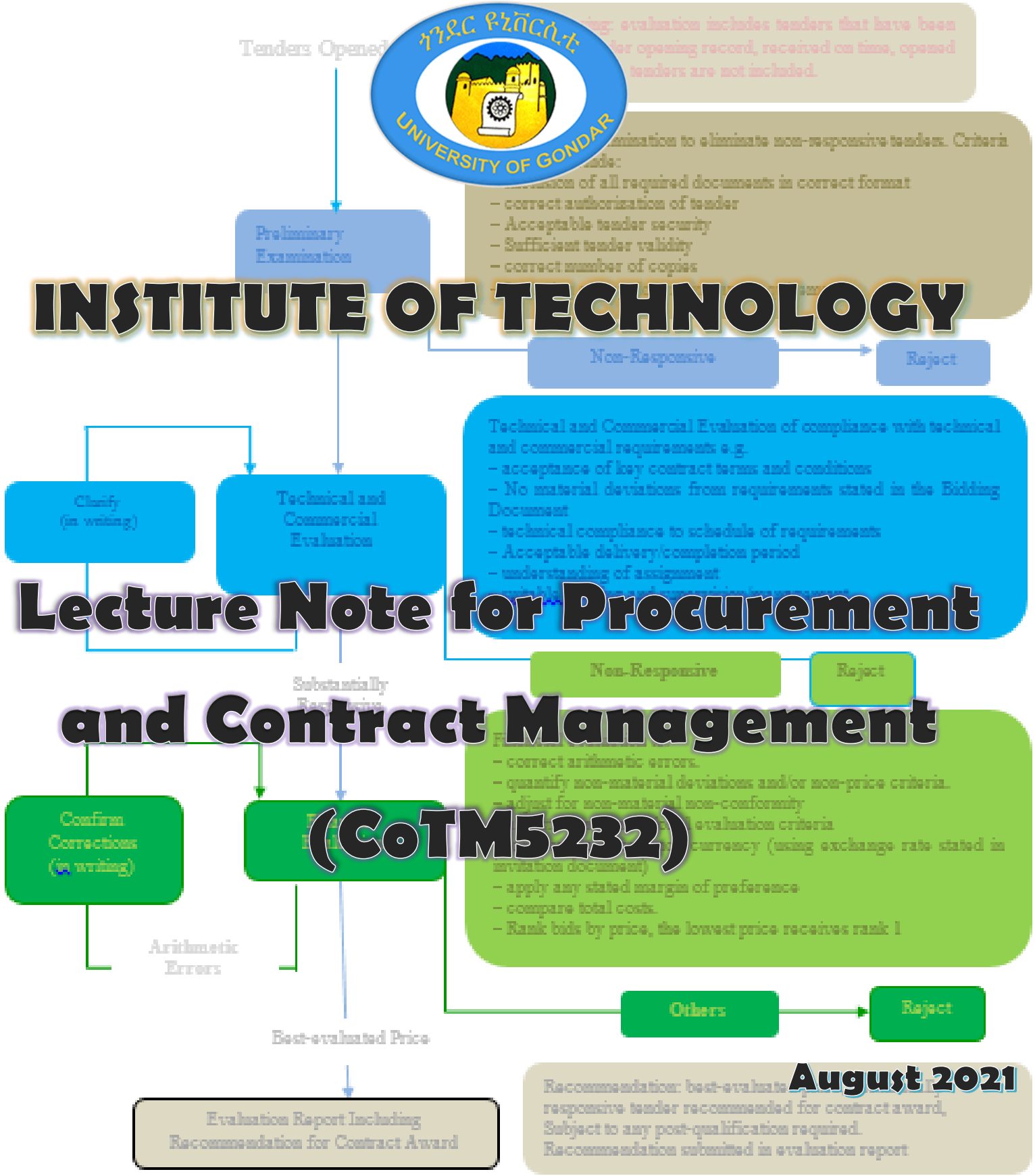


INSTITUTE OF TECHNOLOGY

Lecture Note for Procurement and Contract Management (CoTM5232)

August 2021

COURSE DESCRIPTION

Procurement and Contract: Management, Delivery Methods;
Tendering: Definition, Purpose, Types, Process and Management;
Preparation of tender,
Tender evaluation

Pre-qualification
Post qualification
Statistical approach in tendering to bidders

Contract: Definitions, Types, Awarding of contract, Management of contract;
Contents of Contract Document: Contract agreement, Conditions of contract, Technical specifications, Bill of Quantities, Drawings, Forms, Formats and Schedules: Tender form, Bonds and Guaranties, Bid Bond, Performance Bond, Advance Payment Guaranty, Retention Money Guaranty. **Payment:** Type, Process, Preparation;
Claim administration: Types, Causes, Contractual provisions, Time related claims, Cost related claims, Quality related claims, and Stakeholders satisfaction related claims;
Insurance and indemnification;

COURSE OBJECTIVE

- At the end of this course the student shall be able to select appropriate contract type, prepare bid document (procurement document) and contract document. Student should also be able to make bid evaluation and also be able to administer contracts.

COURSE OUTLINE

- **Introduction**
- **Contract Planning**
  - 1.1. Delivery System
  - 1.2. Procurement Method
  - 1.3.Contract Types
- **Procurement Management**
  - 2.1. Procurement Preparation
  - 2.2.Tendering
  - 2.3.Tender Evaluation
- **Contract Management**
  - 3.1.Contract Formulation
  - 3.2.Contract Administration
  - 3.3.Contract Closing
  - 3.4. Payment
  - 3.5. Contract Change Management
- **Contract Securities**
- **Dispute Management System**

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Module Information

Module Name	Construction Procurement and Contract Management
Module Availability	The hard copy of the module is available at University of Gondar, Institute of Technology Library
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Chapter -1. Introduction

1.1. Construction Industry

There is no doubt that construction is a key activity in any economy; it influences, and is influenced by, the gross domestic product (GDP) of that nation. According to the African Economic Outlook 2015 edition, the Ethiopian construction industry currently provides 9.4 % of the country's GDP (ITE BUILD & INTERIORS 2017).

Significant amount of the country's budget is allocated to economic development through financing infrastructures for development of educational and power projects, construction of railways and road projects which increased road network density, construction of health projects to increase access for water and sanitation infrastructure. And that contributed much in reduction of poverty, in increasing employment expansion through small and medium enterprise development and job creation. Ethiopia has also issued successive public procurement reforms to adhere good governance principles, reform efforts were made in order to promote competitive tendering for the selection of contractors/ consultants/ suppliers and for effective deliver of projects with predictable cost and time (Ministry of Urban Development and Construction 2012).

Construction industry development is a deliberate and managed process to improve the capacity and effectiveness of the construction industry to meet the national economic demand for buildings and other physical infrastructure facilities, and to support sustainable national economic and social development objectives.

The management of construction project involves many people with diverse interests, talents and backgrounds. The owner/client/employer, the design professional/consultant and the contractor/builder comprise the primary triplet of parties, but others, such as subcontractors, material suppliers, banks, insurance and bonding companies, attorneys and public agency officials, are vital elements of the project team whose interrelated roles must be coordinated to assure a successful project. Throughout the project life cycle, from the time the owner first contemplates launching a construction project to that celebrated time, many months or years later, when the completed project is ready for use, the tasks carried

out by the various parties vary in type and intensity (Bennett, The Management of Construction: A Project Life Cycle Approach 2003).

The fragmented nature of the building industry particularly the separation of design and construction, the uniqueness of construction projects and the resulting ephemeral nature of the project organization places great dependence on the project team in setting up the building process and bringing the project to a successful conclusion.

One fundamental aspect of the building process that requires early and particular attention if success is to be achieved, is the selection of the most appropriate organization for the design and construction of the project.

1.2. The Concept of Procurement and Contract Management

Procurement represents a very large fraction of total economic activity. Procurement design directly and substantially affects firms' and countries' performance in the short and in the long run: in the short run, most obviously by immediately determining the costs and quality of inputs in the long run. Procurement design and management is a complex issue though, as contractual problems directly interact with competitive screening and risk management problems. Moreover, procurement is most often a dynamic, repeated activity, with short-term objectives often conflicting with long-term ones (Nicola Dimitri, Handbook of Procurement 2006).

Procurement and Contract Management among stakeholders is mandatory for (Dale F. Cooper, Project Risk Management Guidelines Managing Risk in Large Projects and Complex Procurements 2005)

a) **Fair competition** helps:
   - the Project Owners' to acquire the five rights [Counterpart, Cost (value for money), Time, Quality and Quantity] s/he is entitled to;
   - the Project Financiers' and Regulators' to value market principles and effective utilization of finance such that lowest qualified bids takes the project , and

- the Project Providers' to get impartial and neutral Opportunity for business (Ethical behavior)
- local industry for maximizing opportunities to compete;

b) **For fair distributions of obligations and rights** help to allocate appropriate risks among contractual parties and their remedial rights. That is, their entitlements and provisions are clearly stated and agreed upon.

c) **Government sanctions against specified countries;**

d) **Social justice policies**

Procurement and Contract management has a strong linkage and relationship with Construction Process and Stakeholders Management. The delivery system chosen, the procurement method adopted and the contract types decided upon determine the construction process involved and the relationships and roles of stakeholders along the process (Wubishet 2006).

Procurement of necessary goods/services/works for the project is the logistics aspect of managing a job. It involves deciding what must be procured, issuing requests for bids or quotations, selecting vendors/consultants/contractors, administering contracts, and closing them when the job is finished (LEWIS 2007).

According to Garth Ward (2008) objectives of procurement as obtaining:

- the right goods and services;
- in the right quantities;
- to the right quality;
- at the right time;
- to the right destination;
- at the right price;
- from the right supplier

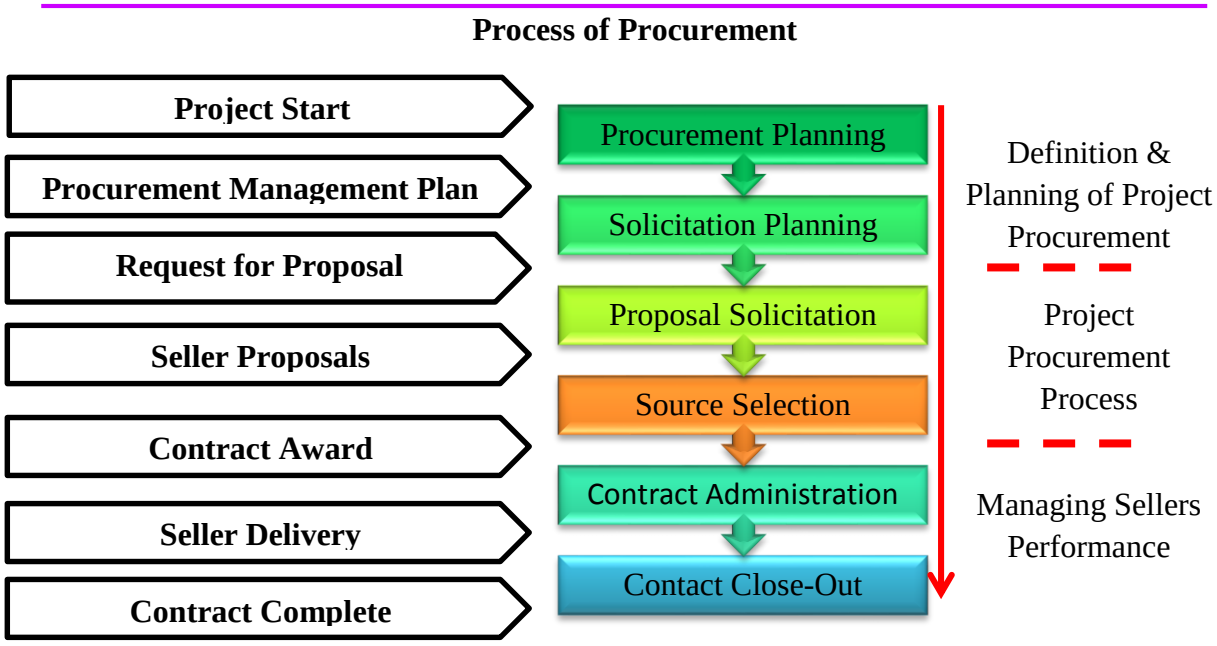


Figure 1: Project Procurement Management: Six Distinct Processes (Source: WARD 2008)

A procurement department usually consists of four or five groups (WARD 2008):

Purchasing: responsible for buying the materials and equipment.

Expediting: responsible for ensuring that the goods are ready on the dates required.

Inspection: responsible for ensuring that the goods meet the desired quality and specifications.

Shipping/Traffic/ Transport: responsible for ensuring that the material is transported from the manufacturers' or suppliers' works to the project location.

Purchasing includes vendor appraisal, contract negotiation, goods inwards inspection and the safe handling and storage of goods received (Lock 2001).

Procurement planning: the process of identifying, describing and quantifying the products to be sourced externally to a project.

Procurement management: is the process of sourcing products from a preferred external supplier.

The procurement management process: is the method by which products are acquired for a project from external suppliers. The process involves controlling the ordering, receipt, review and approval of products from suppliers as well as managing the overall performance of the supplier.

What is the difference between "Procurement and Contract?"

Procurement can be defined as obtaining by purchase, lease or other legal means, plant, equipment, materials, services and works required by an organization.

The process of procurement commences when a need has been established and ends when the project has been delivered. The business need must reflect the full-life value of the project, that is, what the project must deliver over a defined period. It should be recognized that in many instances the project goes beyond the physical works but also extends into the operational phase of a project. The purpose of procurement is to design and construct the proposed project, and covers the acquisition of relevant expertise from professional construction consultants, main contractors, sub-contractors, manufacturers and suppliers. It is normal for this procurement process to be crystalized into formal contractual arrangements (Trebes 2011).

Contract Management at its best is about managing risk, and managing relationships. At its simplest, a contract is a document describing a relationship between two parties, what each of them agree to do, and who carries the risk if things don't turn out as planned. Contract Management is about managing that relationship, and those risks, to ensure that both parties get the result they originally wanted. Everything such as cash flow, revenue, obligations management, and all other areas around dis, flow from dis simple premise.

A construction contract can be explained as the warranty that ensures that the executed job gets the specific amount of compensation or the way compensation will be distributed. Moreover, a construction contract is negotiated specifically for the construction of an asset or a group of interrelated assets.

Chapter- 2. Contract Planning

2.1. Introduction

Contract Planning: Construction projects are components of a certain business or development demands. That is, they are formulated if and only if such businesses or development demands acknowledge their contribution and it is a must to involve them. This requirement is dealt during the basic / strategic planning phase of the overall business. This phase often pass through the identification, feasibility and financing stages of Programs or Projects. Contract is a customary tool used to implement formulated programs or projects. As a result, contract planning becomes part of this basic / strategic phase (Wubishet 2006).

