CHAPTER ONE: BACKGROUND TO THE CONSTRUCTION INDUSTRY

Introduction

The construction industry is an enormously important part of any economy. Economic growth depends on the physical infrastructure that is delivered by the construction industry and its key participants. Construction, responsible for creating, defining and maintaining the built environment within which most other social and economic activities take place, is by far the most important way in which societies create new value. It provides a society with delivery mechanisms for many aspects of its needs such as economic, social, political, environmental, public sector reform. The industry's products are essential to mankind's physical and social day-to-day existence.

1.1 The history of construction project management

Associated with the construction of the Great Pyramids of Egypt and the Wall of China, the history of project management is often dated back to time immemorial. However, despite archaeologists' suggestion that the construction of the Pyramids were one of the largest 'fill-in jobs' ever undertaken by mankind, and with no documented evidence, discussion of the management techniques used can only be conjecture.

Modern day project management traces its root to Henry Gantt's development of the bar chart, otherwise known as the Gantt chart, in the early 1900s. However, project management as a management 'discipline' or recognisable body of knowledge only emerged during the 1960s when companies in the construction, defence and aerospace industries started to use tools and techniques- such as the critical path method (CPM)- requiring new sets of skills, knowledge and expertise to be developed in their application. Even at this stage of development of PM, it was the use of specific tools and techniques

such as CPM that was the focus of attention rather than the use of a holistic strategic approach of management of projects.

More recently, beginning in the late 1980s and early 1990's and largely associated with the recession in America, companies from different sectors (which were originally not known for a project-based production) such as manufacturing, the IT, the leisure, nuclear, health and pharmaceutical, mining, oil and gas, have started to embrace management by projects way of conducting business as a potential source of competitive advantage. There are a variety of reasons put forward as to why this shift occurred including:

- Rapidly changing environments, fierce competitive markets, powerful environmental lobbies etc. all encouraged companies to look for a more agile and adaptable models of management.
- The tasks that organizations were facing had become more complex and cross-disciplinary demanding more sophisticated and flexible organizational approaches.
- The size and scope of projects (in different industries) had required the development of more effective management systems for planning and controlling project performance, schedules, and cost/budget, etc

Thus, along with the development of general project management, which could be applied to manage projects in any industry, construction project management is now becoming one of the most attractive disciplines for training. As a result, it has established itself as one of the core disciplines in academia whereby an increasing number of project management institutions and associations offer education and training in contemporary PM principles and conduct research to capture and formalize accepted practices into the global body of knowledge and curricula of certification programmes.

1.2 Characteristics of the Construction Industry

Generally, the construction industry is labeled as a 'conservative industry' which adopts new technologies and practices at a slower rate as compared to other industries such as the IT, manufacturing and the automotive and invests very little in capital, research & development and training (Egan 1998).

As it is, construction lacks a full utilization of the construction team, bringing the skills of all the participants to bear on deliverable value to the client through integrated project process. The efficiency of the conventional project delivery system currently practiced is constrained by the largely separate and sequential processes through which projects are planned, designed and constructed which intern indicates the fragmented nature of the industry.

The strategy of the conventional processes of sequential project delivery system is meant to minimize risks and changes through thorough descriptions of specifications and contracts. This sequential separate system of project delivery, however, is believed to be an effective barrier to using the skills and knowledge of contractors and suppliers in design and planning of the projects (Latham 1994).

The conventional procurement system, which assumes that clients benefit from choosing a new set of project team selected competitively for every project they engage on, is also believed to be a major obstacle for the advancement of the industry. This aggressive separate procurement system inhibits learning, innovation and development of skill. It prevents parties from developing a synergy on past relationships and also leads to the adversary and confrontational supply chain relation that the industry is known for as the fierce competition on price forces parties to lower their quoting to win the project with a believe that they will compromise through change requests-hence destabilizing the industry (Egan 1998).

Other industries, such as manufacturing and service industry have curbed these problems quite effectively. They have changed the culture and the way they conduct business to a total quality management (TQM) way of conducting business by adopting and fully implementing integrated process approach and partnering form of supply chain management (mutual beneficial supply chain relationship) in parallel with focusing on their customers, improving their leadership style, etc and continuously assessing and improving their approach.

1.2.1 'Unique' characteristics of construction and their effects in the industry

The construction industry is espoused to have a number of characteristics that sets it as 'unique' from most other industries. These characteristics embrace a number of political, social and economic aspects and are believed to have a telling effect in the way the industry is functioning; including the problems mentioned above.

1.2.1.1 Nature of production

In most cases, except for the minor cases of pre-fabricated constructions, the place of production of construction has to be necessarily the place where the product is going to be used. Thus, the working place is changing regularly with workers constantly moving from one site to another, cooperating with different partners and in different chains. Besides because the site of production is the site of product which has to be built yet, work in construction industry is mostly exposed to inclement weather, and therefore, to seasonal cycles and disruption.

