure occurs with the knowledge of all key stakeholders who are actively involved in approving the project. All project parties should be made aware of the pending closeout and be involved in the approval of project closure. The project owner together with the contractor, major subcontractors and consulting engineer should meet to assess the completeness and quality parameters before project closure occurs. This agrees with the views of Havila et al (2013) who stated that the involvement of all stakeholders is very important in the last stage. Any omissions and errors observed are noted down in form of punch holes and the contractors is obliged to work on them before receiving his final payment.

Medlin and Salmi (2013) point out that closing the project does not find a lot of presence in the project management literature and that fewer than 5% pages in a typical literature artefact discuss project closure requirements. Not all the projects undergo a smooth journey culminating in a successful end and some of the projects need to be terminated even before they have accomplished the planned goals and objectives (Havila, et al., 2013). Project completion inspection is important and should be planned for as part of the project closure processes.

Respondents were asked to indicate the extent to which all project closure documents are filled-in as project closure occurs. The mean score was 4.4828 while the standard deviation was 0.3280. This result indicates that the majority of the respondents strongly agreed that all project closure documents are filled-in as project closure occurs. The status of all work orders should be filled-in as project closure occurs. Stakeholders should also indicate their approval of the project and any remaining materials on site should be documented. This concurs with the views of Parson (2005) who pointed out that availability of project documentation meets the criteria of

project close-out process, as the data documented is an important source of information to help improve future projects.

Availability of project inspection report is crucial at the closure of the project. In this regard, the researcher sought to establish the extent to which all project inspection documents are filled-in and finalized as project closure occurs. The mean score was 4.7535 while the standard deviation was 0.0963. This result indicates that the majority of the respondents strongly agreed that all project inspection documents are filled-in and finalized as project closure occurs. This suggests that a formal procedure to terminate the contract is followed at project closure where an inspection is done to verify that the buildings are complete and safe for occupation and a report written thereof. Rohaniyati, (2009) states that project closure involves verification by the client, contractor and consultant that all activities have been finalized; documentation has been done and storing relevant information. It also entails verifying that the project has addressed the terms and conditions of the contracts, finalizing of exit criteria for contract termination, validating exit criteria and formally closing out all contracts associated with the completed project (Guyer, 2011). The purpose of project close-out is to assess the project, ensure completion, and derive any lessons learned and best practices to be applied to future projects.

The study findings are as illustrated in the table 4.21.

Table 4.21: Descriptive Analysis of Application of Project Closure Criteria

	n	Mean	S.D	CV
a. Project closure occurs when all parties have been made aware of the pending closeout	198	4.5081	0.4642	0.3120
b. Project closure occurs when all key stakeholders have given their approval	198	4.5818	0.2943	0.4128
c. Project closure occurs when all project closure documents have been filled-in	198	4.4828	0.3280	0.5205
d. Project closure occurs when all activities in the project plan have been completed	198	4.3495	0.4276	0.4758
e. Project closure occurs when all work orders have been completed	198	4.5081	0.3221	0.3993
f. Project closure occurs when all outstanding commitments have been resolved	198	4.2424	0.4903	0.3962
g. Project closure occurs when the client or customer has accepted the final product	198	4.4091	0.4279	0.3813
h. Project closure occurs when all contracts have been completed	198	4.5949	0.3278	0.4150
i. Project closure occurs when agreement has been reached with the client on the disposition of any remaining deliverables	198	3.1566	0.5617	0.2604
j. Project closure occurs when all project inspection documents have been filled-in and finalized.	198	4.7535	0.0963	0.5915
Composite Results	198	4.4687	0.2740	0.4165

The composite mean score for this section stands at 4.4687, the standard deviation at 0.2740 and the coefficient of variation at 0.4165. This reveals that on average the respondents strongly agreed with application of project closure criteria. Project closure is not done haphazardly. All concerned parties are involved to give their approval in line with the work plan. The fact that sometimes errors later manifest themselves through major cracks and collapse of buildings

suggests that though stakeholders are involved to approve the completed project, this is not done in a systematic manner. This then becomes an issue of ethical concern.

4.8.2 Inferential Analysis of Influence of Project Closure on Quality of Residential Buildings Construction Projects

Objective 4 of the study was designed to establish the relationship that exists between project closure and quality of residential building construction projects. The literature that was reviewed in this study as well as theoretical reasoning associated project closure with quality of residential buildings. Indicators of project closure in the study were level of stakeholder involvement, availability of project inspection report, status of project inspection documentation and sustainability plan. Quality of residential building construction projects on the other hand was indicated by status of project audit, adequacy of minutes of quality meetings, status of testing reports, availability of check sheets and status of approval documents. Indications from both the theoretical and empirical literature pointed to a positive significant influence between project closure and quality of residential buildings construction projects.

Correlation Analysis

Pearson Product Moment correlation coefficient was used to assess the strength and direction of the relationship between project closure and quality of residential buildings construction projects. The Pearson's Product Moment Correlation coefficients showed the value of $r = 0.352$ Shirley et al. (2005) indicates that for a weak correlation, "r" ranges from + 0.10 to + 0.29; in a moderate correlation, "r" ranges between + 0.30 and + 0.49; while in a strong correlation, "r" ranges from +0.5 and + 1.0. The positive or negative sign points to the direction of the relationship. It can therefore be argued that for $r > 0.5$, there was a moderate correlation between the two variables under investigation. The results are shown in Table 4.22.

Table 4.22: Correlation Results for Project Closure

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
	.352 ^a	.124	.120	.39070

a. Predictors: (Constant), project closure

Since $r = 0.352$ in this case, then there was a moderate positive significant correlation between project closure and quality of residential buildings. In this case, the adjusted R-squared is 0.120. This means that project closure variable explains 12% variations in the dependent variable (quality of residential buildings). This means that there might be many factors that can explain variations in quality. Hence, 88% of the variation in quality cannot be explained by project closure. Therefore other variables could be having more influence on quality.

Test of Hypothesis

Analysis of Variance (ANOVA) was used to test the hypothesis. The study calculated the ANOVA coefficient between the independent variable, project closure and the dependent variable, quality of residential building projects. The significant level of testing the hypothesis was 0.05.

Hypothesis four that the study tested was:

H₀: There is no significant influence of project closure on quality of residential buildings

Table 4.25 shows results of the relationship between project closure and quality of residential buildings.

Table 4.25: ANOVA^a Results for Project Closure

Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	5.358	1	5.358	35.100	.000 ^b
Residual	33.813	221	.153		
Total	39.171	222			

a. Dependent Variable: quality of residential buildings construction projects

b. Predictors: (Constant), project closure

From the table, F value is 35.100 and P value is 0.000. At 0.05 level of significance and 95% level of confidence this is statistically significant as the P-Value is lower than 0.05. The study therefore rejected the null hypothesis meaning that there was a significant relationship between project closure and quality of residential buildings in Nairobi County.

De (2001) pointed out that improper handling of project closure can result in several unfavorable effects such as time over run, cost over-run, tarnishing the image and credibility of the project team, locking up valuable human and other resources, that could have been gainfully utilized elsewhere, and stress on the project personnel. The project closure is foreseeable but how it is handled and when it is handled have a huge impact on the success of the project (Hormozi et al., 2000). Quality of the project therefore thrives on ethical behavior of the practitioners at project closure phase.

Regression Modelling

Linear regression was used for modelling the relationship between project closure and quality of residential buildings.

Regression model was represented as

$$Y = a + X_4$$

Quality of residential buildings construction projects = f (Project closure)

Table 4.31 shows the regression model summary of analysis of project closure on quality of residential buildings

Table 4.26: Coefficients for Project Closure

Model	Unstandardized		Standardized T	Sig.
	Coefficients		Coefficients	
	B	Std. Error	Beta	
(Constant)	3.591	.152	23.572	.000
Project closure	.216	.036	.352	.000

a. Dependent Variable: Quality of residential buildings construction projects

Based on the analysis, Y intercept was 3.591 while coefficient of the independent variable (Project closure) was 0.216. Therefore, by substituting the beta value and the constant term, the proceeding regression model was:

$$Y = 3.591 + 0.216X_4 +$$

The coefficient of project closure (X_4) of 0.216 refers to the elasticity of quality of residential buildings due to changes in project closure. The coefficient of 0.216 implies that if project closure increases by 100 percent, quality will improve by 21.6 percent.

This agrees with a study by Guyer, (2011) who observed that quality of a construction project is determined by the procedural project closure. Once the building construction project is sufficiently complete, the contractor will request the architect to conduct a substantial completion inspection to confirm that the work is complete in most respects. By doing so, the contractor implies that the work is complete enough for the owner to occupy the facility and start using it, notwithstanding the fact that there might be cosmetic and minor items yet to be completed.