> ***Definition:*** *A contract is an agreement. An agreement arises out of the acceptance of a proposal or offer. Thus, an agreement is a promise or a set of reciprocal promises. A contract involves a minimum of two parties although more than two may be involved. The basic principle of law is that when one person (promisor) gives a promise or makes an offer and creates a reasonable expectation of performance in the mind of the other person (promisee) to whom it was made; law enforces the promise* (Woolhouse 2020).

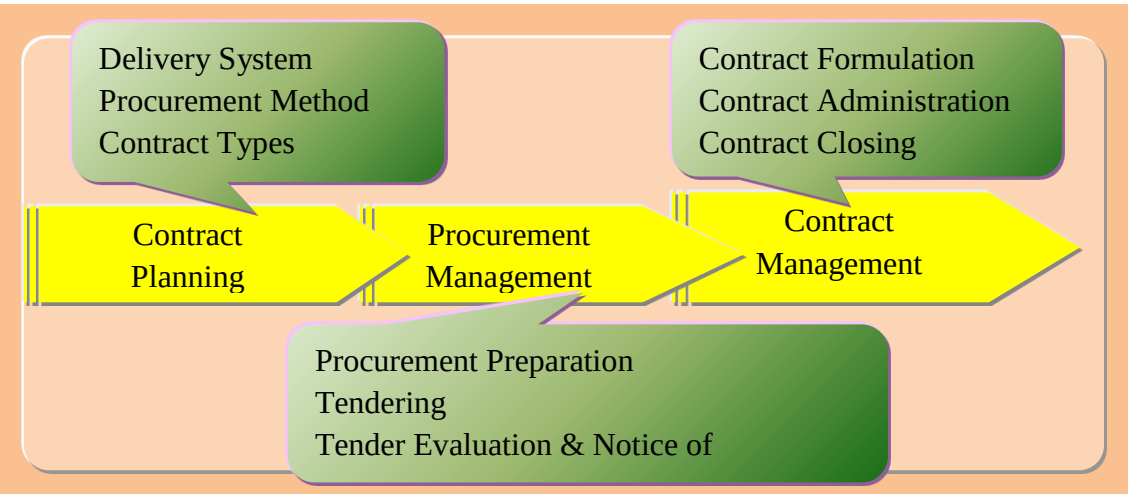


Figure 2: Procurement and Contract Management Processes (Source: Wubishet 2006)

Contract planning includes decisions on proposed Delivery Systems, Procurement Methods and Contract Types to be followed and used together with its provisions for alterations. This is because such decisions are related to regulatory requirements such as (Wubishet 2006):

- ***Ethical*** (Neutrality, Formality, and Impartiality);
- ***Economical:*** (Proof of Competition, Least Qualified and Evaluated Bidder);
- ***Accountable:*** (Obligations and Rights);
- ***HSE*** (Health, Safety and Environment); and
- ***Transparent:*** (Accessibility, Notice of Advertisement, Record of Procurement Proceedings, Debriefing-why they were not successful and Participation of Civil Society).

DISCUSSION POINTS:
Applicable Laws, Rules, Regulations and Guidelines used in Ethiopia

2.2. Historical Development of Procurement Systems

Construction projects before the Second World War (i.e. before 1939) were implemented by conventional methods of procurement that had remained virtually unchanged for over 150 years. Since that time, however, the number of different procurement systems available has substantially increased, as a result of the willingness of an increasing number of clients to sponsor and use new methods because of frustration at the construction industry's perceived poor performance.

Four phases in the development of contemporary procurement systems can be broadly identified.

1. A period of sustained economic growth when the use of conventional methods of procurement still prevailed (why change?)- [1945–1972].
2. A period of recession characterized by a relatively modest increase in the use of non-conventional procurement systems- [1973–1980].
3. A time of post-recession recovery during which the most experienced clients introduced new procurement methods, and design and build and management-orientated systems substantially increased their share of the available workload- [1981–1990].
4. The period from the early 1990s to the beginning of the 'credit crunch' recession that started in earnest in late 2008. This period contained nearly equal phases of recession and recovery, as well as the advent of partnering, an increase in the use

of the various forms of the private finance initiative and efforts by government to improve the industry's performance through the publication of two major reports and changes in the way the industry manages its own projects- [1991–2008].

2.3. Procurement and Contract Delivery System

Project delivery method is a term used to refer to all the contractual relations, roles, and responsibilities of the entities (team members) involved in a project and sequences of activities required to complete a project; or it is organization structures that define a framework of contractual and communication links among project team members. A contracting approach is a specific procedure used under the large umbrella of a procurement method to provide techniques for bidding, managing and specifying a project (Transit Cooperative Research Program 2009).

Project delivery is the process by which all of the procedures and components of designing and building a facility are organized and put together in an agreement that results in a completed project. The process begins with the compilation of needs and requirements of the owner spelled out in the architectural program.

Procurement must be 'Sustainable Procurement' which means using procurement to support wider social, economic and environmental objectives, in ways that offer real long-term benefits to all parties.

The selection of the project delivery method is a decision that is based on a multitude of issues which have been categorized according to the following groups: project-level issues, agency-level issues, public policy/regulatory issues, lifecycle issues, and other issues. Based on these relevant issues, the team has developed a three-tiered project delivery selection system that consists of the following tiers:

Tier 1- Analytical Delivery Decision Approach,
Tier 2- Weighted-Matrix Delivery Decision Approach, and
Tier 3- Optimal Risk-Based Approach.

Analytical Delivery Decision Approach provides a framework for agencies to use in defining project goals and examining the advantages and disadvantages of each delivery method within the context of these project goals. The aim of this approach is to help agencies understand project delivery method attributes and determine whether their specific project goals align with the attributes of a particular delivery method. This approach also provides a "go/no-go" review to determine whether one or more project delivery methods should be excluded from the examination. The Tier 1 approach is designed as a simple and straightforward selection method.

The distinct steps in **Tier 1 and Tier 2** approach listed below:

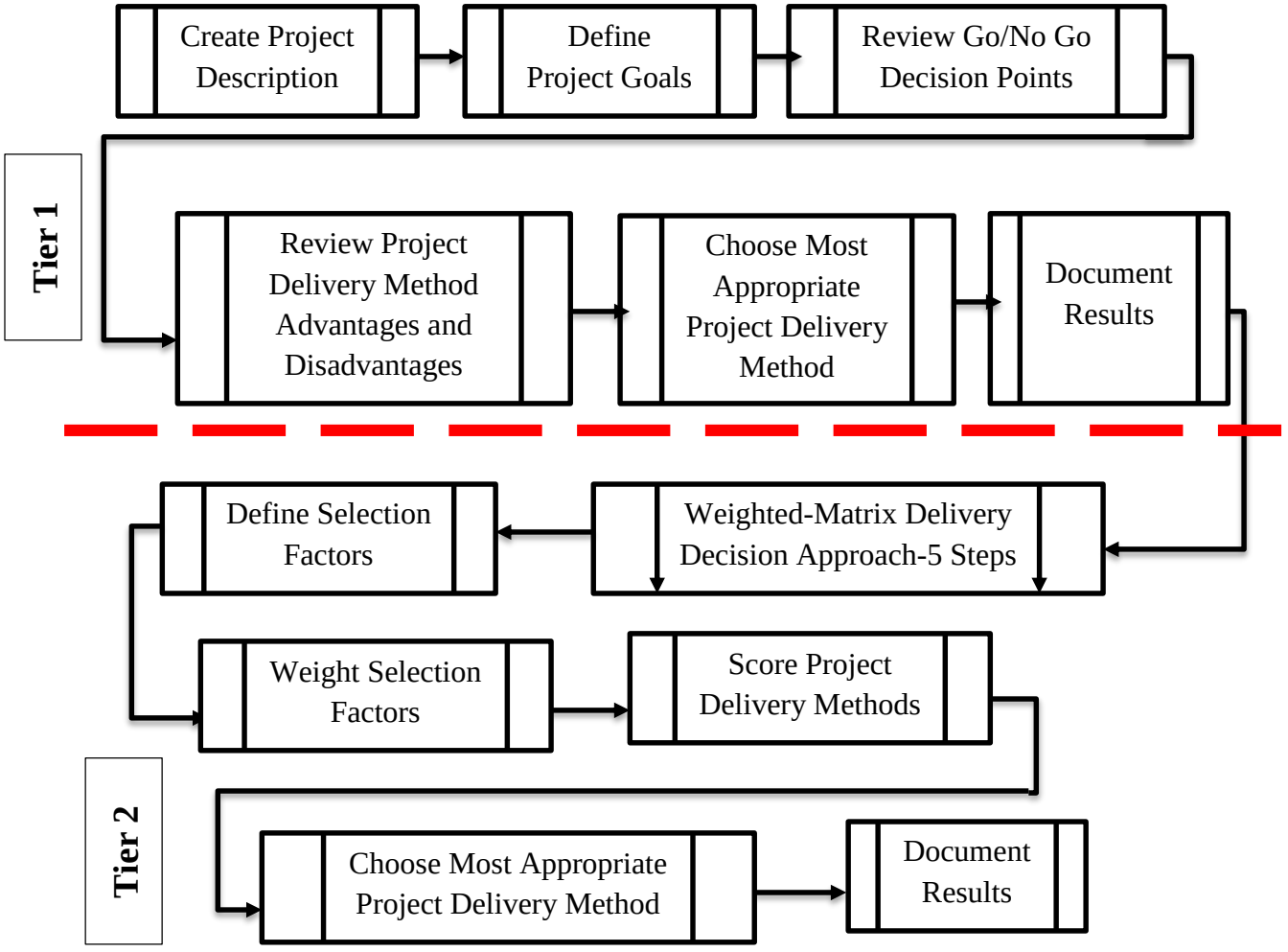


Figure 3: Tier 1 and Tier 2 (Source: Ali Touran 2009)

Optimal Risk-Based Approach leverages the current, risk-based, cost-estimating methods that have emerged in transit and highway agencies in the past few years. Most

project delivery method decisions will be made through completion of the Tier 1 and Tier 2 approaches. The Optimal Risk-Based Approach will be applied only when a decision has not been made after completing the Tier 1 and Tier 2 approaches and when a formal risk management process for the project is already in place. It is important to note that the level of effort involved in using the Tier 3 approach (especially the quantitative approach) is considerably greater than the effort required to use the Tier 1 or Tier 2 approaches.

Table 1: Issues need to consider when selecting a project delivery method (Source: Ali Touran 2009)

Project-level Issues	**Agency-level Issues**	**Public policy/ regulatory Issues**	**Lifecycle Issues**	**Other Issues**
-Project Size -Cost (to handle budget restrictions) -Schedule -Risk Management -Risk Allocation	-Agency Experience -Staffing Required -Staff Capability -Agency Goals and Objectives Agency -Control of Project -Third-Party Agreements	-Competition -Disadvantaged Business Enterprise (DBE) Impacts -Labor Unions -Federal/State/ Local Laws -Stakeholder/ Community Input	-Lifecycle Costs -Maintainability -Sustainable Design Goals -Sustainable Construction Goals	-Construction Claims - Adversarial Relationship

The owner determines which procurement methodology to use to buy the construction works/services/goods and the criteria that will be used to select the contractor. Finally, the owner selects which type of contract to employ.

A project delivery method determines the (Federal Transit Administration 2007):

- Work done by the Agency and the work that is contracted out to consultant and/or construction contractors
- Degree of control the Agency maintains over how the work is done and the control transferred to contractors through contracting out

- Assignment of risks associated with the project work

Project delivery methods differ in five fundamental ways (Jackson 2004):

- The number of contracts the owner executes
- The relationship and roles of each party to the contract
- The point at which the contractor gets involved in the project
- The ability to overlap design and construction
- Who warrants the sufficiency of the plans and specifications

Generally, there are six types of Procurement and Contract Delivery systems. These are:

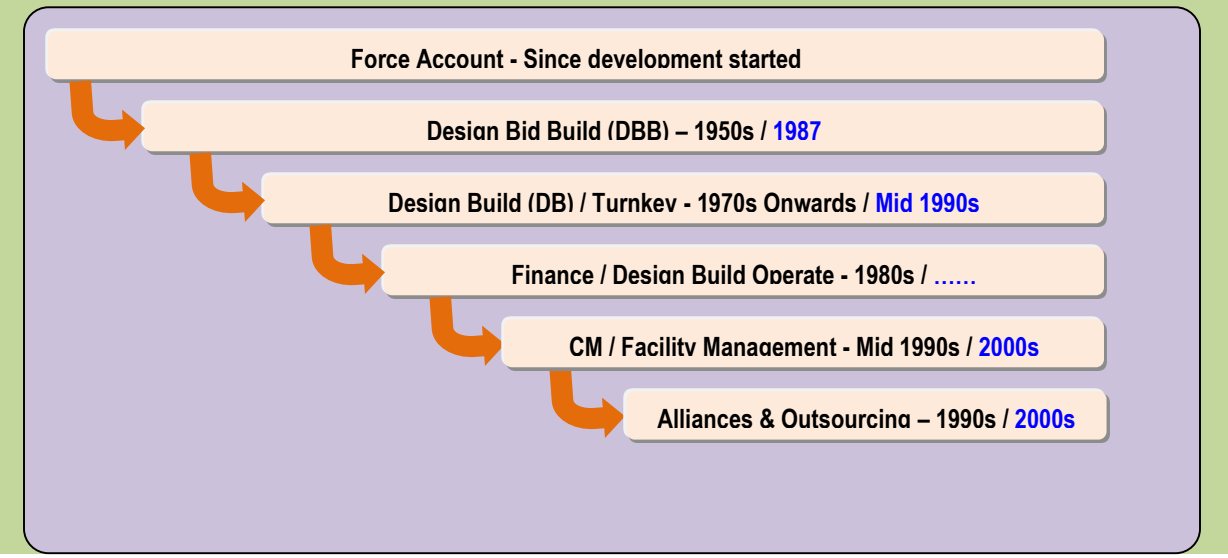


Figure 4: The different Procurement and Contract Delivery Systems and their development overtime [Source:Wubishet 2006 and Trauner Consulting Services, Inc. 2007]

Table 2: Project Delivery Methods (Source: Federal Transit Administration 2007)

Strategy	Sub-Strategy	Description	Owner Control/Risk
Own Forces	Total Project	Owner manages, designs, and constructs project with own forces	Owner has total control and accepts all risks
	Construction	Owner manages and constructs project with own forces, and retains design consultant for design work	Owner has total control and accepts all risks except for design errors or omissions
D/B/B Design/Bid/Build	Owner Managed D/B/B	Owner manages project, contracts out design to engineering consultants and construction to contractors	Maintains overall project control and transfers detailed engineering design/ construction tasks and risks to contractors
	GEC	Owner retains a GEC to manage the design and design consultants	Owner transfers control of design and design management tasks and risks to GEC
	CM	Owner retains CM to manage construction contractors	Owner transfers control of construction and construction management tasks and risks to CM
	PMC	Owner retains a PMC to manage the project including consultants and contractors	Owner maintains control of project scope and transfers project management tasks and risks to PMC
CMAR CM at Risk	Owner may also retain a GEC and PMC	Owner retains a CMAR contractor in final design, who participates in design review, estimating, and value engineering and at some agreed point guarantees a fee to manage and carry out construction	Owner transfers a share of control of scope through design to the CMAR contractor and all of the control and risk of the management and execution of construction
D/B Design/Build	Owner may also retain a GEC and PMC	GEC completes design through preliminary engineering (approximately 30 percent). Owner retains a D/B contractor to complete design and construct the project	Owner maintains control of scope through concept design (30 percent) after which control and risk of design and construction is transferred to D/B contractor
D/B/O/M Design/Build/ Operate/ Maintain	B/B/O or D/B/O & Maintain	As for D/B plus contractor is responsible for the operations and maintenance of the facility for a specified period	Owner transfers control and risk of operations and maintenance to the contractor
Turnkey	Could be used for D/B or D/B/O/M	Owner prepares a performance specification that is bid on by turnkey contractor, who may also participate in financing the project	Owner controls scope of performance specification after which control and risk of conceptual/detail design and construction transfers to turnkey contractor, including operations and maintenance if D/B/O/M

The following are the principal alternative methods of building procurement/delivery now in use.

