Addis Ababa University

Addis Ababa Institute of Technology

School of Civil and Environmental Engineering

Performance of Construction Consultants in Addis Ababa: A Study of Current Practices

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A Thesis Submitted to School of Civil and Environmental Engineering in Partial Fulfillment of the Requirements for the Degree of Master of Science in Civil Engineering (Construction Technology and Management Stream)

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DECLARATION

I, the undersigned, declare that this thesis is my original work and has not been presented for a degree in any other university. All sources of materials used for the thesis have been duly acknowledged.

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DEDICATION

I would like to dedicate this research work to my mom, my dad and my beloved grandfather.

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First of all I would like to thank Almighty God who has graciously blessed me all my life and given me the strength and resolve to complete this work. Nothing would have been possible without Him. I would then like to express my heartfelt gratitude to my advisor Prof. (Dr.-Ing.) Abebe Dinku, for his continual support, patience, guidance and supervision throughout this journey. I am grateful for his generosity in sharing his expertise and his mentorship throughout and beyond the semesters I spent as his student.

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LIST OF ABBREVIATIONS

AAHDPO	Addis Ababa Housing Development Project Office
AA-LRT	Addis Ababa Light Railway Transit
AASHTO	American Association of State Highway and Transportation Officials Standard
ACI	American Concrete Institute
ADB	African Development Bank
ADF	African Development Fund
AIA	The American Institute of Architects
APEGBC	Architects, Professional Engineers and Geologists of British Columbia
ASTM	American Society for Testing and Materials
BaTCoDA	Building and Transport Construction Design Authority
BS	British Standard Specifications
CEBC	Consulting Engineers of British Columbia
CIP	Construction Industry Policy
CM	Construction Management
CPD	Continuous Professional Development
CSA	Central Statistics Agency
EACE	Ethiopian Association of Civil Engineers
EBCS	Ethiopian Building Code Standards
ECIDP	Ethiopian Construction Industry Development Plan
ERC	Ethiopian Railway Corporation

FIDIC	Federation Internationale des Ingenieurs-Conseils /International Federation of Consulting Engineers/
GDP	Gross Domestic Product
GFCF	Gross Fixed Capital Formation
GERD	Grand Ethiopian Renaissance Dam
GTP	Growth and Transformation Plan
IDHP	Integrated Housing Development Plan
MoUDC	Ministry of Urban Development and Construction
MoWUD	Ministry of Works and Urban Development
MUDHo	Ministry of Urban Development and Housing
NGO	Non-Governmental Organization
OECD	Organization for Economic Co-operation and Development
PPA	Public Procurement Agency
PPE	Personal Protective Equipment
RFP	Request for Proposal
RIBA	Royal Institute of British Architects
RSDP	Road Sector Development Program
SME	Small and Micro Enterprises
ToR/s	Terms of Reference/s
UCBP	University Capacity Building program
WBG	World Bank Group

ABSTRACT

The Ethiopian construction industry has become a major force in the economic growth of the country. But it is not functioning at its potential due to numerous issues which continue to hamper its advancement. Construction stake holders are all responsible in one way or another for contributing to the challenges that have become the defining characteristics of the domestic construction sector such as delay, substandard quality, compromise of health and safety, cost overrun, poor contract administration etc.

But since the consultant usually takes on the tasks of design, supervision, contract administration and many more duties in projects, and has a higher responsibility and jurisdiction as compared to other parties, it is logical to infer the performance of the consultant has a make or break effect on construction projects.

The research assessed this dynamic and found major shortcomings by evaluating local consultants' practices according to international practices and experiences. It found that the level of performance and compliance of local consultants to global professional practices is at an average to low level and there is a noticeable disregard for internationally accepted norms. The lowest ranking issues in terms of practice were found to be construction and contract administration tasks as well as feasibility and scope definition tasks. In addition, important issues like health and safety, professional indemnity insurance and environmental and sustainability responsibilities are neglected. Based on these findings, appropriate actions have been recommended.

Keywords: ***construction consultancy, contract administration, Ethiopian construction industry, Ethiopian consultants, performance of consultants, project delivery methods.***

CHAPTER ONE

INTRODUCTION

The news that the Ethiopian construction industry has, in the past 10 years, shown an undisputable and significant yearly growth at a rate of 12.34% (MoUDC, 2012) – and the numerous testimonies of the boom observed in the industry as it is often described – are currently jaded. The timely and burning question now seems to be the question of quality of output and level of professionalism in the industry in terms of timely delivery of projects, safety of workers and the public, not outgrowing their project budgets

Despite its buoyant state, the construction sector faces various challenges at its early stage from maintaining its booming trajectory to roaring in its full potential (Ethiopian Herald, 2016). In Ethiopia, the present state of the construction industry falls short of meeting domestic and international quality standards and the performance demand expected from the sector (MoWUD, 2006). The public as well as professionals raise issues with safety, quality and durability of civil projects.

It is also known that most construction projects outgrow their contractual budget and timeline. Current infrastructure and construction projects show significant cost variation (Zinabu & Getachew, 2015). The cost overrun on projects results in poor investment returns from the use of the project, delay in the utilization of the public facilities and extended inconvenience for the public. Zinabu & Getachew (2015) state that all of these

problems exert a huge financial pressure on the government, and they can hold back or impair planned economic development.

These issues are major warning signs and beg the question: what fundamental responsibilities are the major stakeholders of the industry overlooking or neglecting, if any? Engineering at its core is a profession that serves society by solving pressing problems but it doesn't seem to be fully living up to its reputation in the local construction sector. This is not to imply there aren't exemplary construction parties and projects but they are few and outnumbered. The questionable quality, livability, safety and planning of some condominium housing facilities can serve as an example of lack of regard to and negligence of professional ethics. Moreover, according to various studies, clients including the government are opting for foreign consultants and contractors for mega-projects.

The causes of delay, cost overrun and various other problems in the industry continue to cost the country economically and otherwise. This research in particular addresses the causes of these shortcomings and the reasons that hinder the acceptable if not outstanding performance of the local construction industry as it relates to the performance of consultants. Construction consulting practices in the city of Addis Ababa were assessed and analyzed according to professional guidelines and foreign experience. The research tried to expose the main causes lurking behind problems in the industry that are holding it back.

In addition, research has been conducted to study the various causes of the problems in the industry. But what will differentiate this is the fact that it analyzes the problems as a

system rather than individually considering them. That is to expose the major weaknesses in the practices of construction consultancy. This goes in line with the desired outcome which is to point out key shortcomings and non-compliances in consultancy in the Ethiopian construction industry and the apparent inconsistency with internationally accepted professional norms and conducts. It eventually proposes a suitable industry practice to improve the quality of consultancy services.

The questions this research intends to address stand crucial at this phase in the development of the construction sector in Addis Ababa and Ethiopia at large. Among the recent works in relation to problems in the industry include Assessment of Conditions of Contract Problems in Ethiopian Construction Industry (Getaneh, 2011). In this study, Getaneh (2011) addresses the various problems that emanate from Conditions of Contract. The research assesses various causes such as lack of strict professional conduct to be abided by, and/or the negligence of them by consultants and statutory bodies hence covering a wider scope and as a result painting a bigger picture of the system rather than dissecting the problems.

Getaneh (2011) states that the performance of the local construction sector, construction management and contract administration practices do not meet the standards stipulated in contract provisions. Fetene (2008) also states poor project management, cost underestimation, time-delay, late site hand over and contractual provisions among others are causes for cost overrun. Aberra (2005) states that contractual obligations are seldom, if ever, stated in clear enough language to preclude misunderstandings. He addresses problems associated with contract document preparation which is the task of consultants

in the most prevalent/common traditional client-consultant-contractor relationship. He also implies consultants play a weak role in the handling of disputes. He criticizes the industry's dependence on design engineers or architects to formulate construction documents, i.e. the most likely authors of the misunderstanding, to clarify it and decide on the corresponding responsibilities of the parties (Aberra, 2005).

It is evident and undisputed that consultants play a significant role in the success or failure of a construction project and have the potential to make or break it.

1.1. Statement of the Problem

The central focus of the research is to understand the problems in the construction industry that can be reduced significantly, if not avoided, by applying internationally accepted construction consultancy and contract administration practices.

Based on the studies discussed above, it can be said that the industry falls short of performing on par with international and professional standards. Even though clients as well as contractors take their fair share of the blame for the problems in the industry, much of it can be associated with the lack of knowledge and expertise on part of the design and supervising consultants. The reason consultants should be held to a higher level of responsibility in contributing to these problems is the fact that they are at a significant advantage when it comes to making a professional call – unlike the client who usually doesn't have experience in construction – and have a higher jurisdiction to control and guide the construction works and make sure the contractor performs acceptably.

Consultants have a contractual, legal, professional and ethical responsibility to make sure that construction projects conform to quality requirements, standards and professional expectations. In Ethiopia, the apparent failure to do so continues to cost the country financially and otherwise, causing health and safety problems both on the public as well as the workers of the industry, loss of use by the public of the much needed infrastructures either due to delay or structures rendered partially or completely unserviceable due to quality issues. After assessing the current practices, the good and the bad, comparative analysis was conducted to identify gaps between local and global practices. Selected international practices and norms as well as possible solutions were then recommended.

The theme of this research is an under-explored area in the Ethiopian construction industry where researches tend to lean to the contracting sector. It is believed this study will contribute its part in filling research gap and inspire many more studies in relation to the consultancy sector of the construction industry.

1.2. Objectives

1.2.1. General Objectives

- To study the current practices of construction consultants in Addis Ababa and comparatively analyze them with their contractual, legal, ethical and professional duties and responsibilities as well as international practices.

1.2.2. Specific Objectives

- To study current practices in construction consultancy services in Addis Ababa in terms of contract requirements by analyzing various conditions of contract and international practices.
- To comparatively analyze the practices of consultants with their contractual duties and responsibilities as well as international codes of practices.
- To identify key challenges which result from the gaps between the contractual, legal, ethical and professional duties of consultants and their actual performances.
- To recommend possible solutions.

1.3. Research Questions and Hypotheses

- Negligence, irresponsibility and unprofessional conduct by stakeholders is the reason why the local construction industry is plagued with problems such as cost and time overrun, least regard for health and safety, professional red-tape etc.
- To what extent can the numerous problems in the industry potentially be alleviated if a proven and professionally accepted practice was implemented to improve the current consultancy services in Ethiopia?
- What role does the traditional method of construction management play in the inefficiency of consultants?
- Does the pertinent client-consultant dynamic and project delivery methods influence the performance of consultants? If so, how? And how can it be improved?

1.4. Brief Methodology

The research uses both primary and secondary data; through questionnaires and literature review respectively. Literature review and pilot questionnaire were used to develop the final questionnaire used in the research.

Literature review had been a very important tool from the beginning stages to the very end of this research work especially in studying the responsibilities and duties of consultants internationally as well as locally.

The analysis method was simple descriptive statistics method using frequency distribution approach. The analysis results are presented in tables, charts and percentages. The findings were then presented from which conclusions and recommendations were drawn.

1.5. Scope and Limitations of the Study

The scope of this study is limited to consultants based only in Addis Ababa. Although that seems a small section of the domestic construction industry's participants, almost ninety percent of local consultants are based in the capital city. Therefore, in effect, the study population includes almost all consultants in the country. But this is in no way to imply that the conditions in the city represent other cities in the country and the specific pertinent situations there. However, it can be deemed representative.

The limitations of this study include the fact that it only focuses on local (non-foreign) consultants and among those, only the ones based in the city of Addis Ababa. The other

limitation is that the data collected is prone to be affected by lack of transparency and limited availability of recorded follow up (post-construction) information for projects in the local construction industry. In addition, although the respondents were mostly top staffers of the consulting firms and fairly experienced, there may be a slight natural bias in their responses so as to present their firm as more competent than it actually may be. Although there is no evidence to suggest any major bias, it is worth anticipating such inclinations in this type of performance assessment research.

The other main limitation is that this research doesn't involve the other major industry players due to time and money constraints. The contribution of clients and contractors as well as statutory bodies would have been relevant to this research. Moreover, this research hasn't particularly studied practicing professionals who work as freelance designers or consulting engineers.

1.6. Organization of the Study

This research work is organized in five chapters. The content of each is elaborated below.

- **Chapter 1: Introduction** – This is the first chapter and presents the statement of the problem, research objectives, hypotheses, brief methodology, scope, limitation, beneficiaries and significance of the study.
- **Chapter 2: Literature Review** – This chapter reviews literature related with the topic of the research and attempts to present a theoretical background and framework for the research.

- **Chapter 3: Methodology –** This chapter explains the approaches and methods followed to achieve research objectives. It presents the strategies implemented to collect as well as analyze and present results.
- **Chapter 4: Results and Discussions –** This chapter presents the results and findings of the research and discusses them in detail.
- **Chapter 5: Conclusions and Recommendations –** This chapter is the last chapter of the research. It summarizes and presents the conclusions and recommendations drawn based on the research findings. Finally, bibliography and appendices have been presented.

1.7. Research Significance and Beneficiaries of the Study

The significance of this research is to identify how much of the common problems in the local construction industry are related to the performance of consultants. And also, it is intended to determine how much of the issues that need fixing could be prevented if consultants played their role sufficiently well and were competent in delivering their multi-faceted duties and responsibilities. After exploring these, major shortcomings were discovered and possible remedies were proposed.

Therefore, the output of this research is beneficial to all construction industry stakeholders, the major ones being clients, consultants as well as contractors. Professional associations would also find importance in the final findings of this research as it will inspire new ways to improve the profession's performance and standing in the community as well as assist any existing efforts.

It will also benefit government statutory bodies and policy makers in terms of providing input and policy focus directions to better the industry and improve the overall state of construction consultancy in the country. In summary, this study is expected to:

- Contribute to the improvement of consultancy services in Addis Ababa by exposing areas of weakness and identifying gaps;
- Fairly assess the level of accountability that in fact lies with consultants and perhaps by association with clients;
- Contribute to the improvement of consultancy services and discuss important project management issues in relation with project delivery methods;
- Contribute to the advancement of contract administration practices and suggest successful trends;
- Recommend solutions based on findings and conclusions;
- Spark additional interest in the area of consultancy and inspire further research.

CHAPTER TWO

LITERATURE REVIEW

2.1. The Construction Industry

The construction industry is a large sector of the economy that transforms various resources into constructed physical economic and social infrastructure necessary for socio-economic development. It embraces the process by which the said physical infrastructures are planned, designed, procured, constructed or produced, altered, repaired, maintained, and demolished (MoUDC, 2012; Torbett, Salter, Gann, & Hobday, 2001). The sector accounts for a significant proportion of economic output in OECD countries (e.g. ranging from around 6% of GDP in the UK, to about 12% in Japan) (Torbett et al., 2001).

Construction products are generally regarded as capital goods; and investment in construction constitutes about 50 percent of all investments in capital goods in many countries. In most sub-Saharan countries, the construction industry constitutes less than 5 percent of GDP. The corresponding average for developed countries is 7 percent (World Bank, 1994; Zawdie & Langford, 2000).

Physical infrastructure items deriving from investments in construction occur in three different forms. At the first level are projects in the civil engineering sector which involve the construction of roads, railways, ports, dams, power stations, drainage and water supply projects. Generally, such projects account for as much as 50 percent of the total construction GDP. They involve huge investment initiatives, and are often

undertaken by national governments, which, often with funding support from bilateral and multilateral sources, contract out the work mainly to international construction firms. Secondly, there is the commercial housing sector which involves activities principally aimed at property development. Such activities account for about 30 percent of construction GDP. This is a sector of the construction industry, which, in developing countries in general, is under growing pressure of demand for housing from rapidly growing populations in the face of limited investment resources. The third category of activities in the construction industry involves the construction of buildings for a wide range of end-uses such as schools, hospitals, health centers, hotels, offices, sports centers, factories and agricultural buildings. Such projects generally account for about 20 percent of the total construction GDP (Zawdie & Langford, 2000). The construction industry is a critical sector of the economy that produces building and civil engineering structures. It is not a single industry but rather a complex cluster of industries, including banking, materials and equipment manufacturers, contracting organizations and so forth. It plays an important role in the socio-economic development of any nation. Construction makes a significant contribution to the national economy, it creates employment (especially for the least skilled members of society), it plays a role in the development and transfer of technology, it creates many opportunities for enterprises, and it contributes directly to improving the quality of life of the users of its products (Windapo & Cattell, 2013).

The socio-economic significance of infrastructure projects, especially in developing countries is significant. Good infrastructure projects can, by virtue of the external economies they generate, help enhance the growth process by raising productivity and reducing production costs. They can also help in alleviating poverty by responding to the

needs of the poor for more and better health, education, housing, transport, and water and power supply services. According to the World Bank (1994), a one percent increase in the stock of infrastructure is associated with a one percent increase in gross domestic product across all countries (Zawdie & Langford, 2000).

2.2. The Ethiopian Context: A Brief Background

The Federal Democratic Republic of Ethiopia, a landlocked African country, covers a territory of 1.133 million square km (Mo, Orr, & Lu, 2008). According to CSA (2017), the population of Ethiopia is estimated to be over 94 million making it among the most populous nations in the continent. Addis Ababa, the capital city of Ethiopia, is home to 3.6 million people (World Population Review, 2016) and is well on its way to becoming a vibrant city. Addis Ababa is urbanizing at an exponential rate, and is expected to transform into a megacity of almost 10 million people by 2037 (World Bank Group , 2015).

The construction industry in Ethiopia has been developing tremendously since 2001. Recent studies by Zewdu & Aregaw (2015) indicated that the GDP contribution of the industry has risen to 5.6% and is approaching the sub Saharan average of 6%. Meanwhile, the Gross Domestic Capital Formation (GDCF), which was about 60 percent in 1996/97, has reached nearly 75% in 2002/03. Ethiopian Construction Industry Development Plan (ECIDP) (2014) shows the importance of the construction industry for economic growth as it shares 5.3% of the country's GDP (Zinabu & Getachew, 2015). Getaneh (2011) also states that the contribution has grown to 5.8% in the year 2008/2009 after remaining constant for the previous three years. Furthermore, the Construction

Industry Policy, CIP, states the percentage share of the construction sector to GDP at constant price has increased from 4.5% in 2000/01 to 5.8% by 2009/10 (MoUDC, 2012). Construction industry is known to consume higher percentage of the annual budget of a country; specifically in Ethiopia, it covers 58% of the annual budget (Asmara, 2015).

The construction sector has a number of direct and indirect spill-over effects on other sectors, such as commodities, logistics and agriculture (Boere, Kleingeld, & Dawit, 2015). Beyond its contribution to the nation, the industry is also the 6th major contributor of the continent's infrastructure stock following South Africa, Egypt, Morocco, Algeria and Nigeria (Ayalew, Dakhli, & Lafhaj, 2016). Ethiopia's rapid economic growth has fueled a recent wave of construction in Addis Ababa and elsewhere in the country. The Ethiopian landscape is dotted with construction sites (Boere et al., 2015). Moreover, according to MoWUD (2006) and Fetene (2008), the construction industry has a significant multiplier effect on the economy as a whole. This relationship between the construction industry and the broader economy largely emanates from three of the industry's characteristics: the public sector being the major client, it's large size enabling it to produce investment or capital goods which contribute significantly to national GDP and the fact that it is a major source of employment, directly and indirectly by virtue of its multiplier effect.

It has been widely reported by many that Ethiopia has had a rich history of magnificent construction endeavors like the obelisks of Axum, the rock-hewn churches of Lalibela and the castles of Gondar. With the advent of modern civilization, especially during the late 19th and early 20th century, there have been significant developments in the

construction industry in Ethiopia (Fetene, 2008; Girmay, 2003). But as agreed by researchers and various studies (Fetene, 2008; Getaneh, 2011; MoWUD, 2006), the industry is not performing at its best and is plagued by problems that hinder smooth and successful project delivery. The domestic construction sector is characterized by excessive cost overrun, delay and quality problems (Getaneh, 2011). The author continues to state that one of the major reasons behind this is unclear contract documents and design related problems. Minister of MUDHo Dr. Ambachew Mekonnen also stressed the need for attitudinal change and focus on changing the mindset of construction sector actors particularly contractors and consultants so as to fight the various challenges in the industry (Ethiopian Herald, 2016).

Part of the problem emanates from lack of proper and applicable Conditions of Contract. The contract documents used in the domestic construction industry are not clear. In most cases these documents are distorted and poorly adopted from foreign sources. Incomplete designs that are not appropriate to fit the ground conditions call for design changes while the project is on progress which in turn affects the schedule and the cost structure of the project (Getaneh, 2011). But that is not the only cause. The lack of professional code of conduct and non-conformance to the available or set conditions of contract and codes is also a major problem in the country. The author of the aforementioned research has not addressed possible issues of negligence towards implementing as well as enforcing clauses in the Conditions of Contract beyond the gaps in the Conditions of Contracts themselves.

2.2.1. Scope and Parties in the Industry

The construction industry in Ethiopia consists of various sectors. These are the building and residential development sector, civil engineering sector, professional services sector and self- building sector. Construction firms must be registered and licensed in order to undertake any construction work in Ethiopia. The construction industry comprises of organizations and persons who include companies, firms and individuals working as consultants, main contractors and sub-contractors, material and component producers, plant and equipment suppliers, builders and merchants. These operate in the deferent sub-markets characterizing the construction industry. The firms are classified according to size, expertise and financial capability by the Ministry of Works and Urban Development (Asmara, 2015; MoUDC, 2012).

The constructed infrastructures include:

- Buildings
- Transportation systems and facilities which are airports, harbors, highways, subways, bridges, railroads, transit systems, pipelines and transmission and power lines.
- Structures for fluid containment, control and distribution such as water treatment and distribution, sewage collection and treatment distribution systems, sedimentation lagoons, dams, and irrigation and canal systems. Underground structures, such as tunnels and mines.

According to UNESCO (2010), civil engineers make up a significant proportion, about 50 percent, of all engineers, and many are members of national, regional and international

engineering organizations. Engineering is divided into different fields (civil, mechanical, electrical, chemical, agricultural etc.) and engineering skills may be required at various different levels (research, management, professional, technical etc) (Matthews, Ryan-Collins, Wells, Sillem, & Wright, 2012).

There are more than 350 consultants registered and currently active in the industry according to Contractors, Consultants and Medium Professionals Registration and Licensing Sub Division. As stated by the office, they are seeing a surge in number of applications for construction consultancy in recent years.

According to ADB (2007), consultancy services can commonly be grouped broadly into four categories.

- Pre-investment Studies;
- Detailed Design Studies;
- Supervision and Control of Works Implementation; and,
- Technical Assistance.

2.2.2. Growth of the Construction Industry

Ethiopia, being one of the ancient civilizations in the world, is not new to constructing long standing structures. There are also exquisite historical and cultural heritages aged more than half a century from Emperor Hailesilassie's time that display admirable qualities and workmanship and are still in service.

During the Military regime, construction ventures slowed down. Following the nationalization of many private construction companies in addition to the lack of

international financing for the construction sector following the revolution in 1974, there was a significant decrease in the number of major civil engineering projects in the country (Girmay, 2003). But over the past few years, the Ethiopian construction industry has seen a significant amount of growth. According to Construction Industry Policy (CIP), the sector has registered a remarkable growth. Over the last 11 years there has been increased investment on the development and expansion of various infrastructure projects. Among the major developments, construction of road infrastructure, real estate developments, and condominium housing projects are some of the examples (MoUDC, 2012). After the change of government in 1991 however, a steady increase in projects was observed in the civil construction sector. Not only was there steady growth in the number of engineering projects financed locally, but the contribution of foreign financing agencies as well as the participation of international contractors as well as consultants in major civil engineering projects also increased (Girmay, 2003). The country has been implementing significant number of programs/projects, which include the University Capacity Building Program (UCBP), the Integrated Housing Development Program (IHDP) and the Road Sector Development Programs (RSDP) among others (Ayalew et al., 2016). Construction in Ethiopia is on a constant rise and construction sites can be seen everywhere in Addis Ababa, in other urban areas and throughout the country because of large-scale infrastructure projects like new roads, railways including the Grand Ethiopian Renaissance Dam (GERD). Research institutes forecast that the growth in the Ethiopian construction sector will remain one of the highest in the world (Boere et al., 2015). It will remain this way presumably until at least a reasonable amount of

infrastructure development endeavors are achieved and the country becomes developed enough to have distributed basic facilities to most or all parts of the nation.

In the following sections, efforts to improve various sub sectors of the construction industry are presented.

2.2.2.1. Road Sector Development Program (RSDP) and Addis Ababa Light Railway Transit (AA-LRT)

The Growth and Transformation Plan (GTP) annual progress report states that the Federal and Regional total road length has increased from 56,190 km in 2011/12 to 58,338 km in 2012/13, indicating the construction of 2,148 km by Federal and Regional roads in the year 2012/13 alone. This brings the total length of roads constructed in the first three years since the beginning of the plan in 2009/2010 to 9,538km (GTP, 2014). As per the plan, there has been a major expansion of Federal roads across the country. The Ethiopian Roads Authority (ERA) has plans to expand the current road network to 200,000 km of road within the next five years. Ethiopia currently has about 100,000 km of roads, including low-class and unpaved roads (Boere et al., 2015). Although the plan appears to be an ambitious one with the current level of advancement in the local construction industry and the reputation of successful and timely completion of road projects, the demand is immense. For the plan to become viable, the local construction sector must catch up to the authority's plan.

2.2.2.2. The Integrated Housing Development Program (IHDP)

Although attempts are being made by the city of Addis Ababa to provide condominium housing to residents, the demand far exceeds the current supply (World Bank Group ,

2015). The housing development program, which kicked off more than a decade ago, has surely come a long way but is proving insufficient. The program was inaugurated by the completion of 750 model condominium houses as a pilot program. Since its start in 2004/2005, construction was started on more than a total of 220,000 houses (completed and in the process of being built) in ten years time. Initially G+3 and 4 buildings were being built mostly for low income families. Now construction of up to G+20 condominium buildings has started (Theodros, 2014). A total of 108, 482 houses were transferred to residents of Addis Ababa until the end of 2013 and more than 100,000 houses are planned to be built and transferred in the coming few years. According to Theodros (2014), houses are transferred on transparent and open lottery basis after a percentage down payment from applicants (of 10%, 20% and 40% of estimated cost of the houses) while the remaining amounts are paid in long-term mortgage loans from the Commercial Bank of Ethiopia (CBE). But the transparency issue remains to be debated by many. Several anecdotal as well as some reported cases suggest the prevalence of bias in the transfer process of these housing facilities. Entirely, these residential developments are believed to benefit more than one and a half million people (AAHDPO, 2015).

The challenges in this effort are weak performance and poor quality work at initial phases, relocation of residents from re-development areas, provision of alternative housing to people disrupted by relocation etc (Theodros, 2014). Nonetheless, the government's housing efforts is one of Africa's biggest state-housing projects, building about 32,000 units per year since 2006 and creating a national savings scheme that offers subsidized mortgages to the poorest (Boere et al., 2015).

2.2.2.3. Job Opportunities and Small and Micro Enterprises (SMEs) Businesses

It is widely reported that the agricultural sector employs more than 80% of the work force in Ethiopia. The country had stayed an agrarian country in the past but now the government is shifting gears to an industry-led economy. As a result of this upgrade in policy direction, manufacturing industries are springing up and more job opportunities are presenting themselves to the working class. The Ethiopian Ministry of Urban Development and Construction (MoUDC) had announced in 2014 that it had targeted to create 1.8 million jobs in the budget year. This shows the level of mobilization of labor force the construction industry is responsible for.

The housing construction is also known for the job opportunity it creates for citizens. Since 2004, 552,296 job opportunities were created and on average 60,000 jobs are created annually (AAHDPO, 2015). The other goal of the office is to empower Small and Micro Enterprises (SMEs) to produce construction materials and inputs domestically and to alleviate urban poverty (Theodros, 2014).

2.2.2.4. Cobblestone Urban Road Construction

By using local resources and eliminating the need for expensive imports of oil-based materials, Ethiopia is adopting a greener and more sustainable method of road construction. Plus, cobblestone roads are more durable as well as easier and cheaper to lay (cost of ground preparations being the same, the price of laying 1 meter square of cobblestone costs 280 Ethiopian birr while laying asphalt costs 680 Ethiopian birr).

Moreover, the whole process is extremely labor-intensive; that is a massive opportunity in a country where unemployment is high, especially among the urban youth. The

program has been rolled out to 120 towns and cities across the country; around 2,200,000 square meters have been finished; and an estimated 130,000 people (45% of which are women) are employed in the trade. It is even sparking private sector demand and customers like embassies and schools etc (Theodros, 2014). This sector seems to have slowed down from its widespread initial presence in recent years and has been fairly limited to constructions in condominium compounds and small scale ventures like those procured by private housing associations for the construction of local neighborhood roads.

2.2.2.5. National Railway Network, Airport Upgrade and Hydropower Plants

The railway network in Ethiopia is a series of interconnected railway lines that span the length and width of the country. There is a 10-year master plan to build 5000 km of railway lines across Ethiopia, including 75 km within Addis Ababa. A major component of the network will be the Addis Ababa-Djibouti railway, a 656-km line linking Addis Ababa with the port of Djibouti, providing landlocked Ethiopia with a multimodal transport system to the sea for its exports and imports. This project is now completed and preparation for startup is currently underway. Ethiopia is seeking to have 5000 km of new lines working across the country in a decade's time. The city of Addis Ababa is now adorned with the first light-rail system in Sub-Saharan Africa (Boere et al., 2015). The rail line spans 31.6 km and has been functional since September of 2015. The government of Ethiopia along with the Ethiopian Railway Corporation (ERC) has future plans to expand the railway transport sector of the country further.

An upgrade program in Addis Ababa International Airport is also expected to maximize the airport's service to 120 million passengers every year; the Grand Ethiopian Renaissance Dam under construction on the Blue Nile River which is expected to generate 6000 MW of energy when completed and many other hydropower plants; industry parks and agro-processing zones in cities across the country are among the other major undertakings in the local construction scene (Boere et al., 2015).

2.2.3. Performance of the Local Construction Sector

It is evident from the justifications shown in the previous section that in the last few years there has been a dramatic change in the way construction activity is being undertaken in Ethiopia. This is not only in the form of new technology, but also in the way that construction projects are procured and managed (MoUDC, 2012).

Local consultants and contractors are marginalized partly due to the general low productivity and poor quality of services. With the relatively high quality of products and services being offered by foreign competitors, and as a cost reduction measure, and due to growing quality demands by customers, the local construction industry must mount a productivity and quality improvement revolution to achieve international competitiveness (MoUDC, 2012).

The inefficient and deteriorated state of the construction industry and its poor performance has detrimental effects on the development of the industry. According to MoUDC (2012) & Hailemeskel (2013), weaknesses, problems and constraints hampering the performance and development of the industry include:

- Low capacity and capability of the local contractors and consultants due to weak resource base and inadequate experience;
- Inadequate and erratic work opportunities, inappropriate contract packaging of works which favor foreign firms in donor funded projects, low public investment in infrastructure projects and over dependence on donor funding;
- Inefficient and non-transparent procurement systems;
- Corruption and financial mismanagement in public/private sectors;
- Lack of supportive institutional mechanisms in terms of financial credit facilities, equipment for hire and professional development;
- Unfavorable donor pre-conditions which tend to marginalize local construction enterprises;
- Poor working environment, including low standards of safety and occupational hazards on construction sites;
- Weak and non-facilitative policies and regulatory framework;
- Low productivity and quality; and,
- Low technological base (Hailemeskel, 2013; MoUDC, 2012).

As a result, numerous construction projects suffer problems of cost overruns, time overruns, abandonment and sometimes structural failure leading to building collapses and associated colossal losses (Moohammad, Yusof, & Kamal, 2014). The construction consultants in general have been found wanting by many clients in the discharge of their services. The British Property Federation's survey of major UK construction clients conducted in 1997 showed that more than a third of clients are dissatisfied with the performance of construction professional service providers in coordinating teams,

providing a speedy and reliable service, design and innovation and in providing value for money (Moohammad et al., 2014).

2.3. Common Characteristics of Construction Industries in Developing Countries

According to Abadir (2011), much like in other developing countries, the construction industry in Ethiopia is suffering from many problems like:

- An inadequate capital base;
- Old and limited numbers of equipment and low levels of availability and utilization;
- Low level of management, especially project management knowledge and practice (low level of contract administration, project planning and monitoring capabilities);
- Deficiencies in technical, financial management and entrepreneurial skills;
- Limited experience and participation of the private sector in large construction project or the provision of related consulting services;
- Outdated technology (insufficient and ineffective labor-based construction technology); and,
- Inadequate and inappropriate project organization structures, which lead to problems of authority, responsibility, communication and coordination, etc.

Ayalew et.al (2016) adds that poor cost, time and quality performance, lack of work opportunities and poor level of professionalism are prevalent in construction industries in

developing countries with regard to productivity, quality, safety and health, and environmental performance.

Also the level of construction project management practice in terms of adapting general project management procedures, project management functions, tools & techniques was found to be unsatisfactory particularly the level of practice in terms of safety, risk and time management. The extent of deviation from plan or predetermined requirements like schedule ranges between 61-80% and that of planned costs and other variables such as risk, quality, resources utilization and safety deviates in the range of 21-40% (Ayalew et al., 2016).