Because the character of work is of temporary duration, labor contracts are very often of a fixed term nature. Hence, insecurity of employment and earnings is significantly higher than in other industries. Due to instability of the production process, its exposition to weather, and variable working environment, the incidence of accidents is significantly higher than in most other industry (perhaps only less than mining).

For these reasons of peculiarity regarding the sector's production process including work organization (and others) there are some peculiarities in the construction industry's labor relations, with very often lower wages, particular vocational training systems, social funds to compensate disadvantages caused by health and safety risks, disruption of earnings, and fluctuation with negative effects on earnings, vacation, and pensions.

1.2.1.2 Nature of the product

The outputs of construction are generally large, heavy, durable, expensive, heterogeneous, and immobile in addition to being required over a wide geographical area.
Due to the identity of location of production and location of products, with products immobile, the construction market is mostly restricted to be local. Thus the construction market is dominated by small enterprises that perfectly meet the low-size scale of most sites or the specialization of trade respectively and the geographic market.

1.2.1.3 Demand for the industry's products

Unlike most consumer products that are readily produced in bulk, the demand for the product of the construction industry is generally only produced upon the initiation of, and to the requirements of the clients. With the exception of the sometimes-speculative building, clients must first define their requirements in terms of what product that they want and only then can the construction industry build it.

Moreover, the level and type of demand cannot be controlled, manipulated or easily created by the industry itself. Hence unlike most industries where a considerable proportion of effective demand for their products is created and managed by the producers themselves through extensive marketing and application of new technologies, demand for construction products is mainly secondary or derive. Hence the demand is determined by the demand and output of other goods and services such as investment goods for which the ultimate use is either as a means to further production an addition to or improvement of the infrastructure of the economy a social investment or an investment good for direct enjoyment, which it creates or helps create.

The implication of this is that it is much more difficult for the construction industry to create or manipulate demand for its products since such factors are not under the control of the industry. However, the inability of the industry to manipulate demand could also be partly

attributed to the overall structure of the industry, as will be discussed below.

1.2.1.4 The structure of the industry

The product and production characteristics stated above largely determine the structure of the industry including the proliferation of many small firms, each forming temporary alliances upon project basis for the duration of the project. Further, the construction industry is highly fragmented with the planning, design and procurement of a building being separated from its construction process.

The industry is characterized by high levels of uncertainty. The demand is so variable and the environment so competitive for work that creates low levels of profitability. Researchers (for example, Flanagan et al. 1998) argue that profits in construction will remain low for as long as construction is seen as a low-technology industry and while many firms are prepared to win work with low-profit margins.

The construction industry is large, its activities are fragmented and include a wide range of types and sizes of construction works to enable it meet a variety of client needs. Generally, the vast majority of works are small and although in value terms, each is insignificant, combined, they represent a large part of the construction industry's total output. Time lags in the construction process tend to be long and variable and there are large fluctuations in the demand for construction over time. Because of this, it is only logical that the industry has to respond to the character and pattern of demand as it arises.

Because of all the above reasons and 'peculiarities', it is claimed that it is difficult for construction industry to adopt manufacturing industry-style supply chain management and delivery of projects Cartlidge (2002). On the other hand, the construction industry which is typically associated with late delivery, over budget, low profitability, poor returns and slow up take of new technology and

management philosophies is challenged to discontinue disguising its inefficiency behind the idea of the industry being so different from others (Flanagan et al. 1998; Egan 1998). It is suggested that as the construction industry evolves, it can and will start to learn and benchmark ideas from outside industries, such as manufacturing and the IT (Egan 1998).

1.2.1.5 The Workforce

Although some inputs can be manufactured off-site, construction activities take place on site. This also means that inclement weather could or does affect the progress of the work on site. The industry is, by its very nature, an overwhelmingly domestic and labor-intensive industry despite the advancement in modern technologies. This situation is perpetuated by the fact that because most firms are small, there is no single organization or 'champion' to spearhead change in the industry particularly as it relates to technology. Typically, 90% of construction workers in both developed and developing countries are employed in micro firms with fewer than ten people and small and medium sized firms constitute 97% of all construction firms globally (CSIR, 2003). It therefore follows that the skills and commitment and effective organization of the work force are crucial in determining whether or not the industry can produce a high quality of output at a fair price. It has also become apparent that there is need to change working patterns and challenge existing attitudes, which calls for a need for effective communication, education, training, participation and involvement (Flanagan *et al* 1998).