2.3.1. Force Account Delivery Method

The so-called force account approach to construction project organization is very simple – the project owner acts as the prime contractor and carries out the work with its own labor forces by providing field supervision, materials, equipment and labor. This method is usually confined to relatively small, uncomplicated projects that are built for the owner's use rather than sold to another party upon completion. Such owners usually have their own guidelines for deciding the project magnitude and complexity beyond which they choose to contract with separate construction organizations. They must consider the tradeoffs among the extra time and expense of the formal contracting process and the possible construction cost savings, potential time savings and improved quality resulting from these competitive or negotiated contracts. Often, such small-scale projects are also designed in house by the owner's staff (Bennett, The Management of Construction: A Project Life Cycle Approach 2003) and (Federal Transit Administration 2007).

Often such a system is promoted if the Project Owners believe that there is a comparative advantage in Cost, Time and Quality issues. Besides, when there is a lack of capacity from the private sector to undertake very large and technologically new projects, public companies do undertake such projects using Force account delivery systems (Wubishet 2006).

Advantages	Disadvantage
Avoids time and expense of tendering	Workforce may lack needed skills
Owner can exercise more direct control	Owner may lack needed managerial expertise
	No price competition

2.3.2. Design-Bid-Build/Traditional Delivery Method

A project delivery method in which the owner holds two separate contracts for design and construction. This method is often referred to as the traditional project delivery method. There is no legal agreement between the designer and the contractor.

Design-bid-build is commonly referred to as the traditional method of project delivery, and the traditional accountabilities apply. In this scenario, the owner first hires the architect or engineer to design the building or structure. The design professional prepares a design, moving through the three standard design phases: schematic design, design development

(the design development drawings are often referred to in the industry as DDs), and finally contract documents (referred to as CDs). Under this arrangement, the design professional is usually selected on a qualifications basis and is typically paid a fee or a percentage of the building cost for his or her services.

After the plans and specifications are complete, the owner selects the general contractor who will provide the construction and construction management services. The most common means for selecting the general contractor under this method is by low price or low bid: several competing contractors estimate the project based upon the contract documents and the builder with the lowest price gets the contract. The general contractor typically subcontracts various sections of the work to specialty contractors.

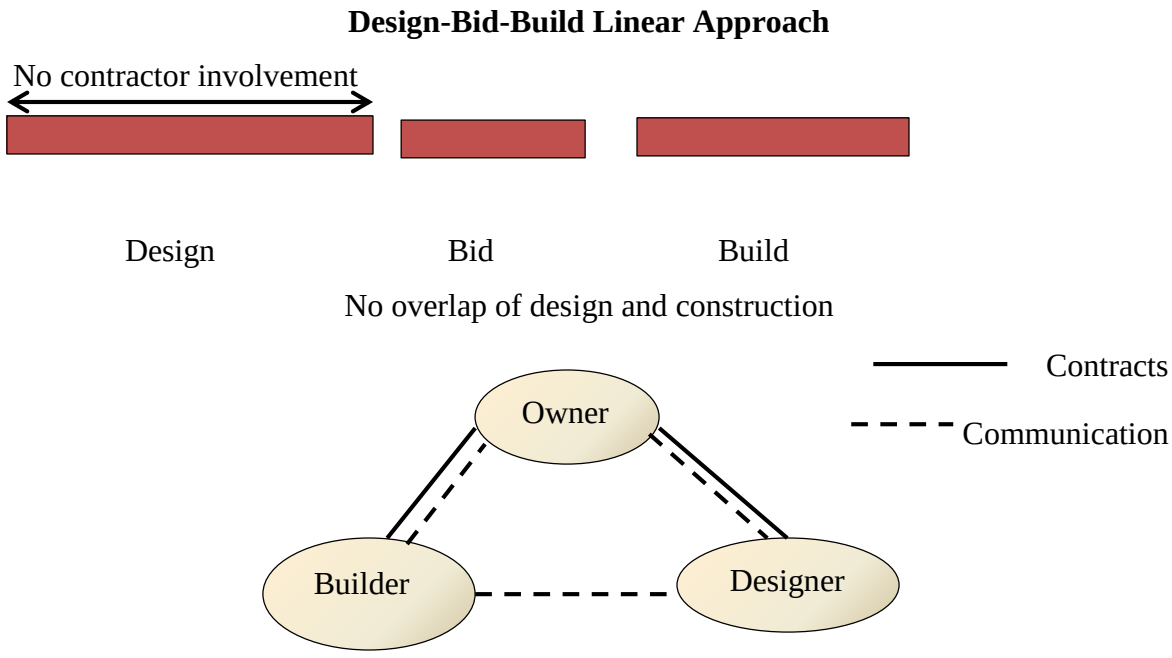


Figure 5: Design-Bid-Build Linear Approach (Source: Ali Touran, A Guidebook for the Evaluation of Project Delivery Methods 2009)

Under the design-bid-build method, the owner warrants the sufficiency of the plans and specs to the contractor. If there are gaps between the plans and specs and the owner's requirements, or any errors and omissions in the design, the owner is responsible for paying for those corrections (Jackson 2004).

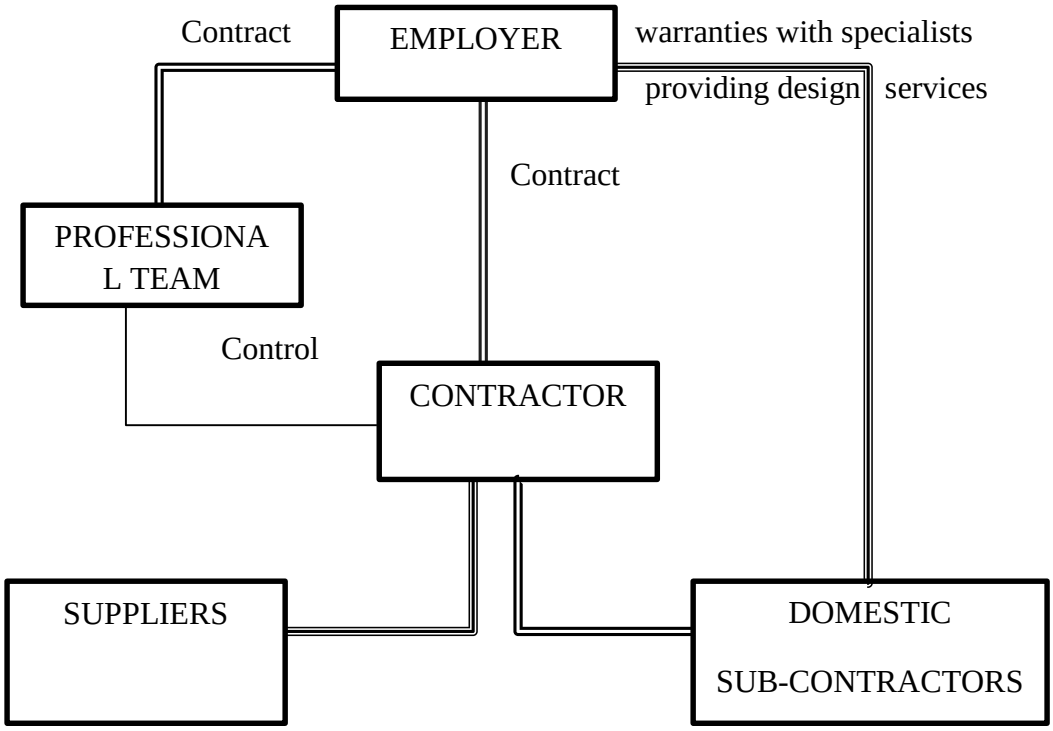


Figure 6: The D-B-B procurement method (Source: Brook 2008)

2.3.3. Design-build

(Sometimes called design and construct or package deals). Design-build is neither a new concept nor a complex one. This project delivery system is similar to that of the master-builder approach of the 1920s and 1930s in which the contractor in the private sector provided an owner with both design and construction services. Some of the earliest design-build projects in the public sector occurred in the 1940s when the Navy used this system to build on-base housing and when NASA started using design-build in 1962. In 1986, approximately 3 percent of all construction-project delivery systems were utilizing design-build; by 1998, this figure had grown to 27 percent (Levy, Project Management in Construction 2018).

Essentially, the contractor is responsible for the design, for the planning, organization and control of the construction and for

A project delivery method in which there is only one contract between the owner and a design-build entity. The design-builder is responsible for both the design and the construction of the project. This method is often referred to as single source project delivery (Jackson 2004).

generally satisfying the client's requirements, and offers his service for an inclusive sum.

The design-build methodology has grown significantly in popularity over the past twenty years. It is often referred to as single-source project delivery and is the closest method we have to the master builder approach of old. In this arrangement, there is only one contract. The owner contracts with a design-build entity, which will be responsible for both the design and the construction of the project (Jackson 2004).

Whereas design-bid-build has linear sequencing of the work, design-build often integrates and overlaps design and construction and allows for something called fast tracking. Under the design-build method, the design builder warrants the sufficiency of the plans and specs to the owner. The design-builder is liable for any gaps between the plans and specs and the owner's requirements for the performance of the building. If there are any shortfalls, the design-builder picks up the tab.

One of the greatest advantages to design-build is the possibility for early contractor involvement. Under this method, all of the team players-the designers, the contractors, the material suppliers and manufacturers-have an opportunity to be in continuous communication throughout the project.

Fast tracking: *A practice utilized to speed up a job by overlapping the design phase and the construction phase of a project.*

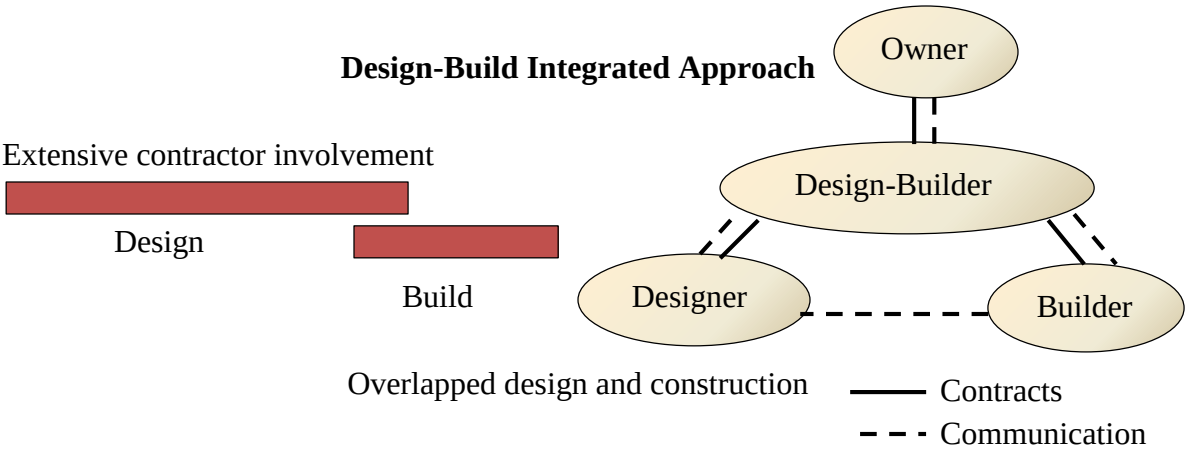


Figure 7: Design-Build Integrated Approach (Source: Ali Touran, A Guidebook for the Evaluation of Project Delivery Methods 2009)

The design-build entity can be configured in three basic ways:

Designer and contractor partnership: In this scenario, two firms simply decide to work together on a single project with one of them at risk for the project. A construction firm and a design firm join forces to go after a project. One of the two partners takes the lead and actually enters into a contract with the owner to provide both the design and construction services. For example, under the ***contractor-led design-build model***, the architect is hired by the builder (not by the owner as in design-bid-build) and the builder actually holds the contract to deliver both design and construction. If it is ***a designer-led design-build model***, the opposite is true. The architect or engineer hires a contractor and is obligated for both the design and the construction. The partnership created is simply an agreement to work together. There is no new legal entity created under this setup. Contractor-led design-build is the most prevalent form practiced today.

Full-service design-build firm: In this model, the design professionals and the construction professionals work for the same firm, under the same roof. This situation permits no excuses for not communicating! One can just walk down the hall when a question or problem arises. Additionally, there commonly exists a higher level of trust among the various disciplines working under the same roof than what you would find under the other models. This, of course, adds to the efficiency.

Joint venture: The joint venture configuration is similar to the designer and contractor partnership with one exception: the design firm and the construction firm actually create a legal entity, the joint venture, for the purpose of carrying out the design and construction of a specific project. Under this arrangement, both parties are at financial risk for delivering the project (Jackson 2004).

Joint venture arrangements are an attractive means of cooperation between organizations. Most typically they are

A joint venture can be defined as number of firms collaborating on a project or a number of projects with a view to sharing the profits, each firm being paid on the basis of its agreed contribution in kind or in financial terms.

temporary arrangements for the purpose of carrying out one project – usually a major project.