2.4.Construction Contracts

According to Uher et.al (2002), the earliest recorded reference to a building contract comes from one of the laws of Hammurabi, the Babylonian conqueror: 'If a contractor builds a house for a man this man shall give the contractor two shekels of silver as recompense. If a contractor builds a house and does not build it strong enough and it collapses and kills the owner the contractor shall be put to death'. In the Middle-Ages, design and construction responsibilities were divided. The building designer was a clergyman and only paid rare visits to the building site. Master masons carried out the work on the actual site. Lump-sum contracts were common in the Middle-Ages for the erection of major works such as castles or palaces. For such works, it was common to draw up a separate contract for the main trades. The mason was bound to a completion date and had to offer a bond to guarantee ability to carry out the works. The principal often co-opted the services of a consultant to ensure that the contractor carried out work

in accordance with the contract. The consultant's name was written into the contract as agent for the principal (Uher & Davenport, 2002).

Ethiopian Civil Code (Article 1675) defines a Contract as *'…an agreement whereby two or more persons as between themselves create, vary, or extinguish obligations of a proprietary nature'*. Construction contracts entail various components which makes them differ from other types of business contracts (Civil Code of the Empire of Ethiopia, 1960). According to Ministry of Works and Urban Development (MoWUD) Standard Condition of Contract for Construction of Civil Work Projects, "Contract" means the Conditions of Contract, Specifications, Methods of Measurement, Drawings, priced Bill of Quantities, Schedule of Rates and Prices, the Letter of Acceptance, the Contract Agreement, Addenda and other documents issued thereof (MoWUD, 1994).

According to PPA General Conditions of Contract, except where otherwise specifically stated and subject to any restrictions in the Special Conditions of Contract, the Engineer will decide contractual matters between the Employer and the Contractor in the role representing the Employer (PPA, 2006; FPPA, 2011).

2.5.Construction Consultancy

Consultants generally refer to knowledge-based professionals (person or organization) employed to: provide expert analysis and advice that will enhance decision-making, provide specialized and one-of service(s), and perform task(s) that are not ordinarily available within the departments or agencies of the Clients (Moohammad et al., 2014). Consulting requires the skills of a multi-disciplinary professional. A key issue in any consulting service is the ultimate success of the project (Wondie, 2016). Consultants have

distinct responsibilities with a high degree of relevance to render a construction project successful. Construction consultancy entails detailed duties and responsibilities. These obligations depend on the type of condition of contract and project delivery method selected.

The consultant plays vital role in the realization of a construction project. It is becoming almost impossible to imagine contemporary life without the consulting engineer's contribution to such fields as health, sanitation, transportation, public works, buildings and communications. The profession demands a high level of engineering competence and ability (Abebe, 2003).

The term 'Consultant' is used interchangeably with 'Engineer' in most contract documents. FIDIC (1987), Sub-Clause 2.1 defines "Engineer" means the person appointed by the Employer to act as Engineer for the purposes of the Contract. According to FIDIC, the Engineer shall carry out the duties specified in the contract and may exercise the authority specified in or necessarily to be implied from the Contract. Consultants play pivotal roles in the conceptualization, planning and development of construction projects (Moohammad et al., 2014).

Furthermore, a consulting engineer is an independent professional engineer who performs professional engineering services for clients on a fee basis. They operate as individual proprietors, partnerships or corporations. Their staffs vary from a lone secretary in a small operation to several thousand engineers, architects, planners, technicians and other employees in a larger firm (Abebe, 2003).

In the construction industry, consultants are usually approached and commissioned by clients to provide services relating to the conceptualization, planning as well as the execution of the construction projects. They usually follow the client's briefs and use their technical skills and professional judgments to bring into reality clients' dream construction projects (Moohammad et al., 2014). Construction consulting is a multi-billion dollar industry in developed countries. Consulting engineering design firms based in the UK sold over $16 billion in 1996 and employed over 150,000 people (Torbett et al., 2001).

According to Torbett et al. (2001), performance measurement in the construction sector is more challenging because of 'tensions' between design and construction parties. This is particularly evident in the roles and responsibilities carried out by architects and contractors who, in Anglo-Saxon processes often vie for supremacy. Pressures to reduce costs and to introduce new technologies and more efficient methods of production have raised the profile of contractors in relation to architects. For example, in the UK, architects were often responsible for liasing with clients. However, clients have increasingly turned to design-build contractors to manage projects and to intervene to resolve problems as they arise.

Torbett et al., (2001) continue to argue that the increasing sophistication of design has placed new pressures on consulting engineers to develop and integrate different bodies of knowledge. New specialist disciplines include acoustics engineering, façade design, fire engineering, building physics, building instrumentation and control systems, geotechnical engineering, knowledge of changing work/use patterns, new materials, as well as wind,

seismic and vibration engineering. The construction process has traditionally been managed through legal contracts which define official obligations among the partners. This can work well for relatively simple, clear cut projects, but where design uncertainty is involved or where new technologies or a new type of building is required, it becomes very difficult to define legal boundaries and responsibilities through the various stages of the project cycle. As a result of unsatisfactory performance, many leading firms have turned to modern partnering arrangements to define new business processes to enhance collaboration. Partnering arrangements focus heavily on the early phases of project definition and overall design. They aim to minimize misunderstandings, improve partner flexibility, accelerate project start up, and allow for better design and innovation, and increase learning from project-to-project. They reduce the amount of legal contractual detail and replace this with broadly agreed work targets and milestones, regular means of communication and systems for design change and conflict resolution between buyers, contractors and suppliers. One of the key aims is to remove the adversarial culture which often exists in construction projects. Unlike consumer products, construction projects are characterized by high cost, high levels of user involvement in design, uncertainty over appropriate design paths, elaborate product architectures, and an unusually high degree of tacit knowledge in design. Because of the complexity of design, suppliers often use simulations to express design ideas and gain feedback from users and other collaborating firms (Torbett et al., 2001).

2.5.1. Types of Consultancy Contracts

There are several types of consultancy contracts. CEBC and APEGBC recommend appointing a consulting engineer using a formal agreement that protects the rights of the

client and the consultant, identifies the scope of the project, and lays out the terms and rules of engagement. The complexity of the agreement depends on the size, complexity, risk, duration and other aspects of the assignment, such as site characteristics. A simple project may require only a simple agreement while a large project will require documentation reviewed by legal counsel. Various standard consulting agreements are available worldwide. For example, CEBC and APEGBC and other organizations have endorsed:

- Association of Consulting Engineers of Canada (ACEC) 31, *Prime Agreement between Client and Engineer*; and,
- Master Municipal Contract Documents (MMCD) – Client Consulting Agreement (CEBC & APEGBC, 2009).

ADB (2007) lists Lump Sum Contract, Time-Based Contract, Percentage Contract and the likes to name a few among other types of consultancy contracts. The most common ones are explained below.

- **Lump Sum Contracts***:* used mainly for assignments in which the content and the duration of the services, as well as the required output of the consultants, are clearly defined.
- **Time-Based Contracts:** appropriate when it is difficult to define the scope and the length of services, either because the services are related to activities by others, for which the completion period may vary, or because the input of the consultants, required to attain the objectives of the assignment, is difficult to assess. This type of contract shall include a maximum amount of total payments to be made to the consultants.

- **Percentage Contracts:** commonly used for architectural services and directly relate the fees paid to the consultant, based on the estimated, or actual, project construction cost, or the cost of the goods procured or inspected. It should be borne in mind that, in the case of architectural or engineering services, percentage contracts implicitly lack an incentive for economic design, and are hence discouraged.

2.6.Licensing and Professional Regulations

The law does not usually imply a warranty that a professional will achieve a desired result, but only a term that he will use reasonable care & skill. A professional is one who holds oneself out, and professes as having the necessary qualifications, skills and expertise in a particular field. He owes a duty to exercise that degree of skill & care which others rely on. Consultants are expected to embody necessary experience, understanding of clients needs and wishes, competence, enough resources (staff, facilities etc), knowledge of local conditions, project management expertise, integrity, honesty, cooperation, great professional standing and reputation (Majid, 2009).

According to UNESCO (2010), there are three main widely accepted approaches to professional regulation in engineering.

1. **Licensing:** In this approach, an area of engineering work is linked to those persons who have demonstrated competence to perform such work. Licensing on a statutory basis prohibits unlicensed persons from performing such work. Non-statutory licensing provides the public with lists of persons competent to perform work within an area of engineering, which may also be undertaken by non-licensed persons.

2. **Registration:** In this approach, those persons who demonstrate their competence against a standard and agree to abide by a code of conduct, are awarded titles and are admitted to a register. Such registration maybe governed by the laws of a country (statutory register) or the regulations or the rules set by the governing body of the profession, which oversees the registration process and maintains the register (non-statutory register). Where governing bodies operate non-statutory registration, they may only use civil action to prevent non-registrants from using the title and are not empowered to restrict any area of work to registrants. (Statutory registration linked to the reserving of an area of work for registered persons has the same effect as statutory licensing.)
3. **Specialist lists:** In this approach, a professional or trade body administers a non-statutory voluntary listing of professionals who have met a defined standard of competence in a specialist area (UNESCO, 2010).

2.7.Roles and Responsibilities of Consulting Engineers

Roles and responsibilities of consultants emanate from the liabilities attached to standard of care expected from a consultant engineer. If there are no liabilities associated with what consultants do, then there is no sense of responsibility, role, and duty of care or even moral obligations. Such liabilities are in turn are associated with the laws of the country that enforce or regulate the profession (Majid, 2009; EFCA, 2014).

Majid (2009) continues to state that consulting engineering roles, responsibilities and obligations are generally poorly understood. The public at large has difficulty in distinguishing between a consulting engineer, a professional engineer and a contractor. Most engineering graduates and universities have only a meager understanding of the role

of a consulting engineer. Even some consulting engineers lack adequate comprehension of their own roles, obligations and responsibilities.

A consulting engineer is an independent professional engineer who performs professional engineering services for clients on a fee basis. Engineering consultancy practices may ne sole proprietorships, partnerships, or bodies corporate providing professional engineering services (Majid, 2009).

The International Federation of Consulting Engineers (FIDIC) represents the consulting engineering industry at the international level and has more than 95 member countries (FIDIC, 2017). A macro economic analysis confirms the industry's significance and importance. The consulting engineering industry, which comprises independent private consulting firms supplying services on a fee-for-service basis, is a major industry worldwide. It has annual revenue of about US$490billion, and is heavily involved with the construction, management and industrial sectors that generate one-half of the world's GDP. Any industry sector, especially one that makes major contributions to conceiving, designing, delivering and maintaining the world's infrastructure, aims to be able to quantify the scope and importance of its activities. However, unlike the manufacturing sector, the services sector, of which the consulting engineering industry forms a part, does not lend itself to a straight forward analysis. Data is lacking and the classification of activities often prevents a rigorous analysis.

In 2007 in France, Architectural and Engineering (A&E) services accounted for 72 percent of industry turnover and 28 percent for Industrial Consultancy. In Sweden, the percentages were 65 percent and 35 percent. For South Africa in 2005, Industrial Consultancy amounted to some 20 percent of Construction. The most important activities

in all countries remain to be activities in Construction, a sector that has a major social and economic role. Given the difficulty in estimating the consulting engineering industry revenue and market size using industry statistics it is useful to turn to output data for different countries. World GFCF in 2007 was US$9,271 billion for a GDP ofUS$54,747 billion. National statistics also give accurate estimates of A&E and Industrial GFCF (e.g. European Union 2007: 54 percent and 46 percent, respectively) (UNESCO, 2010).

2.8.Construction Consultancy in Ethiopia

The office responsible for registering and licensing construction professionals and firms is the Ministry of Construction, in accordance with the powers and duties conferred on it by the definition of powers and duties of the Executive Organs of the Federal Democratic Republic of Ethiopia Proclamation No. 691/2010 Article 25 (1-l) which mandates the ministry to: "register and issue certificates of professional competence to engineers and architects; determine the grades of contractors and consultants, and issue certificates of competence to those operating in more than one regional states" (MoUDC, 2013).

The Ministry has issued 'Directives for the Registration of Consultants and Design Professionals' in 2013, which states in Part VI that application for registration as a consultant in accordance with this directive may be submitted in one of the following categories.

- Building Sector
- Water and Sewerage
- Highway and Bridge
- Construction Management

It also states that for applicants whose areas of involvement does not fall in one of the aforementioned sub-categories, their application may be considered as it comes and the department prepares proposal for grades and requirements of the grades through the participation of the relevant association/s and professionals. The proposal is to be approved by the minister before implementation (MoUDC, 2013).

According to the website Abyssinia Law and the MoUDC directive, further classifications are given for each sector. Applicants for a consulting office in the Building Sector can be registered as *Consulting Architects and Engineers,* which entails preparing total design documents for building and civil projects befitting their categories; *Consulting Architects*, which entails design of building projects; G*eneral Consulting Engineers*, which entails all engineering design works; and, *Specialized Consulting Engineers*, which entails works in specific fields like structural, road, sanitary, mechanical, foundational, electrical, quantity surveying and surveying.

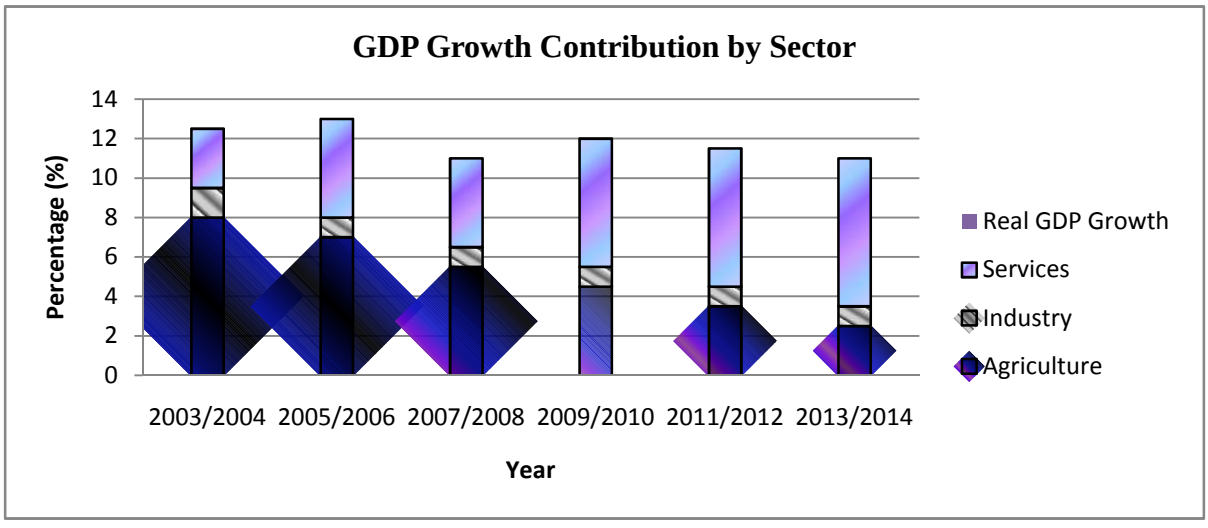
2.8.1. Attempts to Quantify the Size of the Local Construction Consultancy Sector

The number and capacity of consultants in the Ethiopian construction industry is quite small as compared to the other countries worldwide as well as the country's needs and demand. Matthews et al. (2012) argues that as doctors provide a service directly to people, it is sensible to view population levels as approximate indicators of need. However, in the case of engineering, that demand is perhaps more closely related to the needs of the economy. Relating the number of engineers to some measure of current or future economic activity in a country, such as GDP or investment, might be more

appropriate in obtaining a rough estimate of demand (Matthews, Ryan-Collins, Wells, Sillem, & Wright, 2012).

Because there isn't enough statistics available to properly quantify the size of the construction consulting sector, it can only be roughly estimated from various sources such as service tax reports. Consulting is part of the overall professional service package. In figure 2.1 below, a general indication of the overall professional sector's contribution to the GDP is depicted. It can be observed that the contribution of the services sector, of which construction consultancy is a part of, and the industry sector, to the country's economy have been showing steady growth. On the other hand, the agriculture sector's contribution to the national GDP has been decreasing from year to year. Perhaps, this can be explained by the shift in policy away from agriculture-led economy towards an industry led economy. This is rather an insufficient piece of information to infer upon but a rough indication.

Figure 2.1 Ethiopia: GDP Growth and Contribution by Sector



Source: IMF (2016); *[Approximately Reproduced]*

Designating the level of employment and work force involved in engineering consultancy services is also a challenge in Ethiopia where there isn't enough available data or a responsible body that provides such reports. In Table 2.1 below, a rough estimate of the workforce and financial status of the local construction consultancy services has been conducted based on MoUDC's amended directive No 22/2013 for consultants and the designated minimum staffing and financial capability requirements (See Appendix 8 (a) & (b)). Assuming that all of the registered consultants are based in Addis (since more than 90% of them are in fact based in Addis), average cost of office facility rent per m2 was collected in the city. In terms of calculating the costs of office equipments, the prices were collected in ranges i.e. from brand new to used, as well as crossing brand boundaries and were then averaged. The data presented below is understandably underestimated as it is based on minimum requirements.

Table 2.1 Rough Estimate of Workforce and Capital in the Consulting Sector

Estimate of Industry Size (Summary)	
Estimate of Minimum Wok Force	
Professionals	1,584
Non-Professionals	331
Total	1,915
Estimate of Minimum Financial Standing (in ETB)	
Direct Capital Invested	86,635,000.00
Office Rent Expenses	16,318,750.00
Office Equipment Expenses	478,419,750.00
Total	581,373,500.00

2.8.2. Registration of Consultants and Licensing Requirements

Although each categories of service have their own requirements that need to be fulfilled for licensing, some common requirements for all groups state that the manager or owner has to be a registered practicing professional in the specific sector the license is being requested. The applicant also needs evidence of satisfactory finance, equipment, office and office facilities required for the office being applied for and minimum number of registered staff set out by the guidelines. In addition, a certificate of registration from the Ministry of Domestic Trade in accordance with the Commercial Code of Ethiopia is required upon application for registration as a consulting firm.

Any prospective consulting firm, under this directive, must fill the corresponding application form, submit all supporting documents and provide satisfactory evidence relating to the manager, facilities and minimum staff requirements, financial standing (turnover details as specified, if any), equipment and office facilities for classification befitting the category of consulting office applied for. There are incentives to encourage female applicants. For example, where the applicants are female or the company has a majority of female members the turnover requirement is reduced by 5 percent. The ministry has the mandate to suspend or cancel licenses if it deems a party has failed to comply with requirements.

2.8.3. Brief Overview of Standard Conditions of Contract in the Procurement of Consultancy Services in Ethiopia

There are various local conditions of contract and specifications that delegate responsibilities of a consultant such as MoWUD, BaTCoDA and PPA. PPA states that the supplier (of consulting services) shall perform the services and carry out its

obligations with all due diligence, efficiency, and economy, in accordance with generally accepted professional techniques and practices, and shall observe sound management practices, and employ appropriate advanced technology and safe methods. The supplier shall always act, in respect of any matter relating to this contract or to the services, as a faithful adviser to the procuring entity, and shall at all times support and safeguard the Procuring Entity's legitimate interests in any dealings with Sub-consultants or third parties (PPA, 2006). The document also imposes confidentiality, insurance and dispute settlement requirements among others. ADB/ADF and FIDIC are among the prominent international conditions of contracts and have been used as basis to develop local ones.

2.9.International Consultancy Service Trends and Culture: An Overview

Construction, architectural and engineering services are the largest industrial employer in Europe, accounting for more than 28 percent of the total share of industrial employment. Developed countries are the major exporters of construction, architectural and engineering services, while developing countries provide the major markets. Construction, architectural and engineering services are subject to a plethora of rules and regulations related to maintenance of safety of construction works, protection of health and safety of workers and users, building regulations and technical requirements, environmental issues, etc. In most countries, public sector financing and public procurement practices play an important role in the consumption of construction and related services (Mukherjee, 2001).

The organization of work differs considerably between large and small projects and regionally, between Anglo-Saxon countries (N. America, UK, Australia), and North

European countries and Asian countries, (Japan, S. Korea). In N. America, the UK and Australia, consulting engineers are often engaged to carry out specialist design work by prime contractors/project managers. In contrast, large prime contractors in Japan often have integrated capabilities with in-house engineering design teams. A mix of approaches exists in Northern Europe. In some projects, contractors manage the entire project, hiring in an architect. In other cases, the client hires an architect who then selects the contractor. Although there are many different types of bid structure, typically, major projects are broken down into a set of functional packages and the work is parceled out. Packages usually include: (a) architectural services; (b) mechanical and electrical services (including acoustics, lighting, heating, and information technology systems); (c) structural engineering (involving design for structural integrity and the feasibility of construction); and (d) cost consulting services. Architects rarely carry out detailed engineering design work. Similarly, developers/contractors, project managers or general builders conduct little design, except for minor changes for 'buildability', usually approved by consulting engineers. A major project can include dozens or hundreds of companies organized hierarchically. For example the Channel Tunnel had a least four sets of collaborators: (1) the buyer (the UK and French Governments); (2) a consortia of four or five leading contractors; (3) consulting engineering sub-contractors; and (4) a consortium of building companies (Torbett et al., 2001)

According to ADB (2007), procurement of consultancy services is a detailed process. When consultants receive the RFP, and if they can meet the requirements of the ToR, as well as the commercial and contractual conditions, they should make the arrangements necessary to prepare a responsive proposal (for example, visiting the country of the

assignment, seeking associations, collecting documentation, setting up the preparation team). Consultants should also ensure that they submit a thorough proposal fulfilling all requirements in the RFP (ADB, 2007). Once a consultant receives the pre-qualification or request for proposals document, the consultant should study the documents carefully to decide if it can meet the technical, financial and contractual conditions, and if so, proceed to prepare its offer. The consultant should then critically review the documents to see if there is any ambiguity, omission or internal contradiction, or any feature of the terms of reference or other conditions which are unclear or appear discriminatory or restrictive; if so, it should seek clarification from the Client, in writing, within the time period specified in the request for proposals documents for seeking clarifications (ADB, 2000).

2.10. Construction Industry Trends in African Countries: Opportunities and Challenges

There is growing awareness among developing countries about the significance of infrastructure supply and capacity building in construction for socio-economic development, in general, and for the effective implementation of poverty reduction initiatives, in particular. Consequently, developing countries have for some years now been investing about 4 percent of their GDP in the provision of infrastructure (World Bank, 1994). Zawdie & Langford (2000) argue that the fragility of infrastructure in sub-Saharan African countries is largely a product of a systemic deficit in construction capacity, and that capacity building in construction is a major initiative which can pave the way for poverty reduction and sustainable development in sub-Saharan Africa, through the provision of sustainable infrastructure. On many of the large construction projects, international consulting engineering firms are often engaged in project

management, including the tasks of project conceptualization, preparation work prior to contract stage, and supervision of the construction work. Construction capacity development in these countries is an integral aspect of the wider issue of capacity building to be pursued in the context of the objectives of poverty reduction and sustainable development (Zawdie & Langford, 2000). Moreover, indigenous construction companies do not represent a strong source of competition and are thought to lack financial and technical capacity. The African construction sector faces economic and political instability, poor quality of local inputs (including both labor and construction materials), and weak infrastructure (Chen, Goldstein, & Orr, 2009). Sub-Saharan Africa, with the exception of South Africa, lags behind in terms of engineering capacity and research productivity (UNESCO, 2010). Sub-Saharan Africa (SSA) is a vast region, comprising more than 40 countries.

It is also reported that there were an insufficient number of engineers graduating in some countries to fill all the posts that were available. It is also noted that not all those who did graduate could find employment (Matthews et al., 2012).

As discussed previously, physical infrastructure backlog in most of Africa is widely known and acknowledged. Therefore, it was only a matter of time before investors began to realize that the massive infrastructure deficit on the African continent represents a significant and potentially lucrative investment opportunity. The global financial crisis can in part be credited with changing perceptions of Africa as an investment destination. With the United States, Europe, the United Kingdom, Japan and other first world economies falling into recession, and many global markets consequently suffering losses, Africa's positioning changed from risky to a lucrative and relatively safe investment

destination. Seven of the world's ten fastest growing economies are currently located in Africa. In a short space of time, the continent suddenly resembles a massive construction site with real estate markets faring well. By way of illustration, in the first quarter of 2012, the value of prime property in the world's key cities fell by 0.4% while that in Nairobi rose by 24% making it, globally, the strongest performer. This is, however, not just due to perceptions of Africa as a better investment destination compared to the West in light of the global crisis. This performance is underpinned by good governance, institutional reforms and tightened monetary policy which has, amongst other things, kept inflation at bay. By the end of September, 2012, Kenya had recorded 10 consecutive months of dropping inflation rates and, in parallel, a drop in lending rates too. Rapid urbanization, strong current and projected economic growth, a rising middle class, regional integration and strengthened democracy, transparency, accountability and governance in many of Africa's 54 nations are driving opportunities on the continent.

Another notable venture in the continent is the housing market and urbanization. In 2010 Africa had 51 cities with more than a million inhabitants, and only one city – Cairo – with more than 10 million. By 2040, it is expected to have more than 100 cities of more than one million inhabitants and 7 cities of more than 10 million. These pressures are already being felt and in a bid to cope with this rising urbanization, entire new cities are already being developed such as Tatu City in Kenya, the City of Light in Accra and King City in Takoradi, Ghana accommodating 178 000 residents between them and being built at the cost of US$300 million as well as the Greater Port Harcourt City in Nigeria. These new cities are intended to relieve the highly congested metropolises. Moreover, the rise of the African middle class, as a percentage of the population, has been steady – in 1980,

111 million or 26% of the continent's population fell in this category rising to 151.4 million or 27% of the population in 1990 with a further surge to 196 million in 2000 and a dramatic increase to 313 million in 2010, equating to 34.3% of the population (African Development Bank, 2011). Looking at the trends highlighted, construction will continue to drive economic activity on the continent for years to come given the continent's infrastructure needs which are far from being met (Deloitte on Africa, 2012 & 2015).

On the other hand, there are numerous challenges that are stifling the construction industry's growth in the African continent. Public-sector capacity, mismatches between available skills and required skills, globalization/critical global issues, procurement practices and the capacity for sustainable empowerment, access to affordable mortgage/credit and interest rates, poverty, technology, availability of infrastructure, increases in the costs of building materials and bureaucratic statutes and regulations are among the chief challenges (Windapo & Cattell, 2013)**.** In addition, there is common risk in tendering where the difficult construction environment results in tenders that are submitted at less than optimal terms under pressure to chase revenue instead of considering strategically decided long-term growth areas with sustainable margins. Overoptimistic long-term investment assumptions could result in inadequate cash flows to redeem debt, maintain equipment and reinvest in the business. Subsequent agreement of onerous contractual terms after the award of tenders is equally risky. There are also project execution issues reported. The significant public scrutiny of national infrastructure priority projects brings added reputational risk and impact on profitability if projects are not well executed. Furthermore, despite an overall improvement in health

and safety statistics over the last few years, the industry still needs to go further to embed the desired culture. (PWC, 2013).

However, to achieve this and to continue building on this momentum, accelerated infrastructure growth is imperative, specifically infrastructure growth that facilitates manufacturing and intra-African trade. Energy, which is vital to support manufacturing growth, continues to be a key sector in the developing African infrastructure story. But investment and construction activity in transport has also shown growth recently. This reflects the continued economic growth on the continent, as ports and rail provide the backbone for intra-African and global trade, through facilitating the efficient movement of goods and commodities. Africa's rapidly growing middle class continues to drive demand for sustainable social infrastructure. Added to that, growth is being fuelled by continued investment in natural resources and agriculture. Overall, we see the opportunities surpassing the challenges facing our continent. Africa has seen a 46.2% growth in mega project construction value in 2013 and 2014 alone (Deloitte on Africa, 2015).

2.11. Organizational Structure for Various Project Delivery Systems and the Role of Consultants

Delivery methods are organization structures that define a framework of contractual and communication links among project team members. Unlike corporate organization structures that define the main functional and administrative units of a firm, project organization structures define a hierarchy of the key project team members and give the contractual and communication links between them (Uher & Davenport, 2002).

The principal (client) is typically at the head of the organization structure and is contractually linked with one or more key team members. Thomas et al. (2002), continues to explain that project delivery methods are specifically designed organization structures for delivering construction projects within cost and time budgets. They define contractual links among the key project team members and the flow of information within the hierarchical management structure. Methods vary and their nature is determined by the roles played by the project team members, the relationships between them, the timing of events, as well as the formal general conditions of contract used (Uher & Davenport, 2002).

Traditional Management is the most common type of management scheme in the construction industry in Ethiopia. It constitutes of a rather hierarchical relation between the key players in the industry, namely; the client, the consultant/engineer and the contractor. The role of consultants is usually as design and supervision consultants. A consultant is picked (by means of open tendering, short listing etc), who would be responsible to;

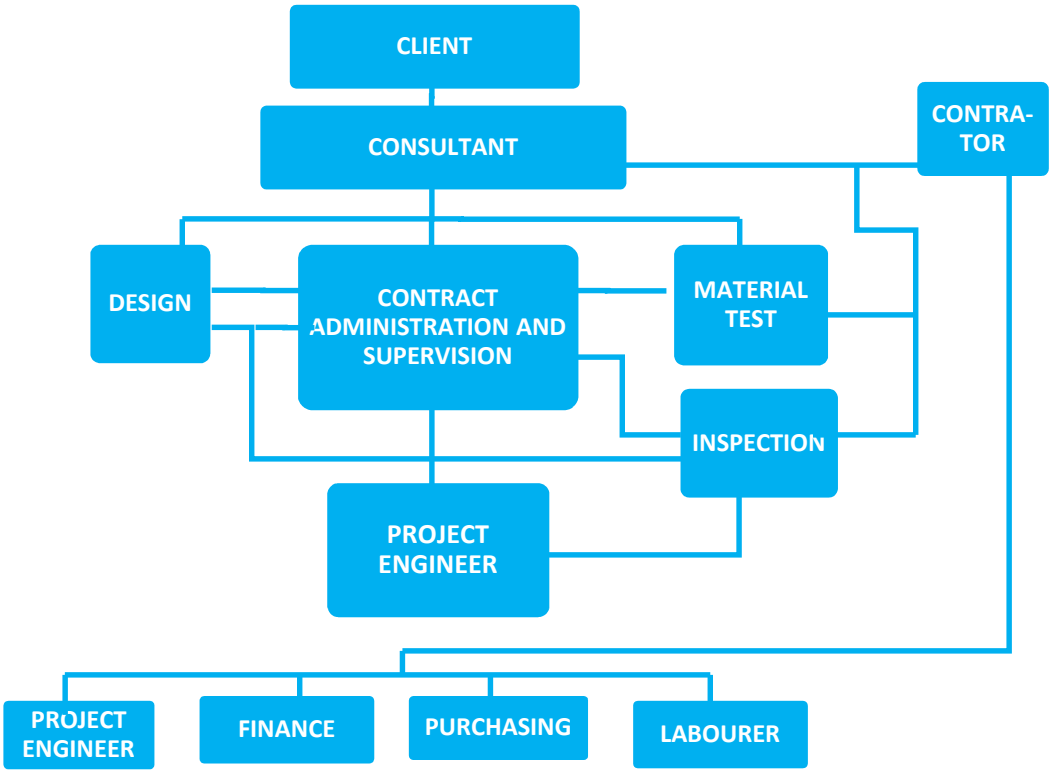
- Provide the design and technical documents (Design);
- Supervise the Contractor's activities (Construction Supervision); and,
- Administer the construction contract (Contract Administration).

Ethiopian Roads Authority (ERA) uses a slightly different approach by hiring two separate consultants for design and supervision, which is commendable as it creates concrete delegation of tasks. But it's also particularly risky to the designing consultant because the supervision consultant can modify or change the design made by the design

consultant – a design review as it is called in the institution – which may lead to rejection of the original design that may have become obsolete due to changing ground conditions, delay, budget or prioritization decisions by the firm which is entirely out of the control of the designing entity.

Most common form of project organization practiced in Ethiopia is the line staff organization; Figure 2.2 below shows the construction organization structure. Different organizations have different levels depending on the magnitude of project and staff available.

Figure 2.2 Project Organization



Source: Uher & Davenport (2002)

The building project management function is best, if performed by specialized professional management or organization. The project management has control over the entire process, co-ordinates it and has authority to make decision on any problems that may arise. Its authority is exercised continuously rather than intermittently. The project management is able to detect and resolve conflicts between quality and cost or between cost and time (Alem, 1999).

2.11.1. Emergence of Alternative Delivery Methods

According to Thomas et al. (2002), the choice of delivery methods was largely limited to three types until the 1960s:

- Traditional (the most commonly used delivery method);
- Design and Construct (establish a single point responsibility for design and construction); and,
- In-house Development (clients who prefer to develop projects by using their own resources).

The architect (or, in the case of civil works, the engineer) was then the undisputed leader of the project team. The principal would seek the architect's professional advice on the feasibility, design, contractual and construction aspects of the project. The architect would normally design and document the project, select the contractor through a tender process and then administer the contract as the principal's superintendent (Uher & Davenport, 2002). But the economic growth followed by the recession in the 1970's in most western countries affected this trend and contributed to the emergence of alternative project delivery methods.