The common working practices, namely self-employment and labor-only sub-contracting, differentiates the construction industry from most other industries. These practices also contribute heavily to the many disadvantages for which the construction industry has been criticized including, the temporary nature of the work, poor site safety record, lower wages and lower social status of its labor force, inadequacy of training and consequent skills shortage.

1.3 Relationship between the Construction Industry and the Economy

The Construction industry has a significant multiplier effect on a given economy. There is a relationship between output, employment, income and demand.

The industry provides significant amounts of fixed investment, contributes considerably to the national output and is a major source of employment; directly and indirectly by its multiplier effect. Studies show that in most countries construction constitutes more than half of capital investment, contributes up to 10% of GDP and employs more than one hundred million people globally which accounts for almost 28% of all industrial employment (CSIR 2003; Winch 2002). For developing nations like our, these figures are believed to be even higher.

Table 1: 1 Contribution of construction towards overall economy in selected countries (1980 market value)

Countries	Value added to GDP	Share of Gross Fixed Capital Formation
France	5	56
UK	6	48
USA	4	55
Kenya	5	48
Ethiopia	?	?

Perhaps related to its inefficiencies as manifested by late delivery, over budget, low profitability, poor returns and slow up take of new technology and management philosophies, construction's contribution towards a given economy is diminishing. It is often being replaced by the service industry, which is quite known for its continuous improvement and customer focus, especially in developed nations which, more or less, have already implemented a will functioning infrastructural network. However, in fast developing economies like the 'Asian Tigers', construction takes the lion's share of the economy.

Certain actions, particularly government ones, such as an increase in the interest rate or decrease in supply of credit affects not only the demand on construction industry but also firms in the industry. Any change in the level of construction output will also affect employment and hence incomes, demand and ultimately outputs of other sectors of the economy.

Consequently, the construction industry is often used as a regulator of the general economy. It has proved a good instrument for transmitting short-term deflation through the economy without creating widespread political upheaval, economic disruption or closure of productivity capacity.

Under conventional "Keynesian" economic theory, when the economy is in a recess, as output and employment falls, the government would increase spending to stimulate economic activity, and when there is a boom, government would reduce its spending. In the same way, low income, low investment and low levels of productive employment feed into one another. Thus, targets for construction output and employment should be integrated within macro-economic planning.

Government's influence coupled with the investment nature of the construction industry's product means that demand tends to fluctuate particularly according to the state of the economy and the social, economic policies of the government, with consequent effects on the industry. Change in the construction industry is constant and is influenced by many factors including interest rates, business uncertainty, and government policy, world events, training and changing expectations of clients. Typically, variations in construction output have little physical short-term effects particularly because of the durability of most construction products. Time lags in the construction process tend to be long and variable and there are large fluctuations in the demand for construction over time. This implies that the amount spent on construction can as a result vary quite sharply from year to year without significantly affecting the state of the built environment.

1.4 Why is it necessary to regulate and standardize construction works?

The fundamental importance of regulations and standardizations are helping create, transparency, facilitations, uniformity/order, etc in various areas of social and economic development.

Specific to construction, the characteristics of the construction processes and products, as discussed above, demand meticulous regulations and standardizations to enable the industry function properly and efficiently.

As discussed above, the industry is fundamental in shaping society's way of life and economic benefits. *It is, therefore, for both economic and administrative reasons that the reductions and increases in government spending are often concentrated on construction projects. And it is due to this monumental importance that government gives a considerable emphasis in shaping the practice of construction*. As part of shaping and defining efficient, transparent, standard and safe practice of construction, government sets up ***laws, regulations and standards along with the responsible bodies to see after these practices.***

CHPATER TWO:
CONSTRUCTION LAWS, REGULATIONS, CODES AND STANDARDS

2.1 Overviews of standardizations and regulations

Construction works are regulated and normalized by a variety of codes, standards, bylaws, regulations, and acts that can vary from country to country or even from province to province and from municipality to municipality. Suiting to their specific demands, way of life, culture, economic development, historical background etc, varies countries/provinces/municipalities set out fitting legal frameworks and standards for construction works.

In most countries, the main themes found in most construction related legal systems includes; but not limited to:

- Planning regulations,
- Environmental protection regulations,
- Waste and waste management and contamination regulations
- Health and safety regulations,
- The bidding and tendering laws
- Regulations on registered professionals and construction enterprises and administration of construction project quality
- Regulations on the procedures for administrative disputes in construction
- Property ownership right laws
- Codes of practices
- Norms and standards

While laws, acts, regulations, etc are meant to regulate the construction industry and its practices, the codes and standards are generally meant to facilitate and standardize these practices. In this regard, the codes and standards are generally concerned with matters affecting public safety and health, structural sufficiency, uniformity and efficiency of procedures and practices, facilitating practices, etc.

Why is it necessary to set construction laws, codes and standards?