In general, joint ventures are not the easiest forms of organizations to manage and operate. Therefore, there must be compelling reasons why parties to a construction contract resort to a formation of a joint venture in contrast to the conventional contractor/subcontractor relationship; these could include the following:

- Pooling of resources and expertise
- Sharing of risks
- Entry to foreign markets
- Access to technological improvements

Types of Joint Venture

Joint ventures can take a variety of forms with varying degrees of complexity. The three main types can be classified as follows:

- ✓ *A simple contractual relationship*
- ✓ *A partnership agreement*
- ✓ *A limited liability company*

Discussion Point

Joint venture types, Definition, Merit and Demerit

The following standard forms of DBB Conditions of Contract are known for use for such delivery system (Wubishet 2006):

- FIDIC White Book for Consultancy Services (Design and Supervision) and Red Book for Construction Works
- Standard Conditions of Contract for Construction of Civil Works, 1994; MWUD

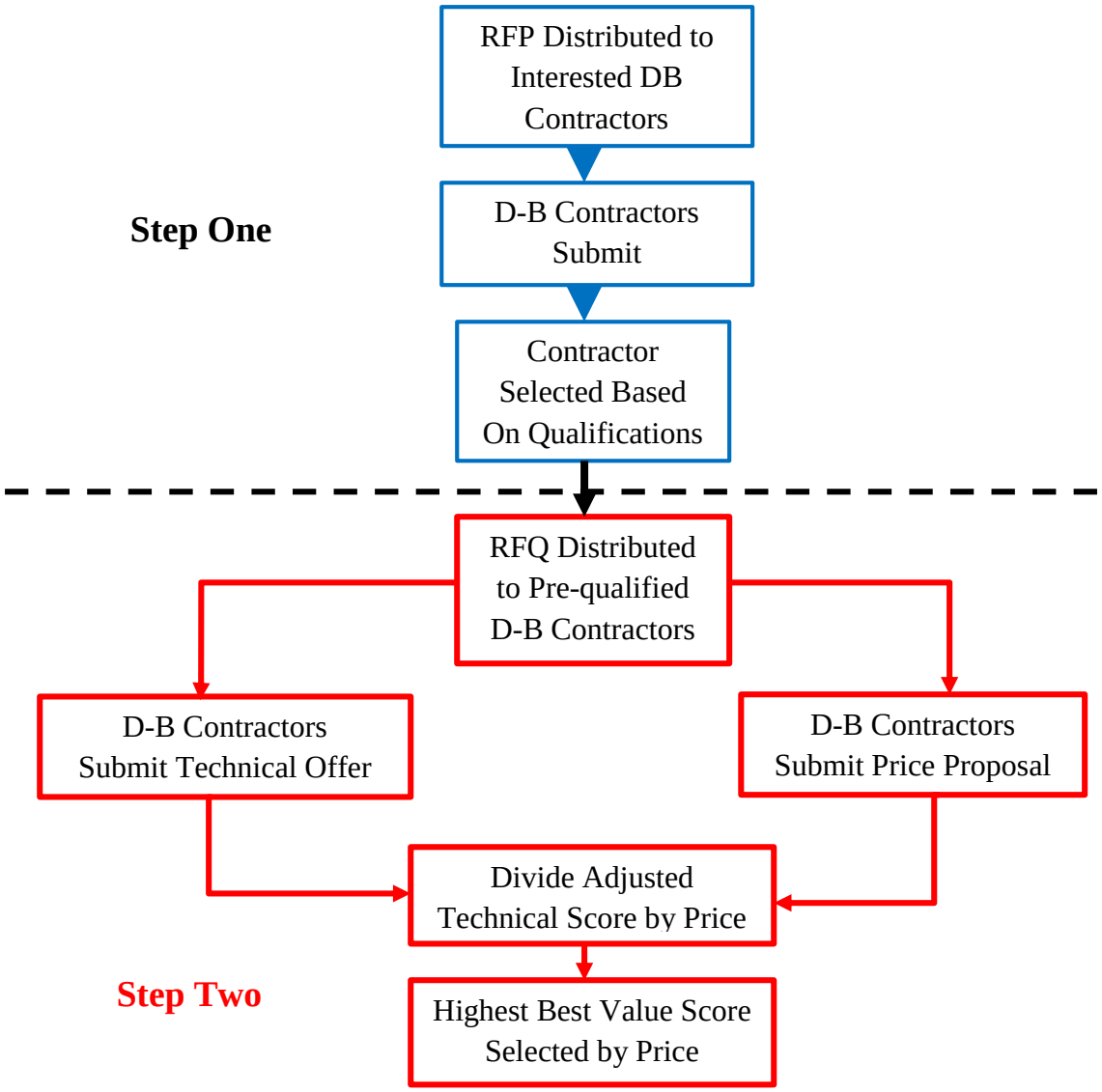


Figure 8: Design-Build Two-Step Best Value Selection (Source: G. Edward Gibson 2001)

Advantages of D/B

1. Single point responsibility is provided, i.e., the contractor is solely responsible for failure in the design and/or the construction.
2. The client has only one person to deal with, namely, the contractor, whose design team includes architects, quantity surveyors, structural engineers, etc.
3. The client is aware of his total financial commitment from the outset.

4. Close intercommunication between the contractor's design and construction teams promotes co-operation in achieving smoother running of the contract and prompt resolution of site problems.

Disadvantages of D/B

1. Variations from the original design are discouraged by the contractor and, if allowed, are likely to be expensive.
2. The client has no means of knowing whether he is getting value for money unless he employs his own independent advisers, which adds to his costs.
3. If the contractor's organization is relatively small, he is unlikely to be as expert on design as he is on construction, and the resulting building may be aesthetically less acceptable.

The following standard forms of DB Conditions of contract are known for use for such delivery systems (Wubishet 2006):

- FIDIC Orange Book
- ENAA Model Form International Contract
- ICE Design & Construct Conditions of Contract
- EIC Contract
- AIA Contract Form A191

2.3.4. Construction Management

The planning, scheduling, evaluation, and controlling of construction tasks and activities to accomplish specific objectives outlined in the contract documents.

Construction management services are provided to the owner independent of the construction work itself. There are two options for the owner to consider under this method (Jackson 2004).

Option 1: Agency CM the Construction Management Association of America (CMAA) defines agency CM as a fee-based service in which the construction manager is responsible exclusively to the owner and acts in the owner's best interests at every stage of the project. In this case, the construction manager offers advice uncolored by any conflicting interest

because he or she does not perform any of the actual construction work and is not financially at risk for it.

This arrangement involves three contracts: one between the owner and the designer, one between the owner and the contractor, and one between the owner and the construction manager. The owner hires a designer and a contractor exactly as described under the design-bid-build scenario. In addition, the owner also contracts with a third party, a construction management firm that provides construction management functions but as an independent agent or representative of the owner.

Agency CM: *A construction management option in which the construction manager acts in the owner's best interests at every stage of the project, from design through construction. The construction manager offers advice and project management services to the owner but is not financially responsible for the construction.*

Multiple prime: *A contracting methodology in which the owner bypasses the use of a general contractor and enters into multiple separate contracts with trade or specialty contractors for the various sections of the work associated with the project, such as concrete, framing, mechanical, and electrical work. Each of the specialty contractors involved becomes a prime contractor on the project.*

The party responsible for the construction work is still an individual general contractor, and that contractor still carries out construction management functions relative to their internal requirements for managing the project to completion. In some unique situations, the owner may elect to bypass a general contractor and contract directly with several specialty contractors and allow the CM firm to manage each of them. These are called multiple prime contracts.

Option 2: At-risk CM (also called CM/GC) The CMAA defines the at-risk CM project delivery method as an option that entails a commitment by the construction manager to deliver the project within a guaranteed maximum price (GMP). The construction manager acts as consultant to the owner in the development and design phases, but does the work of a general contractor during the construction phase.

At-risk CM: *A project delivery method where the construction manager acts as a consultant to the owner in the development and design phases, but as the equivalent of a general contractor during the construction phase.*

Constructability reviews: *A design review process in which experienced contractors and construction managers work with designers to ensure that the details of the design actually can be built in an efficient and cost-effective manner. The process entails review of materials, application, installation techniques, field execution, and building systems*

In this scenario, there are only two contracts, one between the owner and designer and one between the owner and the at-risk CM. Although this might seem like a tricky relationship to manage, owners are comfortable with it because the at-risk CM is also responsible for performing the construction and carries financial liability for bringing the project in on time and within budget. By contrast, under the agency CM model, the construction manager is not at risk for the budget, the schedule, or the performance of the work.

One of the great things about construction management project delivery is that it provides a contractual avenue by which the owner can bring the CM function into play early in the project planning and make direct dialogue with the design team possible. In these circumstances, the construction manager, acting on behalf of the owner, can contribute by providing value engineering, life cycle cost analysis, conceptual estimating and scheduling, and what is called constructability reviews during the design process and head off possible incompatibilities between design and construction, which typically result in cost overruns, time delays, conflicts, and legal claims down the road.

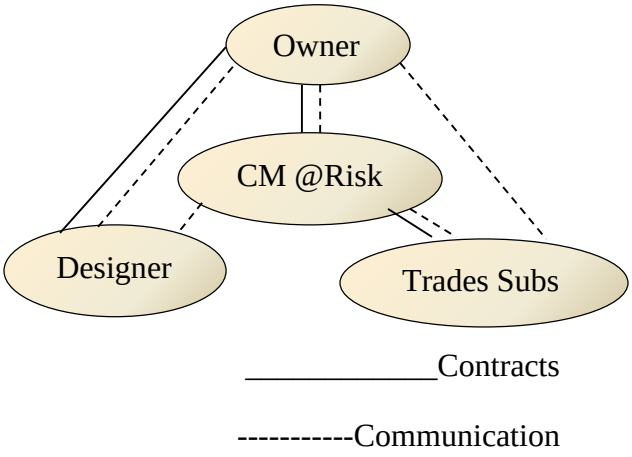


Figure 9: Agency Construction Management (Souce: Ali Touran, A Guidebook for the Evaluation of Project Delivery Methods 2009)

Competition Criteria and Project Delivery

In traditional design-bid-build, price is the primary criterion used to determine who will win the project. Basically, the contractor who submits the lowest price will be awarded the contract. With construction management (specifically, agency CM), qualifications become the main factor in determining which CM firm will win the competition. And with at-risk

CM and design-build, a combination of price and qualifications are considered when selecting the winning team. The following graphic illustrates the connection between project delivery method and selection criteria.

Design-Own-Operate and Build-Own-Operate- Transfer and Their Variations

Design-Own-Operate (BOO)	**Build-Own-Operate- Transfer (BOOT)**
BOL (Build, Operate, Lease)	BRT (Build, Rent, Transfer)
BOD (Build, Operate, Deliver)	BOT (Build, Operate, Transfer)
DAC (Design, Acquire, Construct)	BTO (Build, Transfer, Operate)
DBOM (Design, Build, Operate, Maintain)	DBOT (Design, Build, Operate, Transfer)
BOOM (Build, Own, Operate, Maintain)	BOOST (Build, Own, Operate, Subsidize, Transfer)
DBFO (Design, Build, Finance, Operate)	FBOOT (Finance, Build, Own, Operate, Transfer)
DCMF (Design, Construct, Manage, Finance)	

2.3.5. Finance / Build Operate Transfer (BOT)

- **Build design:** procure, manage, construct and finance the project implementation.
- **Own:** Own the asset during concession period
- **Operate:** manage and operate asset, carry out maintenance, deliver product/ service and receive off take payment
- **Transfer:** Hand over the asset in operating condition at the end of the concession period (Soota 2005)

The build–own–operate–transfer (BOOT) type of project has evolved as a means of involving the private sector in the development of the public infrastructure that promotes Public Private Partnership (PPP). The concept, in use in some parts of the world for some centuries, requires the private sector to finance, design, build, operate and manage the facility and then transfer the asset to the government free of charge after a specified concession period. The term BOT, for build–operate–transfer, was first coined by the Turkish Prime Minister in 1984 in connection with the privatization of that country's public-sector projects. Typical 'concession periods' range from about 10 years, not

including project development time, for some power station projects to as long as 55 years, including approximately 7 years for construction.

It is apparent that such an approach requires a complex organizational structure and carries considerable long-term risk for the project sponsor, while minimizing such risk for the governmental owner (Bennett, The Management of Construction: A Project Life Cycle Approach 2003).

This delivery system is advantageous because of three major factors:

- it minimizes owners' scarcity of financial resources;
- It devoid of considerable risks from the project owners and lesson regulatory activities; and
- The facility is well operated and transferred with free of charge or minimum compensations to project owners.

Such delivery system requires appropriate packaging of projects and their definition clearly. It is advisable to start with small projects and tries to develop experience and expertise to make such delivery system successful.

The following standard forms of BOT Conditions of Contract are known for use for such delivery systems (Wubishet 2006):

- FIDIC Yellow Book

2.3.6. Partnering

> ***Definitions:*** *long-term or project specific commitment between two or more organizations for the purpose of achieving specific business objectives by maximizing the effectiveness of each of the participants.*
> *Whilst alliances and partnerships were not new, it was the CRINE (Cost Reduction In a New Era) initiative that made a difference and demonstrated that they could be made to work to the benefit of all parties to a project. Alliances and partnerships are not types of contract but a relationship between contracting parties with aligned objectives.*

Partnering is a relatively modern concept intended to provide a framework for the establishment of mutual objectives among the members of the building team which attempts to improve working relationships, encourage the principle of continuous improvement and develop an agreed dispute resolution procedure. All of these will benefit both the project and the participants.

This framework of mutual collaboration is designed to encourage trust, co-operation and teamwork in what is traditionally a very fragmented and adversarial process and where the combined effort of the participants should focus on the client's needs and project objectives so that the project is built as efficiently, effectively and economically as possible. Partnering has grown out of the development of strategic alliances initiated by major construction clients in order to manage the supply chain of their projects.