Among the issues that contributed to such changes were:

- Inflation (unstable or investment unfriendly economy);
- Increasing complexity of projects and designs; and,
- Inability of some design consultants to perform as contract administrators amidst contractual conflicts between Contractors and Clients in the early 1970s (Uher & Davenport, 2002).

Alternative delivery methods that emerged throughout the 1970s and the early part of the 1980s are commonly referred to as 'managed' options of project delivery. When they were first introduced, 'managed' delivery methods were expected to provide a quick fix to industry problems. Their structure implied teamwork, which was seen as critical to achieving better project outcomes. However, teamwork often failed to develop because of a highly adversarial industry culture. Where little or no teamwork was realized, 'managed' delivery methods generally failed to improve project outcomes. The full potential of 'managed' delivery methods was realized much later with the introduction of processes such as total quality management and partnering, which helped to develop a new win–win industry culture and create a vehicle for developing teamwork (Uher & Davenport, 2002).

2.11.2. Project Delivery Methods

2.11.2.1. The Traditional Method of Project Delivery

According to (Uher & Davenport, 2002), the principal (client), the design consultant and the contractor are the three main parties that form the structure of the traditional delivery

method. The principal selects the main design consultant to design and document the project. Using a competitive tender process, the principal then selects a contractor and enters into a formal contract (the main contract) with that contractor to build the facility as designed.

In the traditional method of project delivery, the design consultant usually performs two distinct functions: (i) designs and documents the project and (ii) administers the main contract on behalf of the principal or, in other words, becomes a de facto project manager. Without a specialized training in contract administration and project management, however, design consultants cannot administer construction contracts effectively (Uher & Davenport, 2002).

Organizational Structure

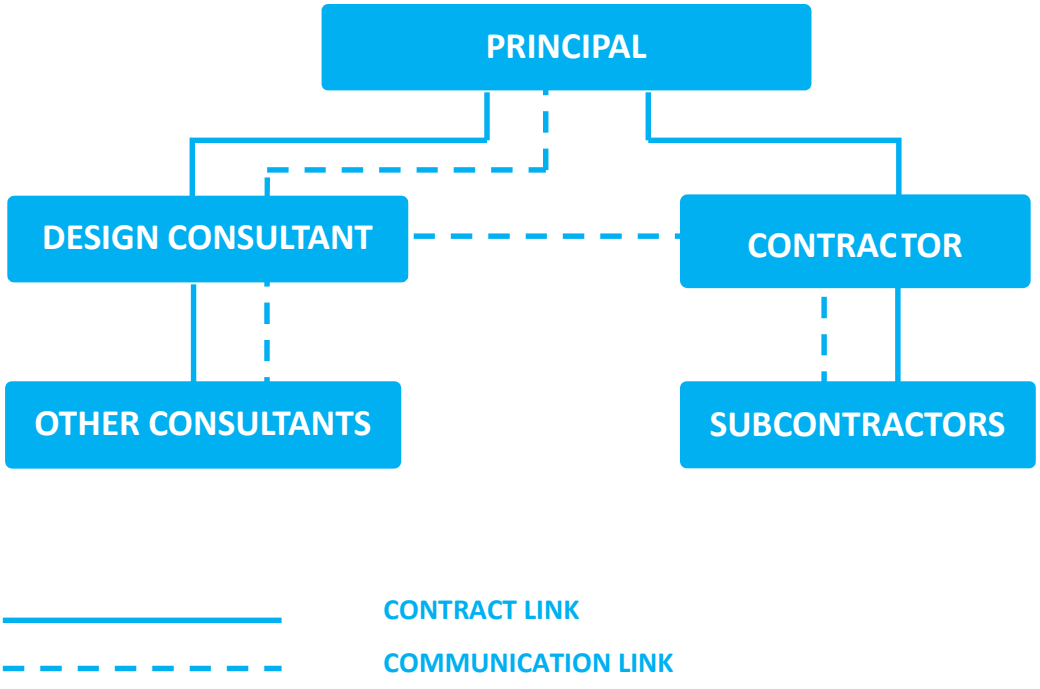
Figure 2.3 shows the hierarchy of the management structure, contractual links formed between project team members and the lines of communication. It is worth noting that the project manager is not involved in the traditional method. But it doesn't mean that the traditional method does not require project management services. These are provided by the principal up till the start of the construction stage, after which the design consultant assumes the responsibility for administering the construction contract. Inexperienced principals may seek advice from specialist consultants such as project managers in conceiving the project and developing the design, but apart from assisting the principal, they are not part of the traditional organization structure (Uher & Davenport, 2002).

The first contract formed is that between the principal and the design consultant. The design consultant is commonly required to design the project, provide estimates of cost,

facilitate production and co-ordination of design documentation, prepare tender documentation, administer the tender process, recommend to the principal selection of the best contractor and any nominated subcontractors, and administer the main contract formed between the principal and the contractor (Uher & Davenport, 2002).

The design consultant acts in an independent role and offers impartial advice to the principal on technical and financial matters as well as on matters concerning the contractor. In addition to producing the best design solution, which requires competence as a designer, the design consultant has to be an efficient manager and coordinator of activities of other members of the design team, such as the structural engineer and specialist designers (Uher & Davenport, 2002).

Figure 2.3 Organizational Structure for the Traditional Method of Project Delivery



Source: Uher & Davenport (2002)

2.11.2.2. Design and Construct (D&C) Method

A design and construct method is also referred to as a package deal or a turnkey method. It gives the contractor the responsibility for both the design and construction. The contractor may be a company with capacity to design and construct or a joint venture comprising a construction contractor and a design firm. Alternatively, the contractor may subcontract the design package to design consultants (Uher & Davenport, 2002).

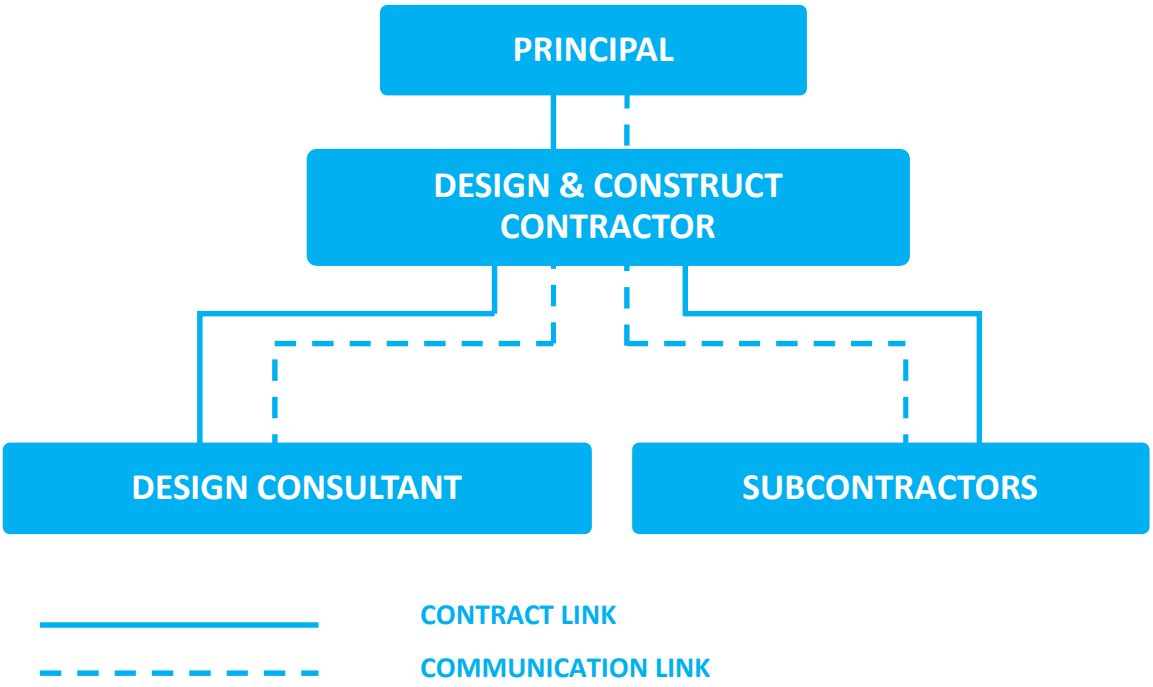
Organizational Structure

The principal's position at the head of the structure makes the principal a de facto project manager as seen in Figure 2.4. If required, the principal may engage services of a specialist consultant (referred to in some conditions of contract as superintendent), to act as the principal's agent in much the same manner as the superintendent's role defined under the traditional method. This approach may, however, extend the lines of communication and isolate the principal from the day-to-day affairs of the project. Considering that D&C projects are expected to be fast-tracked, direct involvement of the principal in the project is essential. Experienced principals have no reason to engage independent superintendents since they have the necessary expertise in-house. Inexperienced principals should consider using the traditional method (Uher & Davenport, 2002).

The D&C project delivery type is very similar to Engineer Procure Construct (EPC) contract. One of the major similarities is that in both types of contracts, there is a single point of service for design as well as construction. Another similarity is that the contractor absorbs more risk in both cases than for example design-bid-build

arrangements. The difference between EPC and D&C projects is that EPC typically has minimal owner involvement and it delivers finished turnkey out puts where as D&C contracts close out with client and construction manager or designer taking an active role in punching out the facility. D&C also provides room for client involvement in design, as well as design details unlike EPC. In EPC, contractors don't provide design details except performance requirements such as output levels, maintenance expense maximums, etc. and carry more risks to the contractor than D&C case (Jordan, 2015).

Figure 2.4 Organizational Structure for the Design & Construct Method of Project Delivery



Source: Uher & Davenport (2002)

2.11.2.3. Construction Management Method

Construction management (CM) is a popular example of 'managed' delivery methods, which are characterized by a more active role for the principal as a member of the project

team. The term 'construction management' may be interpreted differently by different people and has been used loosely to describe a variety of methods of project delivery. But no matter in what form it is used, it implies a team approach. It attempts to unite a three party team of principal, design consultant and construction manager into a non-adversarial, cohesive contractual relationship, all with a common goal to serve the project's objectives and the principal's needs in the best possible way. The construction team members ideally work together from the inception to the completion of the project. The project lifecycle stages are treated as integrated tasks within a construction system. The interaction of construction cost, quality and completion schedules is the prime task of the project team in order to give maximum value to the principal in the most economical time-frame. Fast-tracking is an integral feature of CM (Uher & Davenport, 2002).

Construction management as a method of project delivery can take many forms. CM methods of project delivery can be grouped into 'Agency CM' and 'Non-agency CM' depending on the role performed by the construction manager.

A.) Agency CM Method

The principal selects a design consultant to design a project, and a construction manager to manage construction. A construction manager can be a contractor, design consultant or any other consultant. The key requirement in appointing a construction manager is the knowledge and experience that person has of managing construction. In 'agency construction management' the construction manager operates as the principal's agent in managing construction. The construction manager's main tasks are to manage the

construction stage and coordinate activities of subcontractors or separate contractors. The construction manager has no contract to build (Uher & Davenport, 2002).

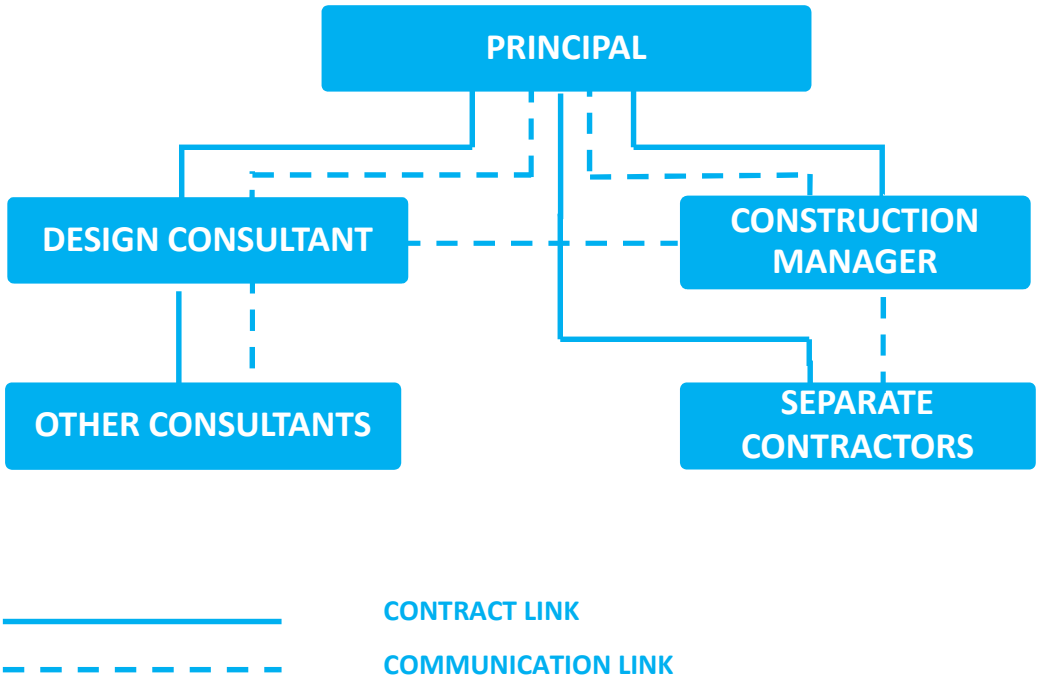
Organization structure of an agency CM method

Figure 2.5 shows the three main team members, namely the principal, design consultant and construction manager, and a series of contract and communication links between various team members. It is worth noting that separate contractors (the trade contractors) are contracted directly to the principal, with the construction manager being responsible for coordination and administration of those contracts. Another important feature of the agency CM method is direct interaction between the design consultant and the construction manager, highlighted by a communication link on the organization chart (Uher & Davenport, 2002).

The principal engages the main design consultant early in the conceptual stage to assist in defining the project scope and formulating the brief. Subsequently, the main design consultant will proceed to design and document the facility. Apart from implementing changes to the design and documentation as required during the construction stage, the main design consultant has no further responsibilities. The responsibility for packaging of work, tendering, letting of contracts to separate contractors and administering those contracts lies with the construction manager. Depending on the extent of work and the degree of risk, the design consultant may be engaged on a lump-sum or a percentage fee contract. As is the case with the traditional method of project delivery, the main design consultant contracts with required specialist design consultant and assumes the

responsibility for co-ordination and integration of all design and documentation activities (Uher & Davenport, 2002).

Figure 2.5 Organizational Structure for the Agency Construction Management Method of Project Delivery



Source: Uher & Davenport (2002)

B.) Non-agency CM Method

The most significant difference between non-agency CM and agency CM methods is in the role performed by the construction manager in relation to construction. Until the start of the construction stage, the construction manager undertakes much the same tasks under a non-agency arrangement as under an agency arrangement. However, under the non-agency arrangement, the construction manager's role changes in the construction

stage to that of a contractor. The agency CM contracts to manage. The non-agency CM contracts to manage and construct (Uher & Davenport, 2002).

While fast-tracking is an important feature of both the agency CM and non-agency CM methods of project delivery, in a non-agency arrangement the design and construction will not be divided into trade packages (separate contracts with the principal) as they will in an agency CM arrangement. Instead, subcontracts will be let to subcontractors on a competitive basis with the construction manager assuming the role of a sole contractor (Uher & Davenport, 2002).

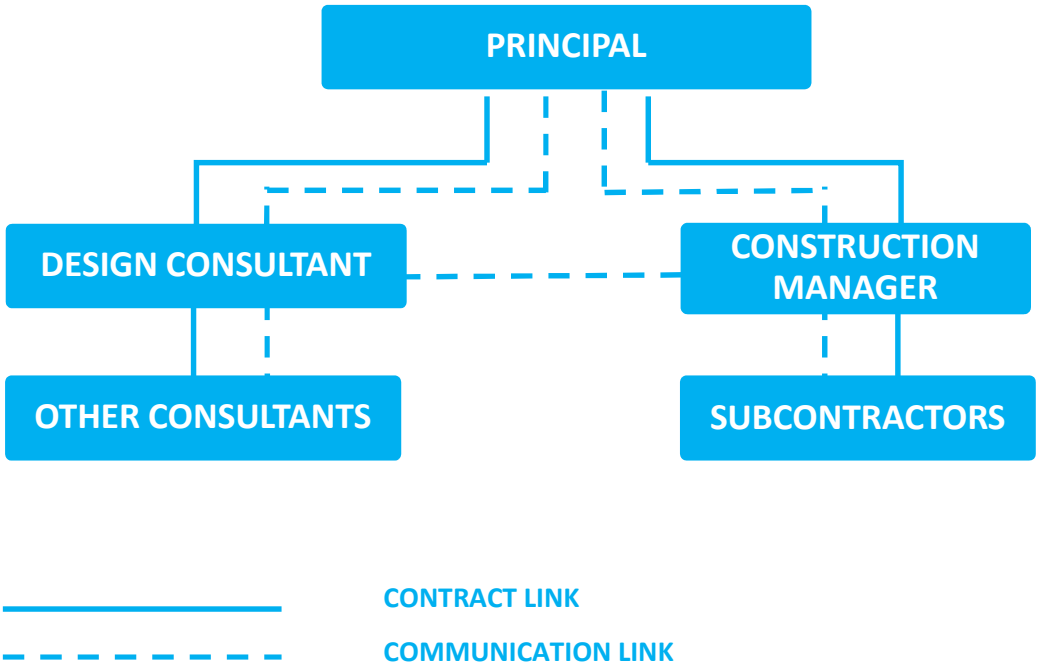
Organization Structure

- The principal has no direct contracts with subcontractors.
- Subcontractors are now contracted to the construction manager.

The principal's intention of using the construction manager as a contractor while maintaining the construction manager's involvement on a project team is clearly apparent in the figure 2.6 below.

The principal may engage the construction manager either by tender or by negotiation. The appointment will be made early in the project's lifecycle if the project is to benefit from the construction manager's input into design buildability. Using competitive tendering, the construction manager will then progressively select subcontractors as the design documentation becomes available and will enter into subcontract agreements. In the construction stage the main role of the construction manager will be to construct the facility through the work of subcontractors (Uher & Davenport, 2002).

Figure 2.6 Organizational Structure for the Non-Agency Construction Management Method of Project Delivery



Source: Uher & Davenport (2002)

2.11.2.4. Project Management Method

The project management delivery method is a unique organization structure with the project manager as a leader of the team. In order to successfully deliver the project, the project manager will apply the concept of project management throughout its lifecycle. The principal appoints and empowers the project manager to represent the principal's interests as the leader of a project team and to bring a businesslike approach into the co-ordination and management of a diverse range of skills and organizations in producing a facility (Uher & Davenport, 2002).

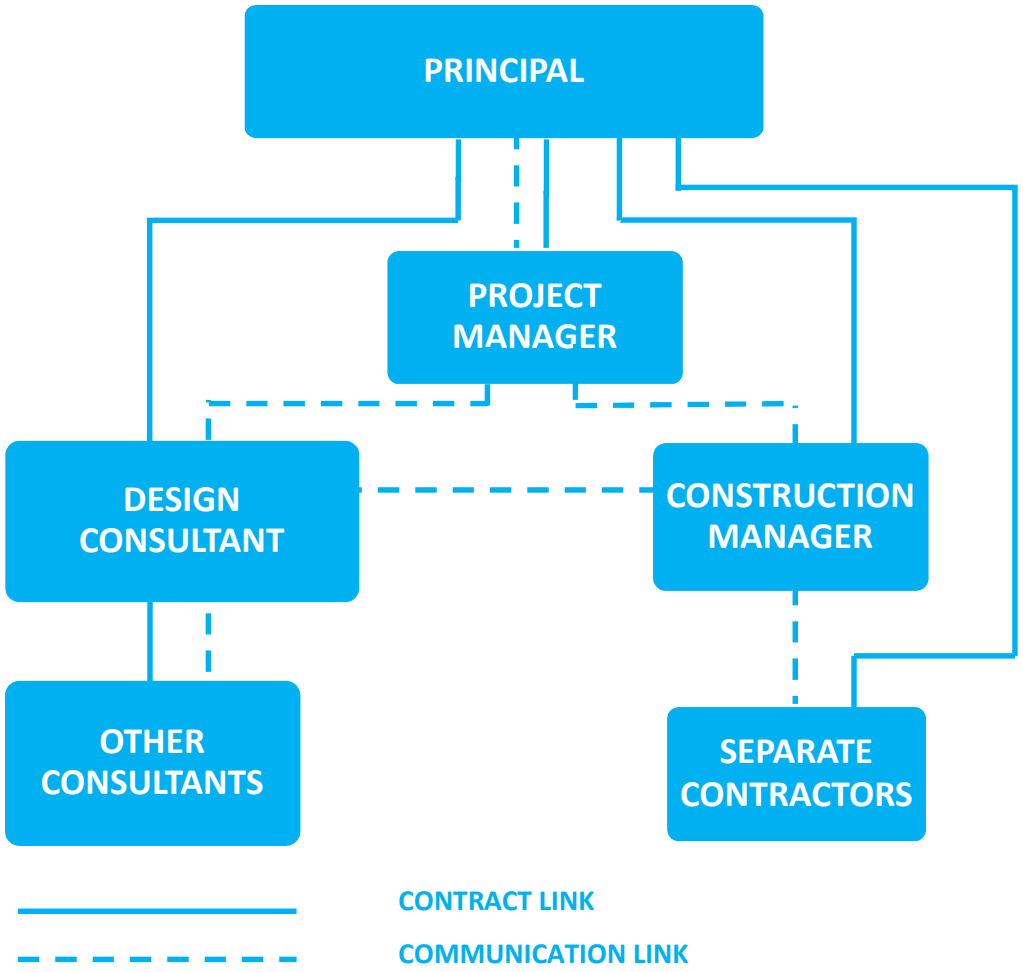
Since the project manager assumes responsibility for the entire project lifecycle, it follows that the principal will need to appoint the project manager early in the life of the project, usually at the start of the conceptual stage. The project team, lead by the project manager, comprises the design consultant, construction manager and other relevant consultants. The principal is also a member of the project team but is fully represented by the project manager in day-to-day decision making. Apart from being an effective team leader and motivator, the project manager is responsible for the development of a strategic plan, organization of the necessary resources both human and physical, co-ordination and integration of activities at each stage of the project's lifecycle, and control of the entire process (Uher & Davenport, 2002).

Organization Structure

In the PM structure shown in Figure 2.7, the project manager is the principal's representative and the team leader. The project manager has no contracts with any other team member. While the principal empowers the project manager to lead the team and be the main day-to-day decision-maker, the principal assumes the responsibility for contracts with the other team members (Uher & Davenport, 2002).

The project manager is the principal's agent and is required to act in the principal's best interest. The principal will engage the project manager in the early part of the conceptual stage to assist in defining the project scope, feasibility, strategic planning and briefing. The project manager will make recommendations to the principal on the selection of the design consultant and the construction manager (Uher & Davenport, 2002).

Figure 2.7 Organizational Structure for the Project Management Method of Project Delivery



Source: Uher & Davenport (2002)

From the beginning of the design stage, the project manager will work closely with the design consultant and the construction manager on developing the design, agreeing on work packages, co-coordinating and integrating the production of documentation, arranging for competitive tendering, awarding contracts to separate contractors and managing construction activities. Because of the principal's involvement on the management team, the principal shares a large portion of the total risk. The principal

expects that some of this risk will be minimized by the application of effective and efficient management practices applied through teamwork (Uher & Davenport, 2002).

2.11.2.5. Private Funding Initiative

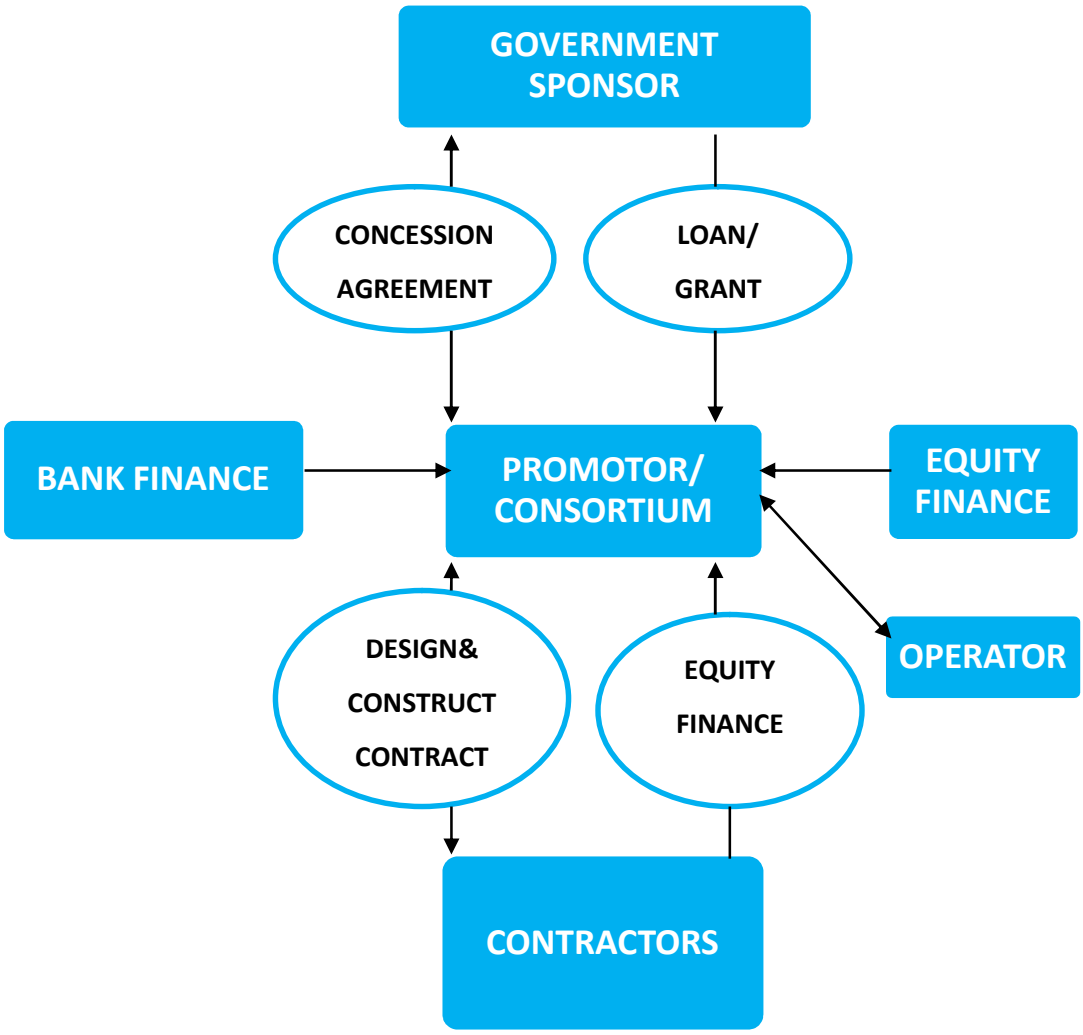
The arrangement in concessional methods is that the contractor or a consortium of the contractor and another party (the operator), commonly known as 'promoter', will contract to build the project, for example a toll road, a bridge, a prison or a water treatment plant, operate the project either under a lease (BOT) or as an owner (BOOT), and at the end of a concession period, say 20 to 40 years, transfer the project to the principal. Under BOOT, the promoter has ownership of the facility and may, if agreed to, use the facility to conduct a related business such as the operation of service stations and food outlets on a toll road (Uher & Davenport, 2002).

Organization structure of a concessional method

As shown in Figure 2.8, the government agency is the principal who initiates the project, negotiates a financial deal with the project consortium or promoter and grants the concession to the promoter. The government agency assumes the responsibility for some of the project risk, particularly the financial risk, since the government agency commonly provides loans and a guarantee of the promoter's or operator's revenue.

The government agency also assumes the political risk (e.g. due to a strong opposition to the project), the economic risk associated with inflation and exchange rate fluctuation, and the maintenance risk related to the cost of maintenance after the end of the concession period (Uher & Davenport, 2002).

Figure 2.8 Organizational Structure for the BOT Method of Project Delivery



Source: Uher & Davenport (2002)

Promoter/consortium - the party who develops a proposal, secures funding, builds the facility and operates it for the period of the concession. The promoter assumes most of the risk of the project.

Contractors - The promoter enters into a D&C contract with a contractor or a number of contractors to design and build the facility. A typical requirement is for contractors to

bring a specified amount of equity into the project. Contractors thus assume the responsibility for a portion of the financial risk. Contractors also assume the responsibility for the design and construction risks.

Operator - The promoter may operate and maintain the facility upon its completion or may enter into a long-term contract with another organization to operate and maintain it for a period of its concession. The operator assumes the risk of accidental damage, equipment failure, vandalism and maintenance. The decline in the level of revenue is another risk for the operator (Uher & Davenport, 2002).

2.11.3. The Different Types of Project Delivery and Their Performance

The direct comparison of different delivery methods is clearly difficult as projects are fundamentally different from each other and are exposed to different levels of risk. Although limited in numbers, research consistently points to the excessive cost and time overruns of projects delivered under the traditional method (Uher & Davenport, 2002).

Non-traditional methods of project delivery have emerged to establish a more effective and efficient contractual framework for better control of the key objectives of cost, time and quality (Uher & Davenport, 2002). Case in point would be managed methods which have enabled design consultants to do what they do best which is design and hence transferred managerial aspects of projects to either the project or construction managers whose level of expertise in management is far better.

This is also a sentiment that is generally agreed upon, at least, in theory by professionals and scholars in the Ethiopian construction sector. The traditional method of project

delivery seems to have negative effects on project goals and output. Therefore, managed project delivery methods are highly favorable, leaving the selection of any particular type to the type and complexity of projects.

2.12. Selection of Consultants

The success of any project depends upon obtaining the most suitable engineering expertise. Selection of the most qualified firm for a specific project will result in a well-planned and designed, economical and successful project. Selecting a consulting engineer is, therefore, one of the most important decisions a client makes. A successful project is one which meets the requirements of the client at the lowest sustainable project lifecycle cost. At roughly 1 to 2 percent of total costs, the cost of engineering is a relatively small percentage. However, the role of the engineer is pivotal in meeting the client's objectives because it is during the design process that construction, operations and maintenance cost savings are most easily achieved. Selecting engineering services for the apparent least cost is often false economy, and can be a disservice to the project and the Client (CEBC & APEGBC, 2009).

CEBC and APEGBC recommend a Qualifications-Based Selection (QBS) process for selecting the most competent and qualified consultant for a specific project. When the consultant with the best understanding of the project and best qualifications to implement it is appointed, their role becomes one of a "trusted advisor", who shares their client's priorities and interest in achieving the best outcomes for the project.

The African Development Bank (ADB) stipulates three principal types of selection procedures which shall be applied according to the type of service required. They are:

a) Selection procedure **based solely on technical quality**, that is to say, the evaluation of the firm's competence, the staff seconded to the assignment and the technical value of the proposal; for assignments of a complex technical nature and those with risks likely to have a negative impact on the final project.

b) Selection procedure **based on technical quality with price consideration**; this is applicable to assignments of variable complexity.

c) Finally, selection procedure which establishes the comparability of **technical proposals and the services and makes a selection on the basis of the lowest price**. This is applicable to assignments of a technical nature.

Although the last two methods of selection seem identical, there is a difference between them. The second one (b) is used for technical offers of an incomparable or varying nature and complexity while the third (c) requires technically comparable offers before picking the lowest eligible offer.

The desirability of these selection methods depends on the project type and complexity, etc. The extent to which price may be used as a selection factor depends, therefore, on the technical complexity of the assignment, its impact on the final product and the comparability of consultants' proposals. As the complexity of the assignments and the impact of the final product increase, the proposals become less comparable and price as a factor should have less effect on the selection (ADB, 2000, 2007).

2.13. Pre-Qualification of Consultants

The concept of pre-qualification in construction aims to assist the employer to make an informed decision. The suppliers are filtered through an evaluation system with various focus points. Such procurement specifications and pre-qualification questionnaires are usually comprehensive evaluation documents that are available for employers in the construction industry. They set out the content, format and set of questions that are widely applicable to prequalification for tendering in construction. To be eligible for prequalification, it is necessary that suppliers demonstrate that they possess or have access to the governance, qualifications and references, expertise, competence, health and safety/environmental/financial and other essential capabilities to the extent necessary for them to be considered appropriate to undertake work and deliver services for buyers. The use of these sets of common criteria by those who undertake prequalification activity or provide prequalification services will help to streamline tendering and procurement processes by facilitating the identification of suitably qualified and experienced suppliers.

The consistent use of prequalification activities would not only significantly reduce the resources invested by suppliers but would also enable assessors and procurement officers to more reliably source suppliers solely on the basis of the level of assurance they provide. The benefit of such prequalification specifications to buyers can include considerable saving in time and money, and that more suppliers (notably SME's) can be encouraged to take part, giving wider choice to clients. They indicate what is to be asked in prequalification processes for construction-related procurement and aim to underpin widely accepted good practice in the construction sector (BSI, 2013). Figure 2.9 below indicates the main areas of focus in prequalification in construction according to BS.