The contractor's request for substantial completion inspection by the architect may include a list of incomplete corrective portions of the work, referred to as the punch list (Havila, Medlin, and Salmi, 2013). The punch list, which is prepared by the contractor, is used by the architect as a checklist to review all work, not merely the incomplete portions of the work. If the architect's inspection discloses incomplete items not included in the contractor's punch list, they are added to the list by the architect. The substantial completion inspection is also conducted by the architect's consultants, either with the architect or separately. Incomplete items discovered by

them are also added to the list. If the additional items are excessive, the architect may ask the contractor to complete the selected items before rescheduling substantial completion inspection.

4.9 Analysis of Combined Influence of Project Construction Phases on Quality of Residential Buildings Construction Projects

In this study, the combination of feasibility assessment, monitoring and evaluation, monitoring and evaluation and project closure were referred to as the project construction phases. In this section, descriptive and inferential statistics on the joint influence of feasibility assessment, monitoring and evaluation, monitoring and evaluation and project closure on quality of residential buildings construction projects were analysed.

4.9.1 Descriptive Analysis of Combined Influence of Project Construction Phases on Quality of Residential Buildings Construction Projects

From the theoretical and empirical literature in this study, findings indicated that ethical practices positively influence quality of construction projects. Proponents of ethical principles argue that projects will require that future project leaders have ethical, and leadership savvy to complete their construction projects successfully (Sunil, Randolph and John, 2004). An application of the three principles of beneficence, justice, and respect for autonomy can guide moral reasoning in project management as they positively influence quality of construction projects. Several questions were developed to measure the extent of this relationship.

The researcher sought to establish the extent to which unprofessionalism in project construction affected quality of building construction projects. The mean score was 3.0909 while the standard deviation was 1.0954. This result indicates that the majority of the respondents disagreed that unprofessionalism in project construction affected quality of building construction projects. This suggests that many contractors and consultants are aware that attainment of quality in building projects greatly depends on the level of professionalism. Applying the necessary knowledge and skills appropriately leads to quality buildings.

Respondents were asked to indicate the extent to which unprofessionalism in project construction was prevalent in Nairobi County. The mean score was 3.0909 while the standard deviation was

1.0954. This result indicates that the majority of the respondents were neutral that unprofessionalism in project construction was very prevalent in Nairobi County. This suggests that many contractors and consultants were non-committal that there were many faulty buildings in Nairobi County. This could be attributed to the fact that many faulty structures were done by a few individuals who form a small percentage and hence generalization may not be done.

The researcher sought to establish the extent to which respondents regularly heard complaints about delivery of building services in Nairobi County. The mean score was 3.1364 while the standard deviation was 0.7172. This result indicates that the majority of the respondents were neutral hence non-committal that they regularly heard complaints about delivery of building services in Nairobi County. This suggests that majority of the contractors and consultants practise professionalism in their line of duty. The complaints of faulty buildings and collapsed buildings are isolated cases that don't happen quite often. Illuminating the few cases was found to be a caution to the few victims of unprofessional behaviour.

Respondents were asked to indicate the extent to which prompt action is taken to correct deviation. The mean score was 2.6414 while the standard deviation was 0.9055. This result indicates that the majority of the respondents disagreed that prompt action is taken to correct deviation. Many contractors and consultants do not take immediate action to correct errors, probably due to extra costs involved or the desire to conceal errors and save one's neck, which is unethical.

The researcher sought to establish the extent to which existing standards for the building industry are deemed as too demanding. The mean score was 2.6212 while the standard deviation was 0.8916. This result indicates that the majority of the respondents disagreed that existing standards for the building industry were too demanding. Existing standards are not beyond the capability of the professionals involved. They are reasonable and all should aim at achieving them.

Respondents were asked to indicate the extent to which adherence to building standards would deter inefficiencies. The mean score was 3.7990 while the standard deviation was 1.0063. This

result indicates that the majority of the respondents agreed that adherence to building standards would deter inefficiencies. This would call for remedial action against individuals involved in unprofessional conduct. There is need to uphold and reinforce adherence to building standards to promote quality deliverables.

The study findings are as illustrated in the table 4.27.

Table 4.27: Descriptive Analysis of Project Construction Phases

	n	Mean	S.D	CV
a. Unprofessionalism in project construction affect quality of building construction	198	3.0909	1.0954	0.3544
b. Unprofessionalism in project construction is very prevalent in Nairobi County	198	1.8333	0.7178	0.3915
c. We regularly hear complaints about delivery of building services in Nairobi County	198	3.1364	0.7172	0.3429
d. I am satisfied with the relations between clients, contractors and consultants of building construction projects in Nairobi	198	3.0303	0.9285	0.3064
e. Problems affecting construction work are well addressed with the relevant authorities	198	2.9596	0.9812	0.3315
f. Problem issues affecting construction work are easy to identify	198	1.8333	1.7178	0.3915
g. Prompt action is taken to correct deviation	198	2.6414	0.9055	0.3428
h. Existing standards for the building industry are too demanding	198	2.6212	0.8916	0.3401
i. Adherence to building standards would deter inefficiencies	198	3.7990	1.0063	0.4195
j. Remedial action is taken against individuals involved in unprofessional conduct	198	2.5404	0.9157	0.3604
Composite Results	198	2.6184	0.9202	0.3544

The composite mean score for this section stands at 2.6184, the standard deviation at 0.9202 and the coefficient of variation at 0.3544. This reveals that on average the respondents were neutral on project construction phases. The standard deviation of 0.9202 however, points to the fact that there were some respondents who agreed that the combined project construction phases influence quality of residential buildings construction projects. A construction project is a system with different sub-parts combined together to make a whole. Systems theory suggests that when there is a problem with one component in the system we cannot isolate that component but take a holistic approach and view the whole system to understand what the problem could be. An error in one phase could affect the overall quality standards.

4.9.2 Inferential Analysis of Combined Influence of Project Construction Phases on Quality of Residential Buildings Construction Projects

Objective 5 of the study was designed to establish the relationship that exists between the combined project construction phases and quality of residential building construction projects. The literature that was reviewed in this study as well as theoretical reasoning associated the combined project construction phases and quality of residential building construction projects. Indications from both the theoretical and empirical literature pointed to a positive significant influence between project construction phases and quality of residential building construction projects.

Correlation Analysis

Pearson Product Moment correlation coefficient was used to assess the strength and direction of the relationship between combined project construction phases and quality of residential building construction projects.

The Pearson's Product Moment Correlation coefficients showed the value of $r = 0.805$. Shirley et al. (2005) indicates that for a weak correlation, "r" ranges from + 0.10 to + 0.29; in a moderate correlation, "r" ranges between + 0.30 and + 0.49; while in a strong correlation, "r" ranges from +0.5 and + 1.0. The positive or negative sign points to the direction of the relationship. It can therefore be argued that for $r > 0.5$, there was a strong correlation between the two variables under investigation. The results are shown in Table 4.28.

Table 4.28: Correlation Results for Combined Project Construction Phases

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
	.805 ^a	.648	.646	.24775

a. Predictors: (Constant), Project construction phases

Since $r = 0.805$ in this case, then there was a strong positive significant correlation between combined project construction phases and quality of residential buildings. In this case, the adjusted R-squared is 0.646. This means that combined project construction phases variable explains 64.6% variations in the dependent variable (quality of residential buildings). This means that there might be many factors that can explain variations in quality. Hence, 35.4% of the variation in quality cannot be explained by the combined project construction phases. Therefore other variables could be having more influence on quality. This agrees with the views of Heil (2008) that systems are comprised of combined subsystems which are smaller entities that make up the larger system. Similarly, in a construction project, these parts are the components of the project cycle, which combine together to form the entire project. Success of the project is a function of the effectiveness of the project components. Each phase in the project cycle determines the success of subsequent phases.

Test of Hypothesis

Analysis of Variance (ANOVA) was used to test the hypothesis. The study calculated the ANOVA coefficient between the independent variable, combined project construction phases and the dependent variable, quality of residential building projects. The significant level of testing the hypothesis was 0.05.

Hypothesis five that the study tested was:

H_0 : There is no significant influence of combined project construction phases on quality of residential buildings

Table 4.29 shows results of the relationship between combined project construction phases on quality of residential buildings

Table 4.29: Anova^a Results for Combined Project Construction Phases

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	27.994	1	27.994	456.086	.000 ^b
Residual	13.481	221	.061		
Total	41.475	222			

a. Dependent Variable: quality of residential building construction projects

b. Predictors: (Constant), project construction phases

From the table F value is 456.086 and P value is 0.000. At 0.05 level of significance and 95% level of confidence this is statistically significant as the P-Value is lower than 0.05. The study therefore rejected the null hypothesis meaning that there was a significant relationship between combined project construction phases and quality of residential buildings in Nairobi County.