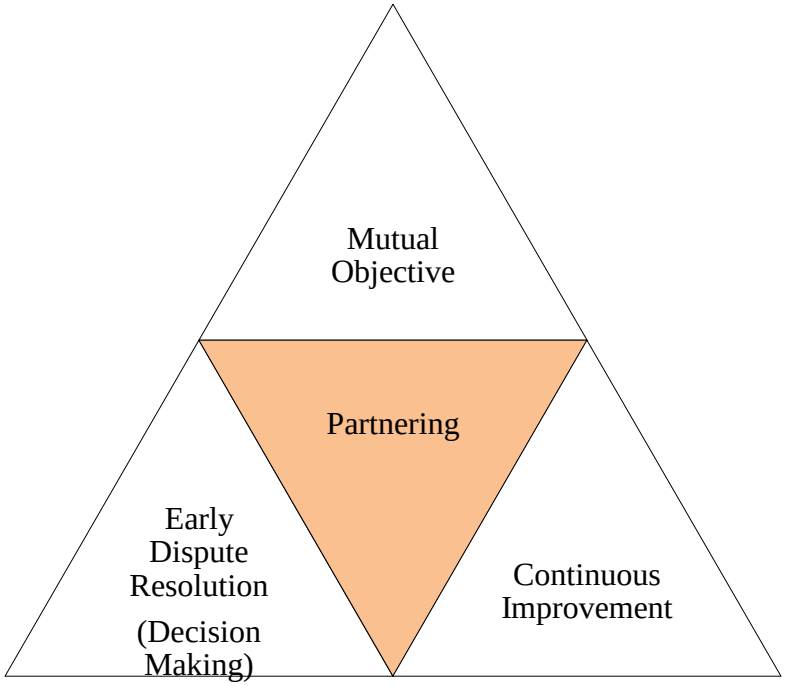


Figure 10: The partnering triangle Source: (Source: Squires 2011)

2.3.7. Alliancing

Under project alliancing, an agency and one or more service providers (constructors, consultants, designers, suppliers, or a combination thereof) collaborate on the delivery of a project. In contrast to partnering, another relationship-based approach to project delivery, alliancing uses contractually established financial incentives to encourage superior project performance and cooperation among the alliance participants.

Typical characteristics of a project alliance include the following:

- The alliance team members jointly develop and agree to a target cost, which is then verified by an independent estimator.
- At project completion, the target cost is then compared to the final cost, and the under-runs or overruns are shared equitably (through pre-agreed ratios) among the participants based on their relative contributions to the leadership, performance, outcomes, and overall success of the alliance. In this manner, all participants have a financial stake in the overall project performance.
- Project risk and responsibilities are shared and managed collectively
- All participants have an equal say in decisions for the project, with decisions made unanimously on a "best-for-project" basis, rather than to further individual interests.
- All participants provide "best-in-class" resources. Full access is provided to the resources, skills, and expertise of all participants.
- The alliance agreement creates a no-fault, no-blame, and no-dispute culture. No legal recourse exists except for the limited cases of willful default and insolvency.

The use of project alliancing to establish and deliver a project generally entails four phases, with the alliance remaining intact until the end of the final phase.

- **Alliance Establishment Phase –** The agency will select project participants on the basis of non-cost criteria, such as technical expertise and experience, financial and management resources, quality and time record, and willingness to commit to a cooperative relationship with the agency. The agency may either select each of the key participants (e.g., designer, contractor, supplier, etc.) in separate selection processes, or allow industry to establish its own teams and submit proposals as an integrated team or consortium. Although conducting separate selection processes allows the agency to select the best individual companies, this approach can be time consuming and may not necessarily yield the best overall team. For such reasons, agencies more commonly choose the integrated team approach to alliance participant selection.

Following participant selection, the agency will conduct a series of meetings and workshops with the selected participants to establish the commercial framework and primary alliance parameters, including the compensation structure, fees for overhead and profit, and the gainshare/painshare arrangement, which are then formalized in an alliance agreement.

- **Project Development Phase** – The agency and the selected alliance participants will work together as an integrated team to develop and agree to a target cost and other performance targets (e.g., timely completion, maintenance costs, quality, etc.).
- **Implementation Phase** – Once the targets are established and agreed to, the alliance team works together to deliver the project with the objective of achieving or exceeding the agreed-to targets.
- **Defects Correction Period –** The participants remain collectively responsible for addressing any defects in the work.

Objective

- Encourage cooperative behavior among project participants by tying compensation to the final project outcome
- Better value for the money and improved project outcomes through collaboration and "best-for-project" decision making

2.3.8. Innovative form of procurement

Now a days, construction industry set out a clear commitment to trialing new models of procurement that include principles of early supplier engagement, transparency of cost, integrated team working and collaborative working. The three key procurement routes (The Chartered Institute of Building 2014):

Two Stage Open Book: a client invites prospective integrated teams to bid for a project based on their ability to deliver an outline brief and cost benchmark. Following the first stage competition, the appointed team works alongside the client to build up a proposal, the construction contract being awarded at the second stage. This differs from Cost Led

Procurement in reducing industry bidding costs, enabling faster mobilization and in providing the opportunity for clients to work earlier with a single integrated team.

Cost Led Procurement: Applying the Cost Led Procurement process, a client can use their knowledge of costs to set a challenging cost ceiling and output specification against which the supply chain can bring experience and innovation to bear in a competitive framework environment. On frameworks with a series of similar capital projects, CLP provides the opportunity to continually improve on the unit costs of the program working collaboratively with the supply chain.

Integrated Project Insurance: The Integrated Project Insurance (IPI) model offers clients the opportunity to create a holistic and integrated project team (an 'Alliance Board') to eliminate the "blame/claim" culture. The innovative "integrated project insurance" package limits the risk for the individual members of the team, fosters joint ownership of the project, and thereby reduces the likelihood of overrunning in terms of cost and time (The Chartered Institute of Building 2014).

2.3.9. Indefinite Delivery/Indefinite Quantity (ID/IQ)

Also known as Job-Order or Task Order or Area-Wide or County-Wide or City-Wide, and Open-Ended Contracting

This is a type of indefinite delivery, indefinite quantity contract (ID/IQ) where the owner contracts with a contractor for an unspecified quantity of work within a specified scope of work. Typically the work is relatively small and routine and may include minor design services. This project delivery method is primarily intended for facility owners who regularly have a need for construction services that exceed the capabilities of the maintenance staff but that are not large enough to justify the cost and time required to procure multiple construction services in a conventional manner.

The agency will identify and develop specifications for task items. Contractors then competitively bid these task items based on unit prices for task items for a specific contract term. The total quantity and exact location of the work are not provided at the time of bid.

After awarding the contract, the agency will issue individual work orders as services are needed at specific locations (Rogers 2008) and (Trauner Consulting Services, Inc. 2007)**.**

Objective of this delivery system includes: Time savings in engineering and procurement, Project Types/Selection Criteria, and Clearly defined, standardized, or repetitive work items.

Advantages

- Reduces overall procurement time by allowing agencies to eliminate separate bid processes for repetitive work items
- Structuring work in small tasks may offer increased opportunities for smaller or disadvantaged businesses
- Provides flexibility in when to let portions of an overall construction program
- Awarding multiple ID/IQ contracts will ensure competitive pricing of work orders
- Long-term contracts can foster a spirit of cooperation/partnership between contractors and the agency

Disadvantages

- Large packages could exclude smaller contractors from bidding
- Without minimum work guarantees, the possibility that selection for award ay not necessarily lead to work orders may discourage potential bidders
- Without advanced knowledge of the timing and duration of task orders, it is more difficult for ID/IQ contractors to manage resources

2.3.10. Private finance initiative

Public private partnership is a partnership which leverages private funding and the strengths of private entrepreneurship and management, for the maximum provision of public services in a climate of scarce public resources. PPP has been used selectively in the past by many governments globally, as a joint venture in public projects where private innovation and finance can reduce costs and enhance services. The PFI is a PPP special case where all the finance needed for the capital funding and its basic operation is supplied

by the private sector in return for a service charge. In the provision of built assets, PFI provides for 100% capital funding and building running costs by using a private joint for a concessionary period of 20–60 years, which may be renewed (Fewings 2005).

This procurement option has been successful in delivering high quality facilities for public services since the early 1990s. 'The involvement of private sector skills which offer the prospect of better value for money'.

How does better value for money happen for PFI projects?

1. Innovative and economical design calculated on whole life basis. Since the project company is responsible for maintaining the asset it is more likely to take care to secure quality of construction work.
2. Allocation of risks to the parties able to manage them at least cost. The private companies were absorbing risk that would previously have been borne by the taxpayer.
3. Greater exploitation of assets – additional income from shared use of facilities or the sale of redundant assets.
4. Integration of design, build and service operation.

Real costs of all the elements of a PFI contract includes and the costs are typically divided between:

- Initial construction costs (30%);
- Maintenance costs (10%);
- Services (50%);
- Financing charges and project management costs (10%).

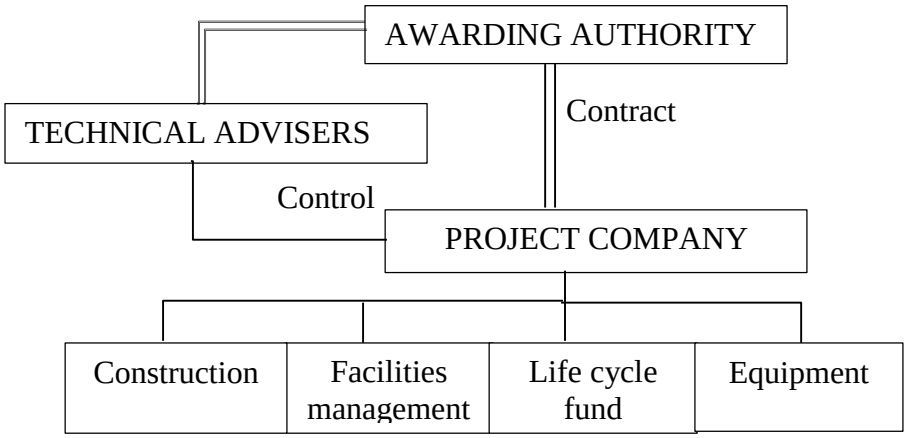


Figure 11: Private finance initiative (Source: Brook 2008)

2.3.11. The Portland Method

The Portland Method, named after the City of Portland, Oregon where it was used, is a hybrid CM at-Risk delivery method using a cost-reimbursable, fixed fee approach to compensation. The delivery is structured into three phases, procurement, pre-construction, and construction.

In the first phase, the agency procures the contractor using a best-value process. The proposer is selected based on qualifications and a fixed fee "bid" covering the contractor's off-site and onsite overhead, including superintendents, management staff, other general conditions costs, and profit, for the life of the project. In the event that differing site conditions increase overall contract time or extra work is ordered in writing by the agency, this fixed fee may be renegotiated accordingly.

During the pre-construction phase, the contractor provides design reviews and construction planning, with a focus on constructability, value engineering cost and time reductions, and joint risk assessments. These efforts culminate in the development of an estimated reimbursable cost (ERC). The intent is to establish reasonable construction costs for labor, equipment, and materials, which factor in the costs of unknowns without establishing a separate contingency. After comparing the ERC with the "Engineer's Estimate," the contractor and agency negotiate a final ERC and combine this with the fixed fee to establish the contract amount. Finally, the contractor will submit a cost control program and subcontracting plan for construction. In the final phase, the general contractor will construct the project by self-performing work on a reimbursable basis and sub-contracting work using firm-fixed-price agreements.

The Portland Method differs from conventional CM at-Risk in that it uses an ERC instead of a GMP. The ERC shifts less risk to the contractor to meet set funding limits. Also, the Portland Method places no limits on the amount of work that the prime contractor may self-perform, a common restriction found in CM at-Risk contracts.

The contractor's early involvement with design review, value engineering, and risk analysis prior to design completion contributed to (Trauner Consulting Services, Inc. 2007):

- Early contractor involvement (design and planning) to reduce cost and schedule.
- Time savings by fast-tracking construction

Advantages

- Allows for innovation and constructability recommendations in the design phase, yet the agency still retains control over the design
- Fixes project cost earlier than Design-Bid-Build
- Potential to fast-track early components of construction prior to complete design

Disadvantages

- Once construction begins, the CM assumes the role of a general contractor, setting up traditional contractual relationships with agency and designer, and potential for disputes over project quality, budget, and schedule
- Best suited to specialized work (e.g. tunneling) with significant risk of cost and time growth
- Agency retains design liability and greater risk of differing site conditions
- In comparison to CM at-Risk with a GMP, reimbursable cost basis shifts less performance risk to the contractor
- Provides no added incentive to motivate contractors to control costs

2.3.12. Integrated Project Delivery (IPD)

Integrated Project Delivery (IPD) started in the United States of America and is now being used internationally.

The definition is: 'Integrated Project Delivery (IPD) is a project delivery approach that integrates people, systems, business structures and practices into a process that collaboratively harnesses the talents and insights of all participants to reduce waste and optimize efficiency through all phases of design, fabrication and construction. Integrated Project Delivery principles can be applied to a variety of contractual arrangements.

Integrated Project Delivery teams will usually include members well beyond the basic triad of owner, designer and contractor. An integrated project includes tight collaboration between the owner, architect/engineers, and builders ultimately responsible for construction of the project, from early design through project handover.' (Source: American Institute of Architects.)

The key to successful Integrated Project Delivery is assembling a team that is committed to collaborative processes and is capable of working together effectively. IPD means that the estimator will work alongside the design team to deliver a fully integrated approach throughout the design and production process (Jewell 2018).