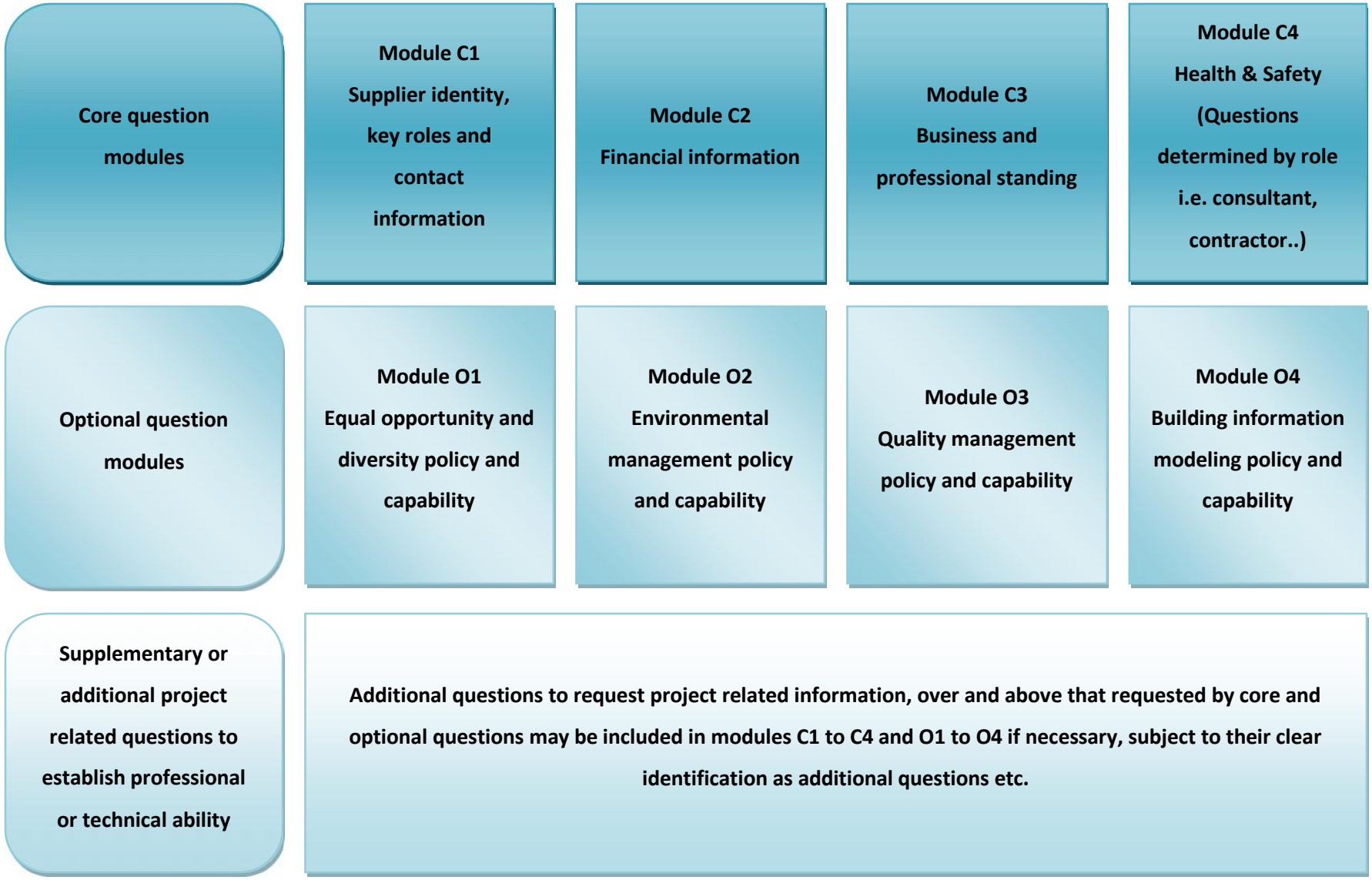


Figure 2.9 Compliance Prequalification [Source: BSI, (2013)]

In the BS specification, the criteria used to assess supplier responses is derived solely from the information required from suppliers in their response to questions from the question modules and any supplementary questions that may be asked. This shall include responses obtained from referees nominated by suppliers. Buyers or assessment providers applying prequalification measures should incorporate transparency to their prequalification processes and shall inform suppliers of any weighting or ranking given to the assessment criteria to be applied, prior to their responding to the questions.

Questions on the core module C1 include name of legal entity, registered office address, contact details, company registration number, VAT registration number, name of immediate and ultimate parent company (where applicable), type of organization (Plc., limited company, sole-traders, other partnership etc.) Module C2 requires information on financial status and copy of recent accounts, bank statements, forecast of turnover for the current year as well as insurance statements along with policy number, limit of indemnity, excess and expiry. Such sensitive information is to be held at the discretion of the employer who should also avoid insisting on requirements which may not be relevant to the procurement. Module C3 inquires about legal and professional issues which include involvement of company and senior officials in civil or criminal cases, settlement and status of current, past and pending claims and involvement in any violation of policies in recent years. Module C4 includes questions about the company's health and safety measure and initiative, the availability of advice or assistance in construction health and safety, the availability of policy and training programs, the ability and expertise of staff to implement such policy, review and performance evaluation to

improve health and safety requirements, routine records of accidents and follow up actions by suppliers, risk assessment and reliable project delivery, the recognition of legal as well as employee health and safety obligations. Questions in this module are dependent on roles of the supplier.

Optional modules may include questions on equality, diversity and the fairness of company affairs, environmental management performance, quality management policy as well as other relevant policies. Moreover, the supplementary module may include questions relating to the technical ability of suppliers to provide the services in the project, involvement in similar projects etc.

Such prequalification measures are used to short list interested suppliers including consultants. The client would benefit due to increased assurance of technical and other capabilities by the shortlisted companies. It can also guide the client in the procurement process. Competent suppliers will benefit from reduced unnecessary competition due to the preliminary vetting. On the other hand, it will encourage less qualified suppliers to improve their services and capabilities (BSI, 2013). There are numerous unique and customized versions of qualification questionnaires used by employers to procure consultancy services worldwide (see Appendix 7).

2.14. Professional Liability of Consultants

ADB (2007) states that consultants are expected to carry out their assignment with due diligence, and in accordance with prevailing standards of the profession. As consultants' liability to the client will be governed by the applicable law, the contract need not deal with this matter, unless the parties wish to limit this liability. If they do so, they should

ensure that: (a) there must be no such limitation in case of the consultant's gross negligence, or willful misconduct; (b) the consultant's liability to the client may in no case be limited to less than a multiplier of the total value of the contract, to be indicated in the RFP, and in the special conditions of contract (the amount of such limitation will depend on each specific case); and (c) any such limitation may deal only with the consultant's liability toward the client, and not with the consultant's liability toward third parties (ADB, 2007).

APEGBC incorporates bylaws that professional engineers are required to follow. It recommends that consulting engineers carry professional liability insurance. Should a client require the consulting engineer to carry additional coverage, this would be at the client's cost, as a disbursement. Alternatively, the client may carry a single project-specific professional liability policy (CEBC & APEGBC, 2009).

The concept of professional indemnity insurance to cover consulting risks or design errors is not widely known nor is it implemented in Ethiopia. There needs to be a professional indemnity coverage regulation, for both local and international firms participating in the Ethiopian construction industry to cover consultancy risks or design error. Otherwise it will encourages consultants to transfer the costs related to calims involving design or contract adminstration errors to the client (Abebe & Girmay, 2003).

When it comes to bid and performance securities, ADB (2007) does not recommended it for consultants' services because their enforcement is often subject to judgment calls, they can be easily abused, and they tend to increase the costs to the consulting industry (without evident benefits), which are eventually passed on to the client.

Consulting engineers and consultant practices are recognized in law as a professional entity upon licensing. That implies responsibilities, obligations and liabilities. It entails benefits as well as obligations between parties to an agreement. The fundamental roles and responsibilities of consultants include safety, health and welfare of the public, acting as a faithful agent or trustee of the client, avoiding deceptive acts in solicitation of employment, and being objective and truthful in public statements. This is the duty of care expected from consultants in the dispensation of their professional services. These liabilities emanate from the common law of the country, acts in the building industry like environmental etc, employment laws, registration regulations, codes of professional conducts, local regulations, technical standards, conditions of contract etc. Misconstruction, misuse, design flaws, miscalculation, lack of proper supervision during construction and any violation of responsibilities could result in a civil action and penalties by building acts and the by-laws incorporated (Majid, 2009).

As Majid (2009) explains, the consultant owes a duty of care to the public (common law) and the client (contract law). In addition, non-registered engineers who practice engineering will be subject to Torts (common law) of the country. A consulting party is also liable even in the absence of a written contract or appointment (contract law) once professional service(s) is rendered. Duty of care is the obligation that a person pursuing a common calling (skilled craftsman, tradesman or professional) is liable in damage for failure to exercise that skill which is normally expected from a person pursuing that calling. Therefore, consulting engineers are required to be proficient in engineering practices, technical standards, code of conduct and regulations and be current in terms of new trends.

Upon failure to discharge their roles and responsibilities, consultants can expect complaints from individuals and members of the public, NGOs, local authorities, government organizations, clients, fellow engineers, contractors, and professional associations. Most common complaints are administrative (not renewing registrations), violation of building acts (unfair competition etc), and negligence cases (design flaws). Statutory bodies and professional associations should step up and act against consultants not working with due care and diligence and exhibiting failure to fulfill responsibilities.

Although it seems like the client is the sole customer of the consultant, the client is merely one customer. When considering risk, a customer is anyone who has rights from the consultant services and their results i.e. the public. There are liabilities from civil law (duty of care to the public), registration/acts (breach of registration/ethics), breach of regulations, and breach of contract laws (fiduciary interests and duty of care to the client).

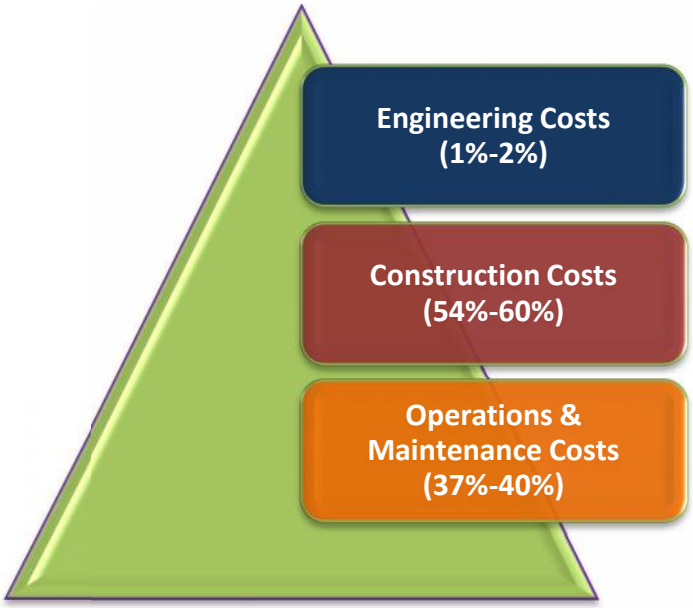
Due to these liabilities, consultancy is a risky business. Competent consultants reduce such risks by judiciously applying design codes and building regulations. They are helpful in deciding acceptable risk levels and tend to express the general judgment or assessments of experienced engineers. Using proper judgment in assessing pertinent conditions is a valuable skill. The other means of reducing risks is to use up-to-date technology as the concept of acceptable risk is time dependent. Engineers are obliged to keep up with technological knowledge and not be by-passed by improved methods and materials in construction. In addition, staying within firms' area of competence is important, even though there is a great temptation to offer all sorts of services in order to make money. A professional consultant knows its limits and seeks expert advice. Lastly,

maintaining good project records and an open communication culture is of paramount importance (Majid, 2009).

2.15. Consultancy Fees

According to CEBC & APEGBC, establishing fee budgets is highly specific to a project, site, time and circumstances. The nature of the individual project determines the scope of the required services and the necessary form of agreement. The method of remuneration selected depends largely on the stage of the project, its complexity, and how well it is defined. Figure 2.10 shows the estimated proportion of life cycle costs of construction projects. The percentages are representative in developed countries but in developing countries like Ethiopia, various studies have shown that construction costs are highly inflated while consultancy fees commonly range between 1.0% and 2.3%, which is extremely low considering the significance of services rendered by consultants.

Figure 2.10 End of Project Lifecycle Costs



Source: CEBC & APEGBC, (2009); Hrvoje & Sasa (2012)

2.15.1. Time Basis

This payment method is recommend when the scope of engineering services is difficult to determine, impossible to determine, not well defined, or when the consultant is not in total control of the required time and disbursements at any stage of the project.

2.15.2. Percentage of Cost of Construction

This payment approach is suitable for engineering services where the cost of the consulting engineering service is a function of the construction or installation costs, and where the project scope and construction or installation budgets are well defined.

2.15.3. Fixed Fee or Lump Sum Payment

Fixed Fee is suitable if the scope and schedule of the project are sufficiently defined to allow the consulting engineer to accurately estimate the effort required. This method provides cost certainty for clients, and encourages innovation and efficiency by the consultant (CEBC & APEGBC, 2009). To adjust the remuneration for foreign and/or local inflation, a price adjustment provision shall be included in the contract if its duration is expected to exceed 18 months. Contracts of shorter duration may include a provision for price adjustment, when local and/or foreign inflation is expected to be high and unpredictable (ADB, 2007).

2.16. Consequences of Consultants' Negligence of Contractual and Professional Duties

As explained in the previous sections, supervision and management of projects in the country is usually the dual role of the design consultant and hence in many instances project management/contract administration is part of the consultancy package.

According to various literatures and anecdotal findings, consultants' negligence of contractual roles and the potential problems it can cause include delay, cost overrun, loss of use etc. There is also a problem regarding accountability and liability because contractors are usually blamed for problems that arise in the industry without necessary investigations. The Civil Code of Ethiopia for example holds a contractor liable for any problems that arise with a building project for 10 years, while the designer and/or supervisor isn't expressly liable. Article 3039 sub articles (1) and (2) state that '*….the contractor shall guarantee during ten years from its delivery the proper execution and the solidity of the work done by him. He shall be liable during this period for such loss or deterioration of the work as is due to a defect in its execution'* (Civil Code of the Empire of Ethiopia, 1960). There is an apparent double standard in the industry that favors consultants. Additionally, according to Vee & Skitmore (2003), when consultants are incompetent, there may be breach of confidentiality agreement, they may not keep the clients' best interests while dealing with sub-consultants, lack of professional ethics (being involved in corrupt practices) & undermined quality of works among others.

Consultants' failure to enforce regulations and supervise construction works properly may lead to negligence of contractors' failures to perform contractually in terms of health and safety provisions, personal protective equipment (PPE) and construction material storage and handling etc.

Moreover, consultants' staff not being available on construction sites is a common yet significant problem. Engineer's representatives or resident engineers are rarely available on site. Intermittent supervision is a common practice on many sites. The statutory bodies

and conditions of contract seem to give the notion that the consultant is held to less stringent requirements as compared to the contractor. For example, MoWUD condition of contracts states on Clause 38 that '*…the contractor should inform the Engineer's representative when works which will be covered up or concealed are to be done so that he/she can observe the work and supervise.*' But it is the duty of the engineer's representative to closely attend to the project and be available to supervise works.

2.17. Project Management and Construction Consultancy

The most common type of client-consultant relationship in Ethiopia is the traditional one where a single consultant designs, supervises and administers construction contracts. But the most important tasks of a managing/supervising consultant and a separate design consultant still boil down to the three aforementioned tasks. Therefore, project management and contract administration become an essential part of the construction project delivery process.

A project is "a temporary endeavor undertaken to produce a unique product, service or result". It has also been defined as *"a problem scheduled for solution"* (Heagney, 2012). It can be understood from the above definitions that a project is time bound (scheduled) and that it needs a deliverable or output at the end of the allocated time. Project Management (PM), therefore, is a discipline that integrates and manages the various aspects of a project. Project management or construction management may thus be defined as the planning, executing and controlling of construction projects to optimize three major pillars of quality, schedule and cost (Abebe, 2003). It is 'application of knowledge, skills, tools, and techniques to project activities to meet the project

requirements. Project management is accomplished through the application and integration of five process groups: initiating, planning, executing, monitoring and controlling, and closing" (Heagney, 2012).

Heagney (2012) estimates that construction projects have about 30% rework. With all the planning and scheduling, unforeseen circumstances may shake up the initial goals of a project. The absence of proper planning, execution and controlling of projects makes them much more vulnerable to disruption. Construction projects are said to be a bit more problematic to manage than other projects because of the special characteristics like their unique nature and involvement of various parties and a large workforce. The function of construction project management is therefore to predict as many of the risk and problems as possible and to plan, organize and control activities so that the project is completed successfully. The performance of these projects against what was planned can be measured and evaluated using a large number of performance indicators that could be related to various dimensions (groups) such as time, cost, quality, client satisfaction, business performance, health and safety requirements etc. The application of sound project management practices provides construction project stakeholders with the means to meet their objectives. The success of a project is measured by the extent to which it meets the predetermined criteria of cost, time, safety, resource allocation, and quality as determined by the owner which are quite difficult to meet in most construction projects. (Ayalew, Dakhli, & Lafhaj, 2016).

Kerzner (2009) states that in the past two decades or so, project success was defined as the completion of an activity within the constraints of time, cost, and performance. Today, the definition of project success has been modified to include completion:

- With acceptance by the customer/user;
- With minimum or mutually agreed upon scope changes;
- Without disturbing the main work flow of the organization; and,
- Without changing the corporate culture (Kerzner, 2009).

The last three elements require further explanation. Very few projects are completed within the original scope of the project. Scope changes are inevitable and have the potential to destroy not only the morale on a project, but also the entire project. Scope changes must be held to a minimum and those that are required must be approved by both the project manager and the customer/user. But in recent years, scope creep is beginning to be seen as a new business opportunity for the contractor. Project managers must be willing to manage (and make concessions/trade-offs, if necessary) such that the company's main work flow is not altered. Most project managers view themselves as self-employed entrepreneurs after project go-ahead, and would like to split their project from the operations of the parent organization.

This is not always possible. The project manager must be willing to manage within the guidelines, policies, procedures, rules, and directives of the parent organization. All corporations have corporate cultures, and even though each project may be inherently different, the project manager should not expect his assigned personnel to deviate from cultural norms. If the company has a cultural standard of openness and honesty when dealing with customers, then this cultural value should remain in place for all projects, regardless of who the customer/user is, or how strong the project manager's desire for success is.

Finally, it should be noted that simply because a project is a success does not mean that the company as a whole is successful in its project management endeavors. Excellence in project management is defined as a continuous stream of successfully managed projects. Any project can be driven to success through formal authority and strong executive meddling. But in order for a continuous stream of successful projects to occur, there must be a strong corporate commitment to project management, and this commitment must be visible (Kerzner, 2009). A project failure is where all the set boundaries like schedule, cost, scope etc are surpassed.

2.18. Professional Jealousy and Antagonism in the Industry

Construction/Engineering is a team-work profession that requires stakeholders' cooperation to achieve project objectives in an effective and efficient manner. But this is often hampered by the underlying unhealthy competition and adversity seen among some parties of the industry. As Thomas et al. (2002) explains, the coordination of activities of all the parties forming the construction team has always been difficult, because of a lack of co-operation, varying levels of proficiency displayed by individual parties, the deeply entrenched antagonism between some groups, or professional jealousy. Ideally, teamwork should be based on the mutual respect, co-operation and pulling in the same direction in order to achieve the desired objectives (Uher & Davenport, 2002).

There exists a great separation between design consultants and contractors. This generates conflict in the construction process and results in project delays and cost escalations due to claims. It is important that methods for conflict mitigation are developed for the industry. In addition, some consultant teams have contributed

inadvertently towards the deterioration of an amicable atmosphere between the client and the contractor. Unnecessarily strict contract adminstration contributes toward a hostile environment whereby the contractor has no desire to settle issues amicably but prefer arbitration instead. Selecting competent consulting firms with a track record of good project management skills is essential. The emphasis on selecting consultants based on least cost needs to be reviewed carefully. This will allow the involvment of less competent consultants, which may increase the incidence of claims in the project. Creating partnerships between all parties of a contract is important in avoiding adversarial approaches (Abebe & Girmay, 2003). Also parties to the contract need to understand they are all in the same team and are working towards the same goal.

2.19. Knowledge Management in Construction Consultancy

Gurteen (1998) defined Knowledge Management (KM) as "an emerging set of organizational design and operational principles, processes, organizational structures, applications and technologies that helps knowledge employees dramatically leverage their creativity and ability to deliver business value". It is the systematic process of acquiring, organizing, and communicating (knowledge sharing) knowledge (both tacit and explicit) of organizational members so that others may make use of it to be more effective and productive. Within the construction context, the KM process has been perceived as the combination of a series of activities for identifying, capturing, sharing and using knowledge. KM is a widely accepted success factor for organizations dealing with complex tasks. One of the major challenges for organizations is to manage knowledge assets for the purpose of gaining competitive advantage in every sector of industry including the construction sector.

The KM framework has four levels of organizational knowledge retention. The level one is when the knowledge is shared amongst the organization employees. The second level is when the shared knowledge is documented (transferred from tacit to explicit). The third level is when the documented knowledge is stored, and the fourth level is when the stored knowledge is accessible, can be retrieved and used easily. The major drivers for successful knowledge management and retention are prevalence of a culture of sharing knowledge, reward and recognition for sharing knowledge, a technology platform that can accommodate multi formats of files, awareness of knowledge retention systems and their benefits among employees, and top management support. Incentives, motivation, leadership, and creation of appropriate platforms and infrastructures create conducive environment for knowledge retention (Arif, Khalfan, Barnard, & Heller, 2012). The platforms may take the form of weekly presentations, architectural meetings which explore innovative ideas, discussion among peers and colleagues about contemporary ideas and industry trends. Incentives may include scholarships, promotions or prizes. Such kind of KM cultures cultivate the rejuvenation of knowledge and encourage active team players and motivated engineers who will come up with renewed and sustainable ways of solving societal problems.

2.20. Engineering Codes of Ethics and Professional Codes of Conduct

Civil engineers hold a privileged position within society, with a unique responsibility for public health, safety and welfare. Engineers and their work are governed by codes of ethics and ethical principles. Professional societies and licensing boards are among the sources that provide coded of ethics (Delatte, 2017). To be ethical and professional are terms that are synonymous with being an engineer. Unlike most science, the work of

engineers frequently directly affects public safety and health and can influence business and even politics. The engineering profession in some countries is self-regulated, which means that it is governed by its own association of engineers. In order to join this association, engineers who apply are screened for competence, first by examining if their degree in engineering comes from an accredited program (or equivalent); if not, applicants are required to pass a number of technical exams. All applicants must complete an exam on ethical principles; and some associations require the passing of an exam on Contract Law principles. Examples of this type of regulation exist in North America (Canada and the United States). In other regions, the profession is regulated by the government, as in some countries in Europe (France and Sweden for example) (UNESCO, 2010).

For the building and designing professions, the incalculable value of human life demands nothing less than the highest moral considerations. An important aspect of ethics in the construction industry is “personal ethics” - often interpreted by construction professionals as just treating others with the same degree of honesty that they would like to be treated. It has been suggested, however, that professionals in general tend to believe that their obligations to their client far outweigh their responsibility to others, such as the public. There also have been cases where criticisms have been made concerning adherence to ethical standards (Vee & Skitmore, 2003).

The first civilian engineering organization in the United States, the Boston Society of Civil Engineers, was founded in 1848. The American Society of Civil Engineers (ASCE) was founded four years later. Though the early leaders of these organizations often

referred to the "high character and integrity" engineers needed to serve the interests others committed to them, the history of codes of ethics really begins a half century later.

The first code of ethics was adopted in the United Kingdom in 1910 by the Institution of Civil Engineers (ICE) and was followed by many others in the United States, and in other countries (UNESCO, 2010). While in the US, the American Institute of Electrical Engineers (AIEE) in 1906 voted to embody in a code the ideas expressed in an address by its president, Schuyler S. Wheeler. After much debate and many revisions, the AIEE Board of Directors adopted a code in March, 1912. The AIEE Code was adopted (with minor amendments) by the American Society of Mechanical Engineers (ASME) in 1914. Meanwhile, the American Institute of Consulting Engineering, the American Institute of Chemical Engineers (AIChE), and American Society of Civil Engineers each adopted a code of its own. By 1915, every major engineering organization in the United States had a code of ethics.

These first codes were criticized almost as soon as they were adopted. They were said to be too concerned with duties to employers and fellow engineers. An engineer's duty to the public was merely to educate. And most serious, some codes permitted conduct others forbad. Attempts to respond to such criticism began almost immediately. Among the first was the code of the American Association of Engineers (AAE), itself an organization intended to include all engineers. None of the early attempts achieved much. But, on the eve of World War II, the American Engineering Council (AEC) began a process that almost achieved agreement among engineers on a single code of ethics. The AEC organized a committee to develop a code for all engineers. Each major engineering society was represented. When the AEC dissolved, the Engineers Council for

Professional Development (ECPD) took over sponsorship. The resulting code was a conscious effort to synthesize the major provisions of earlier codes.

The ECPD Code was enormously successful at creating at least the appearance of unity among engineers. In 1947, all eight major engineering organizations either adopted or assented to the ECPD code. By 1955, it was accepted, at least in large part, by 82 national, state, or local engineering organizations. But the ECPD Code was not as successful as at first it seemed. Some organizations, while "assenting" to the code, retained their own as well to preserve certain detailed provisions that seemed to suit their circumstances better than the corresponding provisions of the ECPD Code. As time went on, these organizations tended to rely more and more on their own code. The ECPD Code slowly lost influence. Although ECPD revised its code in 1963, 1974, and 1977 in an attempt to reverse this trend, the Accreditation Board for Engineering Technology (ABET) replaced the ECPD soon after. The National Society of Professional Engineers (NSPE) initially adopted the 1947 version of the ECPD Code but substituted its own code in 1964 and has since revised it several times. Though still having much in common with the original ECPD Code, the NSPE's Code differs somewhat both in structure and content (Luegenbiehl & Davis, 1992).

However, while the codes are discussed and regularly amended in some of the associations that adopted them, in others they sometimes simply ‘exist’ (UNESCO, 2010). Luegenbiehl et al. (1992) also states that in general, the various codes are not enforced by the organizations adopting them. Though the language often resembles that of statute, codes of ethics are in fact more like guides to conscience or public judgment; that is to say, moral rules. An engineer who violates the code of one of the organizations

to which he belongs is not likely to be expelled (or even formally censured). He is even less likely to have his "license to practice" revoked. Apart from pangs of conscience, the only repercussion he is likely to suffer is the bad opinion of those who know him well enough to know what he has done. His primary concern should be one of justifying his conduct to those concerned and himself. But Vee & Skitmore (2003) explain that association with companies or professionals that conduct business in an unethical manner may result in business decline in varying degrees depending on the extent of the unethical practice.

Luegenbiehl et al. (1992) continues to state that a code of ethics generally appears when an occupation organizes itself into a profession. In some places, such as France, the word 'profession' can refer to any kind of job; in other countries including the United States, Canada, New Zealand, Ireland, South Africa, Australia and the United Kingdom, a profession is an area of activity whose members are provided with specific rights (or at least social recognition) and are trusted with specific responsibilities (UNESCO, 2010). A code of ethics is one of those things a group must have before society will recognize it as a profession. The contents of the code are settled by considering what society would accept in exchange for such benefits of professionalism as high income and high prestige. A code is a way to win the advantages society grants only to those imposing certain restraints on themselves (Luegenbiehl & Davis, 1992).

According to UNESCO (2010) engineering ethics is a new field of contextualized ethics, far from maturity. It has started to interest a larger community of scholars worldwide. The professional community, therefore, needs to focus on researches in engineering ethics aiming at defining the outline of the activities at the heart of engineering ethics.

2.20.1. Business Ethics

Vee & Skitmore (2003) explain that ethics generally evolved initially from religion by many thinkers in the Judeo-Christian tradition. Until relatively recently it was believed that business and ethics should not be mixed. Indeed, the mere term "business ethics" has been called as an oxymoron. It is now recognized, however, that the general concepts of ethics are applicable in business, on the grounds that business exists not solely to suit certain individuals, but because it serves society and meets collective and individual needs.

Plagiarism, conflict of interest, fraud, and corruption are some forms of unethical behavior and misconduct that engineers must fully avoid (UNESCO, 2010). One of the most frequently reported unethical practices in the construction business is bribery, described as: "*the offering of some good, service or money to an appropriate person for the purpose of securing a privileged and favorable consideration (or purchase) of one's product or corporate project"*. Similarly, bribes are the offering of payments or inducements to someone in a position of trust to get them to do something for the bribe payer to which the bribe payer is not entitled. As with most activities with an ethical content, "grey areas" exist. These are between the delineation of actions that are termed "gift giving" and what can be defined as bribery in legal terms (Vee & Skitmore, 2003).

2.20.2. Professional Ethics

Professions have always been linked with the notion of 'service'. Thus, a profession has been described as a group of people organized to serve a body of specialized knowledge in the interests of society. Professions are "occupations that both require advanced study and mastery of a specialized body of knowledge and undertake to promote, ensure or

safeguard some matter that significantly affects others' well-being". Its responsibilities have been variously described as including the satisfaction of "an indispensable and beneficial social need"; and a goal of service to the public. A professional operates in a world of people with whom they work, colleagues and other specialists, and people whom they serve, such as their clients and the public -a relationship that has been termed as "consensual and fiduciary'. Professionals are not exempt from the common ethical behaviors – such as obligations, duties and responsibilities – that are binding on ordinary people and are usually bound by a set of principles, attitudes or types of character dispositions that control the way the profession is practiced. This is known as Professional Ethics, and concerns potential problems confronting members of a profession or group and their impact on society, with the implication that fairness should be attributed not only to clients but also colleagues and the public.

Another challenge in ethics in the construction industry is that of conflict of interest, defined as an interest which, if pursued, could keep professionals from meeting one or more of their obligations. There are various means of protecting oneself against unethical professional conducts such as the right termed the "Right of Conscientious Refusal", which is the right of an employee to refuse to partake in unethical conduct when forced to do so by an employer. This may occur in work or non-work situations, and may not necessary involve breaking the law. Conscientious refusal may be done by either simply not participating in the activity that one sees as immoral, or it may be done with the hope of making a public protest that will draw attention to the situation that one believes is wrong (Vee & Skitmore, 2003).

2.20.3. Construction Industry Ethics

Code of Professional Conducts in the construction industry comprise of principles, rules and notes, regulating a profession.

According to Vee & Skitmore (2003), the common types of unethical behavior architects have been associated with are:

- Concealing of construction errors and stealing someone else's drawing;
- Exaggerating experience and academic achievements in resumes and applications for commissions;
- Charging clients for work not done, costs not incurred or overstated;
- Misleading clients in project management; and,
- Involvement in conflict of interest.

2.20.4. Organizational and Professional Ethical Framework (Code of Ethics)

According to Vee & Skitmore (2003), ethical framework relates to the ethical infrastructure, such as a code of ethical conduct that is implemented within organizations. This determines whether the organization at least has a guiding mechanism in place to steer the ethical decision making process and the enforcement of ethical conduct. Professionals tend to prioritize their obligations to clients higher than their obligations to the public (the 'obligations to the public' being the degree of commitment to environmental ethics and public health and safety). The prioritization of obligations to the client or public is clearly a difficult task for professionals, for if public obligation dominates the client obligation, business would no longer be viable and yet if the client obligation dominates, then the likelihood of unethical and illegal conduct increases.

Vee & Skitmore (2003) list breach of professional obligations and responsibilities in the construction industry which may take the form of one of more of the following:

⇨ *Environmental*:

- Contamination of the soil and erosion;
- Unsolicited clearing of vegetation;
- Careless execution of demolition and construction;
- Storage of construction waste products offsite; and,
- Inadequate protection for public from debris.

⇨ *Conflict of interest*:

- Consultants using their position for financial gain;
- Clients awarding contracts to companies in which they hold interest; and,
- Awarding of contracts to former employees and friends.