These findings concurred with the study of Cao (2010) conducted in China where he observed that the quality management of the whole process of project construction should be paid more attention, including the phase of pre-construction, construction and completion. The consciousness of quality control in the phase of project quality plan should be strengthened, and the focus on the inspection after completion should be transferred to the planning and process control of pre-construction. In addition, this concurs with Systems theory that when an organizational system is functioning properly synergy is present. Systems theory allows for this synergy to be generated because of the communication channels that are open in a properly functioning system (Heil, 2008). A project is a system where the phases of the cycle are interdependent in communication and operations for the success of the whole project.

Regression Modelling

Linear regression was used for modelling the relationship between combined project construction phases and quality of residential buildings.

Regression model was represented as

$$Y = a + (X_1 + X_2 + X_3 + X_4) +$$

Summarized as:

$$Y = a + X_5 +$$

Quality of residential buildings construction projects = f (Combined project construction phases phases)

Table 4.30 shows the regression model summary of analysis of combined project construction phases on quality of residential buildings

Table 4.30: Coefficients for Combined Project Construction Phases

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	Beta	Std. Error			
(Constant)	1.936	0.588		3.292517	.001
Combined Project construction phases Phases	0.587	0.072	0.513	10.260	.001
a. Dependent Variable: quality of residential building construction projects					

Based on the analysis, Y intercept was 1.936 while coefficient of the independent variables (combined project construction phases phases) was 0.587. Therefore, by substituting the beta values and the constant term, the proceeding regression model was:

$$Y = 1.936 + 0.587X_5 +$$

The coefficient of combined project construction phases (X_5) refers to the elasticity of quality of residential buildings due to changes in combined project construction phases. The combined coefficient of X_5 implies that if the coefficient increases by 100 percent, quality will improve by 58.7 percent.

The findings agree with a study by Cao (2010) which showed that creating a good project environment will play an important role in guaranteeing the quality and safety of construction projects, achieving civilized construction, and setting social image of construction corporation. Project quality is a function of combined processes of ethical behavior in the entire project cycle.

The ethical principles of respect, beneficence and justice should be upheld by all stakeholders to guarantee efficiency and overall project success.

4.10 Analysis of Influence of Legal Environment on the Relationship between Project Construction Phases and Quality of Residential Building Construction Projects

This section is on the analysis of research objective 6. Descriptive and inferential statistics on the influence of legal environment on the relationship between project construction phases and quality of residential building construction projects were analyzed.

4.10.1 Descriptive Analysis of Influence of Legal Environment on the Relationship between Project Construction Phases and Quality of Residential Building Construction Projects

Theoretical literature and empirical review in this study indicated that the legal environment moderates the relationship between project construction phases and quality of residential building construction projects. Respondents were asked to indicate the extent to which they were in agreement with stated factors of the legal environment.

The researcher sought to establish the extent to which professional code of ethics and conduct influenced a person to act in an ethical manner. The mean score was 4.4141 while the standard deviation was 0.2817. This result indicates that the majority of the respondents agreed that the professional code of ethics and conduct influenced a person to act in an ethical manner. This suggests strongly that contractors and consultants are greatly bound to duty by the code of ethics and conduct. They act in fear of contravening the code and facing the associated consequences which include among others disciplinary action against the professional. The Code of ethics can offer useful guidance to project practitioners by creating awareness on ethical behaviour and using applying it in decision-making (Mason, 2009). Its aim is to help project practitioners to uphold and maintain high standards of integrity and professional conduct and become accountable of their own actions (PMI Code of Ethics, 2006). The purpose of this Code is to establish an understanding of appropriate behaviour and make project management profession be one full of integrity (Robb, 1996).

The researcher further sought to establish the extent to which National Construction Authority regulations influenced a person to act in an ethical manner. The mean score was 4.1505 while the standard deviation was 0.6645. This result indicates that the majority of the respondents agreed that the National Construction Authority regulations influenced a person to act in an ethical manner. This suggests that legal action taken against those contractors and consultants who fail to conduct themselves professionally does a lot to deter misconduct. NCA deregisters such individuals rendering them dismissed from the practice. NCA also marks buildings which do not conform to their regulations and calls for immediate action or may bring down such unworthy buildings. This largely influences project owners to adhere to the NCA regulations.

In the last open ended question, one contractor cited corruption as a major ethical challenge to the NCA. They cited that the mandate and regulations of the NCA were well spelt out but their implementation were often hampered by the issue of corruption. Areas highlighted as prone to corruption included:

...the use of falsified documents for registration, obtaining of certificates of compliance through bribes, acquisition of desired categories of registration through corruption, and during the upgrading process where contractors give kick-backs. (Respondent 2)

However, no evidence was given to justify the above unethical practices.

Respondents were asked to indicate the extent to which National Building Inspectorate audits influenced a person to act in an ethical manner. The mean score was 4.0172 while the standard deviation was 0.7546. This result indicates that the majority of the respondents agreed that the National Building Inspection audits influenced a person to act in an ethical manner. This suggests that inspections done by NBI to audit buildings if they conform to the set building standards go far in enhancing quality standards.

The researcher also sought to establish the extent to which Manual of Standard Building specifications influenced a person to act in an ethical manner. The mean score was 4.0333 while the standard deviation was 0.8294. This result indicates that the majority of the respondents

agreed that the Manual of Standard Building specifications influenced a person to act in an ethical manner. This suggests that building specifications as spelt out in the Manual of Standard Building Specifications greatly creates awareness on the laid down building guidelines. These have empowered many contractors and consultants to build in line with the laid down specifications. Adhering to these specifications has boosted the building construction industry in terms of quality structures. Nevertheless, a few ignorant practitioners have acted in negligence and have ended up erecting faulty structures that pose a risk to the occupants of the buildings.

Evidence asserts that utilizing ethical principles in project construction phases between contracting parties during project construction helps in ensuring that the projects run smoothly without hitches. Ethical standards according to Sambasivan and Soon (2007) are required in the various construction processes to ensure quality of a project such as in project definition, activity sequencing and determining of activity duration. Failure to adhere to ethical guidelines may therefore affect the project completion time. Transparency International (2005a) argued that corruption if allowed to persist undermines the quality and quantity of services. It corrodes economic development and jeopardizes the provision of basic public goods and services especially in developing countries.

The study findings are as illustrated in the table 4.31:

Table 4.31: Descriptive Analysis on Factors of Legal Environment

	n	Mean	S.D	CV
a. Professional code of ethics and conduct	198	4.4141	0.2817	0.3561
b. Ethics and Anti-Corruption Act	198	4.1212	0.5068	0.3126
c. Laws and regulations of the country	198	4.2414	0.6590	0.4015
d. National Construction Authority Regulations	198	4.1505	0.6645	0.4286
e. National Building Inspection audits	198	4.0172	0.7546	0.4394
f. Manual of Standard Building Specifications	198	4.0333	0.8294	0.4524
g. Internal disciplinary procedures	198	3.0909	0.7945	0.3800
h. Type of judicial system	198	3.2677	0.7896	0.3482
i. Fear of punishment	198	2.0505	1.0213	0.3348
j. Fear of whistle-blowers	198	2.2121	1.1774	0.3665
Composite Results	198	3.8899	0.7879	0.3820

The composite mean score for this section stands at 3.8899, the standard deviation at 0.7879 and the coefficient of variation at 0.3820. This reveals that on average the respondents agreed with the effect of factors of legal environment. The respondents interviewed were further requested to indicate whether they had knowledge of professional code of ethics. All of the respondents indicated they had knowledge of professional code of ethics. This depicts that all the respondents are well versed with the professional code of ethics. The respondents were also requested to indicate whether they had read and understood the code of ethics. From the findings all of the respondents indicated they have read and understood the code of ethics. This depicts that all the respondents are clearly understood the code of ethics.

Similarly, the respondents were requested to indicate whether they practised what is in the code of ethics. From the findings all of the respondents indicated they practised what is in the code of ethics. This depicts that all the respondents put into action what is in the code of ethics. The respondents were requested to indicate whether the professional code of ethics can contribute to

ethical behaviour. Majority (93.9%) of the respondents indicated that professional code of ethics can contribute to ethical behaviour while 6.1% were of the contrary opinion. This depicts that professional code of ethics has a role to play in contributing to ethical behaviour.