2.3.13. Full Delivery or Program Management

- Cost savings
- Seeking innovation
- Desiring integration & technology
- Partnering potential
- Staff reductions
- Avoiding litigation
- Bringing trust back into the process

Full Delivery or Program Management

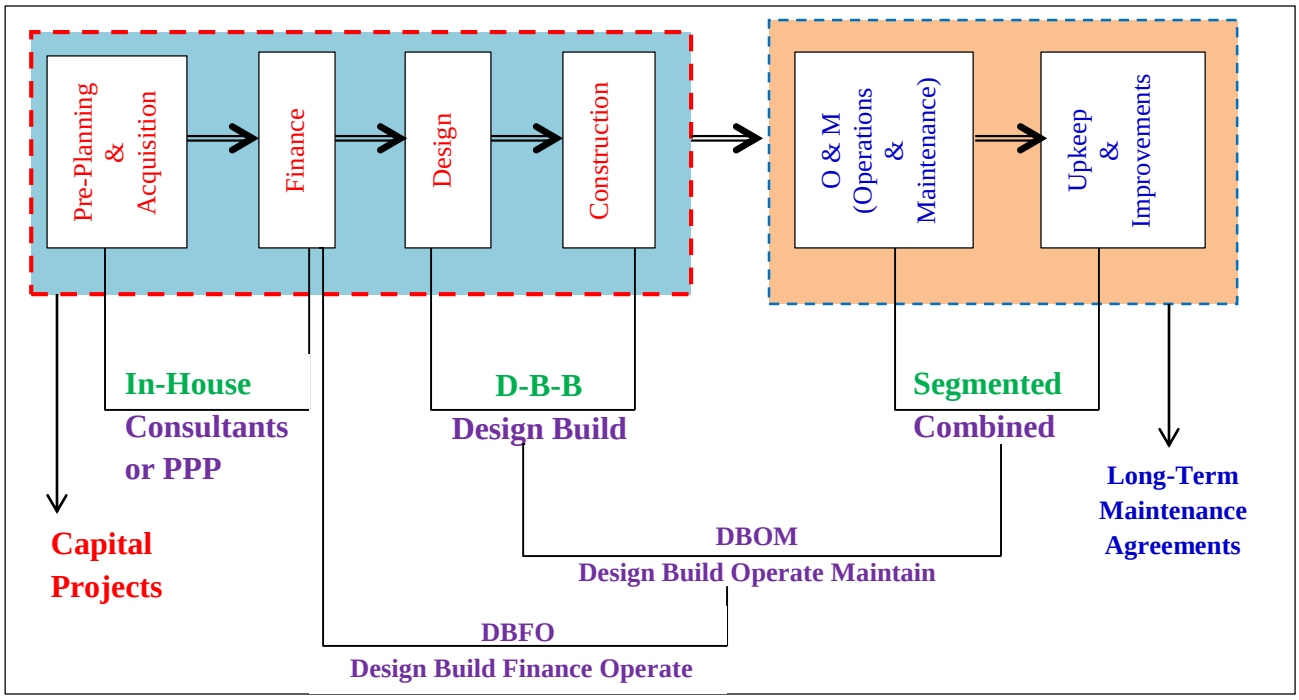


Figure 12: Innovative Procurement Methods (Source: Finnish Road Enterprise 2002)

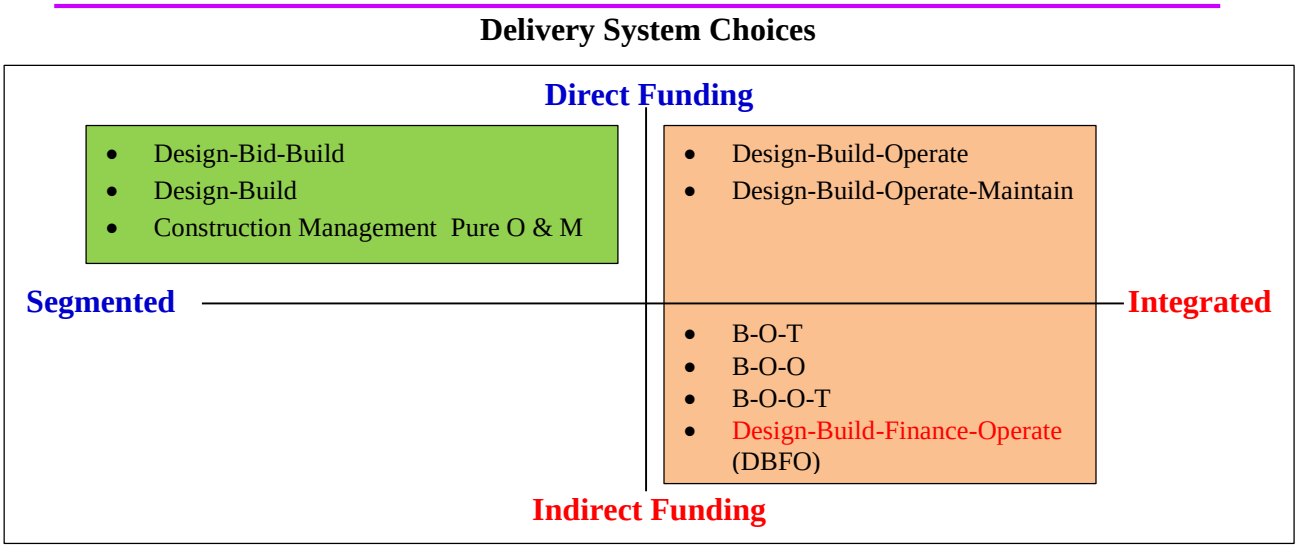


Figure 13: Delivery System Choices (Souce: Finnish Road Enterprise 2002)

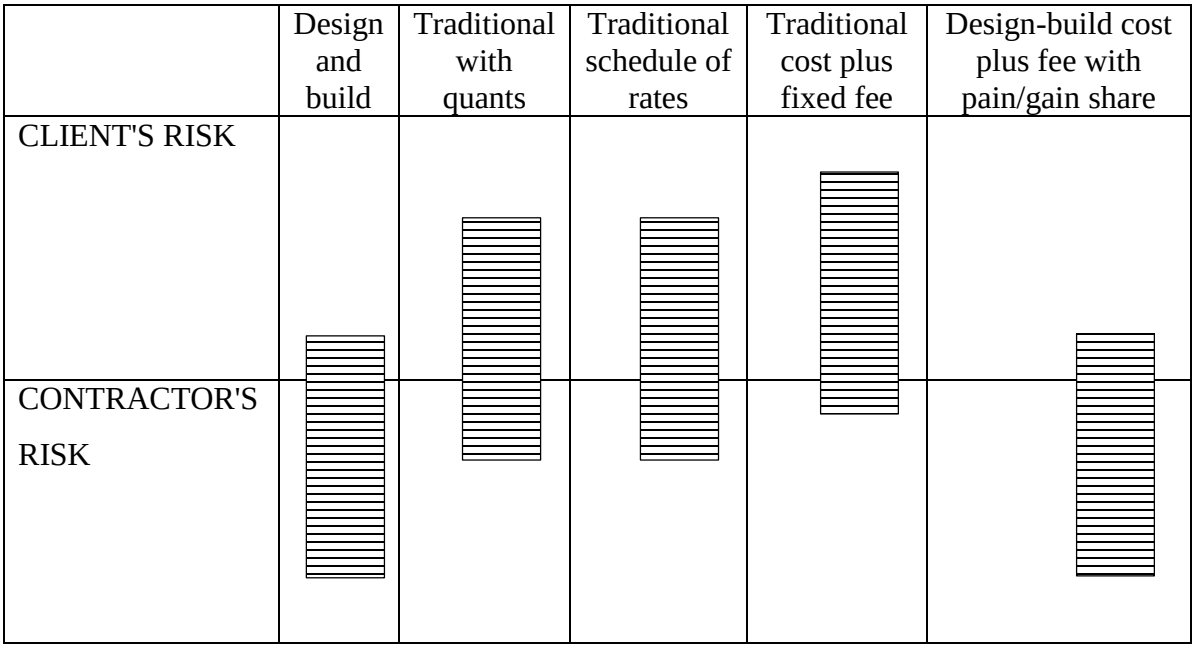


Figure 14: A guide to the apportionment of financial risk (Sorce: Brook 2008)

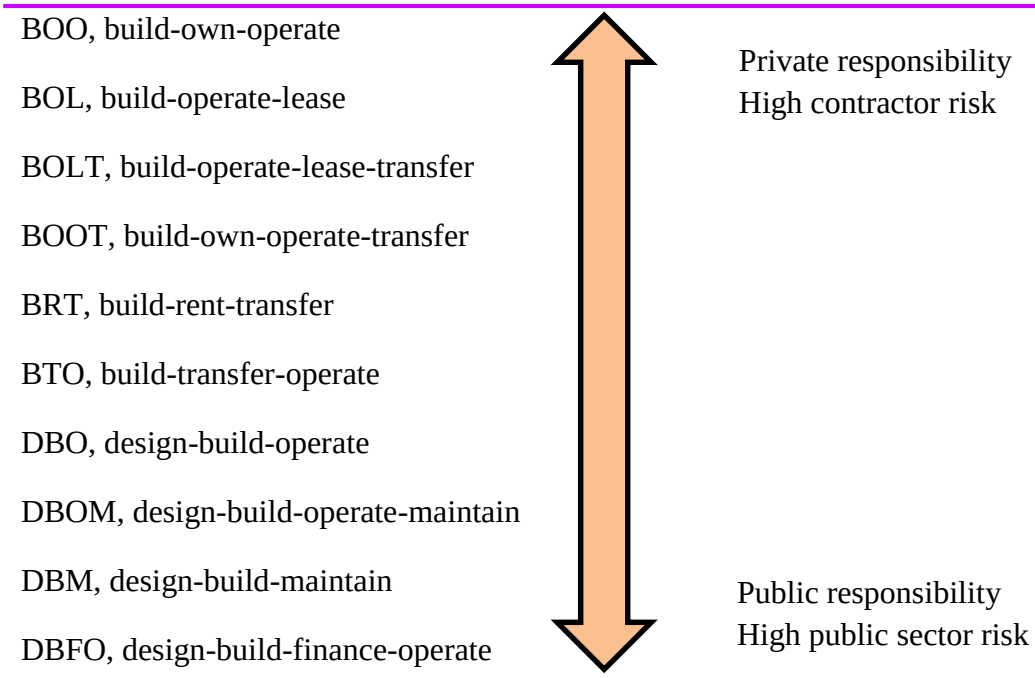


Figure 15: The different types of concessions and their level of contractor/public sector risk (Source: Jewell 2018)

Chapter-3. Procurement Management

3.1. Procurement Preparation

Procurement is the process of finding and agreeing to terms, and acquiring goods, services, or works from an external source, often via a tendering or competitive bidding process. Procurement generally involves making buying decisions under conditions of scarcity. If sound data is available, it is good practice to make use of economic analysis methods such as cost-benefit analysis or cost-utility analysis. Procurement as an organizational process is intended to ensure that the buyer receives goods, services, or works at the best possible price when aspects such as quality, quantity, time, and location are compared. Corporations and public bodies often define processes intended to promote fair and open competition for their business while minimizing risks such as exposure to fraud and collusion.

Procurement involves agreements that describe the relationship between two stakeholders: the procuring entity (the buyer) and the supplier of goods or services (the seller). Agreements can be simple or complex and the procurement approach should reflect the degree of complexity. An agreement can be a contract, a service-level agreement, an understanding, a memorandum of agreement, or a purchase order (Project Management Institute 2017). The differing objectives of these two parties, and the contractual relationship between them, are key determinants in the allocation and management of risk in the procurement process (Dale F. Cooper, Project Risk Management Guidelines Managing Risk in Large Projects and Complex Procurements 2005). Procurement (Tender) preparation includes Project Definition and Scoping, Selection Process for Tenderers, Tender Documentation and Selection Process (Stafford 1998).

Governing principles of procurement rules (Republic of the Philippines 2002):

- Transparency
- Competitiveness
- Streamlined /simple and made adaptable to advances in modern technology
- System of accountability/ liable for their actions
- Monitoring

In addition to the above five principles, the following also included (Lynch 2013),

- Economy
- Accountability
- Fairness (treating all bidders equally)

> *Procurement mean obtaining goods, works, consultancy or other services through purchasing, hiring or obtaining by any other contractual means* (The Ethiopian Federal Government Procurement and Property Administration Proclamation 2009)*;*

According to the Ethiopian Procurement Directive, procurement plan contains

a) The Procurement number,
b) Description of The procurement
c) Quantity of the procurement
d) Procedures to be followed in the execution of the procurement
e) The schedule of main activities to be carried out to complete the procurement
f) The budget and source of finance of the procurement
g) The Type of contract appropriate to the procurement,
h) The roles of main parties involved in the procurement
i) Other matters which are important depending on the nature of the Public Body.

Procurement management includes the process of managing each preferred supplier relationship on an ongoing basis; and the contract management and change control processes required to administer contracts or purchase orders issued by authorized project team members.

A family tree (Procurement management techniques), is a graphical representation of a hierarchical structure to show the relationship of family member items originating from the ancestress item that is sitting on top - at the root – of the reversed tree pattern (Kovächs 2004).

A procurement process: is used to ensure that all products are acquired within the correct timescales, to the level of quality defined and within the budgeted cost identified. The process also sets out the procedures for ensuring that supplier relationships are properly

managed, through the regular review of supplier performance and resolution of supplier issues.

Selection of the procurement method is an important task within the project's implementation. There are procurement choices for both the design and the construction processes. Procurement methods depend on the needs and complexity of each project. Depending on the project delivery method, procurement may start during the design phase (Westland 2006).

The purposes of a Procurement Management System can be summarized into two major points:

1. To satisfy the need for economy and efficiency, and
2. To provide equal opportunity to competitive bidders.

The successful achievement of these purposes requires the following 7 characteristics.

Notice of advertisement: made on an official newspaper, mass media, and notice boards etc. which can enable the advertisement to reach wide range of competitors.

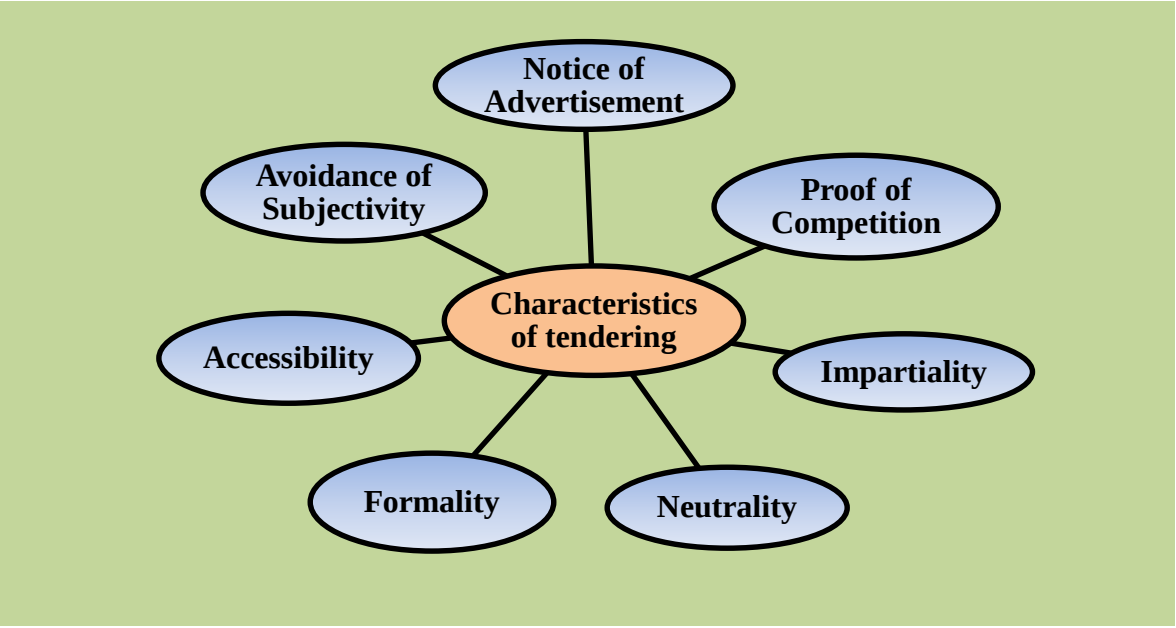


Figure 16: Characteristics of Tendering (Source: Wubishet 2006)

Proof of Competition: Tendering shall be as much as possible proof of competition.