⇨ *Confidentiality and propriety information infringements*:

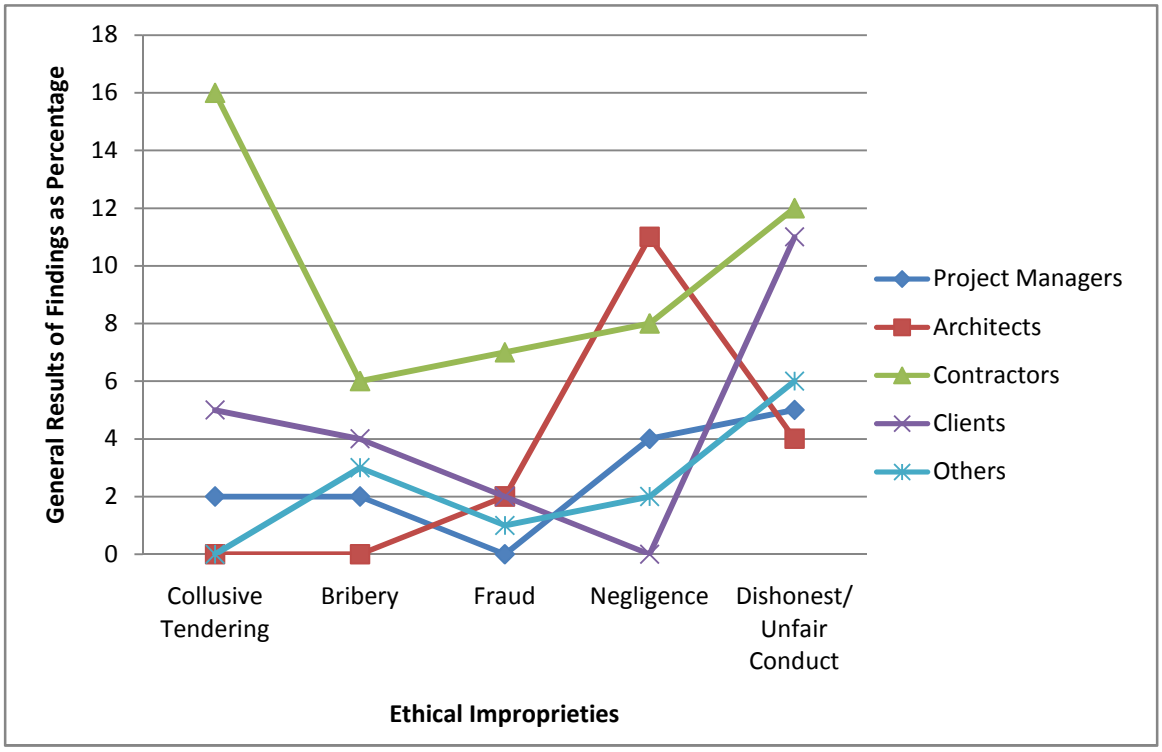
- Developers using architects' drawings' to complete projects with other parties;
- Improper information flow, internally and externally, within a practice;
- Revealing tendering information;
- Clients using architectural drawings to construct buildings without paying the architect; and,
- Consultants and builder discussing client details.

2.20.5. Ethical Improprieties

Some of the most common "grey area" conducts, unethical bordering on illegal, that occur in the modern building construction environment are collusive tendering, bribery, fraud, negligence, dishonesty, and unfairness. As figure 2.11 below indicates, Vee &

Skitmore (2003) found contractors to be the most unethical on all areas with the exception of negligence, where architects are rated higher, and almost the same level as the client in dishonest and unfair conduct. The finding that suggests that negligence of ethical conducts is high among architects and consultants aligns with the general assessment of the local construction industry trends among Ethiopian consultants as well.

Figure 2.11 Correlation of Ethical Improprieties and Professions



Source: Vee & Skitmore (2003)

2.21. Environmental Health and Sustainability in Engineering in African Countries

2.21.1. The Environment and Construction

The construction industry poses an inherent risk to the health and safety of employees and subcontractors. A threat to employees can negatively impact employee morale, resulting in a loss in productivity and reputational risk. Construction companies also have

a moral and legislative obligation to protect areas of the environment where they have an impact. Non-compliance with environmental regulations could lead to reputational risks for the company and possible legal consequences. The construction sector has also increasingly come under scrutiny for the high number of injuries and fatalities experienced. Improving safety, health and environmental (SHE) issues has a profit incentive. The effects of ignoring these critical responsibilities are loss of income due to a halt in production and a decline in gross domestic product. (PWC, 2013). Developing countries are also losing their forests at a very fast rate. Countries in Africa face rapid urbanization with its associated problems of air pollution and pressure on existing infrastructure such as waste management systems. Africa needs to opt for low environmental impact, resource efficiency, economic advantages and social advantages in construction (Ofori, 2000).

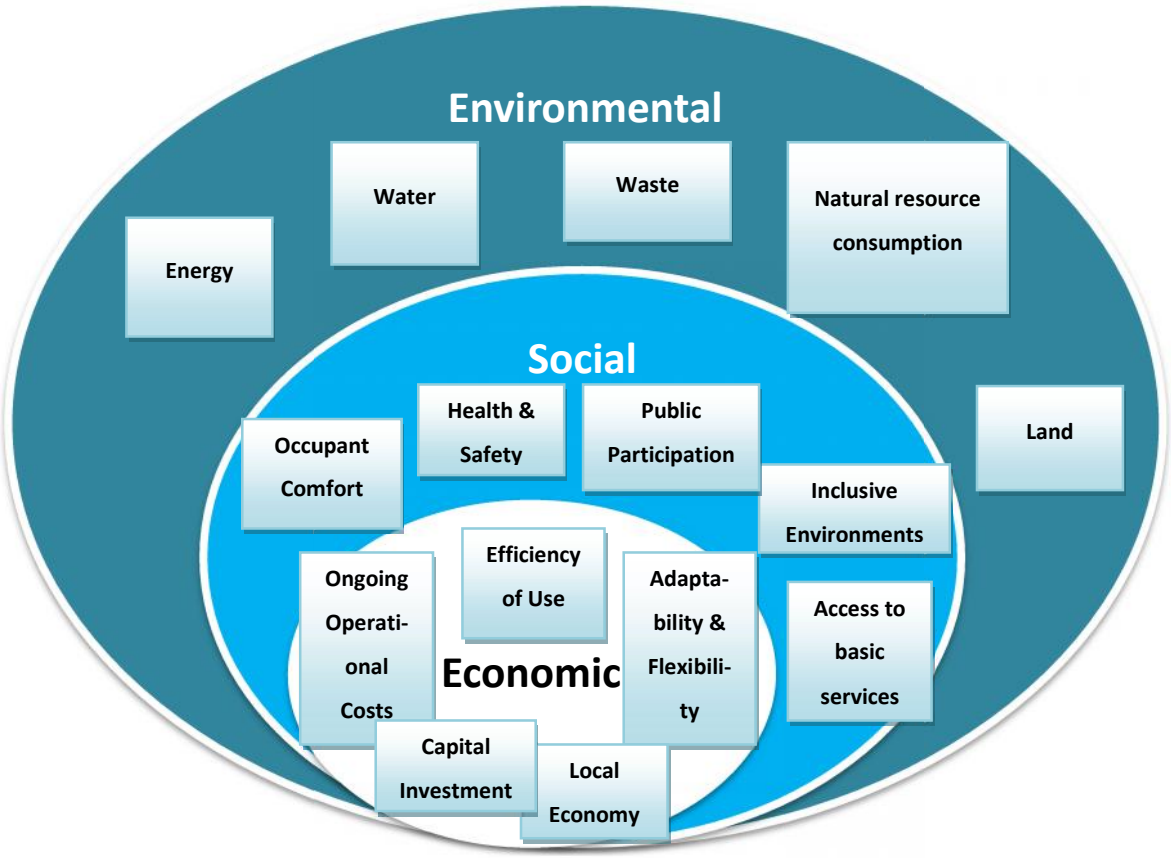
2.21.2. Sustainability

The concept of sustainability links together three aspects of ecological, economic and social well being. Sustainable buildings are zero impact buildings that have no negative environmental, social or economic impacts. Sustainable building and onstruction works fulfill their performance requirements with minimum adverse environmental impacts, while encouraging economic, cultural and social conditions at local, regional and global levels.

Key challenges of sustainable construction in Africa are the use of unsustainable construction materials. The other challenges include deforestation and poor replanting culture after usage of timber etc, lack of funding for sustainable projects, poor or non-existent waste management infrastructures. Increasing energy efficiency and renewable

energy resources in the construction industry is believed to eliminate or significantly reduce environmental and sustainability threats (Tessema, Tiapale, & Bethge, 2009). The various impacts of the built environment on the natural environment are shown in Figure 2.12 below.

Figure 2.12 Environmental, Social and Economic Impacts of Buildings and Construction



Source: Tessema et al., (2009)

2.22. Summary and Gap Identification

The Ethiopian construction industry, though it has a long way to go, is growing and expanding. The sheer volume of construction works in the nation is an indication of that. But as many industries in developing countries, it is characterized by stifling problems.

There needs to be a collaborative effort by all parties from the government to industry players to improve these conditions to ensure these problems are eliminated.

The global construction industry, the consultancy scene in particular, is characterized by a variety of project delivery methods which by definition determine the role of parties to a construction contract. These diverse options have not yet been sufficiently assimilated into the local construction scene in Ethiopia since most respondents admitted to working within the traditional medium of project delivery. Construction industries in developing countries appear to be sticking to the traditional form of project delivery as well. And according to the extensive literature review presented in this chapter, it would be fair to speculate that perhaps project delivery method plays a major role in the success of construction projects. Project delivery methods are very important tools in defining responsibilities and monitoring project progresses. They are used to clearly delineate a party's contractual and administrative duties as well as to implicate the party who fails to perform contractually so that proper actions may be taken to salvage and remedy the situation and hold the responsible party accountable. There is huge untapped advantage to such varied and rich approaches to delivery of construction projects in developing countries. These delivery options enable clients to be able to choose the most suitable method in terms of finance, urgency, complication etc and eliminate unnecessary red tape and bureaucracy that is usually associated with the traditional method.

These added options of project delivery also could be very important in eliminating the highly prevalent and long-lived professional antagonism between consultants and contractors and hence cause for an improved project success rate. This is in no way to

discredit the traditional form of management as it is a key form of project delivery to this day but only to emphasize that there are project types that it may not particularly be suitable to. The one-size-fits-all approach when it comes to project delivery systems and contractual agreements apparent in the domestic construction scene is the cause of many avoidable problems. Clients and professional project management consultants as well as local construction contractors and consultants haven't fully familiarized themselves and their business models with these options. Therefore, the local construction industry has a long way to go in terms of experimenting and incorporating various project delivery models and render its players internationally viable business entities.

In addition, there is a lack of awareness of professional liability and accountability. Duty of care and professional indemnity insurance are not familiar or practical concepts in the domestic construction sector. This has led to negligence and lack of initiatives on the part of consultants to hold themselves to a higher professional standard and responsibility.

Moreover, the trend of selecting consultants based on the least cost method is a problematic one. It poses a dangerous threat to projects and may end up being more costly in many ways in the end. This makes competence and professional capability take a back seat instead of guiding the selection of consultants.

There is also lack of initiatives to enable consultants and contractors to work collaboratively instead of jealousy and antagonism. Team spirit and cooperation is not encouraged and hence hostile construction administration is prevalent preventing proactive elimination as well as amicable settlement of disputes.

Perhaps the most popular and contemporary concept is environmental responsibility and ethics in construction. The developed countries use the term SHE to describe the combined aspects of Safety, Health and the Environment. At a time like this where the planet is said to face greatest environmental threats, there doesn't seem to be a tangible effort to work towards alleviating them in the domestic construction industry. Safety and health issues aren't given the attention they deserve although it is not the sole responsibility of consultants but rather needs a concerted effort by all parties of the industry and the government. But engineers are required by various codes of practice and ethics to hold safety of the public and employees with the highest regard and hold themselves as respectable, ethical and professional members of society.

This research aims to examine the current practices of local consultants with regards to the numerous gaps discussed in this section and comparatively analyze them with globally accepted codes of conduct and industry practices. Then upon identification of gaps between actual practices versus contractual, legal, professional and ethical responsibilities of consultants, possible solutions are proposed.

CHAPTER THREE

RESEARCH METHODOLGY

3.1. Introduction

This section of the research explains and justifies the methods and means in which the objectives of the study were met. Steps taken to gather all relevant information are presented in detail. It also presents research instruments and strategy used in the study. It finally presents the sample size, data collection approaches and method for the analysis of the data gathered.

The methodology used to accomplish this research was mainly desk study accompanied by questionnaires. Desk study included various standard professional documents used in the domestic construction industry such as PPA, MoWUD etc. as well as on an international basis such as FIDIC, AIA along with other relevant literature and researches. Qualitative and quantitative approaches were then employed to analyze the primary data collected.

Questionnaires were distributed and responses were statistically analyzed using Microsoft Excel (MS-Excel). The collected and analyzed data from the questionnaires were used to simply substantiate research findings. The questionnaire was used as one tool to achieve the objectives of the proposed research in addition to literature review. The findings of the research were used to draw conclusions and propose possible solutions to the local construction industry. The details of the research methodology are further explained below.

3.2. Research Strategy

The process of research involves a number of steps (Saeidi, 2002). Different research approaches serve different purposes. A survey is a research approach intended to collect information by asking standardized questions to a carefully selected sample of the population. Surveys can be used to discover particular opinions or trends in the population as well as seeking explanations for any given situation. They are cheap to conduct, allow for anonymity of responses and allow time for respondents to reflect on events and report subsequent changes and feelings. The sample selected for a survey is important as findings are generally presented as being representative of the population as a whole. Surveys are a means of gathering descriptive data from a whole population or from a sample of a population. They can also be analytical in that they assess the relationship between variables in order to understand and explain a phenomenon.

The technique used to collect primary data for this research is through the use of questionnaires (self administered with a few sent and received via email/on-line/). Surveys can provide a large amount of data quite quickly, on a wide range of issues. The literature review was therefore complemented by such additional research tools.

3.2.1. Steps for Conducting the Research

As shown in Figure 3.1 below, there were various steps in conducting this research. They are discussed as follows.

3.2.1.1. Literature Review

Literature review for this research begun during proposal preparation and had lasted for the whole duration of the study until completion as a constant overarching task. Various

publications, books, reports, standard documents, contract documents, professional journals as well as previous researches were examined.

Literature review was instrumental in:

- Identifying global/international body of knowledge and industry practice associated with construction consultancy;
- Assessing the local construction consultancy practices and trends;
- Identifying gaps in consultancy services, if any;
- Designing and structuring research questionnaire and focus points (Survey Study);
- Formulating a conceptual framework and flow for the research;
- Defining the scope of the research;
- Analyzing data; and,
- Summarizing, contextualizing and presenting findings, as well as proposing recommendations.

3.2.1.2. Designing the Questionnaire

The pilot questionnaire was designed based on existing insight and was enhanced with literature review. The final questionnaire (See Appendix 3) incorporates both open-ended and fixed-choice type questions.

It was of an utmost importance that the respondents were assured of the confidentiality of the data they provided. This was done through the cover letter attached with the questionnaires and was confirmed verbally in person.

3.2.1.3. Distributing Questionnaire, Visiting Sites and Offices

The various methods and tools in the action plan for conducting the research like distributing and collecting questionnaires, visiting some offices and construction sites were applied.

Figure 3.1 Flow Chart for Research Methodology

3.2.1.4. Collecting Primary Data, Analyzing the Responses and Discussion

The responses of questionnaire respondents along with any other primary data obtained were analyzed, discussed and summarized. Conclusions and recommendations were then given.

3.3. Sources of Data

The research utilized both primary as well as secondary data sources. Primary data consisted of information gathered actively for the purpose of the research through questionnaire survey filled by consultants in Addis Ababa. The secondary data sources were books, journals, articles, research theses and other documents.

3.4. Research Instrument

This study used questionnaire surveys to collect primary data.

3.4.1. Questionnaire Design

The questionnaire was designed and distributed with the intent of examining the performance of consultants in Addis Ababa. It solely addressed construction consultants that were registered, licensed and active in the industy. It was developed using literature review as well as comments and observations after a pilot questionnaire was drafted and tested on few industry professionals for clarity, effectiveness and suitability for the research work.

3.4.2. Structure of the Questionnaire

The questionnaire used for the research consists of five parts with a mix of open ended as well as closed-ended questions. The first section dealt with respondent and company profile or general information. The second section was survey of consultancy practices and project-related competency and focused on the main phases of any typical construction project ranging from feasibility study to post construction stage. The questionnaire attempted to assess the industry practice and importance given to selected focus areas in the third section. Part four of the questionnaire presented general survey questions regarding consultancy services. Lastly, the fifth part of the questionnaire attempted to get an overview of general competency of consultancy firms in Addis Ababa.

The questions in Part II were designed in accordance with a 5-point Likert scale response system. The respondents were asked to rank their implementation of tasks from points 1 to 5 where 1 = 'Never', 2 = 'Rarely', 3 = 'Occasionally', 4 = 'Often' and 5 = 'Always'. A higher value equal or a score close to '5' would indicate compliance where as a lower rank or a score close to '1' would indicate poor compliance to non-compliance.

3.5. Study Design and Location

The study can be classified as applied descriptive type research because it aims to solve practical problems. The design selected to accomplish the objectives of this research based on the research problem is analytical, non-participant observational study. The actual practices of sampled consultants in the industry were studied. Then the data acquired was analyzed using descriptive statistics using frequency distribution and

findings were presented in graphs, charts and statements. The location of the research is the city of Addis Ababa.

3.6. Sampling Technique

The study population of interest is the collection of Construction Consultancy firms, Grade 1 to 6 in Addis Ababa, Ethiopia. Quota sampling was found to be appropriate for this research and was used according to the various classes of Consultants partaking in the domestic construction sector. Snowball and convenience non-random sampling techniques were used to fulfill the quotas of samples.

3.7. Sample Population of Consultants

The population of the research is Addis Ababa based consultants as determined from the 2008Ec registries obtained from Consultant Registry Office at Sidist Kilo and is shown in Table 3.1 below. Almost ninety percent of the consultants active in the country are based in Addis Ababa.

Table 3.1 Number of Registered Consultants in Addis Ababa

	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6
CA				1		
CAE	64	8	111	8	64	4
CEG	1	1	4		10	
CES			1	1	5	1
CMC		3	2		2	5
HBC	6	1	25	2	5	
Total	**71**	**13**	**143**	**12**	**86**	**10**

Where,

CA = *Consulting Architects*

CAE = *Consulting Architects and Engineers*

CEG = *Consulting Engineering (General)*

CES = *Consulting Engineering (Specialized)*

CMC = *Construction Management Consultants*

HBC = *Highway and Bridge Consultants*

3.8. Sample Size

A larger sample is much more likely to be representative of the population (Singh, 2006). According to Cohen et.al, a quota sample seeks to give proportional weighting to selected factors (strata) which reflects their weighting in which they can be found in the wider population (Cohen, Manion, & Morrison, 2005). Keeping that in mind, sample size for this study was determined based on the result of the sampling technique chosen i.e. quota sampling.

3.9. Sample Size Determination

According to Cohen et al. (2005), there are three quota sample determination stages.

- **Stage 1** – Identify characteristics which appear in the wider population which must also appear in the sample; divide the wider population into homogeneous and discrete groups (strata).
- **Stage 2** – Identify the proportions in which the selected characteristics appear in the wider population, expressed as a percentage.
- **Stage 3** – Ensure that the percentage proportions of the characteristics selected from the wider population appear in the sample (Cohen et. al., 2005).

  Therefore, the following steps were taken accordingly.

Step 1: Total number of consultants in each strata (grade):	**G1 = 71**	**G4 = 12**	**Total = 323**
	G2 = 13	**G5 = 86**	
	G3 = 143	**G6 = 10**	
Step 2: Population Strata and Percentage Distribution	**G1 = 71/323*100 = 21.98%**	**G4: 12/323 *100 = 3.72%**	
	G2 = 13/323*100 = 4.02%	**G5:86/323*100 = 26.63%**	
	G3: 143/323*100 = 44.27%	**G6: 10/323*100 = 3.09%**	

According to Zinabu et al. (2015) which cites Yamane T. (1967), sample size can be determined by using Eq. 3.1 below.

$$n_0 = \frac{z^2 p\,(1-p)\,N}{z^2 p\,(1-p) + Ne^2} \qquad \text{……{Equation 3.1}}$$

Where: n_o = *sample size;*

z = *confidence interval corresponding to a level of confidence;*

p = *population proportion;*

N = *population size; and,*

e = *precision or error limit.*

Picking a confidence level of 90% (z becomes 1.645), p = 50% (percentage choice expressed as a decimal), e = 10% and with N being 323, sample size for consultants becomes;

$$n_0 = \frac{1.645^2 * 0.5 * (1-0.5) * (323)}{[1.645^2 * 0.5 * (1-0.5) + (348) * (0.1^2)]} = 67.65 \approx 68 \text{ Consultants}$$

Incorporating correction for finite sample according to Eq. 3.2,

$$Ss\ (New) = \frac{\text{Sample Size}}{1 + (\text{Sample Size}/\text{Population Size})} \quad \ldots\ldots\ldots\{Equation\ 3.2\}$$

$$Ss\ (New) = \frac{68}{1+ (68/323)} = 56.17 \approx \underline{56 \text{ Consultants}}$$

Step 3: Quota Sample and Percentage Distribution

- G1: 56 * 21.98/100 = 12.30 ≈ 12
- G2: 56 * 4.02/100 = 2.25 ≈ 2
- G3: 56 * 44.27/100 = 24.19 ≈ 24
- G4: 56 * 3.72/100 = 2.08 ≈ 2
- G5: 56 * 26.63/100 = 14.91 ≈ 15
- G6: 56 * 3.09/100 = 1.37 ≈ 1

3.9. Analysis Plan

The main input for this research was extensive desk study which supported the data collected, especially through the use of questionnaires which was compiled and analyzed

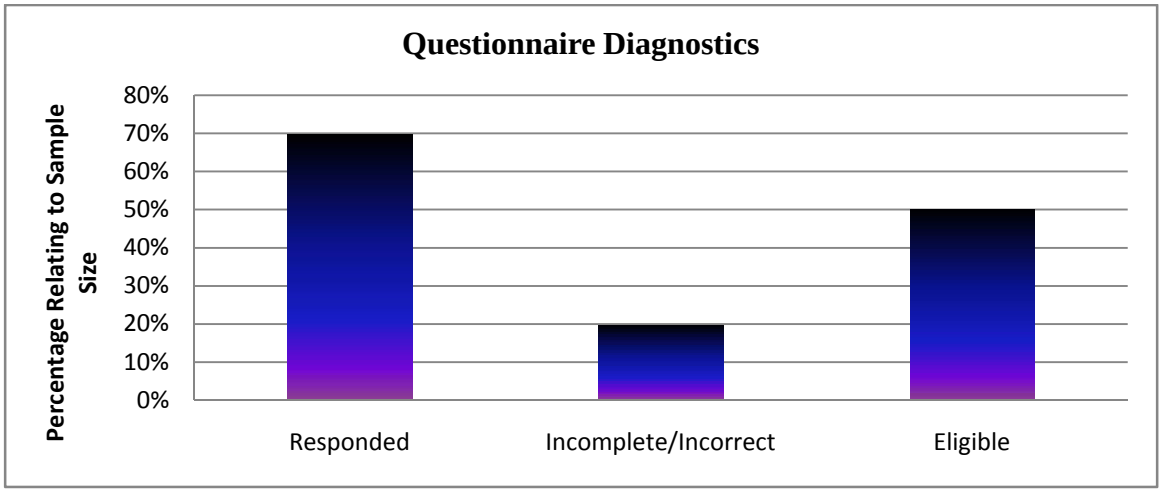
using Microsoft Excel software package because it suited the type of the research as well as the analysis method chosen i.e. descriptive statistics method. The approach used in the descriptive statistics method was the frequency distribution approach.

CHAPTER FOUR

RESULTS AND DISCUSSIONS

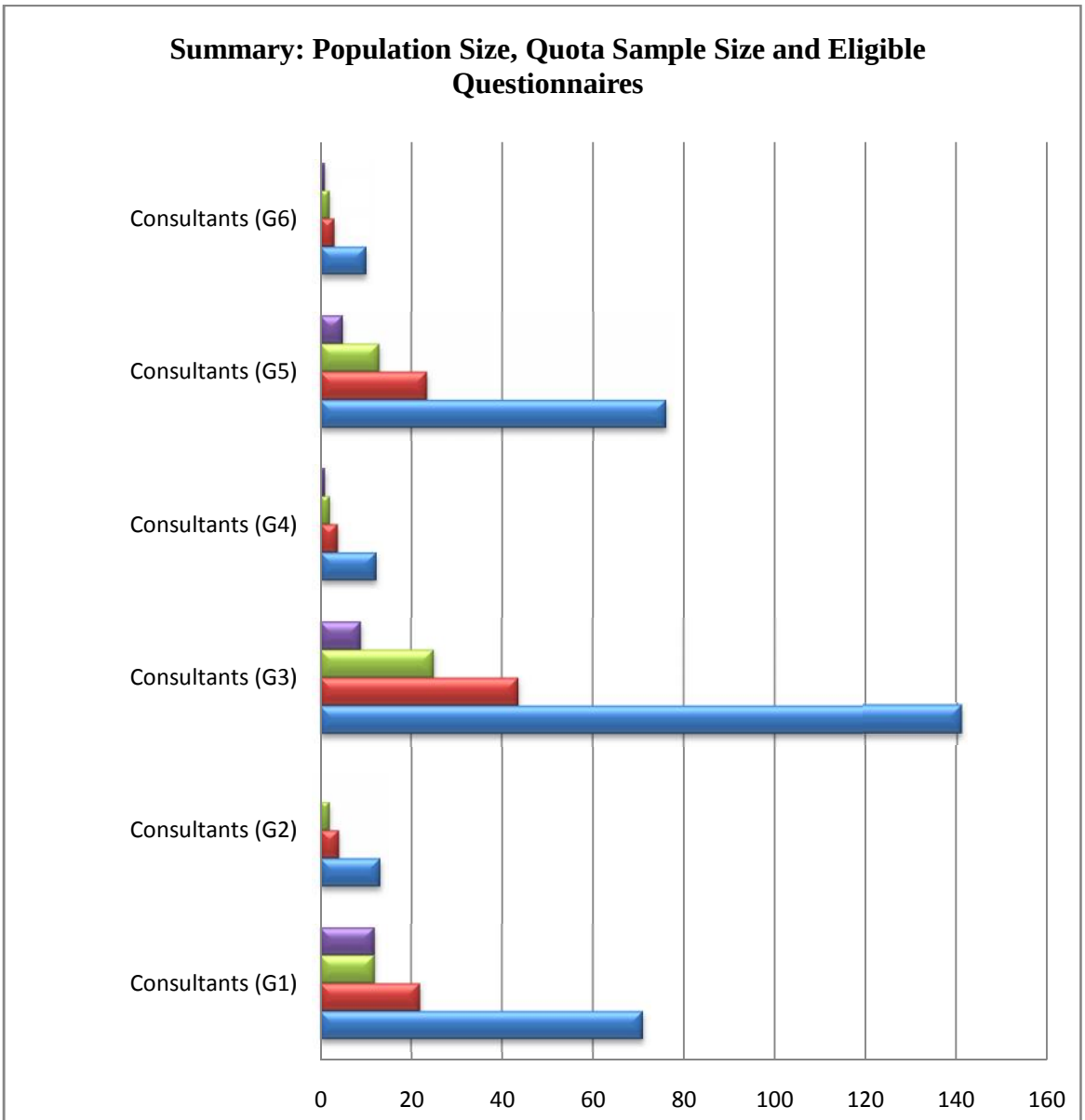
The data collected through primary and secondary methods has been analyzed and presented in this chapter. The analysis method is the descriptive statistics method. The findings have been presented using frequency distribution in tables, bar charts and pie charts. The questionnaires were distributed to 56 local sampled consultants. Among these, 39 were returned. That shows a response rate of 69.6%. 11 of the collected questionnaires were rejected because they were incomplete and/or incorrectly filled. As a result, the remaining 28 questionnaires were used in this study. This summary of the analysis of the questionnaires is shown in Figure 4.1 below.

Figure 4.1 Questionnaire Diagnostics



In this chapter, the results of the performance assessment of the 28 local consultants based in Addis Ababa are presented. Figure 4.2 shows in detail the sample size and number of eligible questionnaire used in this research.

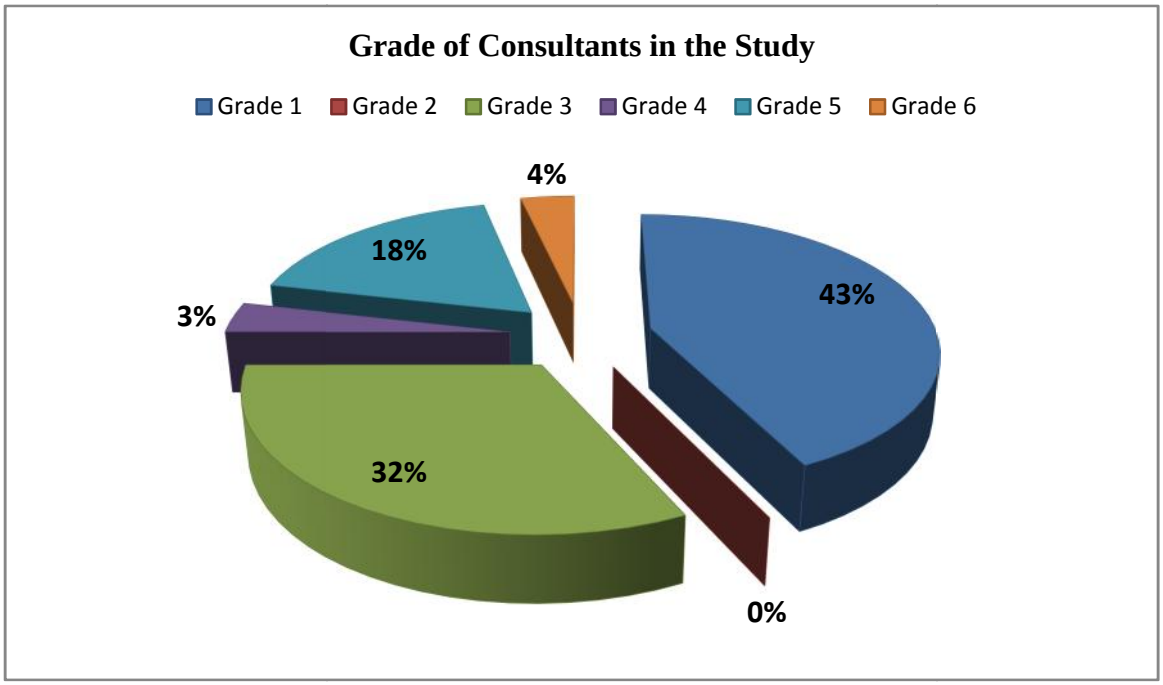
Figure 4.2 Summary of Study Population, Sample Size and Number of Eligible Questionnaires



	Consultants (G1)	Consultants (G2)	Consultants (G3)	Consultants (G4)	Consultants (G5)	Consultants (G6)
Number of Eligible Questionnaires From Each Category	12	0	9	1	5	1
Quota Sample Size	12	2	25	2	13	2
Population Percentage (%)	21.98	4.02	43.65	3.70	23.50	3.09
Total Population	71	13	141	12	76	10

The categories or grades of registration of the respondents are presented in Figure 4.3 below. It can be seen that the majority of the respondents are Grade 1 and Grade 3 consultants.

Figure 4.3 Classes of Consultants included in the Research



The respondents were mostly master's and bachelor's degree holders. Their positions in the individual firms they represented constituted a variety of roles; chiefly among the respondents were general managers, deputy general managers, department heads (design, contract administration, architecture, construction supervision etc), project coordinators as well as office engineers.

Figure 4.4 and 4.5 present the respondents' level of professional experience in the construction industry and their level of education, respectively.