The major reasons that governments set out rules and regulations and continuously follow up the applicability of these rules and regulations is to reduce the **vulnerability of the built environment to risk,** while the needs for standards, codes, and norms is principally **to facilitate practices and protect stakeholders' interests.**

By setting appropriate regulations, codes and standards, statutory agencies try to:

- Improve the living standards and safety of the citizens using infrastructures delivered by construction.

Eg. Urban planning codes, building safety codes, waste handling regulations; fire safety requirements etc could fall under this category.

- Increase the efficiency and quality (both in terms of processes and products) of the built environment

Regulations pertaining to professional licensing, occupational health and safety regulations, material and equipment standardization, norms pertaining to 'best' practices, etc

- Ensure fair trade within the sector, fair treatment of all parties, and guarantee protection for investment

Laws and regulations related to tendering & contract administrations, proclamations pertaining to the procedures and practices as well as authorities and responsibilities of each agencies administering sectors of construction, labor laws, laws dealing with property ownership rights, etc.

- Ensure uniformity and continuity of operation

Regulations related to building permissions and requirements to submit as built drawings: help to apply a professional and documented maintenance scheme. Regulations pertaining to imports and exports of

construction products and services: seen as part of the standardization and technology update scheme.

- Ensure safety of the environment

Environmental safeties requirements that projects are expected to comply with are part of this scheme.

Who promulgates laws, codes and standards?

In different countries different statutory bodies, professional associations, safety and health (and environmental) watchdogs etc participate in setting up the rules and regulations that govern construction. In almost all of these countries, the laws are promulgated by the 'law makers' while the regulations, codes and standards could be set by the bodies such as ministry of construction/infrastructure and municipalities or even professional associations such as the ACI, ASTM, BS, etc.

In Ethiopian context, various authorities and agencies have had authorities and responsibilities handed to them to promulgate and effect regulations, codes and standards. Accordingly, varies of them have contributed and participated in shaping practices in the industry. To mention a few the Building and Transport Construction and Design Agency (BaTCoDA) has developed such documents like the standard conditions of contract which has been basis for such works during subsequent times.
The EBCA developed a 'norm' for team composition and productivity of the various works to be executed in building jobs which can be used as a basis of scheduling and cost estimations, which later is modified by the Ministry of Works and Urban Development (MoWUD).
The MoWUD also has developed, among other, the now famous MoWUD standard conditions of contact and the Ethiopian Building Code Standards of practices as well as standard specification codes. The Ethiopian Road Authority, in its part, has developed various standard practices and norms that facilitate road construction works. The major of these includes the Construction Management System (CMS), The Equipment Maintenance System, The Standard Specifications and Procurement System released in 2002.

Under the current system, while the **parliament** has the ultimate legal say in proclamations and legal aspects, the following are the major governing bodies of construction:

- The **Ministry of Works and Urban Development,** the party mandated to regulate and promulgate laws, codes, standards, etc meant to promote efficiency, transparency, accountability as well as growth in the industry**;** Etc.
- **Municipalities**: Bodies who are given the mandate to look after urban housing construction and its associated legalities;
- The **Ethiopian Road Authority**: Besides being a major client of the road sector by itself, the ERA is the party mandated to look after the road sector construction works;
- The **Ministry of Water Resources**; is the party mandated to overlook water sector development programs;
- In addition to the above (mainly national bodies), the regional regulating bodies also have a huge stake in shaping how the industry should perform in each state (or will have when they develop their capacity).

The major proclamations, codes and standards currently in use in the industry

Procurement and Contract related

- Proclamation 430/2005: Establishes Procedures in Public procurement and Establishes Public Procurement Agency (PPA) to foster efficiency and transparency in the system.
- The PPA SBDs provide the full details of practices that need to be followed in public procurement, both for national and international bidding of goods, works and services (both consultancy and non-consultancy).
- The MWoUD's standard condition of contracts for construction works was the predecessor to PPA's and follows much of the FIDIC's approach

- The ERA's NCB's and ICB's are prepared to be used in road construction procurement and administration processes by the ERA and its associates..

In addition to the local procurement standards documents and procedures, international documents such as the **FIDIC procurement and contracting documents** for various big and/or international contracting, **the bank harmonized version of FIDIC (normally used on projects financed by the multilateral banks) and its associated procurement guidelines**, **the EDF APC conditions of contracts for projects financed** by the European Development Fund, are also major procurement and contracting documents in use in the industry.

Standard codes and specification related

- The **Ethiopian Building Code Standards provides** codes of practices meant for harmonization of designs, constructions and material selection practices with appropriate level of safety, and economic provisions.
- **Standard technical specifications for building construction works** prepared by various parties such as MWoUD, BaTCoDA, etc provide various technical specifications and standards that are meant to guide construction works and provide public safety.
- **Technical Specifications for Road Works**: Published by the Ethiopian Road Authority with other documents such as the design guidelines and procurement procedures, the specs are meant to guide the road sector designs and construction works.