Neutrality: in the specifications avoid preference to limited alternatives, provided quality is not compromised.

Accessibility: The place where bid documents are purchased shall be clearly indicated. The bid documents shall be complete and clear. The purchasing cost of bidding documents shall be nominal to cover reproduction and mailing costs. The place, dates and time for submission shall be notified. Sufficient bidding period shall be given. Besides the amount of bid security should be reasonable enough not to discourage bidders to participate, usually 1 - 5% of the bid amount is practiced.

> *A document fee to cover printing costs is sometimes charged, to encourage the return of complete and undamaged sets of tender documents. The amount of any document charge must be clearly stated in the tender advertisement* (Successful Tendering Guide The Tender Process 2012).

Impartiality: During tendering if clarification is requested, do so accordingly but to all participating bidders so as not to lead to partiality or preference. Often Pre-Bid Submission Meeting is used for this purpose. Negotiation is not allowed during tender period.

Formality: Strict adherence to the submission & opening of bids, i.e., place, date and time, and rejection of late and non-responsive bids shall be a formality to all tenders.

Avoidance of subjectivity: Criteria for evaluation shall be strictly set out in the instruction to bidders' part of the bidding document and all evaluations shall be carried out accordingly. Hence, award will also be done accordingly for the lowest evaluated and qualified bidder.

Project Procurement Management also includes administering any contract issued by an outside organization (the buyer) that is acquiring the project from the performing organization (the seller), and administering contractual obligations placed on the project team by the contract.

Table 3: Relationship between procurement knowledge area and process groups (Ethiopian Construction Project Management Institute 2019)

Knowledge Area	Process Groups				
	Initiating	Planning	Implementing	Controlling	Closing
Procurement		Plan Procurement	Conduct Procurement	Administer/ Control Procurement	Close Procurement

The procurement process for works projects typically involves the following steps:

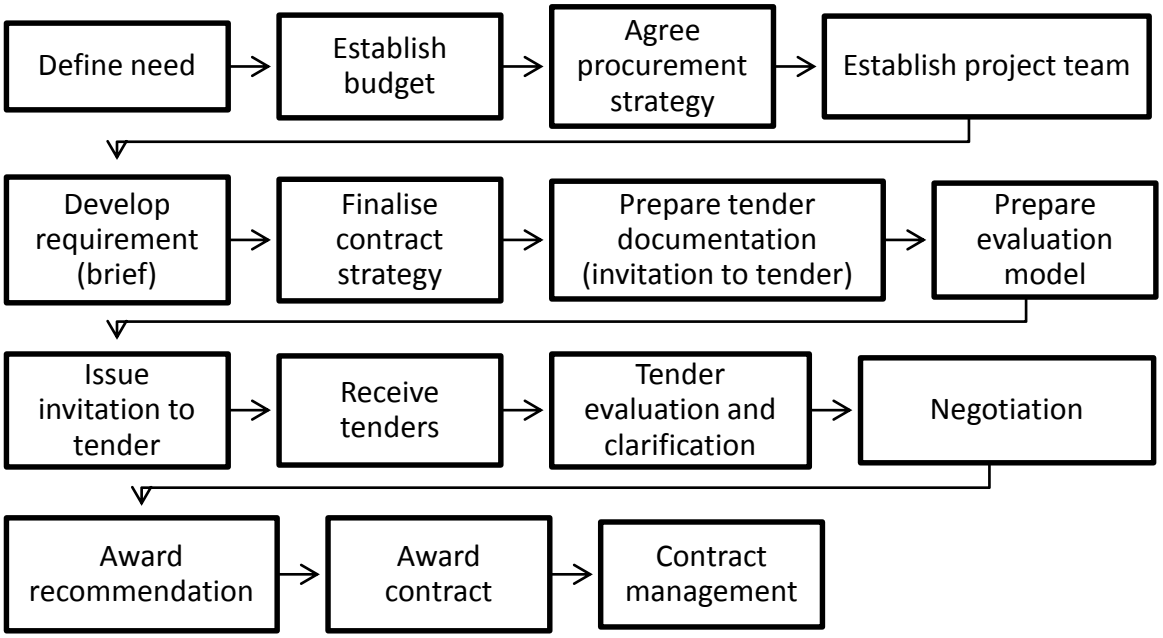


Figure 17: Procurement process (Source: Trebes 2011)

3.2. Tendering Requirements

The invitation to tender collects all the requirements that have come to light in the planning phase. These requirements are essentially laid down by the client, but they may also relate to legal or technical matters.

They can be categorized as follows: Costs, Deadlines, Function, Scope, and Quality

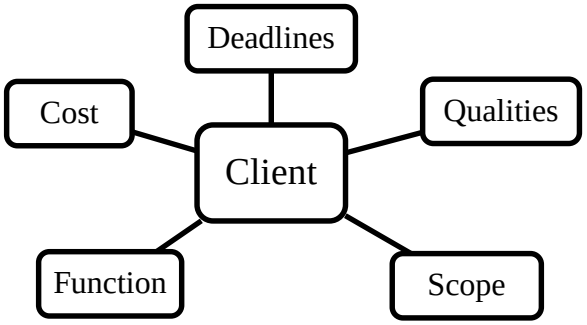


Figure 18: Tendering criteria (Source: Franssen 2019)

3.3. Procurement Methods

According to the Ethiopian Federal Government Procurement and Property Administration Proclamation No.649/2009, the following methods shall be used in public procurement:

j) Open Bidding;
k) Request for Proposals;
l) Two stage Tendering;
m) Restricted Tendering;
n) Request for Quotation;
o) Direct Procurement.

Procurement types can be classified based on the things to be procured and the way how they are procured. There are five bases for classifying procurement methods. These are (Ministry of Finance and Economic Development 2010):

Table 4: Five bases for classifying procurement methods (Source: Wubishet 2006)

Bases	**Things Procured**	**Bidders' Coverage**	**Geographical Coverage**	**Procurement Awareness**	**Procurement Steps**
Types	-Goods -Services (Consultancy Vs Other Services) -Works	-Negotiated -Competitive (Short listed Vs Open)	-International -Regional -National -Local	-General PN -Specific PN	-Single -Two Staged Pre – Qualification Post - Qualification

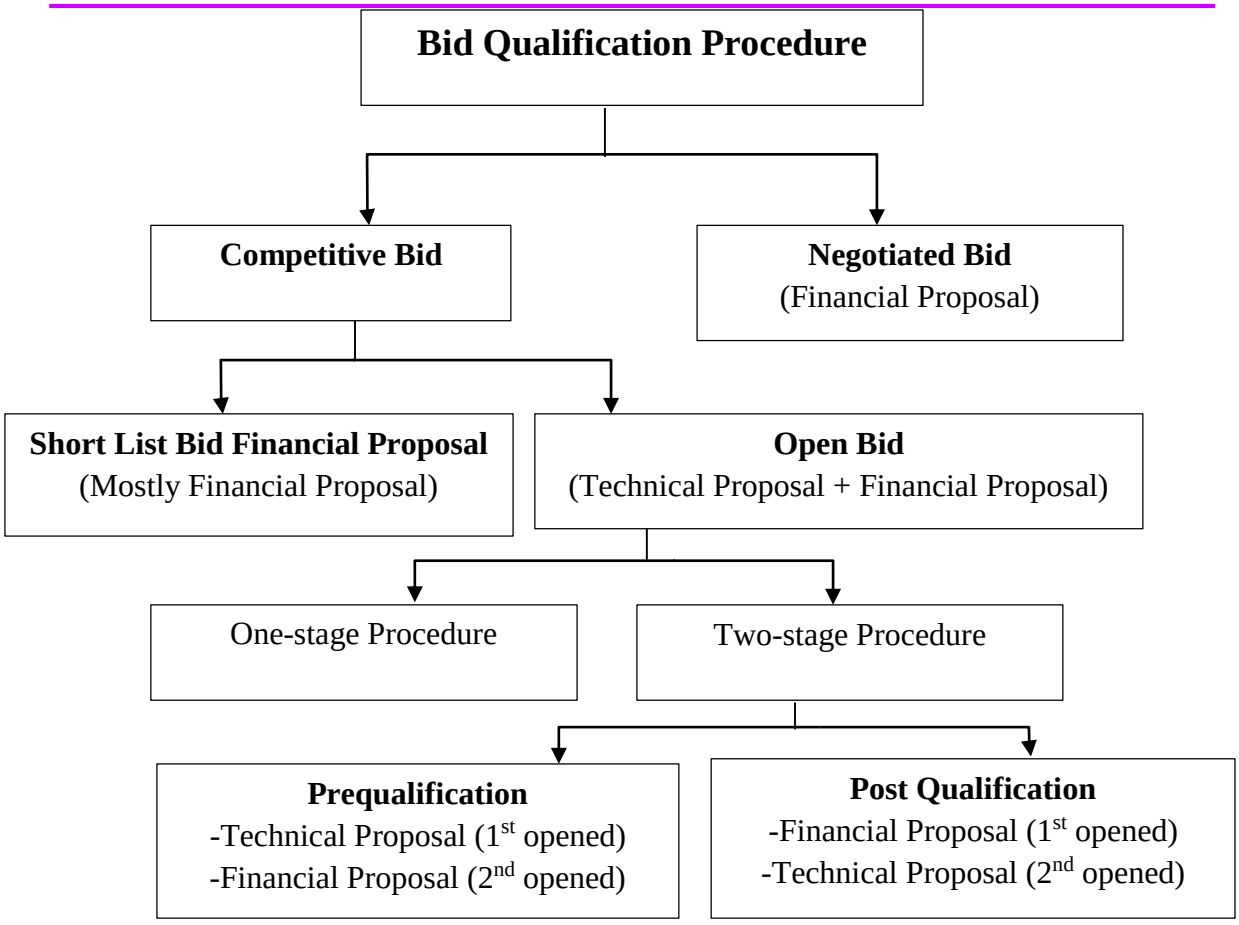


Figure 19: Bid qualification procedure (Source: Wubishet 2006)

- **Things to be Procured:** Goods Vs Services Vs Works

According to the Ethiopian Federal Government Procurement and Property Administration Proclamation No.649/2009, based on things to be procured, procurement types can be classified into four major categories; namely, Procurement of Goods, Services, Works, and Consultancy Services.

Procurement of Goods: mean raw material, products and equipment and commodities in solid, liquid or gaseous form, marketable software and live animals as well as installation, transport, maintenance or similar obligations related to the supply of the goods if their value does not exceed that of the goods themselves;

Procurement of Services: mean any object of procurement other than works, goods and consultancy services: such as maintenance, security, janitorial, electricity, telecommunication and water supply services;

Procurement of Consultancy Service: mean a service of an intellectual and advisory nature provided by consultants using their professional skills to study, design and organize specific projects, advice clients, conduct training and transfer knowledge;

Procurement of Works: mean all work associated with the construction, reconstruction, up grading, demolition, repair or renovation of a building road, or structure, as well as services incidental to works, if the value of those services does not exceed that of the works themselves and includes build-own-operate, build- own-operate-transfer and build-operate-transfer contracts;

- **Bidders' Coverage:** Competitive Vs Negotiated Tendering

Generally, procurement types can be classified into Competitive and Negotiated Tendering when bidders' coverage is taken as a basis for classification.

Competitive Tendering: The objective of competitive bidding is to acquire the goods, or works, or services at the most economic cost to the project owner. This type of tendering is commonly used for the selection of better and capable winning bidder among the various eligible firms. Competitive bidding can either be **Open [**allows anyone to express an interest to tender and usually advertised in journals or on websites**] or Limited [**a shortlist drawn up by the project client/ team or may be drawn from a pre-agreed framework/ approved-suppliers list**] Competitive Bidding,** in the form their invitations. Open bidding can either be one stage or two stage in the form of their evaluation (RICS 2014) and (Wubishet 2006).

The open competitive bidding process includes six main phases: (i) advertisement and notification, (ii) preparing and issuing the Bidding Document, (iii) bid preparation and submission, (iv)bid opening, (v) bid evaluation, and (vi) contract award (Asian Dvelopment Bank 2018).

Negotiated Tendering (Single contractor selection): this works hand in hand with negotiation as a tender technique. A contractor is selected and then the negotiation process begins. It is basically a shortlist of one (RICS 2014).

- **Geographical Coverage:** International Vs Regional Vs National Vs Local Tendering

Procurement can be made using either of the four methods based on geographical coverage: these are International ***(>150,000,000 for works, >50,000,000 for materials, >7,500,000 for consulting services, and >21,000,000 for other service)*** Regional, National and Local Tendering. Such types of procurements are generally caused by three major factors. These are Local Capacity, Financial Sources and Globalization.

When projects could not be carried out by local capacity, project owners are forced to make tendering out of their localities. Policies of the financial sources dictate the type of tendering geographically. The World trend for Globalization and the principles of Free Trade and Trade Liberalization also encourages international tendering (Wubishet 2006).

- **Procurement Awareness**: General and Specific Procurement Tendering

To enhance proof of competition and increase accessibility, projects are recommended to create awareness starting from its initiation. Following this requirement, General Procurement Notice is made during projects planning phase and it is only interests of the bidders are aroused because sufficient tender documents are not available. This approach is used:

- **The Project Owners to**
  - ✓ identify interested bidders to issue Invitations by letters and save time;
  - ✓ identify bidders relevant for the procurement required; and
  - ✓ protect loss of cost in preparing lots of tender documents.
- **The Bidders to:**
  - ✓ give sufficient time to assess the cost of the project;
  - ✓ protect loss of cost only to participate; and
  - ✓ Encourage competent bidders who wary about law-balling to participate.

General Procurement Notice (GPN) is of two types. These two types are based on their purpose why and when they are notified. The first type is when the purpose is to create awareness and let bidders' prior information about upcoming projects such that they can follow up its development and include them in their plan. This type of GPN is used for procurement of works and goods and is often announced as soon as the design implementation service is started. The Second type is when the purpose is to determine interested bidders who could be invited in the form of Limited Competitive Tendering. This type of GPN is used for procurement of services and is often announced after financial sources are determined. GPN covers the Employer and its financiers for its project; Description of the project with its probable or planed implementation time; type of procurement method and address where further information can be obtained.