Figure 4.4 Experiences of Respondents

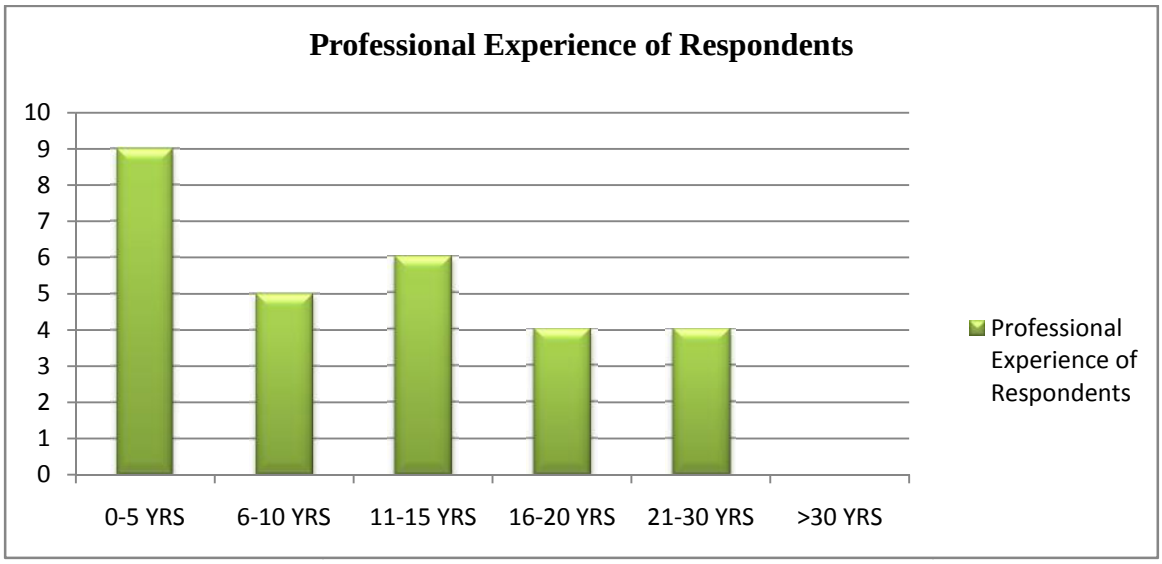
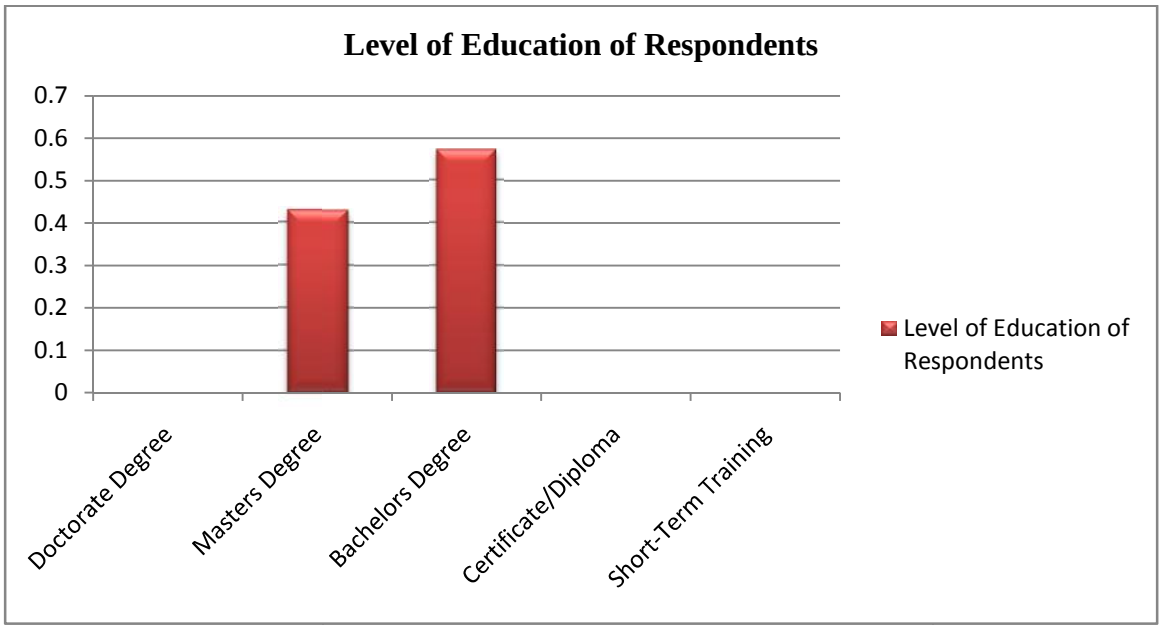


Figure 4.5 Educational Backgrounds of Respondents



Most of the respondents had 0-5 years in experience in the industry. The represented organizations have been active in the industry from 5 to 31 years. Eight out of the total eligible respondents have some form of an ISO certification.

4.1. Findings

The performance assessment has been conducted for the major stages of any construction project broadly categorized into seven phases namely the Feasibility Stage, Pre-Design Stage, Design Stage, Construction Documents Preparation Stage, Bidding/Negotiation Stage, Construction and Contract Administration Stage and Post Construction Stage.

The findings were analyzed using a 5-point Likert scale. This was done for all the seven comprehensive construction phases. The results of the descriptive statistical analysis are presented in tables as follows. Consultants were asked to address sub-tasks of the major phases according to a 5-point Likert Scale point system where: *'1'* stands for *'Never'*, *'2'* stands for *'Rarely'*, *'3'* stands for *'Occasionally'*, *'4'* stands for *'Often'* and finally *'5'* stands for *'Always'*. The list of said sub-tasks in each phase can be found on Part II of the questionnaire on Appendix 3. The higher the number, the favorable it is for the consultants as it implicates compliance and vice versa. The allocated values are as follows: 0.1-1 = 'Never', 1.1-2 = 'Rarely', 2.1-3 = 'Occasionally', 3.1-4 = 'Often', 4.1-5 = 'Always'.

4.1.1. Feasibility Stage Sub Tasks Performance Results

According to Table 4.1 below, which depicts the extent of consulting firms' feasibility stage practices, the highest frequency among the responses is 17 representing 60.71% of the respondents. The mean score is 2.85, which falls within the third Likert Scale description indicating occasional compliance. This implies that local consultants *occasionally* adhere to commonly practiced feasibility stage subtasks.

Table 4.1 Feasibility Stage Results

	Likert Scale Description	Allocated Value	Frequency	Percentage	Mean	Median	Mode	St. Dev	Variance
1	Never	0– 1	0						
2	Rarely	1.1– 2	0						
3	Occasionally	2.1 – 3	17	60.7143	2.8544	2.6667	2.3333	0.5592	0.3126
4	Often	3.1 – 4	11	39.2857					
5	Always	4.1 – 5	0						
	Total		**28**	**100**					

Results from the findings indicated that consultants showed an average level of performance and were found to be complacent in doing the bare minimum by not demanding consistency in the services they provide.

In addition, the maturity of individual subtasks within the parent feasibility phase has been presented in table 4.2 below. The lowest maturity levels belong to solicitation of legal and insurance expertise and risk assessment tasks, while the highest was presentation of reports and recommendations.

Table 4.2 Maturity of Subtasks in Feasibility Phase

List of tasks on questionnaire for 'Feasibility Stage'	Likert Scale Ranks
Final presentation of all reports and recommendations in a clear manner with adequate evidence	3.84
Investigation of project background information thoroughly to enrich the planning endeavor and meet project objectives & constraints	3.68
Performance of comprehensive analysis of major cost items, risks, similar project rates etc to provide an accurate and up-to-date- cost estimate	3.64
Presence of filing system for all project related documents	3.60
Provision of Clients with innovative and creative ideas and options to minimize time, cost, risks and improve quality	3.56
Consideration of conflicts with other projects, additional hiring, expansions etc when taking on a new project	3.25

List of tasks on questionnaire for 'Feasibility Stage'	Likert Scale Ranks
Assignment of unique project number/name to all projects	3.12
Regulatory restrictions and site/location constraints assessment	2.89
Professional liability insurance for Clients	2.84
Time schedule, basic services cost, additional services compensation, insurance and personnel costs, reimbursable expenses consideration while preparing project budget	2.80
Employment of in-house legal personnel to deal with contractual and legal matters	2.76
Selection, organization and discussions between design teams (structural, mechanical, electrical and other special consultants)	2.68
Project team formation	2.60
Social, Economic, Environmental impact assessment	2.56
Assigning of each team member with distinct roles	2.52
Solicitation of legal and insurance expertise before submitting final agreement to a client	2.12
Estimation and considerations for annual project operating expenses such as taxes, insurance, leasing etc	2.00
Preparation of risks and impacts estimation along with mitigation measures	1.73

4.1.2. Pre-Design Stage Sub Tasks Performance Results

According to Table 4.3, which depicts the extent of consulting firms' pre-design stage practices, the highest frequency is 19 representing 67.85% of the respondents. The mean score is 4.02, which falls within the fourth Likert Scale description indicating there is often compliance to requirements. Hence, consultants *often* adhere to commonly practiced pre-design stage subtasks.

During the pre-design stage, the consultants showed a notable level of performance and the highest Likert scale ratings. This result indicates that local consultants perform better

on this stage than any of the other stages such as contract administration and supervision stage, feasibility stage etc.

Table 4.3 Pre-Design Stage Results

	Likert Scale Description	Allocated Value	Frequency	Percentage	Mean	Median	Mode	St. Dev	Variance
1	Never	0 – 1	0						
2	Rarely	1.1 – 2	0						
3	Occasionally	2.1 – 3	8	28.5714					
4	Often	3.1 – 4	1	3.5714					
5	Always	4.1 – 5	19	67.8571	4.0175	4.2611	3.0000	0.7052	0.4973
	Total		28	100					

In terms of maturity, tasks under pre-design stage were found to be mostly performed well and have been ranked as shown in Table 4.4.

Table 4.4 Maturity of Subtasks in Pre-Design Phase

List of tasks on questionnaire for 'Pre-Design Stage'	Likert Scale Category
Preparation of schematic design (Site plans, floor plans, sketches, models and renderings)	4.80
Obtaining necessary permits from responsible agencies	4.76
Requesting soil investigation report from the Client	4.60
Accommodating the Client's comment after the presentation and addressing changes in scope with the Client	4.52
Visiting the site to make observations in person (site evaluation)	4.40
Attempting to create/obtain lists of special equipments or fixtures required by the Client before design begins	4.25
Presentation of schematic design, materials file, cost estimates etc to the client	4.12
Exhaustively obtaining all tools available to you like aerial photographs, maps, solar orientation data and diagrams etc to further understand the site location	4.04
Preparation of Environmental Impact Assessment report	3.47
Requiring written approval for Schematic Design and written authority to proceed to design development phase	3.44
Making design team and all staff visit the site before proceeding to the design phase	2.96

4.1.3. Design Stage Sub Tasks Performance Results

During this stage, consultants were found to perform better than during feasibility stages. Table 4.5 depicts the extent of consulting firms' design stage performance. The highest frequency is 20 representing 71.43% of the respondents. The mean score is 3.37, which falls within the fourth Likert Scale description indicating there is often compliance in this stage. Hence, consultants *often* adhere to commonly practiced design stage subtasks.

Table 4.5 Design Stage Results

	Likert Scale Description	Allocated Value	Frequency	Percentage	Mean	Median	Mode	St. Dev	Variance
1	Never	0 – 1	0						
2	Rarely	1.1 – 2	0						
3	Occasionally	2.1 – 3	7	25.000					
4	Often	3.1 – 4	20	71.4286	3.3658	3.4545	3.4545	0.4111	0.1690
5	Always	4.1 – 5	1	3.5714					
	Total		28	100					

Table 4.6 depicts the ranks of tasks under design phase and their respective maturity levels. Design stage is among the phases with better performance maturity of tasks. As can be seen in the table, the task that is most consistently implemented is preparation and presentation of schematic designs according to the client's ToR. The least mature task is the service of value engineering as part of the engineering services rendered which was found to be not a very common practice among local consultants. Value engineering is a global trend whereby professionals and parties partaking in a given project assess and look for ways to find a better engineering and design solution in order to ensure the technical, economical, environmental, professional etc viability of a construction project by implementing foresight and professional modifications at the initial project phases. The practicality, impacts as well as benefits of such modifications are highly dependent on how early in the project's life cycle they are conducted.

Table 4.6 Maturity of Subtasks in Design Phase

List of tasks on questionnaire for 'Design Stage'	Likert Scale Category
Development of schematic designs (Compliance with codes)	4.24
Presenting drawings in a clear manner (Easy to visualize)	4.24
In-house design team (For Consulting Architects)	3.84
Compliance with client's brief /ToR/ in early stages of design	3.8
Final meeting to submit and discuss any remaining design issues to reach an agreement on structural, mechanical etc systems	3.77
Technical, financial, environmental, professional, safety and quality standard of designs	3.76
Clarity, uniformity & comprehensiveness of drawings with insignificant or no errors	3.64
Constructible designs (less technical difficulties with contractors)	3.62
Provision of innovative, efficient, sustainable design options	3.61
Preparation of plans, elevations, sections, area calculations etc	3.52
Preparation of site plans indicating locations of facilities	3.5
Presentation of drawings at professional standards with adequate details	3.4
Production of all design documents in the same format as architectural drawings	3.32
Further putting effort into assisting the client in identifying additional objectives and requirements	3.24
Considering all design options to lead the project in a cost-effective direction	3.2
Valuing clients' requirements in the ToR and abiding by them fully	3.08
Proactively recommending mitigation measures should challenges occur in the future	2.96
Providing preliminary construction cost estimates	2.64
Introduction and implementation of value engineering i.e. work on achieving a design that is technically sound, practical, aesthetically pleasing, and cost-effective?	2.61

4.1.4. Construction Documents Preparation Stage Sub Tasks Performance Results

During this stage, consultants were often compliant same as in the design stage results. Table 4.7 depicts the extent of consulting firms' construction document preparation stage performance. The highest frequency is 26 representing 92.85% of the respondents. The

mean score is 3.61, which falls within the fourth Likert Scale description indicating there is often compliance. Hence, consultants were found to *often* adhere to common practices and responsibilities in this stage.

Subsequently, the maturities of tasks in this phase are presented in Table 4.8 below showing the ranks from highest to lowest levels.

Table 4.7 Construction Documents Preparation Stage Results

	Likert Scale Description	Allocated Value	Frequency	Percentage	Mean	Median	Mode	St. Dev	Variance
1	Never	0 – 1	0						
2	Rarely	1.1 – 2	0						
3	Occasionally	2.1 – 3	2	7.1429					
4	Often	3.1 – 4	26	92.8571	3.6148	3.5556	3.8889	0.2803	0.0786
5	Always	4.1 – 5	0						
	Total		28	100					

Table 4.8 Maturity of Subtasks in Construction Documents Preparation Stage

List of tasks on questionnaire for 'Construction Documents Preparation Stage'	Likert Scale Category
Review of construction program/schedule and budgets with actual project progress	4.84
Establish a clear chain of command for your projects	4.36
Re-checking documents for code compliance, owner & statutory bodies requirements; develop list of required drawings	4.12
Periodically review, update and finalizing the preliminary construction cost estimate at this stage	4.04
Communicate and check with appropriate regulatory agencies to establish and schedule review	3.8
Preparing final drawings & specifications only after assessing and assisting the client with pertinent issues like permits etc.	3.64
Preparing testing and quality control programs	3.48
Preparing bidding documents in-house	2.68
Train your personnel who are not experienced	2.12

4.1.5. Bidding/Negotiation Stage Sub Tasks Performance Results

Bidding/Negotiation stage was one of the stages where the respondents had top scores, which implies this stage is often conducted procedurally and routinely.

Although the performance results are good, there are some anecdotal findings of unethical conducts and collusions between consultants and contractors. That is because this research was concerned with performance of routine tasks. Firms could perform most of the expected tasks and may still manage to trick the system as following procedures and bureaucracy may not guarantee ethical conducts.

Table 4.9 depicts the extent of consulting firms' Bidding/Negotiation stage performance. The highest frequency is 14 representing 50.00% of the respondents. The mean score is 3.69 which, falls within the fourth Likert Scale description indicating there is often compliance. Hence, consultants were found to *often* follow commonly practiced bidding/negotiation stage subtasks.

Table 4.9 Bidding/Negotiation Stage Results

	Likert Scale Description	Allocated Value	Frequency	Percentage	Mean	Median	Mode	St. Dev	Variance
1	Never	0 – 1	0						
2	Rarely	1.1 – 2	0						
3	Occasionally	2.1 – 3	12	42.8571					
4	Often	3.1 – 4	2	7.1429					
5	Always	4.1 – 5	14	50.000	3.6904	3.6818	2.9091	0.9213	0.8489
	Total		28	100					

Table 4.10 below presents maturity of tasks under bidding/negotiation stage where the highest rank belongs to preparation and distribution of bid documents whereas the lowest

rank belongs to legal counsel which is rare unless the client is a financial heavyweight with significant assets that may be jeopardized.

Table 4.10 Maturity of Subtasks in Bidding/Negotiation Phase

List of tasks on questionnaire for 'Bidding/Negotiation Stage'	Likert Scale Category
Preparing and distributing well prepared bid documents	4.40
Obtaining winning contractors' performance bond and insurance coverage etc	4.36
Issuing Notice to Proceed for contractors?	4.30
Identifying and assigning responsibilities in advertising for bids, receiving bids, bid evaluation and negotiation	4.04
Reaching acceptance and rejection decisions along with client, prepare Tender Report and notify bidders accordingly	3.88
Duly returning bid-security to disqualified bidders or bidders who wish to withdraw	3.87
Investigation of bid date is suitability (doesn't coincide with other major project bid dates)	3.72
Analyzing/assessing/, check for irregularities in bid submissions	3.70
Reviewing qualifications of interested bidders	3.68
Holding pre-bid meetings?	3.40
For bidding by invitation, duly notifying selected bidders	3.27
For bidding by negotiation, in collaboration with the Client, negotiation with contractors	3.10
Distribution of responses to bidders' requests for clarification to all bidders as addendum	2.96
Consulting Clients' legal counsel on existence of laws regarding the bidding process & documents	1.36

4.1.6. Construction and Contract Administration Stage Sub Tasks Performance Results

In this stage, consultants were found to perform at an average level similar to most stages i.e. occasional compliance to required sub-tasks. Table 4.6 depicts the extent of consulting firms' construction and contract administration stage performance. The highest frequency is 17 representing 60.71% of the respondents. The mean score is 2.32,

which falls within the third Likert Scale description indicating there is occasional compliance. Hence, consultants adhere to commonly practiced construction and contract administration subtasks *occasionally*.

Table 4.11 Construction and Contract Administration Stage Results

	Likert Scale Description	Allocated Value	Frequency	Percentage	Mean	Median	Mode	St. Dev	Variance
1	Never	0 – 1	0						
2	Rarely	1.1 – 2	9	32.1429					
3	Occasionally	2.1 – 3	17	60.7143	2.3240	2.5455	2.5455	0.5588	0.3123
4	Often	3.1 – 4	2	7.1429					
5	Always	4.1 – 5	0						
	Total		28	100					

Maturity levels, as shown in Table 4.12, indicate that submittals and payment certificates are handled well by consultants. On the other hand, handling of disputes, health and safety and general supervision, keeping data and project information and documentation are very rarely practiced.

Table 4.12 Maturity of Subtasks in Construction and Contract Administration Phase

List of tasks on questionnaire for 'Construction and Contract Administration Stage'	Likert Scale Category
Promptly reviewing and taking appropriate action when you receive submittals from contractors	4.00
Swiftly reviewing and approve payment certificates	3.44
Having a system for handling correspondence and submittals	3.08
Establish project meeting schedules	3.04
Recruiting, supervising & stationing of site staff	3.00
Preparation of correspondence and meeting reports	3.00
Reviewing and updating project schedule	2.84
Reviewing and evaluating contractor's list of remaining work	2.81
Upon receipt of notice of substantial completion, inspection to confirm	2.72
Conducting a final inspection and preparation of final inspection report	2.7

List of tasks on questionnaire for 'Construction and Contract Administration Stage'	Likert Scale Category
Maintaining a 'submittals' log	2.68
Scheduling and reviewing testing	2.62
Impartially administering Contracts	2.56
Provision of Certificate of Substantial Completion and formally closing out projects	2.53
Within the defects liability period, assessing the project and determining if any work is required by the contractor	2.48
Effectively and impartially reviewing Claims according to contractual provisions	2.04
Assembling and filing for future reference, complete project and cost records	1.96
Proactively maintaining financial control of contract	1.88
Keeping client informed on the progress of work according to the time interval in the agreement (monthly, bi-monthly etc)	1.85
Regularly and duly supervising Contractors	1.84
Producing, issuing and filing field reports, project photographs, change orders, construction change directives, quality control reports, insurance policies etc accordingly	1.80
Duly engaging in resolving disputes	1.68
Archiving project information with fixed duration of retention	1.67
Advocating for & demanding the implementation of health and safety procedures on site (Personal Protective Equipments etc.)	1.28

4.1.7. Post Construction Stage Sub Tasks Performance Results

During the post construction stage, the consultants showed a fairly higher level of performance and one of the highest Likert scale rating indicating a favorable and reassuring performance.

Table 4.13 depicts the extent of consulting firms' post construction performance. The highest frequency is 15 representing 53.57% of the respondents. The mean score is 3.95, which falls within the fourth Likert Scale description indicating there is often

compliance. Hence, consultants *often* adhere to commonly practiced post construction stage subtasks.

Table 4.13 Post Construction Stage Results

	Likert Scale Description	Allocated Value	Frequency	Percentage	Mean	Median	Mode	St. Dev	Variance
1	Never	0 – 1	0						
2	Rarely	1.1 – 2	0						
3	Occasionally	2.1 – 3	0						
4	Often	3.1 – 4	13	46.4286					
5	Always	4.1 – 5	15	53.5714	3.9496	4.2000	4.2000	0.4006	0.1605
	Total		28	100					

Table 4.14 presents the maturity of tasks under post construction phase, which is a fairly well performing phase where all subtasks have high maturity.

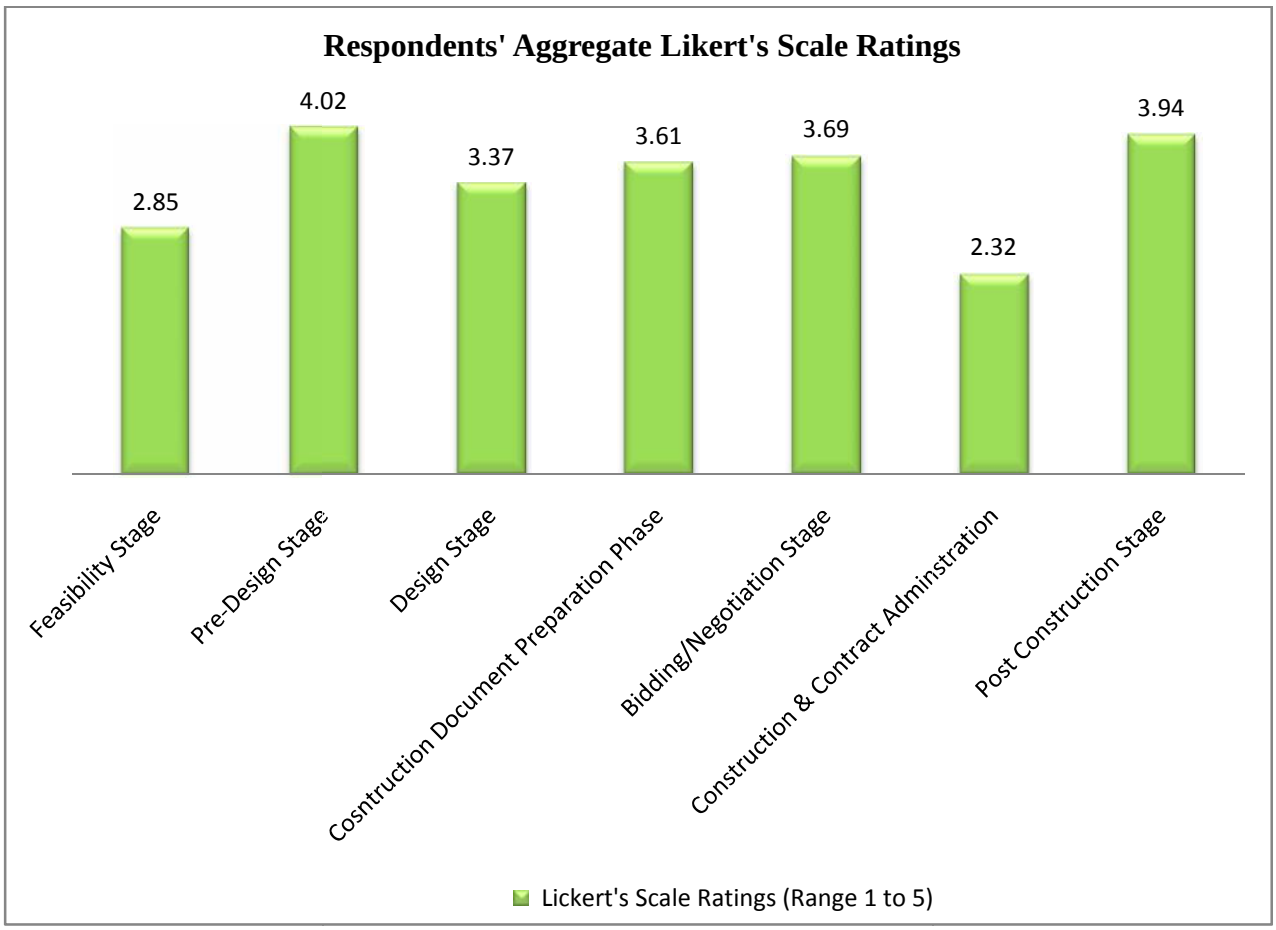
Table 4.14 Maturity of Subtasks in Post Construction Phase

List of tasks on questionnaire for 'Feasibility Stage'	Likert Scale Category
Formally closing out projects	4.76
Settling all outstanding claims that would affect cash flow of the contractor	4.28
Providing clear, adequate, comprehensive quality as-built drawings at the end of projects	4.24
Undertaking due investigation and maintenance inspection and drawing up a comprehensive list of defects	3.68
Performing post-construction services if provided in Client-Consultant agreement like recording drawings and post contract evaluation	3

The responses in the questionnaire regarding the major phases of a construction project and the tasks involved in each of these phases are presented as an aggregate result in figure 4.6 and 4.7 below.

Feasibility Stage ranks at 2.85, which lies at occasionally which indicates that subtasks are not performed to absolute standard but sporadically. Performance of respondents at the Pre-design phase rated the highest of all the other stages at 4.02, which indicates that pre-design subtasks are carried out often.

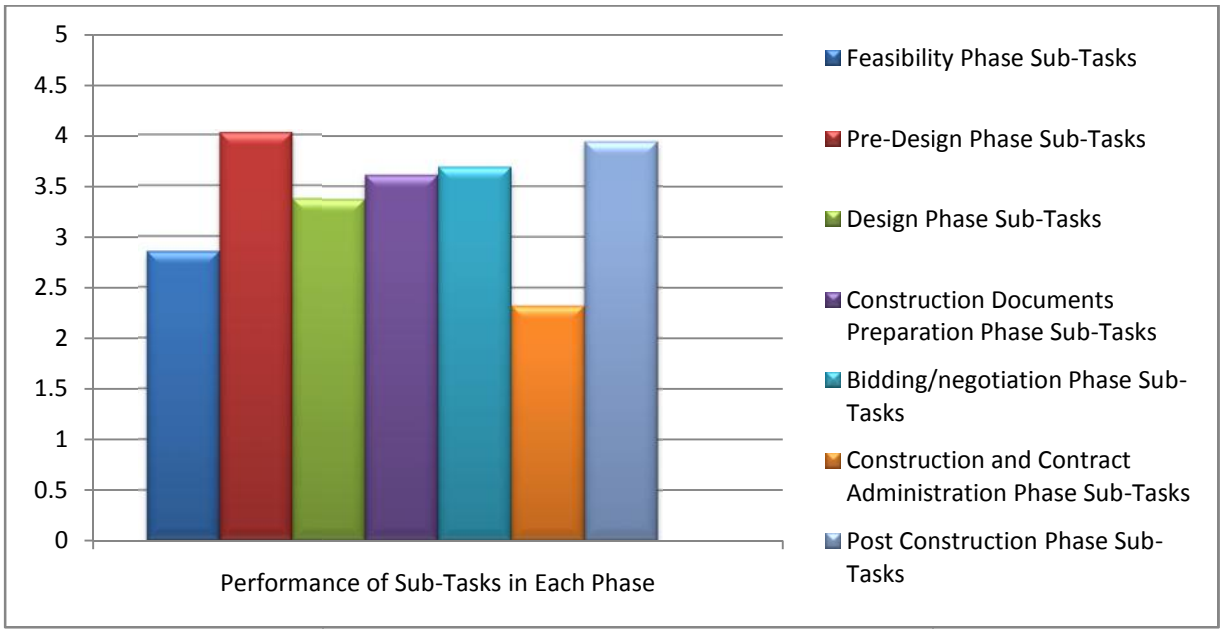
Figure 4.15 Aggregate Likert Scale Results



Design, Construction document preparation and Bidding/Negotiation stage subtasks, which rated 3.37, 3.61 and 3.69 were followed occasionally. Construction and Contract Administration Phase has the lowest ranking at 2.32. This indicates that the important

tasks that define the phase are rarely carried out. The last phase, post-construction, ranked 3.94 indicating that the subtasks are followed often.

Figure 4.7 Likert Scale Ratings



The respondents were then asked to score the importance of factors considered to be major issues in improving quality of construction projects. They were also asked to give a practice review of these focus points. The focus areas in decreasing ranks of practice by respondents are listed below.

- *Communication within your organizations and outside with separate entities like your clients, contractors etc;*
- *Formal project close-out;*
- *Post construction inspection and services;*
- *Project Monitoring and Controlling;*
- *In house design teams;*

- *Attentive time management with periodic assessments and modifications;*
- *Proficiency in local regulations governing the construction industry;*
- *Abiding by registration requirements and improving status;*
- *Awareness of common law and statutory requirements;*
- *Cost Management with periodic assessments and remedial actions;*
- *Financial awareness of the local environment and expertise;*
- *Collaborative designing and communication between various teams of a design (Structural, mechanical, electrical etc);*
- *Project quality management policies and efforts;*
- *Proper human resource management;*
- *Certifications and acknowledgements;*
- *Thorough scope definition and aiming for minimal scope changes;*
- *Training staff/ project personnel;*
- *Professional indemnity insurance to Clients and other insurance requirements;*
- *Implementing health, safety and environmental responsibilities;*
- *Proper and adequate staffing;*
- *In house /readily available/ contractual expertise;*
- *In house /readily available/ legal expertise;*
- *Adherence to international codes of practice;*
- *Performance in compliance with client-consultant agreement;*
- *Maintaining project information in archives after completion;*

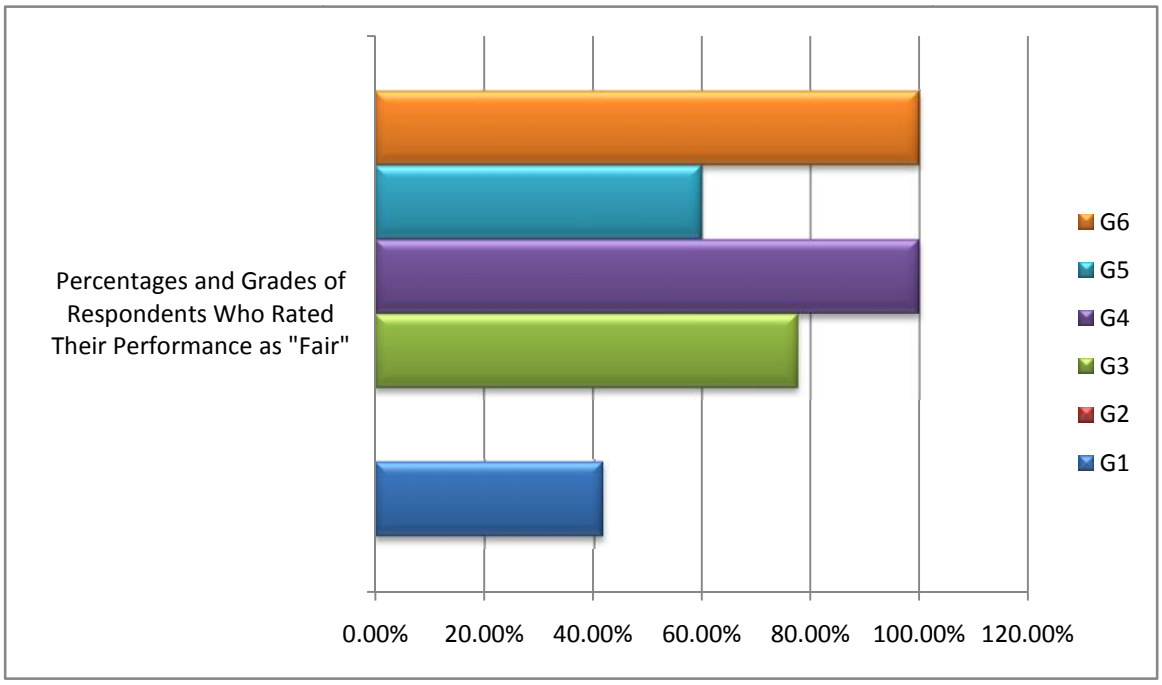
- *Proficiency in global engineering practice, professional and technical standards, codes of practice and regulations and staying up-to-date;*
- *Awareness of liability due to professional services offered;*
- *Proper risk management; and,*
- *Duty of Care to client and the public.*

Respondents by a large margin rated these areas of focus at the maximum levels of importance i.e. '*Very Important'* and '*Important'*. The average rate of '*Moderately Important'* was given by eight respondents to professional indemnity insurance, in house contractual and legal expertise and formal project close-out. Two respondents addressed in-house legal expertise as '*Slightly Important'*.

The other part of this section of the questionnaire tried to address the industry practice of these focus areas. It found that these important issues, although respondents agree they are very important, are not practiced. The least practiced issues include: professional indemnity insurance, safety, health and environmental responsibilities, in-house legal expertise, staff training, thorough project scope study, effective time/schedule management, proficiency in global engineering practices, awareness of liability/*'Duty of Care'/,* financial expertise and market awareness, project quality management policies, human resource management, risk analysis/management, in-house legal teams and collaboration between various departments, certifications, and post-construction services. These issues make for the most part of the whole focus points. This shows that the consulting industry is not taking these matters to practice and there is much room to improve when it comes to consulting services in Ethiopia.

In addition, the respondents rated the quality of their services as '*Fair*' as shown in Figure 4.8 below.

Figure 4.8 Percentage and Grades of Respondents who rated their services as *"Fair"*



An aggregate of 68% of the respondents had worked with international clients/projects. When asked what issue they would say is the most pressing challenge that affects their performance, most noted that lack of skilled professionals. They also agreed that there is not enough awareness, motivation, opportunity, system and communication to equip them.