Besides these national standards and specs**,** guidelines and specifications from **the British Standard (BS), American Standard for Testing Materials (ASTM), American Concrete Institute (ACI), American Association of State Highways & Transport Officials (AASHTO), TRL standards,** etc are major standards and specifications that are in common use in the industry.

Norms in construction works

Though not codes or standards that are meant to be strictly followed, norms do play a great deal in facilitating construction works. In Ethiopian

construction, the following are common norms in use to determine productivity.

- **The EBCA standard productivity, the BaTCoDA productivity standard and the MWoUD's Ethiopian Construction Productivity Norms** are documents predominately prepared by updating them serially (as put in this respective order). They provide guidelines of team composition and their productivity with respect to the various major job items in building works.

- **Construction Management System;** Though quite old, the ERA's CMS do still play a significant role in road construction resource allocations and scheduling.

- **Equipment Management System;** produced recently by the ERA, is a good guidelines in fleet maintenance.

Regulations Concerning Construction Services Practices and Ownerships

- The **Ethiopian Building Proclamations:** A draft document which is meant to guide building works and establish the respective duties and responsibilities of the parties involved in its implementation.

- **The Property Ownership law:** In the current setup, there is no separate property ownership law for individual houses. The majority of property related issues are addressed in the Civil Code. In addition, in recent years, there have been proclamations dealing with apartments.

- **Building Permit Regulation (Addis Ababa**) is a document formulated with the objectives of making the city a convenient living place for its residents, improve transparency and accountability in the services provided by the public sector and thereby reduce inefficiencies, provide professional and ethical service and incur uniformity in to the building works, make the construction works safe, efficiently coordinate the infrastructure in

the city, the regulations gives requirements, accountabilities and procedures that needs to be followed in undertaking a building work in the city

- Procedures and requirements pertaining to building permits
- Provides building design standards
- Precautions and procedures to be followed in refurbishing and demolition
- Requirements and procedures in supervision of the building work
- Consultant licensing requirements and their duties
- Procedures in service payments for professionals and the municipality services

Others

Besides the above major codes and standards, standards and legal guidelines concerning labor laws, health and safety regulations, environmental protection acts, etc are common areas of interest under the construction circle of influence.

2.2.1 INTERNATIONAL LAW OF CONTRACT

- The common Parties & Stakeholders in the Construction Contract are contractor and employer.
- The contractor could be: General contractor or joint venture, i.e. in terms of organizational form; Domestic or local or foreign or international, i.e. in terms of nationality; Private or public, i.e. in terms of ownership ;Only constructor or both designer & contractor, i.e. in terms of contractual obligation;
- The employer could be:-
  - Public or private or community

- different standard conditions of contract are developed by certain institutions or recommended by international financing or development institutions;
- FIDIC is developed by an international federation of national association of independent consulting engineers. Its full name is Federation International Des Ingenieurs-Conseils ; It was founded in 1913 by five national associations of independent consulting

engineers within Europe; The objectives were to promote in common the professional interests of the member associations and to disseminate information of interest to members of its component national associations; It has begun to prepare & disseminate standard conditions of contract since 1957 for international use.

- **Typical tender (contract) documents in the international construction contract & divided in to legal, commercial & technical parts.**

The Legal Part

- The Contract Agreement;
- The (latest) Minutes of Meeting, if any;
- The Letter of Acceptance(Award);
- The Tender (NB: Including the Appendix to Tender, if any);
- The Special Conditions of Contract;
- The General Conditions of Contract;
- Others, if any

The Commercial Part

- The Performance Security Form;
- The Payment Security Form;
- The Advance Payment Guarantee Form;
- The Bid Security Form;
- The Insurance Forms;
- The Retention Money Security Form;
- Others, if any

The Technical Part

- The Technical Specifications;
- The Drawing;
- The Bill of Quantities;
- Schedule of Requirements, if any;
- Others, if any;

2.2.2 NATIONAL /LOCAL CONTRUCTION CONTRACT…

This part of the course cover, the issue of

The Standard Conditions of Contracts in use in Ethiopia i.e. the Conditions of Contract:
Of the MoWUD(Ministry of Works & Urban Development); and PPA (Public Procurement Agency) under the Ministry of Finance & Economic Development).

- The MoWUD Conditions of Contract are important local conditions of contract. The current one is valid since 1994. Such conditions of contract is highly resembles that of FIDIC's conditions of contract. It applies for civil engineering works.
- The PPA Conditions of Contract are recent one. They have been issued in January 2006. They are applicable to all possible sorts of public procurement.