The respondents interviewed were requested to indicate whether there were professional malpractices in the residential building construction industry in Nairobi County. According to the findings majority (54.2%) of the respondents interviewed indicated that to a very large extent there were professional malpractices in the residential building construction industry, 29.2% indicated to a moderate extent while 8.3% indicated to a large extent and to a very small extent respectively. This reveals that to a very large extent there are professional malpractices in the residential building construction industry.

Respondents interviewed indicated the reasons why the residential building construction industry is more prone to professional malpractices. The researcher developed ten items on an interview guide to measure the extent of agreement with reasons for professional malpractices. Respondents were questioned on the extent to which professional malpractice was due to the fragmented nature of the construction industry. The mean score was 3.1667 while the standard deviation was 0.8165. The result indicates that the respondents interviewed were neutral that the reason for professional malpractice was the fragmented nature of the industry.

Interviewees were also asked the extent to which professional malpractice was due to bureaucratic nature of procurement. The mean score was 4.2750 while the standard deviation was 0.6469. The result indicates that the respondents interviewed agreed that the reason for professional malpractice was the bureaucratic nature of procurement. A number of professionals circumvent the elaborate procurement procedure and eventually the wrong people get the job. They were in addition asked the extent to which professional malpractice was due to the high competition to get projects. The mean score was 3.7500 while the standard deviation was 1.2597. The result indicates that the respondents interviewed agreed that the reason for professional malpractice was due to the high competition to get projects. The lucrative nature of the building industry has created room for the entry of many practitioners, some of who are not competent and yet are very keen to obtain the contracts.

In addition the respondents interviewed were requested to indicate whether the professional code of ethics and conduct in buildings construction contributed to performance. According to the findings, majority (54.2%) of the respondents interviewed indicated that to a large extent professional code of ethics and conduct in buildings construction contributed to performance, 33.3% indicated to a moderate extent while 12.5% indicated to a very large extent. This depicts that to a large extent professional code of ethics and conduct in buildings construction contributes to performance.

The researcher interviewed NCA and NBI officers in top management on how they would rate the performance of their respective organizations in enforcing laws and regulations. Majority (75.0%) of the respondents indicated that the performance of their organizations was average, with 20.8% indicating high performance while 4.2% indicated very high performance. This depicts that the performance of the organizations in enforcing laws and regulations was average, indicating a strong need to increase their capacity to facilitate this enforcement.

Upon further interrogation of officers in top management positions in order to obtain information on whether performance of the residential buildings construction projects in Nairobi County had been satisfactory, respondent 3 said:

Of late, owing to the many cases of collapsed buildings in Nairobi and the loss of many lives, performance is not satisfactory. We, however, at the NCA have greatly increased our effort in ensuring laws and regulations in the construction industry are being observed. (Respondent 3)

The respondent was further interrogated on what the indicators of performance in the residential buildings construction projects in Nairobi County were and said the following:

... key among them are quality, cost-effective and sustainable housing where health and safety standards are assured. Performance also entails completing the buildings in time without unnecessary delay as this ultimately impacts negatively by escalating cost. (Respondent 3)

Apart from the professional malpractices listed in the interview guide, the respondents interviewed indicated other main professional malpractices they were aware of in the building industry in Nairobi County. These included failures to file documents in a timely manner, failure to represent a client as set forth in the code of ethics, misuse of client funds, failure to appear on behalf of a client, carelessness in the preparation or review of documents for some of the construction projects. In addition the respondents interviewed indicated that other malpractices included accounting malpractice which includes negligence or carelessness in the preparation or review of financial documents, accounts or statements. Engineering malpractice included design errors, failure to properly consider loads and load-bearing capacities. The respondents interviewed further indicated that malpractice may emanate in the case where professionals involved in construction breach their duty of protecting people involved in construction, resulting in loss or personal injury that can result in claim against the negligence. In construction, negligence may occur because of the negligence by the parties involved in the construction process where the contractors, architects, quantity surveyors, engineers, project managers are the people who will be liable for the negligence claims.

The respondents at NCA and NBI interviewed were also requested to indicate the professional malpractices they have ever witnessed or noticed someone get involved. They were asked the extent to which they had witnessed cases of corruption and bribery, fraud and false representation of facts. The mean scores were 4.0417, 3.000 and 4.1667 respectively, while the standard deviations were 0.2041, 1.0215 and 0.5647, respectively. The result indicates that the respondents interviewed agreed that they had witnessed these malpractices. This depicts a great need to enforce the regulations governing building construction as well as adherence to the code of ethics. Unprofessionalism in construction is manifested in poor design and supervision, poor materials and workmanship. Others are columns failure due to bending, concrete not meeting the minimum strength for structural elements, lack of proper supervision, lack of regular maintenance, poor quality materials, non-approval of works, and lack of professional input during supervision and inadequate design of structural drawings.

To prevent unprofessionalism the respondents interviewed indicated that accreditation of building inspection firms (both governmental, non-governmental, national and county) would

ensure that proper procedures and standards are maintained in line with international standards and national and county regulations are adhered to. It will also ensure that only competent construction workers and inspectors are mandated to authorize, approve and supervise building works and carry out inspections. Qualifications of the workers in the construction sites will help develop a viable career path for building officials and provide independent assessment of a person's competency in a particular area. Qualifications can help a National and County Authorities assess its personnel to demonstrate organizational competence.

This long-term standard will improve both capacity and capability in the building construction sector. The standards will help construction practitioners monitor, review and continuously improve their performance and ensure sound record-keeping and information-storage practices that are also essential in the building control environment. These provide an audit trail of how construction practitioners process consent applications, undertake inspections and issue code compliance certificates, the decisions they make and the rationale for those decisions.

The National Society of Professional Engineers (2003) has also developed a code of ethics for the professionals in that field. Important cannons therein state that engineering has a direct and vital impact on the quality of life for all people. Accordingly, the services provided by engineers require honesty, impartiality, fairness, and equity, and must be dedicated to the protection of the public health, safety, and welfare. This concurs with the views of Goldman Sachs (2009) that taking unfair advantage of anyone through manipulation, concealment, abuse of privileged information, misrepresentation of material facts, or any unfair dealing practice is a violation of the Code Engineers must perform under a standard of professional behavior that requires adherence to the highest principles of ethical conduct.

Respondent 2 was asked to state the main professional malpractices he was aware of in the residential building construction industry in Nairobi and responded as follows:

These days everything in the construction industry, including the building industry, needs to be done faster and needs to cost less, and this has a massive impact on the project outcome. The building industry as a whole has witnessed compromises and unethical

practices from sourcing of building materials through to procurement, delivery and construction processes. In addition, there is failure to adhere to building codes leading to construction defects, low structural integrity of the building...We are however making every effort to be more vigilant in our enforcement of building regulations. (Respondent 4)

When interrogated further on his opinion about the main reasons for professional malpractices in the residential building construction industry in Nairobi, the answer was as follows:

First and foremost is the desire to erect buildings at the cheapest possible cost. This is irrespective of the ramifications this would have on the environment. Secondly, there is failure by the contractor to handle tricky situations wisely, such as cases where the client wants the building completed quickly without due regard of concrete curing time. Another reason is incompetence of the contractors engaged to carry out the project, leading to poor quality work. (Respondent 4)

When respondent 4 was asked how they prevent unprofessionalism in the residential buildings construction industry in Nairobi County, the answer given was:

... by barring anyone who is not registered by the NCA from carrying out any construction work. Any contractor who practices without a valid NCA license commits an offense and is liable to prosecution and a fine as prescribed under the NCA regulations. The Authority carries out due diligence on each contractor before registration to ensure that only qualified contractors are practicing. In addition, the NCA liaises with the officers of the county government responsible for the approval of building plans and construction works. NCA has also issued hotlines to the public to be used for reporting directly to the NCA in case of any malpractices or if a person suspects that a given construction is

not up to the required standards. Finally and above all, there is need by the parties involved to use moral reasoning and adhere to prevailing regulations as these form a strong foundation of quality works. They need to connect with the environment they are operating in, in such a way that any emerging issue would receive the attention it deserves. (Respondent 4)

The responses above are a clear indication that construction authorities are not blind to the fact that project practitioners engage in unprofessional practices that compromise on quality of projects. They however indicated various ways of preventing unprofessionalism among them a sound quality assurance system which would strengthen decision-making and lead to better quality and greater consistency in compliance and performance of regulatory building control functions.