The respondents also fully (100%) acknowledged that the quality of consultancy service offered plays a major role in the successful completion of a project. 26 of the respondents (92.8%) also disclosed that they have faced cost overrun, delay, quality issues and major scope changes in previous projects. The reasons they gave for that are listed below:

- Lack of proper engineering management practice tailored to construction projects;

- Change of work scope (because of changing client need or non-thorough scope study);
- Unforeseen conditions;
- Quantity estimation error;
- Delays from municipality approval;
- Changes on rules and regulations;
- Shortage of finance;
- Right of way problems;
- Disputes; and,
- Lack of skilled man power.

The respondents were also asked to state what codes and conditions of contract they use and abide by for their services. The most listed were: BaTCoDA, EBCS, PPA, FIDIC, MoWUD, BS, ASTM, AASHTO and ACI.

The respondents were asked if they had a safety management plan in place and 6 responded yes. And when asked if they use safety manuals and enforce safety measures, 2 responded that they do adhere to safety standards. But all of the respondents answered '*No'* to the question of employing a safety officer on site. On the question of accidents on site, 23 responded they have experienced accidents on site. They listed contractors' failure to properly aware their staff about safety issues, missing safety instruction on construction sites, inconsistent practices of safety manuals, poor workmanship as the causes. The respondents were also asked to rate their general competency. The results are shown in figure 4.9 and 4.10 below.

Figure 4.9 General Competency Ratings

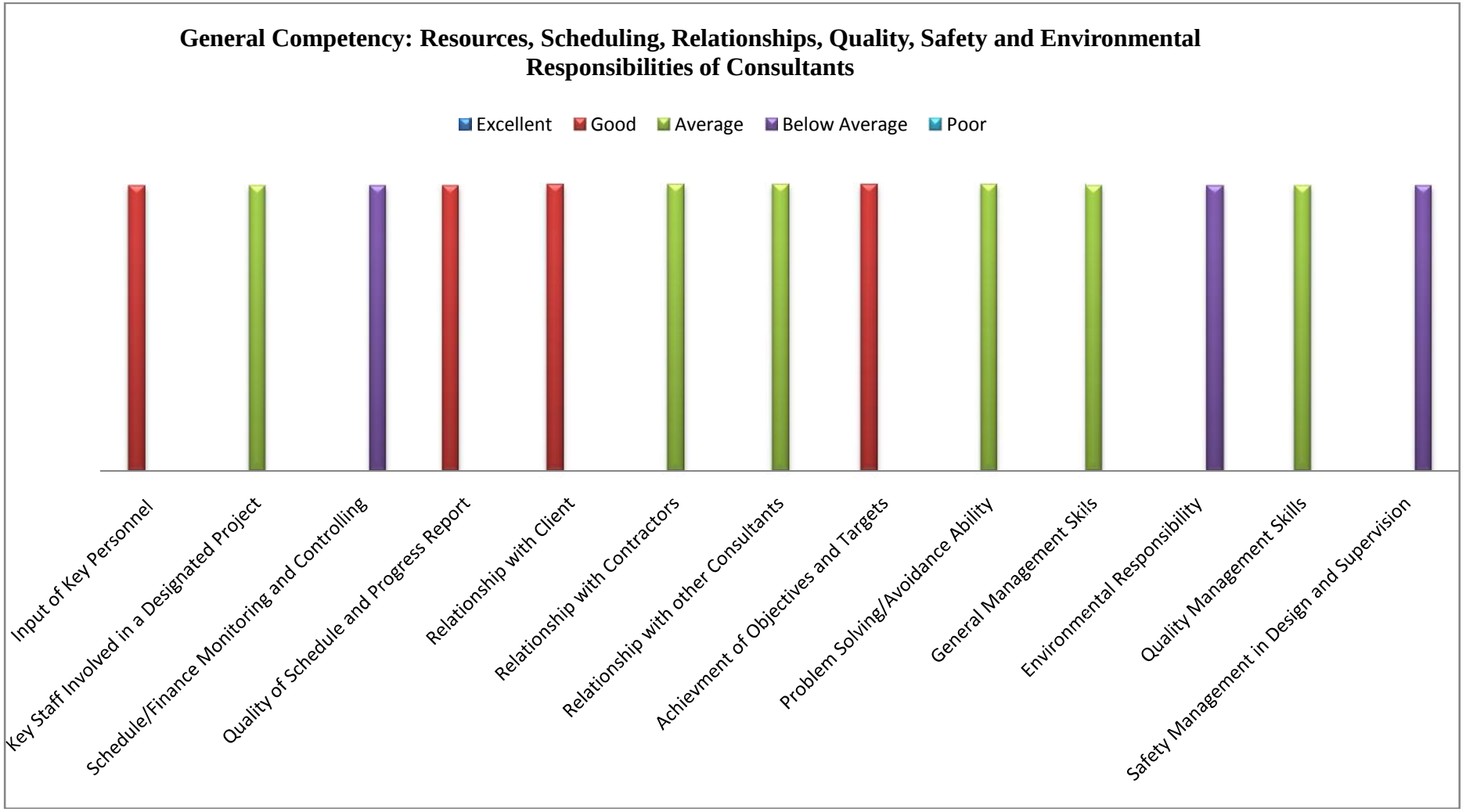
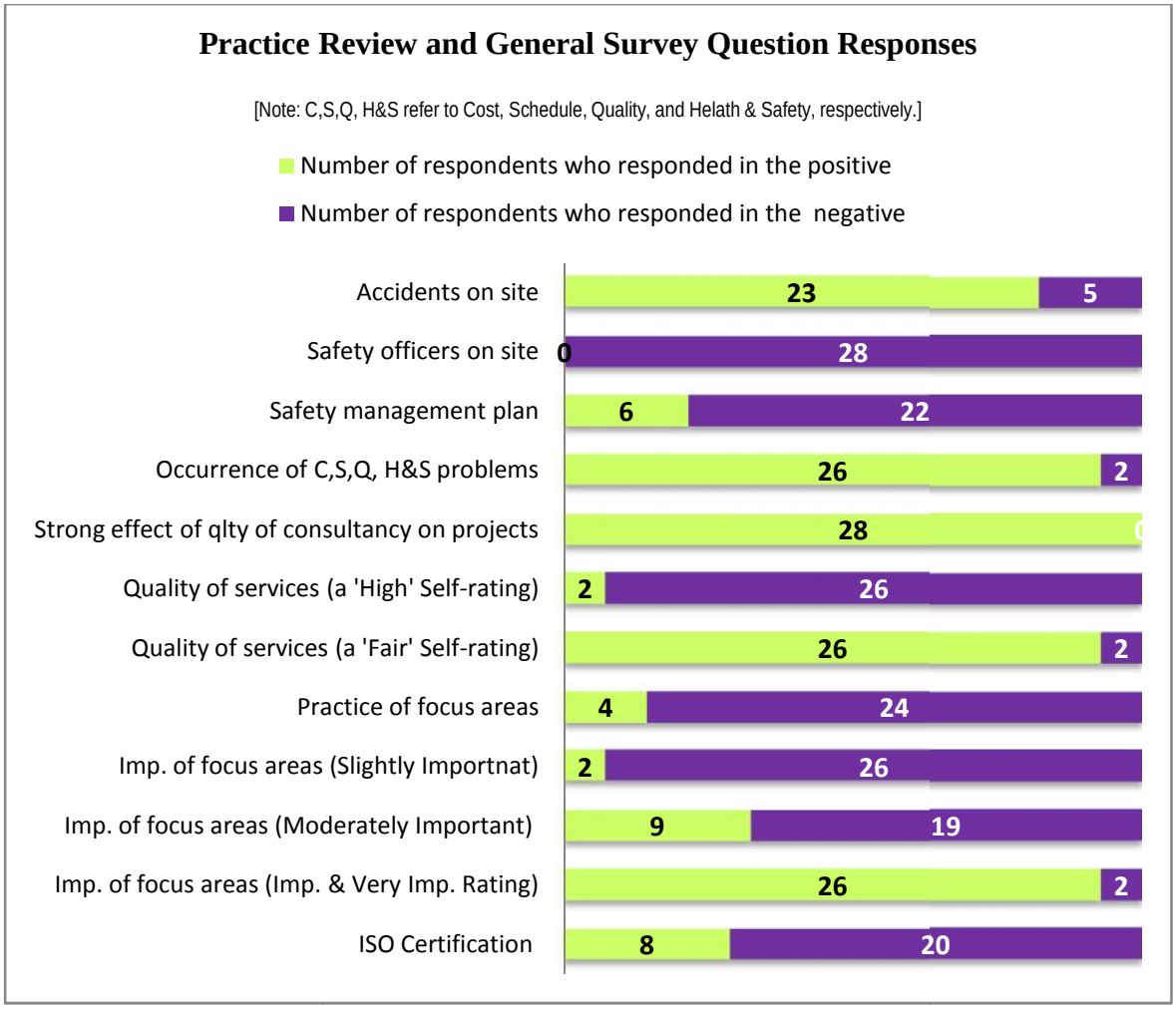


Figure 4.10 Summary of Responses to Practice Review and General Questions



4.1.8. Synopsis of Results

The results of this research are summarized as follows.

- Respondents were only master's and bachelor's degree holders.
- Majority of the respondents only have 0-5 years experience in the industry.
- Only 28% of them have some form of ISO certification.
- Regarding the major phases: 'Feasibility' and 'Construction and Contract Administration' phase sub-tasks were *'Occasionally'* performed with the

lowest scores. The other phases i.e. 'Pre-Design', 'Design', Construction Document Preparation', 'Bidding/Negotiation' and 'Post Construction' were found to be implemented *'Often'*. 'Post Construction' phase subtasks were found to be undertaken *'Often'* with the highest result.

- Level of importance responses for the major focus areas presented in Part III of Appendix 3 were rated as *'Important'* and *'Very Important'*.
- 32% replied *'Moderately Important'* to professional indemnity insurance, in house legal and contractual expertise and final project closeout.
- 7% labeled in-house legal expertise as *'Slightly Important'*.
- To the practice review, most of these focus areas weren't practiced.
- Most rated their own performance as *'Fair'* only.
- 100% said quality of consultancy services greatly affects a project.
- Lack of skilled professionals, opportunity, motivation and communication is the problem according to respondents.
- A staggering 92% of the respondents disclosed to having faced cost overrun, delay, quality problems and safety issues in projects they oversaw/are overseeing.
- Only 6 of the 28 respondents said they have a safety management plan in place.
- None have safety officers on site.
- 82% have experienced accidents on construction sites.

4.2. Discussion

The results presented in the previous section on the performance and current practices of consultants in Addis Ababa are consistent with previous studies that suggest that the industry is not performing to its potential. In light of the literature review conducted and the findings, it can be seen that consultants' performance doesn't indeed fully comply with international codes and practices and they fail to practice their contractual, ethical, professional and legal responsibilities thoroughly and entirely.

The simple statistical analysis of the data gathered on the seven major phases for construction projects has used the mean score as well as standard deviation among others. According to (Moohammad, Yusof, & Kamal, 2014), a mean value is an indicator of central tendency and popularity by showing where scores tend to cluster in the given distribution while standard deviation is widely used for measuring the extent to which the scores tend to deviate from the mean.

The mean score and standard deviation results of the research with regards to performance of consultants in Feasibility, Pre-Design, Design, Contract Documents Preparation, Bidding/Negotiation, Construction and Contract Administration and Post-Construction stages are: 2.85 and .5592; 4.02 and .7050; 3.37 and .4111; 3.61 and .2803; 3.69 and .9213; 2.32 and .5588; and 3.95 and .4006 respectively indicating where responses tended to cluster in the each phase with minimal deviations as explained above.

The other general survey questions also indicate grave negligence and unprofessionalism. The main areas where this was evident were health, safety and environmental

responsibilities as well as professional indemnity insurance and duty of care. There is also the issue of inconsistency in terms of professional conducts. There seems to be fluidity in terms of what consultants deem to be their duty in dealing with different projects.

In terms of maturity of subtasks under each phase, the analysis suggests that each phase had strengths and weaknesses specific to it. In feasibility stage, soliciting legal and insurance expertise as well as risk and impact assessment scored low. In pre-design phase, local consultants scored low when it came to preparing environmental impact assessment reports and making their staff visit the construction site. In design stage, development of mitigating measures should problems arise, as well as value engineering schemes haven't matured. Staff training in contract documents preparation stage and, consulting clients' legal team, if any, in bidding/negotiation phase scored low. In construction and contract administration phase, health and safety and project record keeping scored low maturity levels. Finally, post-construction stage subtasks each showed high maturity.

These results depict the scene of construction consultancy in Addis Ababa as having some way to go; more in some stages than others but needing diligence, progress and improvement nonetheless.

4.3. Summary

The research has covered various issues relating to the construction industry and consulting services. It has and discussed issues relating to the Ethiopian construction

industry. Also topics like construction contracts and construction consultancy as a discipline were studied from the perspective of various local and international conditions of contract. The literature review also discussed the distinction between project management and construction consultancy. The other topic covered was organizational structures for different project delivery methods since the role of consultants is affected by the delivery method in the contract. In addition, the aspect of consultants' duties and consequences of negligence as well as various topics were discussed. Summary and gap identification were also presented.

The research methodology employed was thoroughly discussed in the third section followed by findings and discussion in the fourth section. Lastly, conclusions and recommendations are presented.

The major contributions of this study include the attempt to empirically state the level of performance of consultants and study the consultancy aspect of construction project outcomes instead of focusing on contracting parties which is the usual case. It contributes to narrowing the research gap that lies there. It gives a hint as to the operations and level of competency of consultants and inspires further research.

It also gives consultancy firms an indication of their strengths and weaknesses which will help them evaluate and craft, accordingly, strategic improvement schemes and decisions that will benefit their businesses as well as their professional status in the industry and enhance the country's economy. In addition, it is helpful in indicating areas of policy focus and reformation for the government to assist the growth of the construction sector.

CHAPTER FIVE

CONCLUSIONS AND RECOMMENDATIONS

After analyzing the data acquired through primary and secondary sources, key findings have been presented in the previous chapter. This chapter presents the overall conclusions and recommendations drawn based on the findings of the research.

5.1. Conclusions

The findings of the research show that there is a large room for improvement of consultancy services in Ethiopia. The results suggest that construction industry consultants in Addis Ababa generally perform at an average to below average range. It can be concluded that:

1. Construction consultants in Addis Ababa perform averagely and unsatisfactorily during 'Feasibility' and 'Construction and Contract Administration' phases indicating a lack of professional diligence and commitment. Construction and Contract Administration results were the lowest from all the phases which indicates that this area of service needs special attention. This aligns with various researches and anecdotal stories on the current state of the local construction industry which is plagued with various problems which result from poor supervision and contract management such as quality problems, cost and time overruns etc.

2. Local consultants perform comparatively better during 'Pre-Design', 'Design', Construction Document Preparation', 'Bidding/Negotiation' and 'Post

Construction' phases. This implies that consultants often carry out required responsibilities during these stages. Although it is an encouraging result, it still implies loose enforcement on the consultants' parts as they are not performing these tasks strictly and consistently for all projects. Therefore, these areas need to be further mastered and constantly put into effect.

3. 'Post Construction' phase tasks were fulfilled often with the highest results perhaps due to the phase's short lifetime and rather limited subtasks. This accomplishment needs to be intensified. Because although it is the area where local consultants performed their relative best, there is still room for mastery and expertise to strive for.

4. Although the majority of local consultants believe that major issues like health and safety, environmental responsibility, professional liability and insurance etc are important, their industry practice is contradictory. They don't practice these important issues that are part of their professional, legal, contractual and ethical responsibilities as well as part of the global trend in consultancy services.

5. Most local consultants acknowledge and rate their performance and services as merely satisfactory. This realization can be capitalized as it enables them to advance and improve their performance and level of expertise since all of them believe the quality of consultancy services greatly influences the outcome of a construction project.

6. Consultants' services are negatively affected by lack of incentives, skilled professionals, opportunities and communication problems between construction parties.

7. Most local consultants continue to face cost overrun, delay, quality problems and safety issues in projects they are involved in. These result, partly, from the gap between the duties of consultants and their actual performance on the ground such as poor contract administration and supervision, lack of commitment in enforcing health and safety and environmental requirements. A small number of consultants have a safety management plan in place and none have safety officers on their project sites to enforce these requirements. Most consultants experience accidents of varying degrees on projects. Therefore, workers and the public continue to be exposed to unnecessary accidents and danger.

8. Most consultants have good cultures in terms of staffing, progress reports and relationship with clients. But when it comes to key staff being placed on a designated project, they showed weakness. Other areas where consultants need improvement are general management skills, quality management skills, relationship with contractors and other consultants. In addition, there is grave discord between consultants' responsibilities and actual performance in regards to safety requirements, proactive problem solving and avoidance during a project's lifetime, finance and schedule management as well as environmental issues. These areas need the most attention and intentional work as they are the culprits behind the most prevalent shortcomings of the local construction industry in Ethiopia.

5.2. Recommendations

5.2.1. Recommendations for Action

Based on the research findings, the following recommendations are given to improve performance and state of consultancy services in Addis Ababa.

1. There needs to be more awareness of international practices and codes of professional conduct and support for their implementation with in local consulting firms by incorporating them into organizations' professional and business goals. The concept of professional indemnity insurance and liability on part of consultants is neither well recognized nor enforced in the industry. Therefore, awareness of these liabilities should also be created among industry players and consultants should be held to such liabilities in order to ensure better performance.

2. Consultants should implement a formal performance measurement system at project and company level and customers (clients) should require prequalification screenings at the beginning of projects and undertake performance evaluation (timeliness, quality of service, thoroughness of supervision etc) at the end of projects so that other clients including the government could mandatorily require prior performance evaluations and qualification assessments into the award of contracts hence forcing consultants to incorporate better professional standards and goals into their business model. The industry should also cultivate the branch of individual consultancy and technical assistance for clients. These are professional project management teams that work with the client from the inception stage of projects so that feasibility studies, ToRs, and scope of projects could clearly be

designated and to lead the selection and pre-screening of consultants in order to ensure competency and smooth project delivery.

3. The industry should use various delivery methods instead of the customary or traditional one. There are various project delivery methods that enhance the performance of consultants as well as reduce conflicts and empower the prime contractor. These approaches introduce a lot of advantages and present opportunities to improve the performance of consultants by holding them to higher standards of performance or alternatively by reducing the considerable power vested in them significantly or removing it entirely so that non-compliance doesn't have as grave an impact on the project as it would have had in the traditional delivery method. Project delivery methods are great tools to be chosen to suit each project and situation rather than a one-size-fits-all approach of the traditional form of construction project management prevalent in the local construction industry.

4. Consulting firms should collaborate and strengthen their market presence by means of partnering and joint ventures according to their areas of expertise in order to maximize their financial, technical, professional and ethical capabilities. They should fully staff their workforces with competent professionals in all stages of a project lifecycle. Consultants should enhance their man power resources particularly by incorporating in-house legal and contractual departments. Furthermore, they should place knowledge management frameworks in their organizations which encourage the sharing, multiplication, retention and storage of ideas and knowledge. Such platforms and incentives encourage innovation, creativity and professional competency among colleagues and employees.

5. The government, in collaboration with higher education institutions, should conduct an extensive study to identify challenges that are hindering consultants from performing according to international standards and craft policies and strategies to mitigate these problems. Consulting firms should also create strong ties with universities and educational institutions to advance the profession through knowledge injection, technical competitiveness, technological innovation, environmental consciousness as well as awareness of international business and professional trends. Furthermore, consultants along with the support of professional associations and the responsible government body should organize trainings and workshops for members and foster competent professionals. Registration and licensing regulations should also be revised and various screening measures and evaluation schemes should be put in place and enforced consistently to ensure competency and appropriate expertise. In addition, professional associations should become active players in the industry and enforce professional and ethical codes of conduct that should be followed judiciously by member organizations. The associations should incorporate strict membership requirements before professionals and institution are allowed to join in order to set a higher standard and credibility for the profession. Consulting firms and associations should also invest in continuous professional development (CPD) efforts so as to devise a workable and practical professional standard for the construction industry in Ethiopia and increase their desirability and professional competitiveness in the local as well as global market. Statutory bodies as well as professional associations have a major role in regulating and improving construction consultancy in Ethiopia.

5.2.2. Recommendations for Further Research

One major limitation facing this research is that it doesn't include other key industry players like contractors and clients as well as statutory bodies but is rather based solely on consultants' input. Therefore, further research including these major parties should be conducted so as to further investigate and understand the topic and recommend well rounded solutions. In addition, the reasons behind the low performance of construction supervision and contract administration phases within consulting firms should further be scrutinized in order to understand the specific challenges in that area. Deeper studies in to the issues of codes of ethics and professional conduct as well as environmental responsibilities and licensing and regulation loopholes are also needed to further understand the consulting subdivision of the industry. Moreover, studies on the standardization of fees for consultancy services are recommended.

Lastly, research is needed to refine the performance measurement areas used in this study and further explore various parameters and methods to get a better evaluation of the performance of consultants.

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APPENDICES

APPENDIX 1

Agreement: Standard RFP for the Procurement of Consultancy Services

[Issued by the PPA (Version 1, January 2006); File Ref: CONS-RFP-NCB-SECTION 9]

This Agreement is made the……. day of the month of …… between …… of …….. (hereinafter called the "Procuring Entity") and …….. of …… hereinafter called the "Supplier").

WHEREAS

(a) the Procuring Entity has requested the Supplier to provide certain consultancy services (hereinafter called the "Services") as defined herein and attached to this Contract;

(b) the Supplier having represented to the Procuring Entity that it has the required professional skills, personnel and technical resources, has agreed to provide the Services on the terms and conditions set forth in this Contract;

NOW THEREFORE the parties hereto agree as follows:

1. The documents forming the Contract shall be as stated and in the order of priority stated in the General Conditions of Contract.
2. The mutual rights and obligations of the Procuring Entity and the Supplier shall be as set forth in the Contract, in particular:
   a) The Supplier shall carry out the Services in accordance with the provisions of the Contract; and
   b) The Procuring Entity shall pay the Supplier the Contract Price of Ethiopian Birr _____ or such other sum as may become payable under the provisions of the Contract, at the times and in the manner prescribed by the Contract.

IN WITNESS WHEREOF, the Parties hereto have caused this Contract to be signed in their respective names as of the day and year first above written.

Signed by _____ (for the Procuring Entity)

Name: _____ Authorised Representative

Position: _____

Signed by _____ (for the Supplier)

Name: _____ Authorised Representative

Position: _____

Witnesses

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

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

Appendices

Appendix A: Description of Services

Detailed descriptions of the Services to be provided, dates for completion of tasks, submission of reports and other deliverables etc.

Taken from Section 6 of the Request for Proposals document, modified as required by the comments and suggestions in the Supplier's proposal and any negotiations.

Appendix B: Key Personnel and Sub-Consultants

Team Composition, including names (where already known), firms, positions, tasks assigned and staff-months for each. List of approved Sub-Consultants.

Taken from Form T5 Team Composition and Form T7 Staffing Schedule of the Supplier's proposal, modified and supplemented as required.

Appendix C: Breakdown of Contract Price/Cost Estimates

For Lump Sum Contracts, list the breakdown of fee rates and reimbursable expenses, using Forms F3 Summary of Fees and F4 Summary of Reimbursable Expenses from the Supplier's proposal, modified and supplemented as required. Add the wording "This appendix will be used exclusively for determining remuneration and costs for additional services". For Time-Based Contracts, list the estimated input quantities, fee rates and reimbursable expenses and show totals for each activity, if applicable, and the overall assignment. Use Forms F2 to F4 from the Supplier's proposal, modified and supplemented as required. Add the wording "The inputs and quantities shown are estimates only. Payment will be made for the actual inputs provided, in accordance with the terms of the contract".

Insert multiple tables, as required, where the assignment is divided into separate activities.

Appendix D: Services and Facilities Provided by the Procuring Entity

Details of the inputs to be provided by the Procuring Entity, including data, services and facilities and any counterpart staff.

APPENDIX 2

Questionnaire Cover Letter

Dear Respondents,

I am presently engaged in analytical observational study of Ethiopian Construction Consulting Companies in Addis Ababa and their current industry practices. To accomplish this, I have designed a questionnaire and I am distributing it to you seeking your earnest response.

The main objective of the research is:-

To study the current practices of construction consultants and comparatively analyze it with their contractual duties and responsibilities & selected international practices, identifying key gaps in the process.

Ultimately, the goal is to improve the local construction industry and benefit all stakeholders.

Confidentiality

I solemnly assure you that the information you provide in this questionnaire will remain confidential and that the information you provide me with will only be used for academic purposes.

I kindly ask you to please complete the questionnaire and return it to me within 7 days of receipt. If you have any questions, please do not hesitate to contact me.

Mob: 0913-22-74-10 or email: enugetachew@gmail.com

Thank you for your time and cooperation.

Regards,

Nuhamin Getachew, Graduate Student at Addis Ababa Institute of Technology (AAiT)
School of Civil and Environmental Engineering
MSc in Construction Technology and Management Program
Advisor: Prof. (Dr.- Ing.) Abebe Dinku

APPENDIX 3

Questionnaire for Consultants

PART I - RESPONDENT AND COMPANY PROFILE/GENERAL INFORMATION

Direction: Please answer the following general questions by filling the blanks and marking "X" on the spaces provided as appropriate.

1. Name of your organization (optional)_____
2. Name of the person filling the questionnaire (Optional): _____
3. E-mail address/contact info./(for possible follow-up communication): _____
4. Position/role in the company you represent: _____
5. What is the highest level of education you have received?

A. Doctorate Degree
B. Masters Degree
C. Bachelors Degree
D. Certificate/Diploma
E. Short-Term Training
F. Other(Please Specify)_____

6. Level of experience in the construction industry: (Tick the choice that applies to you.)

Professional Experience in Years	
0-5	
6-10	
11-15	
16-20	
21-30	
>30	

7. Years your organization has been active in the construction industry? _____
8. Your organization is involved in: (Tick the choice/choices that apply to you.)

Consultants	
Building Projects	
Bridge and Highway/Road Projects	
Construction Management	
Specialized Consultant	
Water and Sewerage Projects	
Other (please specify below) {_____}	

9. What grade/class/ is your company currently registered in? (Grade 1,2 etc) _____
10. Does your organization have any certification? Please state. _____

PART II –SURVEY OF CONSULTANCY PRACTICES

Project Related Competency

Direction: Please answer the following survey questions regarding construction consultancy practices.
Mark "X" in the spaces provided to indicate your answer according to the scale below.
1 = Never 2 = Rarely 3 = Occasionally 4 = Often 5 = Always N/A = Not Applicable

	1	2	3	4	5
FEASIBILITY STAGE:					
Do you study the Social, Economic, Environmental implications/aspects of projects you participate in?	☐	☐	☐	☐	☐
Do you assess regulatory restrictions and site/location constraints?	☐	☐	☐	☐	☐
Do you estimate and make considerations for annual project operating expenses such as taxes, insurance, leasing etc?	☐	☐	☐	☐	☐
Do you put together a project team?	☐	☐	☐	☐	☐
Do you clearly assign each team member with distinct roles?	☐	☐	☐	☐	☐
Do you provide professional liability insurance for your Clients?	☐	☐	☐	☐	☐
Do you select, organize and hold discussions between design teams (structural, mechanical, electrical and other special consultants)?	☐	☐	☐	☐	☐
Do you consider time schedule, basic services cost, additional services compensation, insurance and personnel costs, reimbursable expenses while preparing project budget?	☐	☐	☐	☐	☐
Do you consider conflicts with other projects, additional hiring, expansions etc when taking on a new project?	☐	☐	☐	☐	☐
Do you solicit legal and insurance expertise before submitting final agreement to a client?	☐	☐	☐	☐	☐
Do you employ an in-house legal personnel to deal with contractual and legal matters?	☐	☐	☐	☐	☐
Do you assign a unique project number/name to all your projects?	☐	☐	☐	☐	☐
Do you have a filing system for all project related documents?	☐	☐	☐	☐	☐
Do you value and investigate project background information thoroughly during the feasibility stage to enrich the planning endeavor and meet project objectives & constraints?	☐	☐	☐	☐	☐
In efforts to provide quality recommendation to your clients, do you carry out risks and impacts estimation along with mitigation measures?	☐	☐	☐	☐	☐
Do you provide Clients with innovative and creative ideas and options to minimize time, cost, risks and improve quality?	☐	☐	☐	☐	☐
Do you perform comprehensive analysis of major cost items, risks, similar project rates etc to provide an accurate and up-to-date- cost estimate?	☐	☐	☐	☐	☐
Do you present all reports and recommendations in a clear manner with adequate evidence to support them? (quality of	☐	☐	☐	☐	☐

reports..)