The PPA Standard Conditions of Contract

The PPA, under its legal mandate provided under The Public Procurement Proclamation, it has prepared & issued certain standard tender & contract documents for the purpose of public procurement. The conditions of contract are applicable to the procurements of the federal government.
The Standard Conditions of Contract cover the following types of procurement.
These are Standard Conditions of Contract for the procurement of:- Consultancy Services; Non-consultancy Services; Works; Goods; including Simple Request for Quotations & Local Purchase Order**;**

Procurement of Works
The Standard Conditions of Contract for the purpose of the procurement of Works have been prepared for International Competitive Bidding (ICB) & National Competitive Bidding (NCB), separately; User's Guide has been also prepared, separately, both for the ICB & the NCB.
The Conditions of Contract have been also prepared both in Amharic & English language, The conditions of contract are based on Design-Bid-Build project delivery system, The type of contract could be based on BOQ, in which case it becomes measurement based, Or based on Activities Schedule, in which case it becomes lump sum, The role of the engineer is envisaged.

The PPA documents is divided in to the following three parts, namely,

- **Bidding Procedure and documentation;**
- **Schedule of Requirements; and**
- **Contract;**

1. Bidding Procedure & Documentation

Under this part, the following are included, namely,

Section 1 Instruction to Tenderers (ITB);

- General part;
- Bidding Documents;
- Preparation of Bids;
- Submission of Bids;
- Bid Opening & Evaluation;
- Award of Contract;

Section 2 Bid Data Sheet (BDS)

Section 3 Evaluation & Qualification Criteria (EQC)

- Average Annual Volume of Construction Work;
- Experience as Prime Contractor;
- Acquisition of essential Equipment(by way of ownership, hire or lease);
- Personnel;
- Liquid Assets and/or Credit Facilities;
- The issue of Joint Venture;

Section 4 Bidding Forms

- Bid Submission Form;
- Priced Schedules (BOQ or Schedule of Activities);
- Bid Security;
- Qualification Information**;**

Section 5 Eligible Countries

2. Schedule of Requirements & Documentation

Section 6 Schedule of Requirements

- Scope of Works;
- Technical Specification;
- Drawings;
- Bill of Quantities or Activity Schedule;

3. Contract & Contract Documentation

Under this part, the following are included.

Section 7 General Conditions of Contract (GCC)

The GCC is composed of 62 Clauses.
It contains the following parts.

- General; (Clause 1-26)
- Time Control; (Clause 27-32)
- Quality Control; (Clause 33-36)
- Cost Control; (Clause 37-54)
- Finishing the Contract; (Clause 55-62)

General (Clause 1-Clause 26)
Letter of Acceptance
A Letter of Acceptance means the formal acceptance, signed by the Employer, of a contractor's Letter of Tender. This offer and acceptance constitute a legally binding agreement of the Parties to enter into a Contract Agreement

Tender Security
A Tender Security (alternatively called a Tender Bond) is provided by each of the tenderers. It entitles the Employer to monetary compensation from the successful tenderer in the event that he: withdraws his tender after the latest time specified for its submission and before its period of expiry; refuses to accept the correction of errors in his tender in accordance with the tender conditions; fails to sign the Contract within the time specified in the Tender Documents;

Works Contract Documents Sufficiency & discrepancy

- The Conditions of a Works Contract should state the priority of the various component documents of the Works Contract in order to establish, in the event of discrepancy between them, what takes precedence. The order of precedence may be stated, for example, as: Contract Agreement, Letter of Acceptance, Completed Form of Tender and Appendix to Tender, Conditions of Particular Application,

General Conditions of Contract, Specifications, Drawings ,Priced Bill of Quantities (including Method of Measurement) other Schedules (proposals/undertakings) of the Contractor's Tender

Engineer

The "Engineer" is usually defined generically in Conditions of Contract as meaning "the person appointed by the Employer to act as the Engineer for the purposes of the Contract and named as such in … (*reference to other part of the Contract),* The Engineer must: formally delegate duties and authorities to the Engineer' Representative. Notify the Contractor of that delegation in writing, copied to the Employer.

Contractor's Representative

Most forms of contract require that the Contractor shall appoint a Contractor's Representative, and give him authority to act on the Contractor's behalf under the Contract. Further, the Contractor's Representative shall be full-time on Site, give his whole time to directing the Contractor's performance of the Contract, and shall, on behalf of the

Contractor, receive instructions and notices from the Engineer. The Commencement Date marks the start of the Time for Completion, and therefore determines the date by which the Contractor must substantially complete the Works.

Commencement Date

The signing date of the Works Contract is not necessarily the date for commencement of the Time for Completion of the Works. Most forms of Works Contract (certainly FIDIC) require that the Engineer shall give to the Contractor a Notice of Commencement Date.