4.10.2 Inferential Analysis of Influence of Legal Environment on the Relationship between Project Construction Phases and Quality of Residential Building Construction Projects

Objective six of the study was designed to establish the influence of legal environment on the relationship between project construction phases and quality of residential building construction projects. The literature that was reviewed in this study as well as theoretical reasoning associated legal environment with the relationship between project construction phases and quality of residential building construction projects.

Indications from both the theoretical and empirical literature pointed to a positive significant influence of legal environment on the relationship between project construction phases and quality of residential building construction projects.

Correlation Analysis

Pearson Product Moment correlation coefficient was used to assess the strength and direction of the influence of legal environment on the relationship between project construction phases and quality of residential building construction projects.

The Pearson’s Product Moment Correlation coefficients showed the value of $r = 0.831$. Shirley et al. (2005) indicates that for a weak correlation, “r” ranges from + 0.10 to + 0.29; in a moderate correlation, “r” ranges between + 0.30 and + 0.49; while in a strong correlation, “r” ranges from +0.5 and + 1.0. The positive or negative sign points to the direction of the relationship. It can therefore be argued that for $r > 0.5$, there was a strong correlation between the two variables under investigation. The results are shown in Table 4.32.

Table 4.22: Correlation Results for Influence of Legal Environment on the Relationship between Project Construction Phases and Quality of Residential Building Construction Projects

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.831 ^a	.691	.681	.23536

a. Predictors: (Constant), Project construction phases

b. Moderating Variable: legal environment

Dependent Variable: Quality of residential building construction projects

Since $r = 0.831$ in this case, then there was a strong positive significant correlation between influence of legal environment on the relationship between project construction phases and quality of residential buildings. In this case, the adjusted R-squared is 0.681. This means that influence of legal environment on the relationship between project construction phases variable explains 68.1% variations in the dependent variable (quality of residential buildings). This means that there might be many factors that can explain variations in quality. Hence, 31.9% of the variation in quality cannot be explained by influence of legal environment on the relationship between project construction phases. Therefore, other variables could be having more influence on quality.

Test of Hypothesis

Analysis of Variance (ANOVA) was used to test the hypothesis. The study calculated the ANOVA coefficient between the independent variable, influence of legal environment on the

relationship between project construction phases and the dependent variable, quality of residential building projects. The significant level of testing the hypothesis was 0.05.

Hypothesis six that the study tested was:

H₀: There is no significant influence of influence of legal environment on the relationship between project construction phases on quality of residential buildings

Table 4.33 shows results of the relationship between influence of legal environment on the relationship between project construction phases and quality of residential buildings

Table 4.33: ANOVA^a Results for Influence of Legal Environment on the Relationship between Project Construction Phases

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	14.932	4	3.733	67.390	.000 ^b
Residual	11.99	218	.055		
Total	26.922	222			

a. Dependent Variable: Quality of Residential Building projects

b. Predictors: (Constant), Legal Environment, Project construction Phases

From the table F value is 67.390 and P value is 0.000. At 0.05 level of significance and 95% level of confidence this is statistically significant as the P-Value is lower than 0.05. The study therefore rejected the null hypothesis meaning that there was a significant mediating influence of legal environment on the relationship between project construction phases and quality of residential buildings in Nairobi County. This meant that legal environment plays a key role in the mediating relationship between project construction phases and quality of residential buildings in Nairobi County.

Regression Modelling

Linear regression was used for modelling the mediating influence of legal environment on the relationship between project construction phases and quality of residential buildings

Regression model was represented as:

$$Y = a + (X_1 + X_2 + X_3 + X_4) + X_6 +$$

Summarized as:

$$Y = a + X_5 + X_6 +$$

Quality of residential buildings construction projects = f (Influence of legal environment on the relationship between project construction phases phases)

Table 4.34 shows the regression model summary of analysis of influence of legal environment on the relationship between project construction phases on quality of residential buildings

Table 4.34: Coefficients for Moderating Influence of Legal Environment on the Relationship between Project Construction Phases and Quality of Projects

Model	Unstandardized		Standardized	T	Sig.
	Coefficients				
	B	Std. Error	Beta		
(Constant)	1.855	0.536		3.4608	.001
Project construction phases Phases	0.589	0.073	0.413	10.2603	.001
Legal Environment	0.719	0.044	0.727	16.3409	.005

a. Dependent Variable: Quality of Residential Buildings

Based on Field (2009), Y intercept was 1.855 while coefficient of the independent variables (Project construction phases phases, X_5) was 0.589. Coefficient for legal environment, X_6 was 0.719. Therefore, by substituting the beta values and the constant term, the proceeding regression model was:

$$Y = 1.855 + 0.589X_5 + 0.719X_6 +$$

The coefficient of legal environment (X_6) of 0.719 refers to the elasticity of quality of residential buildings due to moderating influence of legal environment on the relationship between project construction phases. The coefficient of 0.719 implies that if influence of legal environment on project construction phases increases by 100 percent, quality will improve by 71.9 percent.

Table 4.39 shows that the standardized Beta statistic from legal environment increased from 0.413 to a higher significant value of 0.727 depicting a significant improvement on influence of project construction phases on quality of residential buildings due to mediation effect of legal environment.

In section 4.12.2, the study found that there was a strong significant relationship between combined project construction phases and quality of residential buildings in Nairobi County. When the relationship was mediated by legal environment, r value changed from 0.805 to 0.831, hence the relationship became even more significant.

These findings concur with those of responses from interviews conducted where those in NCA and NBI management positions were asked to indicate whether the legal environment influenced the relationship between project construction phases and quality of residential buildings construction industry. According to the findings majority (62.5%) of the respondents indicated that to a large extent that the legal environment influences the relationship between project construction phases and quality of residential buildings construction industry, 25.0% indicated to a moderate extent, 8.3% indicated to a very large extent while 4.2% indicated to a very small extent. This depicts that to a large extent that the legal environment influences the relationship between project construction phases and quality of residential buildings construction industry. Regulations if well enforced and adhered to will lead to increased efficiency and quality outcome.

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter presents a summary of the study and its findings, the conclusions and recommendations of future study. In what follows the key findings among the relationships of the variables of the study is undertaken and juxtaposed with conclusions. The chapter further discusses the recommendations of the study. Finally, the chapter provides the contribution of the study to new knowledge in project management and provides a roadmap that future studies should consider.

5.2 Summary of Findings

5.2.1 Influence of Feasibility Assessment on Quality of Residential Building Construction Projects

The first objective sought to establish how feasibility assessment influence quality of residential building construction projects in Nairobi County. From the descriptive analysis, the composite mean score was 4.2449 with a standard deviation at 0.1839. This implies that on average the respondents strongly agreed with influence of feasibility assessment on quality of residential building construction projects. Results of hypothesis testing indicated $r = 0.769$ $P=0.000 < 0.05$ $F(1,222) = 357.791$. The null hypothesis H_1 : There is no significant influence of feasibility assessment on quality of residential building construction projects in Nairobi County was therefore rejected.

5.2.2 Influence of Contract Negotiation on Quality of Residential Building Construction Projects

The second objective sought to assess the influence of contract negotiation on quality of residential buildings construction projects in Nairobi County. The composite mean score stood at 3.5217 and the standard deviation at 0.9052. This reveals that on average the respondents agreed with influence of contract negotiation on quality of residential building construction projects. Results of hypothesis testing indicated $r = 0.629$ $P=0.000 < 0.05$ $F(1,222) = 162.422$. The null hypothesis H_2 : There is no significant influence of contract negotiation on quality of residential buildings construction projects in Nairobi County was therefore rejected.

5.2.3 Influence of Monitoring and Evaluation on Quality of Residential Building Construction Projects

The third objective sought to assess the influence of monitoring and evaluation on quality of residential buildings construction projects in Nairobi County. The composite mean score for this section was 3.3374 while the standard deviation was 1.4742. This implies that on average the respondents agreed with influence of monitoring and evaluation on quality of residential building construction projects. Results of hypothesis testing indicated $r = 0.409$ $P=0.000 < 0.05$ $F(1,222) = 49.770$. The null hypothesis H_3 : There is no significant influence of monitoring and evaluation on quality of residential buildings construction projects in Nairobi County was therefore rejected.

5.2.4 Influence of Project Closure on Quality of Residential Building Construction Projects

The fourth objective sought to establish ways in which project closure influence quality of residential building construction projects in Nairobi County. The composite mean score stood at 4.4687 with a standard deviation of 0.2740. This means that on average the respondents strongly agreed with influence of project closure on quality of residential building construction projects. Results of hypothesis testing indicated $r = 0.352$ $P=0.000 < 0.05$ $F(1,222) = 35.100$. The null hypothesis H_4 : There is no significant influence of project closure on quality of residential building construction projects in Nairobi County was therefore rejected.