PRE-DESIGN STAGE

Do you request soil investigation report from the Client?	☐	☐	☐	☐	☐
Do you visit the site and make observations in person? (site evaluation)	☐	☐	☐	☐	☐
Do you exhaustively obtain all tools available to you like aerial photographs, maps, solar orientation data and diagrams etc to further understand the site location?	☐	☐	☐	☐	☐
Do you make your design team and all staff visit the site before proceeding to the design phase?	☐	☐	☐	☐	☐
Do you prepare Environmental Impact Assessment Report?	☐	☐	☐	☐	☐
Do you obtain necessary permits from responsible agencies?	☐	☐	☐	☐	☐
Do you attempt to create or obtain lists of special equipments of fixtures required by the Client before design begins?	☐	☐	☐	☐	☐
Do you prepare schematic design (Site plans, floor plans, sketches, models and renderings)?	☐	☐	☐	☐	☐
Do you present schematic design, materials file, cost estimates etc to the client?	☐	☐	☐	☐	☐
Do you accommodate the Client's comment after the presentation and address changes in scope with the Client?	☐	☐	☐	☐	☐
Do you require written approval for Schematic Design and written authority to proceed to design development phase?	☐	☐	☐	☐	☐

DESIGN STAGE

Do you proceed to develop schematic designs in more detail and accuracy (Compliance with codes)?	☐	☐	☐	☐	☐
Do you produce all design documents in the same format as architectural drawings?	☐	☐	☐	☐	☐
Do you prepare site plans indicating locations of facilities?	☐	☐	☐	☐	☐
Do you prepare plans, elevations, sections, area calculations etc?	☐	☐	☐	☐	☐
Do you hold a final meeting to submit and discuss any remaining design issues with the client to reach an agreement on structural, mechanical etc systems?	☐	☐	☐	☐	☐
Do you also provide preliminary construction cost estimates?	☐	☐	☐	☐	☐
Do you have an in-house design team (For Consulting Architects)	☐	☐	☐	☐	☐
Do you comply with client's brief /Terms of Reference/ during the early stages of design?	☐	☐	☐	☐	☐
Do you comply to legislative requirements so as not to face challenges ahead?	☐	☐	☐	☐	☐
Do you value clients' requirements in the Terms of Reference and abide by them fully?	☐	☐	☐	☐	☐
Do you further put effort to assist the client in identifying additional objectives and requirements?	☐	☐	☐	☐	☐
Do you introduce and implement value engineering i.e. work	☐	☐	☐	☐	☐

on achieving a design that is technically sound, practical, aesthetically pleasing, and cost-effective?					
Do all your designs meet technical, financial, environmental, professional, safety and quality standards and requirements?	☐	☐	☐	☐	☐
Do you proactively recommend mitigation measures should challenges occur in the future?	☐	☐	☐	☐	☐
Are your designs constructible (less technical difficulties with contractors)?	☐	☐	☐	☐	☐
Do you provide innovative, efficient, sustainable design options for your clients?	☐	☐	☐	☐	☐
Do you consider all design options to lead the project in a cost-effective direction?	☐	☐	☐	☐	☐
Do you present drawings at professional standards with adequate details?	☐	☐	☐	☐	☐
Are drawings clear, uniform, comprehensive, with insignificant or no errors?	☐	☐	☐	☐	☐
Do you present drawings in a manner that is not too technical and is easy to visualize for the client?	☐	☐	☐	☐	☐
CONSTRUTION DOCUMENTS					
Do you review construction program/schedule and budgets with actual project progress?	☐	☐	☐	☐	☐
Do you train your personnel who are not experienced?	☐	☐	☐	☐	☐
Do you communicate and check with appropriate regulatory agencies to establish and schedule review?	☐	☐	☐	☐	☐
Do you establish a clear chain of command for your projects?	☐	☐	☐	☐	☐
Do you periodically review, update and finalize the preliminary construction cost estimate at this stage?	☐	☐	☐	☐	☐
Do you re-check documents for code compliance, owner & statutory bodies requirements and develop a list of required drawings?	☐	☐	☐	☐	☐
Do you prepare final drawings & specifications only after assessing and assisting the client with pertinent issues like permits etc.?	☐	☐	☐	☐	☐
Do you prepare bidding documents in-house?	☐	☐	☐	☐	☐
Do you prepare testing and quality control programs?	☐	☐	☐	☐	☐
BIDDING/NEGOTIATION STAGE					
Do you investigate if the bid date is suitable (doesn't coincide with other major project bid dates)?	☐	☐	☐	☐	☐
Do you identify and assign responsibilities in advertising for bids, receiving bids, bid evaluation and negotiation?	☐	☐	☐	☐	☐
Do you consult Clients' legal counsel on existence of laws regarding the bidding process & documents?	☐	☐	☐	☐	☐
Do you review qualifications of interested bidders?	☐	☐	☐	☐	☐
For bidding by invitation, do you duly notify selected bidders?	☐	☐	☐	☐	☐
For bidding by negotiation, do you, in collaboration with the	☐	☐	☐	☐	☐

Client, negotiate with contractors?					
Do you prepare and distribute well prepared bid documents?	☐	☐	☐	☐	☐
Do you hold pre-bid meetings?	☐	☐	☐	☐	☐
Do you distribute responses to bidders' requests for clarification to all bidders as addendum?	☐	☐	☐	☐	☐
Do you duly return bid-security to disqualified bidders or bidders who wish to withdraw?	☐	☐	☐	☐	☐
Do you analyze/assess/, check for irregularities bid submissions?	☐	☐	☐	☐	☐
Do you along with the client reach acceptance and rejection decisions, prepare Tender Report and notify bidders accordingly?	☐	☐	☐	☐	☐
Do you obtain winning contractors' performance bond and insurance coverage etc?	☐	☐	☐	☐	☐
Do you issue Notice to Proceed for contractors?	☐	☐	☐	☐	☐
CONSTRUCTION & CONTRACT ASDMINSTRATION					
Do you review and update project schedule?	☐	☐	☐	☐	☐
Do you have a system for handling correspondence and submittals?	☐	☐	☐	☐	☐
Do you prepare correspondence and meeting reports?	☐	☐	☐	☐	☐
Do you produce, issue and file field reports, project photographs, change orders, construction change directives, quality control reports, insurance policies etc accordingly?	☐	☐	☐	☐	☐
Do you establish project meeting schedules?	☐	☐	☐	☐	☐
Do you keep your client informed on the progress of work according to the time interval in the agreement (monthly, bi-monthly etc)?	☐	☐	☐	☐	☐
Do you swiftly review and approve payment certificates?	☐	☐	☐	☐	☐
Do you promptly review and take appropriate action when you receive submittals from contractors?	☐	☐	☐	☐	☐
Do you maintain a 'submittals' log?	☐	☐	☐	☐	☐
Do you schedule and review testing?	☐	☐	☐	☐	☐
Do you effectively and impartially review Claims according to contractual provisions?	☐	☐	☐	☐	☐
Do you duly engage in resolving disputes?	☐	☐	☐	☐	☐
Upon receipt of notice of substantial completion, do you inspect to confirm it?	☐	☐	☐	☐	☐
Do you review and evaluate contractor's list of remaining work?	☐	☐	☐	☐	☐
Do you provide Certificate of Substantial Completion and formally close out projects?	☐	☐	☐	☐	☐
Do you conduct a final inspection and prepare a final inspection report?	☐	☐	☐	☐	☐
Do you assemble and file for future reference, complete	☐	☐	☐	☐	☐

project and cost records?					
Do you archive project information with fixed duration of retention?	☐	☐	☐	☐	☐
Within the defects liability period, do you assess the project and determine if any work is required by the contractor?	☐	☐	☐	☐	☐
Do you recruit, supervise & station site staff?	☐	☐	☐	☐	☐
Do you impartially administer Contracts?	☐	☐	☐	☐	☐
Do you regularly and duly supervise Contractors?	☐	☐	☐	☐	☐
Do you proactively maintain financial Control of Contract?	☐	☐	☐	☐	☐
Do you advocate for & demand the implementation of health and safety procedures on site (Personal Protective Equipments etc.)	☐	☐	☐	☐	☐
POST CONSTRUCTION SERVICES					
Do you perform post-construction services if provided in Client-Consultant agreement like recording drawings and post contract evaluation?	☐	☐	☐	☐	☐
Do you provide clear, adequate, comprehensive quality as-built drawings and records at the end of projects?	☐	☐	☐	☐	☐
Do you undertake due investigation and maintenance inspection and draw up a comprehensive list of defects?	☐	☐	☐	☐	☐
Do you settle all outstanding claims that would affect cash flow of the contractor?	☐	☐	☐	☐	☐
Do you formally close-out your projects?	☐	☐	☐	☐	☐

PART III - LEVEL OF IMPORTANCE AND PRACTICE REVIEW OF FOCUS AREAS

(Level of Importance Scale: 1 = Very Important, 2 = Important, 3 = Moderately Important, 4 = Slightly Important, 5 = Not Important)

Focus Areas	Level of Importance					Industry Practice		
	1	2	3	4	5	Y	N	N/A
Professional Indemnity Insurance to Clients and other insurance requirements								
Implementing Health, Safety and Environmental responsibilities								
Proper and adequate Staffing								
In house /readily available/ contractual expertise								
In house /readily available/ legal expertise								
Adherence to international codes of practice								
Performance in compliance with client-consultant agreement								
Project Monitoring and Controlling								
Formal project close-out								
Post construction inspection and services								
Maintaining project information in archives after completion								
In house design teams								
Collaborative designing and communication between various teams of a design (Structural, mechanical, electrical etc)								
Training staff/ project personnel								
Preparation of thorough scope for minimal scope changes								
Attentive time management, periodic assessments,modifications								
Proficiency in local regulations governing the industry								
Proficiency in global engineering practices, professional & technical standards, codes of practice, regulations & staying up-to-date								
Awareness of liability due to professional services offered								
Awareness of common law and statutory requirements								
Abiding by registration requirements and improving status								
Certifications and acknowledgements								
Cost Management, periodic assessments & remedial actions								
Financial awareness of the local environment and expertise								
Project quality management policies and efforts								
Proper human resource management								
Communication within your organizations and outside with separate entities like your clients, contractors etc								
Proper risk management								
“Duty of Care” (Responsibility of a party claiming to be a professional to act with due diligence and professionalism)								

PART IV – GENERAL SURVEY QUESTIONS

1. How do you evaluate/rate your expertise in providing consultancy services? (Fairly and objectively)

☐ Low ☐ Fair ☐ High

2. Have you previously had international clients who hired you for professional consultancy services?

☐ Yes ☐ No

3. If you answered 'No' to the previous question, why?_____

_____

4. What would you say is the most pressing challenge in the industry for you that impacts your performance negatively?

☐ Lack of opportunity and necessary infrastructure

☐ Lack of awareness

☐ Monetary strains

☐ Lack of motivation

☐ Lack of skilled professionals

☐ Other (Please specify.)

_____

5. In your expert opinion, do you think the quality of consultancy service plays a major role in successful completion of a project?

☐ Yes ☐ No ☐ I Don't Know

6. Have any of your previous projects faced cost overrun, delay, quality issues, major scope changes etc?

☐ Yes ☐ No

7. If your answer is yes, what do you believe caused these problems?_____

_____

8. When engaged in projects, what codes and professional documents do you follow for compliance? (Please indicate whether they are international or local

publications)_____

_____

9. Do you have a safety management plan?

☐ Yes ☐ No

10. Do you have a safety officer on site?

☐ Yes ☐ No

11. Do you use safety manuals?

☐ Yes ☐ No

12. Please state the safety maunals you use?_____

_____

13. Have you had incidents of accidents on site?

☐ Yes ☐ No

14. What were the causes of these accidents?

_____

_____

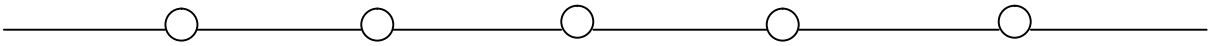
_____

PART V – GENERAL COMPETENCY

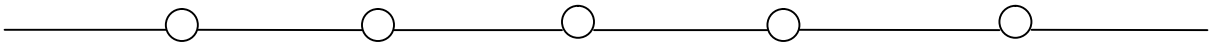
(Direction: Mark "X" inside the circles)

1. Resources

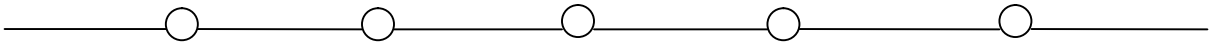
1.1. Input of key personnel in the project



1.2. Adequacy for professional input of key personnel

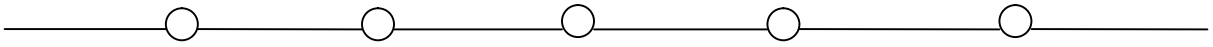


1.3. Key staff involved in one designated project

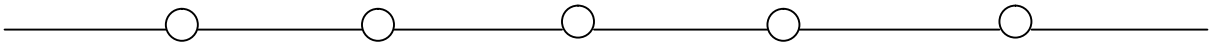


2. Scheduling

2.1. Schedule/Program monitoring and control

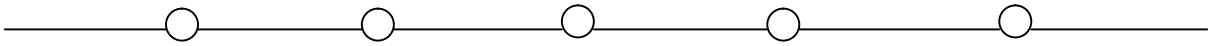


2.2. Adequacy of schedule reporting; quality of program and progress report

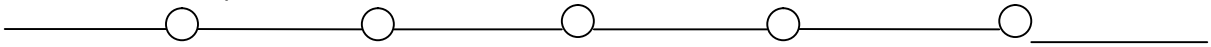


3. Relationship

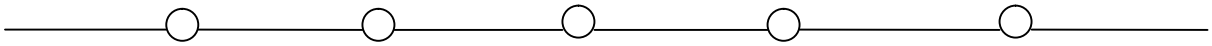
3.1. Relationship with Client



3.2. Relationship with the Contractors

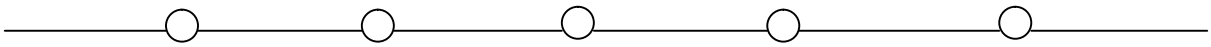


3.3. Relationship with other Consultants

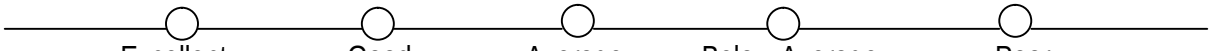


4. Others

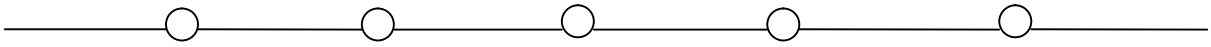
4.1. Achievement of objectives and targets



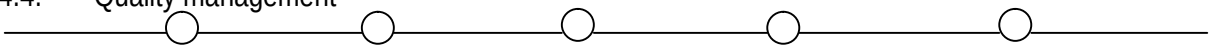
4.2. Responding quickly to the request and instructions of client & problem solving /avoidance-ability



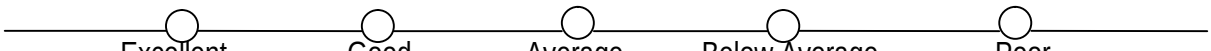
4.3. General management skills



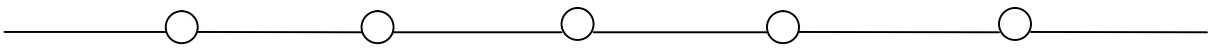
4.4. Quality management



4.5. Safety management in design and supervision (Safe method statement and effective communication with contractors on safety issues)



4.6. Environmental management(reduced environmental impact like pollution etc and increased social satisfaction)



*****END*****

[Note: Sections of the Questionnaire were developed and adopted from: "City of Oakland Consultant Performance Evaluation Form" (City of Oakland) and AIA D200 Project Checklist (AIA, 1995) with minor modifications to suit the context of this research.]

APPENDIX 4

Threshold Project for Different Categories and Classes of Consultancy in Ethiopia

Ser. No	Category	Class and Project Size (mill. Birr)						
		I	II	III	IV	V	VI	PP
1	Water Resources Consultancy	350+	350	250	150	100	75	50
2	Irrigation, Drainage and Flood Control Consultancy	350+	350	250	150	100	75	50
3	Sanitary Engineering Consultancy	120+	120	100	80	60	40	20
4	Hydraulics Engineering Consultancy	350+	350	250	150	100	75	50
5	Architectural and Engineering Consultancy	120+	120	100	80	60	40	20
6	Engineering Consultancy (general)	350+	350	250	150	100	75	50
7	Architectural Consultancy	120+	120	100	80	60	40	20
8	Specialized Consultancy	120+	120	100	80	60	40	20
9	Consultancy in Construction Management	350+	350	250	150	100	75	50
10	Highway and Bridge Consultancy	350+	350	250	150	100	75	50

Source: MoUDC Directive No 22/2013

APPENDIX 5

Various Professional Codes of Ethics

A.) Code of Ethics of the American Society of Civil Engineers

It shall be considered unprofessional and inconsistent with honorable and dignified bearing for any member of the American Society of Civil Engineers:

1. To act for his clients in professional matters otherwise than as a faithful agent or trustee, or to accept any remuneration other than his stated charges for services rendered his clients.
2. To attempt to injure falsely or maliciously, directly or indirectly, the professional reputation, prospects, or business, of another-Engineer.
3. To attempt to supplant another Engineer after definite steps have been taken toward his employment.
4. To compete with another Engineer for employment on the basis of professional charges, by reducing his usual charges and in this manner attempting to underbid after being informed of the charges named by another.
5. To review the work of another Engineer for the same client, except with the knowledge or consent of such Engineer, or unless the connection of such Engineer with the work has been terminated.
6. To advertise in self-laudatory language, or in any other manner derogatory to the dignity of the Profession.

B.) Accreditation Board For Engineering and Technology - Code of Ethics of Engineering

The Fundamental Principles

Engineers uphold and advance the integrity, honor and dignity of the engineering professional by: (I.) using their knowledge and skill for the enhancement of human welfare; (II.) being honest and impartial, and serving with fidelity the public, their employers and clients; (III.) striving to increase the competence and prestige of the engineering profession; and (IV.) supporting the professional and technical societies of their disciplines.

The Fundamental Canons

1. Engineers shall hold paramount the safety, health and welfare of the public in the performance of their professional duties.
2. Engineers shall perform services only in the areas of their competence.
3. Engineers shall issue public statements only in an objective and truthful manner.
4. Engineers shall act in professional matters for each employer or client as faithful agents or trustees, and shall avoid conflicts of interest.
5. Engineers shall build their professional reputation on the merit of their services and shall not compete unfairly with others.
6. Engineers shall act in such a manner as to uphold and enhance the honor, integrity and dignity of the profession.
7. Engineers shall continue their professional development through their careers and shall provide opportunities for the professional development of those engineers under their supervision.

APPENDIX 6

RIBA Code of Professional Conduct

Source: RIBA (2005)

Introduction

1. This Code and its accompanying Guidance Notes set out and explain the standards of professional conduct and practice that the Royal Institute requires of its members.
2. This Code comprises:
    - **Three principles** of professional conduct
    - **Professional values** that support those principles
    - **Guidance Notes** which explain how the principles can be upheld.

The Royal Institute's Values

Honesty, integrity and competency, as well as concern for others and for the environment, are the foundations of the Royal Institute's three principles of professional conduct set out below. All members of the Royal Institute are required to comply.

The Three Principles

Principle 1: Integrity

Members shall act with honesty and integrity at all times.

Principle 2: Competence

In the performance of their work Members shall act competently, conscientiously and responsibly. Members must be able to provide the knowledge, the ability and the financial and technical resources appropriate for their work.

Principle 3: Relationships

Members shall respect the relevant rights and interests of others.

Upholding the Principles

The notes below offer some brief guidance on how members can uphold the three principles. More detailed advice is set out in Guidance Notes to the Code, which is available separately.

1. Principle 1 – Honesty and Integrity

1.1. The Royal Institute expects its Members to act with impartiality, responsibility and truthfulness at all times in their professional and business activities.

1.2. Members should not allow themselves to be improperly influenced either by their own, or others', self-interest.

1.3. Members should not be a party to any statement which they know to be untrue, misleading, and unfair to others or contrary to their own professional knowledge.

1.4. Members should avoid conflicts of interest. If a conflict arises, they should declare it to those parties affected and either remove its cause, or withdraw from that situation.

1.5. Members should respect confidentiality and the privacy of others.

1.6. Members should not offer or take bribes in connection with their professional work.

2. Principle 2 – Competence

2.1. Members are expected to apply high standards of skill, knowledge and care in all their work. They must also apply their informed and impartial judgment in reaching any decisions, which may require members having to balance differing

and sometimes opposing demands (for example, the stakeholders' interests with the community's and the project's capital costs with its overall performance).

2.2. Members should realistically appraise their ability to undertake and achieve any proposed work. They should also make their clients aware of the likelihood of achieving the client's requirements and aspirations. If members feel they are unable to comply with this, they should not quote for, or accept, the work.

2.3. Members should ensure that their terms of appointment, the scope of their work and the essential project requirements are clear and recorded in writing. They should explain to their clients the implications of any conditions of engagement and how their fees are to be calculated and charged. Members should maintain appropriate records throughout their engagement.

2.4. Members should keep their clients informed of the progress of a project and of the key decisions made on the client's behalf.

2.5. Members are expected to use their best endeavors to meet the client's agreed time, cost and quality requirements for the project.

3. Principle 3 – Relationships

3.1. Members should respect the beliefs and opinions of other people, recognize social diversity and treat everyone fairly. They should also have a proper concern and due regard for the effect that their work may have on its users and the local community.

3.2. Members should be aware of the environmental impact of their work.

3.3. Members are expected to comply with good employment practice and the RIBA Employment Policy, in their capacity as an employer or an employee.

3.4. Where members are engaged in any form of competition to win work or awards, they should act fairly and honestly with potential clients and competitors. Any competition process in which they are participating must be known to be reasonable, transparent and impartial. If members find this not to be the case, they should endeavor to rectify the competition process or withdraw.

3.5. Members are expected to have in place (or have access to) effective procedures for dealing promptly and appropriately with disputes or complaints.

The supporting Guidance Notes

Guidance Note	Related Principle(s)
1. Integrity, Conflicts of Interest, Confidentiality and Privacy, Corruption and Bribery	Principle 1, Principle 3
2. Competition	Principle 1, Principle 3
3. Advertising	Principle 1
4. Appointments	Principle 2
5. Insurance	Principle 2
6. CPD	Principle 2
7. Relationships	Principle 3
8. Employment and Equal Opportunities	Principle 3
9. Complaints and Dispute Resolution	Principle 3

Application of the Code

1. Professionalism

The purpose of this Code is to promote professional good conduct and best practice. Members should at all times be guided by its spirit as well as its precise and express terms.

2. The Law

Members must comply with all relevant legal obligations. It is not the remit of this Code to duplicate the provisions of business, employment, health and safety, environmental and discrimination law.

3. Amendments and Additions

Periodically the Royal Institute will publish further guidance on specific aspects of professional practice and conduct. Members must observe such amendments and additions as they come into effect.

Other Applicable Codes

1. United Kingdom Codes

Chartered Members who are also registered in the United Kingdom are subject to **The Architects' Code**, published by the **Architects Registration Board** (ARB)**.**

2. Other National Codes

A member practicing in a country outside the United Kingdom may be required to be a member of, or registered by, that country's professional or regulatory body for architects.

If this is the case the Royal Institute recognizes that a member's first obligation will be to comply with the rules of conduct published by the local professional or regulatory body.

3. Other Professions' Codes

This Code applies to all members regardless of their fields of activity, contracts of employment or membership of other professional organizations. The Royal Institute recognizes that members may participate in other professional activities and that when they do so the rules of the relevant professions' governing bodies will take precedence over this Code. Under normal circumstances the Royal Institute would take no action under this Code if the matter is also under consideration by another, more directly involved, professional body. However, such action may be considered necessary if the matter raises issues connected with a member's status as a member or an architect.

Discipline

1. Contraventions of this Code

Any member who contravenes this Code shall in accordance with **Byelaw 4** of the Royal Institute's Charter and Byelaws, be liable to reprimand, suspension or expulsion. The power to sanction a member for professional misconduct is exercised by the Disciplinary Committee on behalf of the Royal Institute's Council through a delegation of authority made under Byelaw 4.4.

2. Remit

Members' conduct outside the practice of architecture will not normally fall within the remit of this Code and the Royal Institute's Disciplinary Procedures, unless the

Disciplinary Committee determines that such conduct generally offends against the honor and integrity of the profession.

3. Judgments from External Competent Authorities

A judgment from a competent court or tribunal against a member in his or her professional capacity as an architect may be considered sufficient evidence of a breach of this Code.

4. Investigations

Any member, against whom a complaint of professional misconduct has been received, may be required to answer inquiries arising under the **Disciplinary Procedure Regulations.** At the conclusion of an investigation, the Disciplinary Committee may reprimand, suspend or expel any member whose conduct is found to be in contravention of this Code or otherwise inconsistent with the status of a member.

5. Professional Conduct Committee Judgments from the ARB

Where a member is sanctioned by the ARB's Professional Conduct Committee, the Disciplinary Committee shall determine whether or not to impose the same, or an alternative, sanction on behalf of the Royal Institute.

APPENDIX 7

Sample Consultant Qualification Questionnaire (Form)

➔ *(Questionnaire to be completed and submitted to client's office as part of their statement of qualification.*)

1. Name of firm_____

   Contact Person_____

2. Mailing Address of firm_____

   Physical address of firm_____

   Telephone No. (Area code) (_____)_____Fax No. (Area code) (_____)_____

   Company Web Site URL:_____

3. State of organization_____Date established_____

   Date Authorized to do business in (Area of Project)_____

4. License no.:_____Type of valid professional license:_____

5. Professional Liability Insurance Company _____

   Current Professional Liability Insurance Limits_____Insurance Co. Best Rating:_____

6. Have claims ever been filed with the professional liability insurer?_____If Yes, attach statements of explanation.

7. Officers or Principals of firm: _____.

8. Have Principals ever had licenses suspended? _____If yes, attach explanation.

9. Has firm ever been suspended or terminated from a project? If yes, attach explanation._____.

10. Has firm ever been denied prequalification or disqualified from bidding public works? _____If yes, attach explanation.

11. In the past five years, has your firm been involved in an unresolved job dispute or an owner-consultant dispute and/or litigation on a public works project? Yes___No___. If yes, attach a brief explanation and results of each dispute and/or litigation.

12. Project Title/s (of each selected projects according to client's criteria…) _____

Project Construction Budget at inception_____.

Construction Cost at Bid Award_____.

Construction Cost at Completion_____% of Change Order_____.

Project completed: Ahead of schedule___On Schedule____Behind Schedule____: By____+/-Days.

AFFIDAVIT

The submitter of the forgoing statements contained on this Technical Qualifications Questionnaire has read the same, and it is true to the best of the submitter's knowledge. Any reference named therein is hereby authorized to supply the Client with any information necessary to verify the statements.

By signing below, the proposer certifies and declares under penalty of perjury under the laws of (area of the location of the project) that the foregoing is true and correct.

SIGNATURE OF AN INDIVIDUAL/PARTNER/CORPORATION

Executed this_____day of_____,_____in the city of_____,

country of_____state/city of_____. .

Signature of applicant_____.

[Adopted from Administrative Office of the Courts/AOC/ California: Request for Architectural and Engineering Qualifications – Form 1]

APPENDIX 8

(a) Number of Registered Consultants (2008Ec)

	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6
CA				1		
CAE	64	8	111	8	64	4
CEG	1	1	4		10	
CES			1	1	5	1
CMC		3	2		2	5
HBC	6	1	25	2	5	
Total	**71**	**13**	**143**	**12**	**86**	**10**

(b) Rough Estimate of the Construction Consultancy Sector Size in Terms of Workforce and Financial Capacity

⇨ ***(Analysis based on MoUDC's Amended Directive No. 22/2013 and its minimum stipulated requirement.)***

- *Estimates of staff employed in the consulting industry in professional and non-professional (jobs not particularly related to the profession of engineering or construction) positions, capital and expenses invested in rent and office equipments were calculated for Consulting Architects and Engineers (CAE), Consulting Architects (CA), Consulting Engineers – General (CEG), Consulting Engineers – Specialized (CES), Construction Management Consultants (CMC) and lastly Highway and Bridge Consultants (HBC) and are presented in tables on the following pages.*

Consulting Architects and Engineers (CAE)

Staff Requirement

Type	Practici-ng Profess-ional Architect	Practic-ing Profess-ional Structural Engineer	Profess-ional Architect	Professi-onal Structural Engineer	Profess-ional Electrical Engineer	Profess-ional Sanitary Engineer	Graduate Architect	Associate/ Graduate Engineer	Enginee-ring Aide	G1	G2	G3	G4	G5	G6	Amount	
Professionals	1	1	1	1	1	1	1	2		64						576	
	1		1	1		1	1	1			8					48	
	1		1	1					1			111				444	
	1		1	1					1				8			32	
	1						1		1					64		192	
															4	0	
																1,292	**Total**
			Secretary														
Non - professionals			1	1	1	1	1									255	Total
			G1	G2	G3	G4	G5	G6									

Finance

Type															
								G1	G2	G3	G4	G5	G6		
Capital		800,000.00	400,000.00	200,000.00	100,000.00	50,000.00		64	8	111	8	64		80,600,000.00	
Office Rent		Minimum Area Required (m2)					Rent/m2							Total Cost of Rent	
		300	225	150	75	40	350	0	0	0	0	0		14,283,500.00	
Office Equipments				Qty/Pcs						Price/Pcs					
Computer		8	6	5	4	3				12,250					
Plotter		3	2	2	1					190,000					
Blueprint Machine		1	1							75,000					
Laptop		4	3							18,500					
Sets of tables and chairs		12	10	8	6	5				15,000					
Vehicles		3	2	1	1					375,000					
Photocopy Machine or Scanner		1	1	1						19,500					
A3 Size Printer		1	1	1	1	1				14,500					
	Cost of Equipments in Each Grade	2,156,000	1,518,000	970,250	718,500	126,250									
	No. of Firms in each Grade	64	8	111	8	64								Total Cost of Office Equipments	
	Total Cost/Grade	137,984,000	12,144,000	107,697,750	5,748,000	8,080,000								271,653,750.00	
														366,537,250.00	**Grand Total**

Consulting Architects (CA)

Staff Requirement

Type	Practicing Architect	Professional Architect	Engineering Aide	G4	Amount	
Professionals	1	1	1			
				1	3	
					3	**Total**
			Secretary			
Non - professionals			1		**1**	**Total**
			G4			

Finance

Type				
		G4		
Capital	75,000	1	75,000.00	
Office Rent	Minimum Area Required (m2)	Rent/m2	Total Cost of Rent	
	50	350	17,500.00	
Office Equipments	Qty/Pcs	Price/Pcs	Total Cost of Office Equipments	
Computer	4	12,250	49,000	
Plotter		190,000	0	
Blueprint Machine		75,000	0	
Laptop		18,500	0	
Sets of tables and chairs	6	15,000	90,000	
Vehicles		375,000	0	
Photocopy Machine or Scanner		19,500	0	
A3 Size Printer	1	14,500	14,500	
			153,500.00	Total Cost of Office Equipments
			246,000.00	Grand Total

Consulting Engineers - General (CEG)

Staff Requirement

Type	Professional Structural Engineer	Professional Electrical Engineer	Professional Sanitary Engineer	Practicing Engineer	Associate/ Graduate Engineer	Engineering Aide	G1	G2	G3	G4	G5	Amount	
Professionals	1	1	1	1	1	1	1					6	
	1	1	1	1		1		1				5	
	1			1	1	1			4			16	
	1			1		1				0		0	
											10	0	
												27	**Total**
			Secretary										
Non - professionals			1	1	1	1	1					16	Total
			G1	G2	G3	G4	G5						

Finance

Type						G1	G2	G3	G4	G5	
Capital	250,000.00	175,000.00	140,000.00	75,000.00		1	1	4	0	10	985,000.00
Office Rent	Minimum Area Required (m2)				Rent/m2						Total Cost of Rent
	130	90	70	50	350	0	0	0	0	0	175,000.00
Office Equipments			Qty/Pcs					Price/Pcs			
Computer	7	6	5	4				12,250			
Plotter	2	1	1					190,000			
Blueprint Machine	1	1						75,000			
Laptop	3	2						18,500			
Sets of tables and chairs	10	8	7	6				15,000			
Vehicles	2	1	1					375,000			
Photocopy Machine or Scanner	1	1	1	1				19,500			
A3 Size Printer	1	1	1	1				14,500			
Cost of Equipments in Each Grade	1,530,250	904,500	765,250	173,000	0						
No. of Firms in each Grade	1	1	4	0	10						
Total Cost/Grade	1,530,250	904,500	3,061,000	0	0						**Grand Total**
						5,495,750.00		Total Cost of Equipments			**6,655,750.00**

Consulting Engineers - Specialized (CES)

Staff Requirement

Type	Practicing Engineer	Professional Engineer	Associate/Graduate Engineer	Engineering Aide	G3	G4	G5	Amount	
Professionals	1	1	1		1			3	
	1		1	1		1		3	
	1			1			5	10	
								16	**Total**
			Secretary						
Non - professionals					1	1	1	7	Total
					G3	G4	G5		

Finance

Type										
								G3	G4	G5	
Capital				150,000.00	75,000.00	30,000.00		1	1	5	375,000.00
Office Rent		Minimum Area Required (m2)					Rent/m2				Total Cost of Rent
				100	30	30	350				98,000.00
Office Equipments				Qty/Pcs						Price/Pcs	
Computer				4	4	3				12,250	
Plotter				1	1					190,000	
Blueprint Machine										75,000	
Laptop				2	1					18,500	
Sets of tables and chairs				7	6	5				15,000	
Vehicles				1						375,000	
Photocopy Machine or Scanner				1	1	1				19,500	
A3 Size Printer				1	1	1				14,500	
	Cost of Equipments in Each Grade			790,000	381,500	145,750					
	No. of Firms in each Grade			1	1	5					
	Total Cost/Grade	0	0	790,000	381,500	728,750					Grand Total
								1,900,250.00	Total Cost of Office Equipments		**2,373,250.00**

Construction Management Consultancy (CMC)

Staff Requirement

Type	Practicing Professional in Engineering Management & Planning	Professional Engineer in Construction Supervision	Associate/ Graduate Engineer	Engineering Aide	G2	G3	G4	G5	G6	Amount	
Professionals	1	1	1	1	3					12	
	1	1	1			2				6	
	1	1	1							0	
	1							2		2	
									5	0	
										20	**Total**
			Secretary								
Non - professionals				1	1	1	1			7	Total
				G2	G3	G4	G5	G6			

Finance

Type											
								G2	G3	G4	G5	G6	
Capital			100,000.00	15,000.00	10,000.00	10,000.00		3	2	0	2	5	350,000.00
Office Rent		Minimum Area Required (m2)					Rent/m2						
			75	50	30	30	350	0	0	0	0	0	134,750.00
Office Equipments				Qty/Pcs					Price/Pcs				
Computer			6	4	3	3			12,250				
Plotter									190,000				
Blueprint Machine									75,000				
Laptop			3	3					18,500				
Sets of tables and chairs			8	8	6	6			15,000				
Vehicles			1	1					375,000				
Photocopy Machine or Scanner			1	1	1	1			19,500				
A3 Size Printer			1	1	1	1			14,500				
	Cost of Equipments in Each Grade		658,000	633,500	160,750	160,750							
	No. of Firms in each Grade		3	2	0	2	5						Grand Total
	Total Cost/Grade		1,974,000	1,267,000	0	321,500	0						4,047,250.00
								3,562,500	Total Cost of Office Equipments				

Highway & Bridge Consultants (HBC)

Staff Requirement

Type	Professional Bridge Engineer	Professional Geologist	Professional Material Engineer	Practicing Highway Engineer	Professional Road Engineer	Associate/Graduate Engineer	Enginee-ring Aides with Road Experience	G1	G2	G3	G4	G5	Amount	
Professionals	1	1	1	1	1	1	1	6					42	
	1	1	1	1					1				4	
	1		1	1	1	1	1			25			150	
	1		1	1	1		1				2		10	
	1		1	1			1					5	20	
													226	**Total**
		Computer Operator	Secretary											
Non - professionals		1	1	1	1	1	1						45	Total
		G1	G1	G2	G3	G4	G5							

Finance

Type													
							G1	G2	G3	G4	G5		
Capital		200,000.00	150,000.00	100,000.00	75,000.00	50,000.00	6	1	25	2	5		4,250,000.00
Office Rent		Minimum Area Required (m2)					Rent/m2						Total Cost of Rent
		250	200	100	75	50	350	0	0	0	0	0	1,610,000.00
Office Equipments				Qty/Pcs						Price/Pcs			
Computer		6	5	5	4	4				12,250			
Plotter		2	1	1						190,000			
Blueprint Machine		1	1	1						75,000			
Laptop		2	2							18,500			
Sets of tables and chairs		9	8	8	6	6				15,000			
Vehicles													
Theodolite		2	2	2	1	1				1,375,000			
4-Wheel Drive		3	2	2	1	1				1,037,500			
Photocopy Machine or Scanner		1	1	1	1	1				19,500			
A3 Size Printer		1	1	1	1	1				14,500			
	Cost of Equipments in Each Grade	6,597,000	5,342,250	5,305,250	2,585,500	2,585,500							
	No. of Firms in each Grade	6	1	25	2	5							
	Total Cost/Grade	39,582,000	5,342,250	132,631,250	5,171,000	12,927,500							Grand Total
							195,654,000.00	Total Cost of Office Equipments					**201,514,000.00**