Performance Security

The Contract will require that the Contractor obtain and provide to the Employer, copied to the Engineer, a Performance Security (also called a Performance Bond). The Performance Security, from a bank or financial institution acceptable to the Employer, entitles the Employer to monetary compensation (to the limit of the amount of the security)

Advance Payment Security

If the Contract provides for an Advance Payment by the Employer to the Contractor, it will state the amount and currencies in the Appendix to Tender, and should include within the Contract Documents a proforma of the Advance Payment Security (also called a Bank Guarantee for Advance Payment) to be delivered by the Contractor before he can receive the Advance Payment.

Employer

Has a responsibility to:

- Pay the due payments for the contractor;
- Provide the site and right of access to it in due time;
- Look into the statutory aspects of the construction such as permission to construct, custom clearance etc;

Power of Engineer

His authorities can be limited [by specifying matters he needs to get approval from the Employer on PCC), Care must be taken not to stifle the engineer's performance by overly limiting his authorities, Most issues limited are:

- Consenting with contractor to the sub-letting of part of the works
- Certifying additional cost determined
- Awarding an extension of time
- Certifying payment if the contract price will be exceeded;
- Issuing any taking-over certificate;
- Authorising the use of provisional sums in excess of the monetary limit for variations;
- Certifying additional payment
- Issuing Defect Liability Certificate
- Risky (emergency) situations are always exempted

Engineer's approval

In most cases the Engineer's approval doesn't relieve the contractor of his duties. Even the engineer's approval of as built drawings may not relieve the contractor of his duties if work wasn't executed accordingly.

Sub contract

- Subletting; usually not allowed to sublet the whole work is to be held responsible for the performance of his subcontractors; Require

Engineers approval and without the approval of the Employer in writing.

Risks

- Employer's (Excepted) force majeure risks-War, hostilities, rebellion, revolution etc entitle the contractor for Excusable delays or Excusable compensable delays Contractor is not normally required to insure for such risks However, some of these risks are insurable (eg defaults from designer), Employer can insure for such risks but can also provide the premium to contractor to insure together with contractor's risks

Insurance of work

- Under PPA, Contractor need to insure: Loss of or damage to the Works, Plant, and Materials, Loss of or damage to Equipment, Loss of or damage to property (except the Works, Plant, Materials, and Equipment) in connection with the Contract; and Personal injury or death.

Cost of Insurance

Premium is an amount to be paid for a contract of insurance; Contractors should include cost of insurance in their tender they should be provided details of information, excess levels etc.

Site inspection and tender sufficiency

- The contractor inspects the site before tender satisfy, that is Hydrological and climatic conditions, Availability of resource and skill, The nature of work and availability of material

Time Control
(Clause 27-Clause 32)

Program

Often submitted before signing Agreement Form and needs to be approved by Engineer Mobilization (if applicable) and detailed work program, The details and time for submission to be stated in the special condition of contract.

Extension of Time

- Disruption Claims
- Prolongation Claims
- Acceleration

- Concurrent Delays
- Successive Delays
- Critical and Non Critical Activities
- Time at Large

Usually incorporate possibilities of extension of the intended completion time, Otherwise, given the possibility of change clauses, time may be put at large, Under time at large condition, Contractor expected to complete work in a reasonable time.

Quality Control
(Clause 33-Clause 36)

Execution of the work

Contractor is obliged to perform the work, with due diligence, with strict conformity of the contract (provided that it is legally and physically possible) and to the satisfaction of the Engineer, Work to be in accordance to the drawings and specifications, If specs and drawing are generic, work and material to be of the highest quality-that approved by the Engineer, Contractor should care for the work executed and keep it safe , The contractor controls the resources and runs the execution of the work;

Key Resource Deployment

Contractor is expected to comply with:

- Key personnel requirements
- Key equipment requirements
- Make workmanship to the quality specified
- Use the appropriately specified materials and keep the operations safe, etc

Workmanship and Material

Contractor is expected to execute the work: Using quality material and workmanship specified for If, upon inspection, work is not to quality specified contractor will be asked to rectify, Cost of inspection could be covered by contractor if work was faulty.

Cost Control
(Clause 37-Clause 54)

Contract Type

- An Admeasurements Contract with a Bill of Quantities
- A Lump Sum Contract with an Activity Schedule

Change in BOQ

- Rate will be adjusted if the increment or decrement of quantity exceeds:

In the Bill of Quantities for the particular ítem by more than **25%**the change excedes **5%** of the Initial Contract Price.Both condition have to be satisfied.