5.2.5 Influence of Combined Project Construction Phases on Quality of Residential Building Construction Projects

The fifth objective sought to examine how the combined project construction phases influence quality of residential building construction projects in Nairobi County. The composite mean score was 2.6184 with a standard deviation of 0.9202. This depicts that on average the respondents moderately agreed with influence of combined project construction phases on quality of residential building construction projects. Results of hypothesis testing indicated $r = 0.805$ $P=0.000 < 0.05$ $F(1,222) = 456.086$. The null hypothesis H_5 : There is no significant influence of project construction phases on quality of residential building construction projects in Nairobi County was therefore rejected.

5.2.6 Influence of Legal Environment on the Relationship between Project Construction Phases and Quality of Residential Building Construction Projects

The sixth objective sought to analyze the moderating influence of legal environment on the relationship between project construction phases and quality of residential building construction projects in Nairobi County. The composite mean score for this section stood at 3.8899 with a standard deviation at 0.7879. This shows that on average the respondents agreed with the moderating influence of legal environment on the relationship between project construction phases and quality of residential building construction projects. Results of hypothesis testing indicated $r = 0.831$ $R^2=0.691$ $P=0.000<0.05$ $F (1,222) =67.390$. The null hypothesis H_0 : The strength of the relationship between project construction phases and quality of residential building construction projects in Nairobi County does not depend on the legal environment was therefore rejected.

5.3 Conclusions of the Study

Research objective one in this study was to establish how feasibility assessment influence quality of residential building construction projects in Nairobi County. Epistemologically, project feasibility study phase is paramount in attainment of quality outcome as it comprises an evaluation and analysis of the potential of a proposed project and is based on extensive investigation and research to support the process of decision-making. This leads to the conclusion that a quality perspective should be considered in conducting a feasibility assessment and this should be consciously considered before the start of building construction. Evidence of the assessment should exist and qualified assessment personnel be engaged in the construction work. This is because in all the underlying values and assumptions used by humans to choose or act, the conscious and unconscious processes of human activity always have an ethical dimension.

Research objective two in this study was to determine how contract negotiation influences quality of residential building construction projects in Nairobi County. Analysis done indicated there is a significant relationship between contract negotiation and quality of residential building projects. Project construction phases are found in contract negotiation, a situation that as an unavoidable dependence on the ethics and values which humans hold. The researcher therefore

concludes that ethical principles should be integrated in the process of selecting a contractor and contract documents should be comprehensively filled without any pending details.

Research objective three in this study was to assess ways in which monitoring and evaluation influences quality of residential building construction projects in Nairobi County. The study concluded that integrating monitoring and evaluation leads to an increase in quality of residential building construction projects. The researcher concludes that consciously considering monitoring and evaluation would guarantee sustainable construction as this would ensure compliance with work plan, assessment of quality of building materials on site, availability of progress reports and application of M and E findings. This is because the aim of sustainable construction is to restore and maintain a balance between the natural and built environments, and establish buildings that maintain and promote human dignity and enhance economic development.

Research objective four in this study was to establish how project closure influences quality of residential building construction projects in Nairobi County. On project closure of residential building construction projects in Nairobi County, the study concluded that project closure occurs when all contracts have been completed. Project closure involves verification by the client, contractor and consultant that all activities have been finalized; documentation has been done and storing relevant information. It also entails verifying that the project has addressed the terms and conditions of the contracts, finalizing of exit criteria for contract termination, validating exit criteria and formally closing out all contracts associated with the completed project. The researcher concludes that project close-out procedure is necessary in order to assess the project, ensure completion, and derive any lessons learned and best practices to be applied to future projects.

Research objective five in this study was to examine how the combined project construction phases influence quality of residential building construction projects in Nairobi County. The study concluded that the most common unethical conduct evidenced by the contractors that influence quality of building projects are cover pricing, bid cutting, poor documentation, late and short payments, subcontractors' lack of safety ethics, unfair treatment of contractors in tender/final account negotiations, competitors' overstatement of capacity and qualifications to

secure work, competitors' falsification of experience and qualifications and bureaucratic government policy. The researcher further concludes that quality of the expected building requires appropriate measures to deal with the pressing ethical issues confronting the building industry.

Research objective six in this study was to analyse the influence of legal environment on the relationship between project construction phases and quality of residential building construction projects in Nairobi County. Results from the regression modelling indicated that legal environment significantly influences the relationship between project construction phases and quality of residential building construction projects. It was therefore concluded that legal environment influences the relationship between project construction phases and quality of residential building construction projects. If there is no legal framework in the construction industry, the project construction phases will not operate effectively, and thus the expected quality will not be realized and the industry would perform dismally.

5.4 Recommendations

1. Findings in this study revealed that feasibility assessment was the main predictor variable of project quality. The study recommends that project practitioners should ensure that feasibility study is done comprehensively by experts in various fields to ensure that the decision to proceed with a project is only made after key aspects are assessed and information needed obtained. Information on site data, choice of available technology, design and manpower, lines of communication, control techniques, environmental compliance, adequacy of design and implementation funds and schedule control should be obtained and documented. Prospective project developers should see the objective evaluation of a project concept with a feasibility study as an important aspect of the study. This objectivity can provide project practitioners with helpful information that might have been overlooked by those participating directly in the project. Hiring a consultant to create the study can be the most important decision in the creation of the study. Project practitioners should use a good consultant for the project. They should determine if a consultant is technically qualified to create a feasibility study. In addition, a consultant must have the demeanour to work well with a particular group. Using an

outside consultant brings objectivity to the feasibility study rather than merely providing the results that the group wants.

Consultants have a legal obligation to provide a responsible analysis. They should not be asked to alter the results merely to conform to members desires for a project's viability. Once the consultant has been selected, the group should provide detailed instructions on the study requirements. This usually calls for a Terms of Reference (TOR) and is normally developed in line with the kind of study to be undertaken. The contract should state clearly the requirements and role of both the group and the consultant. It should have timelines, delivery dates, explicit deliverables, and what is to be accomplished before payment is made.

2. Contract negotiation was shown in this study to be the second main predictor variable of project quality. The study makes a recommendation that project practitioners should ensure that project managers should hold stakeholder engagement sessions before the start of a project to ensure contract negotiation is all-inclusive. This will ensure that every interested party plays their role in ensuring the construction contract does not take longer than intended because of the actions or inactions of any one of the project players. Competent and experienced contractors should be hired to ensure that the right project team is spearheading the process of construction project implementation. Contractors should be vetted before contract award to ensure that they have a history of paying their staff and industry good standing to deliver well on their contract agreements. If they show a sign of cash flow problems they are not to be picked to implement a project. They should also cushion the client from some risks through insurance and performance security deposits. This will also guarantee proper program and quality of works.
3. The study revealed that monitoring and evaluation was a significant predictor variable of project quality. The implication of this finding is that monitoring and evaluation should always be applied to the entire construction process from planning, design and construction of buildings until project closure. This would ensure that the project restores and maintains a balance between the natural and built environments, and establish buildings that maintain and promote human dignity and enhance economic development. Project implementation process should be overseen by a competent consultant to ensure good supervision/inspection. This will also ensure that the project plan is followed to the

letter and all the amendments done at the right time and in an appropriate way to ensure successful project delivery. Developers/ project champions/ owners should ensure construction projects are not starved of finances. This will ensure that construction projects do not stall.

4. The findings revealed that project closure influences quality of residential building construction projects in Nairobi County. The study recommends that a project audit should be done after the completion of all project phases. This aims at establishing whether the project goal was accomplished and whether the activities were conducted in the right manner. This would also establish whether the resources were utilized effectively and if there was any wastage.
5. The combined project construction phases were shown to be a predictor of project quality. This implies that all the project players should be trained on all factors that influence successful implementation of construction projects. They should especially be educated on the key metrics of project quality. Budget, scope and timelines should be deliberately managed so that a quality project can be realized. Empowering ethics education would be significant for setting the foundations of a professional, together with input on his roles in the construction industry from professional institutions later in his professional life.
6. Legal environment in this study was found to moderate the relationship between project construction phases and quality of building construction projects. The implication of this finding is the need for an industry-wide code of ethics in order to foster an overall ethical environment. Internship with approved organizations should be made regulatory or obligatory for young technical graduates for a period of six months to groom them on professional matters including ethical aspects. Crucially, implementation of such regulations would require the willingness and commitment by the legislative body to enforce them. Legal aspects should always be a consideration in any construction project. This would ensure that the project follows the right legal procedures that would ensure the project does not become a harm in the future which may have wide-ranging ramifications on the environment.

5.5 Contribution of the Study to New Knowledge on Ethics in Project Management

The distinct contributions to knowledge that have arisen out of this research are identified. The first contribution is the integration of ethics with existing regulations to form a firm foundation for quality to thrive in construction projects. Findings showed that project construction phases namely, feasibility assessment, contract negotiation, monitoring and evaluation and closure have significant influence on project quality. Juxtaposing ethical codes of conduct and existing regulations would lead to better quality projects.

Another contribution to new knowledge lies in the interconnectedness of people and their environment which acts as a locus for project success. Interconnectedness applies here to the manner in which the individuals and their environment are inextricably linked. Findings showed that how the players within the construction industry interconnect with one another and with the stimulus in the environment will help us to understand the moral reasoning and ethical behaviour of individuals in all four phases of construction projects. Similarly, we will often gain new insights into ethical behaviour when we see how project players are connected to a larger environmental context.

Thirdly, is the discovery that legal environment has special significance in promoting ethical practice in the building construction industry. Individuals feel obliged to behave ethically if existing laws are enforced and measures taken against the culprits. This acts as a deterrent and plays a significant role in ensuring quality of works. Finally, the researcher is contributing to the project management discipline by offering project practitioners proven ways of understanding their potential to influence project outcome by using an ethical lens in their practices.

5.6 Suggestions for Further Research

There are several avenues for further research that have emerged from this research.

- i. A study can be carried out to investigate the influence of individual factors on the relationship between project construction phases and quality of building construction projects.
- ii. A study can be done with the legal environment as the independent variable to ascertain the effect this would bring on project quality.

- iii. A research into how professional ethics impact construction quality in developing economies, a case study of Kenya.
- iv. A research into professionals' ambivalence towards ethics in the Kenyan Construction Industry.

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APPENDICES

Appendix 1: Letter of Request of Transmittal of Data

26th April, 2017

MARY N. MWENDA
UNIVERSITY OF NAIROBI
SCHOOL OF OPEN AND DISTANCE LEARNING
P. O. BOX 30197
NAIROBI
Cell: 0721 582886

RE: REQUEST FOR YOUR PARTICIPATION

I am a PhD candidate at the University of Nairobi and currently conducting a research as partial requirement for the award of the degree of Doctor of Philosophy in Project Planning and Management. My research topic is “Project construction phases, Legal Environment and Quality of Residential Building Construction Projects in Nairobi County”.

The purpose of this letter is to request you to participate as a respondent in this study by completing the attached questionnaire as accurately as possible. All information collected through this exercise will only be used for academic purposes.


Thank you.

Yours Faithfully,

Mary N. Mwenda

Reg. No. L83/94316/14

Appendix 2: Research Clearance from the University


UNIVERSITY OF NAIROBI
OPEN & DISTANCE e-LEARNING CAMPUS
SCHOOL OF OPEN AND DISTANCE LEARNING
DEPARTMENT OF OPEN LEARNING
NAIROBI LEARNING CENTRE

Your Ref: _____
Our Ref: _____
Telephone: 318262 Ext. 120
REF: UON/ODeL./SODL/NLC/271

Main Campus
Gandhi Wing, Ground Floor
P.O. Box 30197
NAIROBI
1st August, 2017



TO WHOM IT MAY CONCERN

RE: MARY NYAWIRA MWENDA -REG NO - L83/94316/2014

This is to confirm that the above named is a student at the University of Nairobi, Open Distance and e_Learning Campus, School of Open and Distance learning, Department of Open learning pursuing Doctor of Philosophy in Project Planning and Management.

She has done the course work and currently working on her research thesis entitled "Ethical Concerns in Project Construction Phases, Legal Environment and Quality of Residential Building Construction Projects in Nairobi County, Kenya." Being supervised by Dr. Lilian Otieno and Professor Christopher Gakuu and now ready to collect data.

Any assistance accorded to her will be highly appreciated.

DR. ANGELINE MULWA
COORDINATOR
NAIROBI REGION

Appendix 3: Research Clearance from NACOSTI


THIS IS TO CERTIFY THAT:
MS. MARY NYAWIRA MWENDA
OF UNIVERSITY OF NAIROBI, 3206-1000
TRIKIA, has been permitted to conduct
research in Nairobi County

on the topic: ETHICAL CONCERNS IN
PROJECT CONSTRUCTION PHASES,
LEGAL ENVIRONMENT AND QUALITY OF
RESIDENTIAL BUILDING CONSTRUCTION
PROJECTS IN NAIROBI COUNTY, KENYA.

for the period ending:
21st August, 2018

.....
Applicant's
Signature

Permit No : NACOSTI/P/17/81732/18775
Date Of Issue : 22nd August, 2017
Fee Received : Ksh 2000



.....
Director General
National Commission for Science,
Technology & Innovation


Permit

CONDITIONS

1. The Licence is valid for the proposed research, research site specified period.
2. Both the Licence and any rights thereunder are non-transferable.
3. Upon request of the Commission, the Licensee shall submit a progress report.
4. The Licensee shall report to the County Director of Education and County Governor in the area of research before commencement of the research.
5. Excavation, filming and collection of specimens are subject to further permissions from relevant Government agencies.
6. This Licence does not give authority to transfer research materials.
7. The Licensee shall submit two (2) hard copies and upload a soft copy of their final report.
8. The Commission reserves the right to modify the conditions of this Licence including its cancellation without prior notice.



REPUBLIC OF KENYA



National Commission for Science,
Technology and Innovation
RESEARCH CLEARANCE
PERMIT

Serial No.A 15422
CONDITIONS: see back page

Appendix 4: Interview Guide for NCA and NBI Management

Introduction

The purpose for this interview is to collect information on “Project Construction and Quality of Residential Buildings Construction Projects in Nairobi County”. The information collected will be used solely for academic purposes and it is expected that the findings from this study will make a significant contribution towards enhancing quality and timely service delivery in residential building construction projects in Kenya. The information collected will be handled with confidentiality and with academic professionalism. Kindly assist with the interview.

Section A: Demographic Information

- 1) Indicate position in organization
- 2) Highest Level of Education
- 3) How long have you worked with this regulatory body?

Section B: Specific Information

- 1) Has the performance of the residential buildings construction projects in Nairobi County been satisfactory?
.....
- 2) What are the indicators of performance in the residential buildings construction projects in Nairobi County?
.....
.....
.....
.....
- 3) How would you rate the extent of public satisfaction with the nature of residential buildings in Nairobi?
.....
Briefly give a reason for your response above
.....
.....
.....
- 4) How would you rate contractors’ performance in Nairobi County?

.....
Briefly give a reason for your response
.....
.....

5) How would you rate the extent of your involvement in quality of residential buildings construction?

.....
Briefly give a reason for your answer
.....
.....

6) Does the professional code of ethics and conduct in buildings construction contribute to performance?

.....
Briefly give a reason for your answer.....

7) Do you think there are professional malpractices in the residential building construction industry in Nairobi County?

.....
8) If Yes, what are the reasons why the residential building construction industry in Nairobi County is more prone to professional malpractices?
.....
.....
.....
.....
.....

9) To what extent do you agree with the following statements on quality of residential building construction projects in Nairobi County?

10) Which of the following malpractices have you ever witnessed or noticed?
.....

11) Do you think the interaction between project practitioners and the environment has an influence on quality in the building construction industry?

.....
.....
Briefly give a reason for your answer.....

12) What are the main professional malpractices you are aware of in the residential building construction industry in Nairobi?

.....
.....
13) What in your opinion are the main reasons for professional malpractices in the residential building construction industry in Nairobi?

.....
.....
14) How would you prevent unprofessionalism in the residential buildings construction industry in Nairobi County?

.....
.....
15) How would you rate the organization's performance in enforcing laws and regulations within its mandate?

.....
.....
16) In your opinion, to what extent do you agree that the following project construction phases in a project influence quality of residential buildings construction industry in Nairobi County?

Feasibility assessment

Contract negotiation

Monitoring and evaluation

Project Closure

15) Does the legal environment influence the relationship between ethical concerns in project construction and quality of residential buildings construction industry in Nairobi County?

.....
If Yes, briefly explain how its influence

.....
.....
.....

16) Any other comment

Thank you

Appendix 5: Questionnaire for Contractors and Consultants

Introduction

The purpose of this questionnaire is to collect information on the influence of project construction phases on quality of residential buildings construction projects in Nairobi County. The information collected will be used solely for academic purposes and it is expected that the findings from this study will make a significant contribution towards enhancing quality and timely service delivery in residential building construction projects in Kenya. The information collected will be handled with confidentiality and with academic professionalism. Kindly fill in the information as directed in the various sections provided.