Variation

- Increase or decrease the quantity of any work (other than by re-measurement).
- Omit any such work.
- Change the character or quality of any such work.
- Change lines, levels, dimensions.
- Execute (necessary) additional work.
- Change the sequence or timing of construction.
- Variation should be within the scope of the work
- Provide provision for procedures and conditions to fix rates of altered items
- In most cases, Engineer given the authority to give change orders and fix rates

Note: A contractor is **not** required to sign, approve or even agree to a variation order. It is an order to do certain works.

Payment

Contractor shall submit to the Engineer monthly statements,The Employer shall pay the Contractor within 30 days, Interest(at prevailing bank interest rate) for delayed payment by the client , Minimum interim amount shuld be specified

Payment Form

Work Done
plus Variations
plus Day works
plus Contract Price Adjustment (CPA)
less Retention

plus Materials on Site (MoS)
less Advance Payment repayment
plus Any other amount

Compensation Events
Failure to give possession of site, Delay in issuing drawing, Adverse physical, political or economic conditions, Delay in Advance payment , The effects on the Contractor of any of the Employer's Risks,Contractor to uncover or to carry out additional tests upon work, which is then found to have no Defects.

Contract Price Adjustment
Sub-Clause 47.1, Increases or decreases to be determined in accordance with Part II (Particular Conditions), recommended for projects lasting over

one year. The Contract may contain, as all standard forms of FIDIC contract do, provision for adjustment of the Contract Price for any increase or decrease in Cost arising from a change in the Laws of the Country made after the "Base Date" defined as the date 28 days prior to the latest date for submission of tenders

Methods of Calculating CPA
The most common methods are
- Proven Cost Method
- Formula Method

Proven Cost Method

Description	Unit	Qty	Basic Price	Current Price	Difference	CPA
Cement	**qt**	**200**	**300.00**	**400.00**	**100.00**	**20,000.00**
Diesel	**l**	**1000**	**10**	**15**	**5.00**	**5,000.00**

200*100=20000
+
1000*5=5000

Total CPA for this Month (Birr) 25,000.00

Formula Method

Pn= a + b Ln/Lo + c Mn/Mo + d En/Eo + etc.

Where: Ln, Mn, En, etc., are the current cost indices

Lo, Mo, Eo, etc., are the base cost indices

- ✓ **PPA uses formula method of CPA**

Retention

- 5% limit, 50% released at Taking Over, 50% released at Defects Liability Certificate, The contractor can replace it with Retention Money Guarantee.

Advance Payment

- Interest free Up to 30% to the Contractor for mobilization and front end expenses for that specific project

Liquidated Damages

- ❖ FIDIC Clause 47 liquidated damage
- ❖ PPA Clause 49 liquidated damage
- Sub-Clause 49.1
- Pre agreed amount stated in the Appendix to Bid
- Types of damages by the client, The additional cost of supervision consultants, Benefit obtained from completion of the project

Finishing the Contract (Clause 55-Clause 62)

Completion

Contractor shall request the Engineer to issue a certificate of Completion of the Works.

The Employer shall take over the Site and the Works within seven days of the Engineer's issuing a Certificate of Completion.

Hand over

Upon substantial completion, contractor can ask for taking over certificate; Work need to pass inspection and contractor promises to rectify defects and complete outstanding works during defect liability period, Taking over can be partial, Final certificate is issued after defect liability period.

Final Payment

Final payment: Payments after certification of acceptance-after defect liability period, Net balance including retention money, due within reasonable days of submission of final statement

2.3 General and special conditions of contract

General condition of contract

A document called the General Conditions is ***an essential part of the contract***. It defines the responsibilities of the parties involved in the contract- the owner and the general contractor. It describes the guide lines

that will be used in the administration of the contract. It is often referred to as boiler plate, implying that the same documents are standard to all contracts. Contractors must know exactly what is contained in the boilerplate. Various standard forms of General Conditions have been development by different organizations. These forms are familiar to all parties concerned, and the wording is not only clearly understood, but has also been tested in the courts.

Supplementary Conditions

- The Supplementary Conditions are sometimes known as Special Provisions or Special Conditions. The purpose of the Supplementary Conditions is to provide an extension of the General Provisions of the contract to fit the specific project at hand. They serve as amendments or augmentation to the General Conditions.
- Items included in the Supplementary Conditions are entirely subject to the discretion of the owner, and may include topics such as:

❖ The number of copies of contract documents to be received by the contractor
❖ Survey information to be provided by the owner
❖ Materials provided by the owner
❖ Changes in insurance requirements
❖ Phasing requirements
❖ Site visit
❖ Start date of the construction

- Requirements for security and temporary facilities
- Procedures for submittal and processing of shop drawings.
- Cost and schedule reporting requirements
- Traffic control and street cleaning requirements
- Responsibilities fir testing of materials
- Actions to be taken in the event of discovery of artifacts