Section A: Demographic Information

1) Gender {Please tick one () }

Male Female

2) Age Group {Please tick one () }

21 – 25 Years 26 – 30 years 31 – 35 years 36 – 40 years

41 – 45 Years 46 – 50 years 51 – 55 years Over 55 years

3) Highest Level of Education {Please tick one () }

High School Certificate Diploma

Bachelor's Degree Post Graduate Degree Other (specify)

.....
.....

4) In which Category of NCA are you registered? {Please tick one () }

NCA1 NCA2 NCA3 NCA4

NCA5 NCA6 NCA7 NCA8

5) How long have you worked in the building construction industry?

.....
.....

Section B: Quality of Residential Building Construction Projects

5. This section contains items on quality of residential building construction projects in Nairobi County. To what extent do you agree with the following statements on quality of residential building construction projects in Nairobi County? Kindly rate the following statements using a scale of SA – Strongly Agree; A – Agree; N – Neutral; D – Disagree; and SD – Strongly Disagree

Parameters	Strongly Agree SA	Agree A	Neutral N	Disagree D	Strongly Disagree SD
a) As a project professional, I am quite often satisfied with the standards of work done in construction of residential buildings					
b) Project audit is an important aspect in quality management					
c) Project audit is often ignored					
d) Project approval documents in most cases are not available					
e) The “as-built” drawings are not always included in the approval documents					
f) Minutes of meetings are often inadequate in covering quality aspects					
g) Results of testing of materials for quality are often not documented					
h) Check sheets on quality are often available					
i) Check sheets do not always cover all aspects of quality					
j) Failure to meet quality standards in one stage affects work progress in the next stage					

6. To what extent do you agree with the following statements regarding effects of unethical practices in building construction industry on quality of residential buildings Construction projects in Nairobi County? *(Please tick applicable).*

Effects	Strongly agree	Agree	Neutral	Disagree	Strongly Disagree
a) Undermines managerial efficiency					
b) Re-direct resources to individual interests					
c) Deters investment					
d) Curbs economic growth					
e) High rate of uncompleted projects					
f) High rate of collapsed buildings					
g) Delays in the construction process					
h) Increases cost of projects					
i) Encourages shoddy works					
j) Hinders sustainable development					
OTHERS, state them:					

Section C: Project Construction Phases

This section contains items on project construction phases and their influence on quality of residential building projects in Nairobi County.

7. Kindly show the extent to which you agree or disagree with the following statements regarding project construction phases, using a scale of SA – Strongly Agree; A – Agree; N – Neutral; D – Disagree; and SD – Strongly Disagree

Parameters	Strongly Agree	Agree A	Neutral	Disagree	Strongly Disagree
a)Unprofessional conduct in project construction is very prevalent in Nairobi County					
b)Unprofessionalism in project construction affect quality of building construction					
c)We regularly hear complaints about delivery of building services in Nairobi County					
d) I am satisfied with the relations between clients, contractors and consultants of building construction projects in Nairobi					
e)Problems affecting construction work are well addressed with the relevant authorities					
f)Problem issues affecting construction work are easy to identify					
g)Prompt action is taken to correct deviations					
h)Existing standards for the building industry are too demanding					
i)Adherence to building standards would deter inefficiencies					
j)Remedial action is taken against individuals involved in unprofessional conduct					

Section D: Feasibility Assessment of Building Construction Projects

This section contains items on influence of feasibility assessment of residential buildings construction projects in Nairobi County

8. To what extent do you agree with the following statements regarding feasibility assessment of residential buildings construction projects in Nairobi County? *(Please tick applicable)*.

Parameters	Strongly Agree	Agree	Neutral	Disagree Strongly	Disagree
a) Feasibility assessment is important before the start of building construction					
b) Evidence of feasibility assessment is an important consideration before the start of building construction					
c) Level of qualification of feasibility personnel is an important consideration before the start of building construction					
d) Selection of feasibility expert is best done by the project owner					
e) A feasibility report is necessary before the start of building construction					
f) A meeting to discuss feasibility report is an important consideration					
g) Level of use of feasibility data has an influence on quality of residential buildings					
h) Technical feasibility has the greatest influence on quality of construction work					
i) Go /No-Go decision should be made by all key stakeholders in a meeting					
j) Choice of site has an influence on quality of buildings					

Section E: Contract Negotiation of Residential Buildings Construction Projects

9. Indicate your level of agreement with the following statements on Contract negotiation of residential buildings construction projects in Nairobi County?

Parameters	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
a) Competitors overstating their competence and qualifications to secure work					
b) Competitors overstating their experience and capabilities and falsification of qualifications					
c) Project owner selecting contractor and consultant based on personal ties					
d) Contract documents are adequate in content					
e) Procurement procedure not keenly followed					
f) Main consultant cutting other consultants fees					
g) Consultant withholding information from the client which results in variations					
h) Loading sub-contractors prices to conceal other costs within the project					
i) Main contractors not paying and deducting subcontractors fees without proper justification					
j) Competition to get projects is high					

Section F: Project Monitoring and Evaluation of Residential Building Construction Projects

10. To what extent do you agree/disagree with the following statements on monitoring and evaluation of residential building projects in Nairobi County? *(Please tick applicable).*

Parameters	Strongly Agree	Agree	Neutral	Disagree Strongly	Disagree
a) Monitoring and evaluation of building construction projects is important					
b) I am satisfied with the level of monitoring and evaluation done on our building construction projects					
c) A sustainability champion is often found on site					
d) Compliance with work plan is assessed on site					
e) Site visits are done frequently to assess conformity to the work plan					
f) Quality of building materials is frequently tested on site					
g) Quality of building materials is sometimes found to have been compromised					
h) Findings of assessment done during site visits are documented in progress reports					
i) A report on milestones attained in construction work is captured in the progress reports					
j) Deviations noted in project performance are corrected immediately					

Section G: Project Closure of Residential Buildings Construction Projects

11. Kindly rate the extent to which your company applies the following project closure criteria in the construction of residential buildings projects in Nairobi County? *(Please tick applicable)*.

Parameters	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Project closure Occurs:					
a) When all parties have been made aware of the pending closeout					
b) When all key stakeholders have given their approval					
c) When all project closure documents have been filled-in					
d) When all activities in the project plan have been completed					
e) When all work orders have been completed					
f) When all outstanding commitments have been resolved					
g) When the client or customer has accepted the final product					
h) When all contracts have been completed					
i) When agreement has been reached with the client on the disposition of any remaining deliverables					
j) When all project inspection documents have been filled-in and finalized.					

Section H: Project Construction Phases and Quality of Residential Building Construction Projects

12. What, in your view, is the significance of ethical considerations in the quality of residential building construction projects in Nairobi County?

Parameters	Agree	Do Not agree	Don't Know
a) Promotion of managerial efficiency			
b) Use of resources for right causes			
c) Encourages investment			
d) Promotes economic growth			
e) Promotes legal and judicial systems			
f) Prevents delays in the project procurement process			
g) Leads to economical projects			
h) Prevents substandard works			
i) Prevents delays in obtaining permits from public agencies			
j) Promotes sustainable development			
Others, state them:			

Section I: Legal Environment in Residential Building Construction Projects

This section contains items on influence of legal environment on quality of residential buildings construction projects in Nairobi County.

14 i) Do you think we have enough Laws, regulations and procedures to deal with unethical issues in the residential buildings construction projects in Nairobi County?

Yes No

If Yes, state them.....

ii) Do you have a professional code of ethics?

Yes No

iii) Have you read and understood the code of ethics?

Yes No

iv) Do you practice what is in the code of ethics?

Yes

No

v) What are the obstacles to practicing the Code of Ethics of your professional body?

.....

vi) Do you think a professional code of ethics can contribute to ethical behaviour?

Yes

No

13. Kindly rate the following factors of the legal environment on the degree to which you agree/disagree that they affect a person/s to act in an ethical manner? (*tick*)/ using a scale of SA – Strongly Agree; A – Agree; N – Neutral; D – Disagree; and SD – Strongly Disagree

Parameters	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
a) Professional code of ethics & conduct					
b) Ethics & Anti-Corruption Act					
c) Laws and regulations of the country					
d) National Construction Authority Regulations					
e) National Building Inspection audits					
f) Manual of Standard Building Specifications					
g) Internal disciplinary procedures					
h) Type of judicial system					
i) Fear of punishment					
j) Fear of whistle-blowers					

Thank you