Specific Procurement Notice (SPN) is an Invitation for Tender or a Request for Proposal when the project is ready for implementation. SPN can be sent to those interested bidders identified following GPN directly. Otherwise, it should be advertise on the bases of enlarging opportunities (Wubishet 2006).

- **Procurement Steps:** This includes Single Vs Two Staged; and Pre - Vs Post - Qualification Tendering.

In the single-stage bidding procedure, Bidders submit bids in one envelope containing both the price proposal and the technical proposal. The envelopes are opened in public at the date and time advised in the Bidding Document. The bids are evaluated, and following approval by bid evaluation committee, the contract is awarded to the Bidder whose bid has been determined to be the lowest evaluated substantially responsive bid.

In the two-stage bidding procedure, Bidders submit their technical and financial proposals at the same time in separate envelope, in accordance with the specifications and their evaluations one after the other.

Some administrations allow the procurement of works using a two-stage tendering process whereby in the first stage all n contractors and consultants are evaluated on the basis of some criterion and in the second stage (n - i) ($0 \leq i \leq n2$) contractors and consultants compete again for the contract award (Nicola Dimitri, Handbook of Procurement 2006).

Pre or Post Qualification Tendering: Procurement can also be based on Pre - or Post - Qualification processes. The stages in prequalification include:

Advertising →Registration →Admittance →Issuance →Clarification of the pre-qualification document →Submission (Receive) →Evaluation →Qualification & Notification →Announcement (Kovács 2004)

Pre-qualification is an internationally accepted practice in procurement management. The technical proposals are opened at the date and time advised in the Bidding Document. The technical proposals are evaluated and then deficiencies, unnecessary provisions, and unsatisfactory technical features with allotted points are pointed out to the Bidders. If any complain by the bidder, show the bidders their mistakes in their technical proposals that lead to failure to meet the requirements of the Employer. Bids of Bidders who are unable to reach the minimum requirement (70% in Ethiopian case) will be rejected as deficient bids. After the evaluation of technical proposals has been approved by Employer, the second stage is to invite (inform) bidders to attend the opening of their financial bid/proposals at a date and time advised by the Employer. The price proposal is evaluated, and following Employer's approval, the contract is awarded to the Bidder whose bid has been determined to be the lowest evaluated substantially responsive bid.

Pre - qualification can be of two types. The First is when companies are already considered qualified during their licensing requirements which entitled them for a single stage tendering process. For such types of tendering, the most important tender evaluation criteria become the low priced bid. The Second is when two staged tendering is used to pre-qualify tenderers' for their technical competency. Once bidders qualify for the tender, either the lowest priced bidder or the lowest evaluated bidder based on the weighted average of the technical and financial scores will be recommended for award (Wubishet 2006).

Pre - qualification should be based entirely on the ability of the bidder to carry out the required works satisfactory. The following criteria are often used in determining this ability of the bidder;

- Legal Qualification (Eligibility Qualification)
- Experience and past performance,
- Health, Safety and Environment Records, if any,

Discussion Points:

Merit and Demerits of the different Procurement Methods

- Capability in respect of personnel and equipment (assets),
- Organizational arrangement and facilities,
- Financial Status or Standing-Economic indicators (turnover, credit history, forecast cash-flow, financial stability, credit rating, liquidity, profitability, bank guarantees, leverage, equity), and litigations (Maria 2015)
- Schedule of Commitments

Generally, prequalification procedures are illustrated in figure 24 and 25 on page 61 and 62.

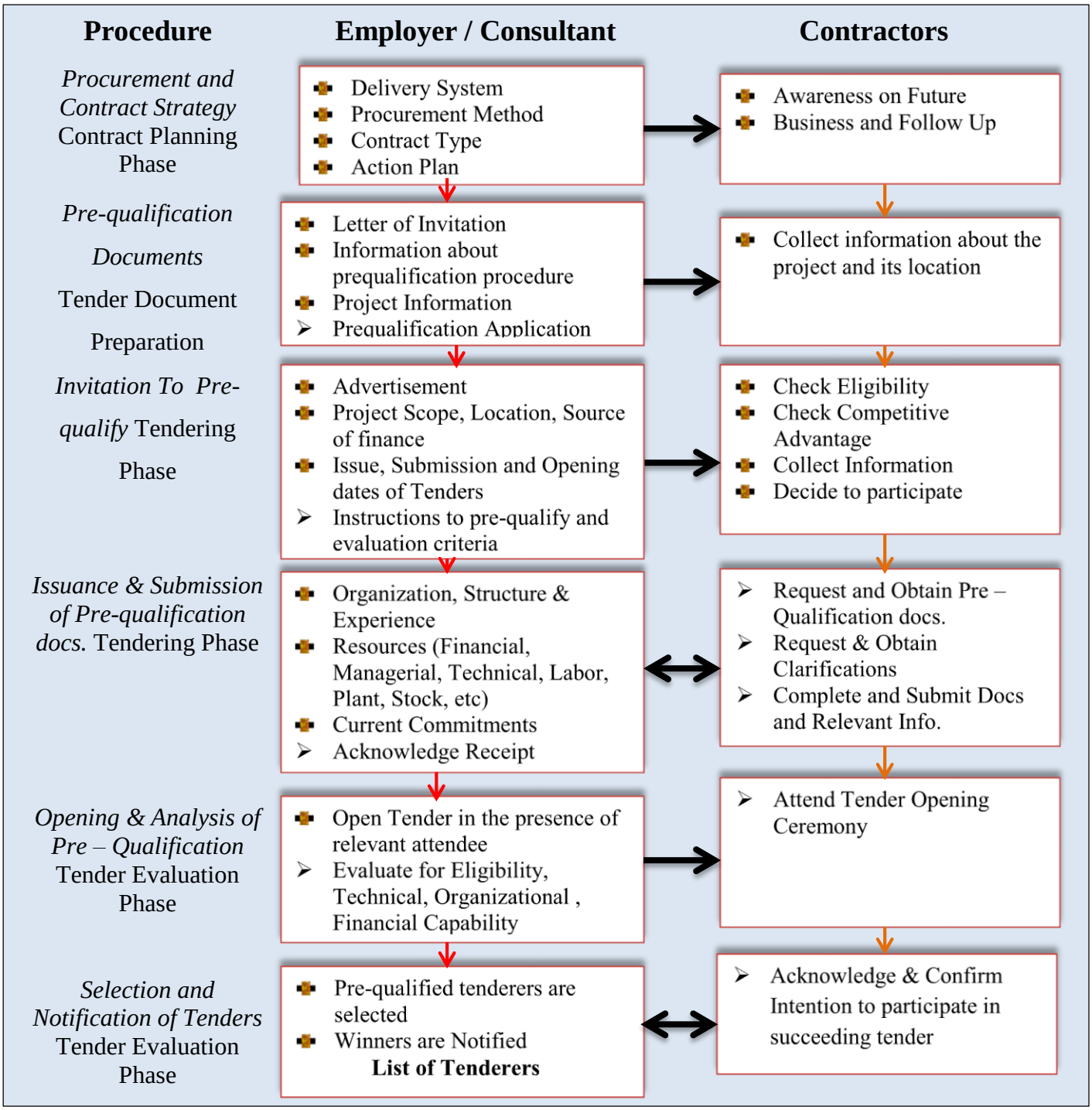
Post - qualification is a tendering type where Financial Evaluation is carried out first and rank bidders on the basis of their offer for tender price. That is, Technical Evaluation will be done after the Financial Evaluation. However, Technical Evaluation is performed step by step starting from the lowest financially evaluated bidder until technically or cumulatively qualified bidder is determined. The advantage of this approach is not to loose the lowest financially evaluated bidder and to save time during technical evaluations. However, Post qualification approaches often cause to fix evaluators on financial results and be locked and biased for successive technical evaluations.

FIDIC, 1994 recommended a procedural Flowchart for Procurement for Prequalification; however, it is presented here with little modification to suit the current practices (Figure 17).

DISCUSSION POINT

1. How they apply in Ethiopia? Amount of Money for each types?
2. Merit and Demerits of the different Procurement Methods?

Figure 20: Procedural Flowchart for Procurement (Source: FIDIC 1994)



Procurement Management process can be idealized into three major processes. These include Preparation, Tendering, and Evaluation (including Award Recommendation) Processes Figure 19.

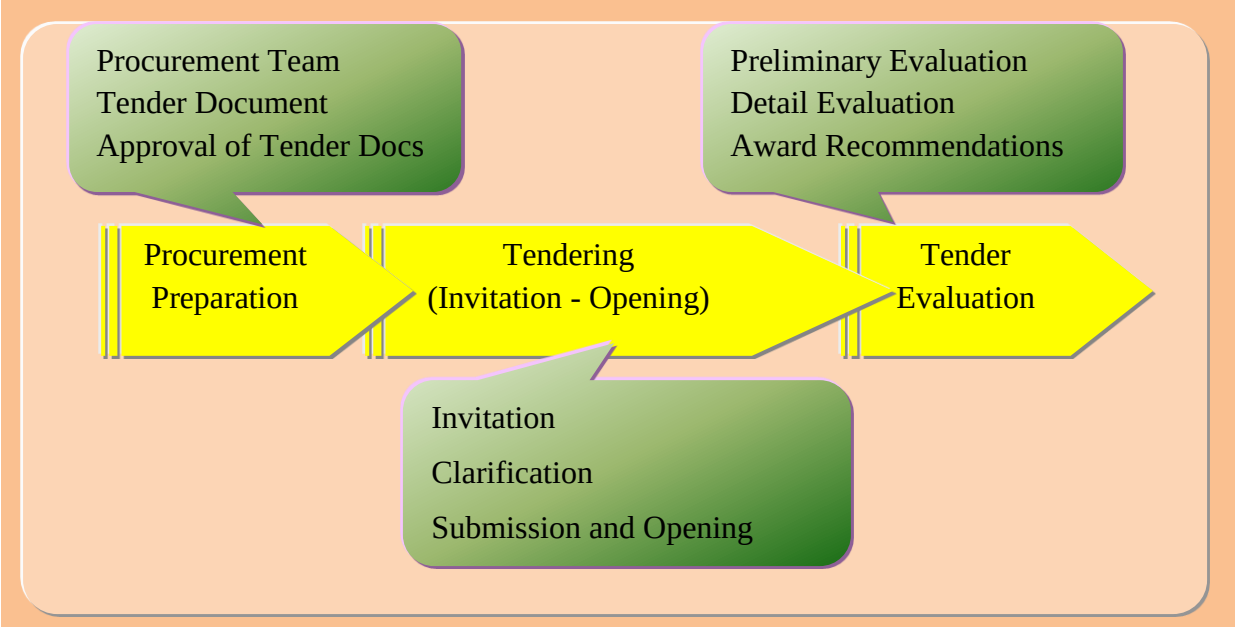


Figure 21: Procurement Management Process (Source: Wubishet 2006)

Tendering is: the bidding process, to obtain a price; and how a contractor is actually appointed

Tender through (Public Works and Government Services Canada 2011)**:**

- Invitation to Tender
- Request for Quotation

Proposal Call trough:

- Request for proposal
- Request for Standing Offer
- Request for Supply Arrangement

Decision to Bid or Not to Bid

Be patient and wait for the tender opportunity that is right for your business – it is a waste of time tendering for contracts that you are not going to win. The most common reason for lack of success is poor choice of tender opportunity.

Figure 22: Factors to be considered in bidding (Source: Calin M. Popescu 2003)

Internal Factors	Project Related Factors	External Factors
✓ Current Commitments ✓ Other Available Projects ✓ Bidding Time ✓ Bonding Requirements ✓ Business Plan: impact on the firm's future growth and other capital investments. ✓ Personnel and Equipment ✓ Finances	✓ Past Working Experience ✓ Quality of Drawings and Specifications ✓ Contract General Conditions ✓ Time Constraints ✓ Public Relations ✓ Project Funding ✓ Award Time ✓ Project Special Requirements	✓ Competition ✓ Economic Outlook ✓ Local Labor Condition ✓ Availability of Suppliers and Subcontractors

3.4. Tender Document

Project tendering is the process by which bids are invited from interested construction contractors to carry out specific packages of construction work. The tendering process should adopt and observe the key values of fairness, clarity, simplicity and accountability, as well as establish the concept of apportionment of risk to the party best placed to assess and manage it.

3.4.1. Procurement Team

Procurement Team is a group of experts who provide a wide range of services to all project participants involved or interested in the activities relating to the purchasing of materials and supplies required for project implementation. The team negotiates with private/government contractors regarding prices and delivery terms on the one hand, and communicates with the project management team regarding necessary procurement items, technical specifications and requirements from the another hand (MyManagementGuide.com 2010).

Use the 7'Cs model for building up the team. These are (Soota 2005):

- Conceiving,
- Concurring,
- Committing,
- Communicating,
- Coordinating,
- Counseling
- Controlling.

A successful bid team should include a mixture of individuals who can bring different perspectives and expertise to the formulation of the best solution and proposal documentation. Bid team (Successful Tendering Guide The Tender Process 2012)

Bid Manager - someone who is going to manage the tender.

Technical Experts - the best technical people who can bring expertise as well as new ideas.

The Writers - are skilled at presenting clear technical and sales documentation.

Contributors - internal or external specialist contributors who can supply additional specialist information and knowledge to the proposal.

Administrators - someone who is responsible for formatting and collating of the proposal documentation.

Proofreader- responsible for checking the tone, flow and formatting of the overall proposal

Fault Finder - pessimistically judge the bid and find areas of improvement.

Ethiopian Procurement Regulation states that a Procurement team consisting of a minimum of five members shall be established. These are Buyer, Procuring officer (Seller), Manager, Director, and Analyst (Wubishet 2006).

Suggested Phraseology

Instructions to Bidders - instructions to bidders/tenderers in case of **competitive tendering**, or instructions to participants/candidates in case of competitive negotiation); or ***bidders*** (applicant)' conference - pre-solicitation conference in general, pre-bid conference or bidders /'tenderers' conference in case of competitive tendering, or pre-proposal conference in case of competitive negotiation (Kovächs 2004).

Tender documentation

The SBD whether it is National Competitive Bidding (NCB) or International Competitive Bidding (ICB) are composed of Invitation to Tenderers in addition to the three (3) parts with nine (9) sections as shown below:

(1) Invitation to Tenderers

Part 1 – Tendering Procedures

Section I: Instructions to Tenderers (ITT)

This Section provides information to help Tenderers prepare their tenders. Information is also provided on the submission, opening, and evaluation of tenders and on the award of Contracts. The text of the clauses in this Section can only be modified, adjusted or supplemented through Section II, Tender (Bid) Data Sheet.

Section II: Tender Data Sheet (TDS or BDS)

This Section includes provisions, which are specific to each individual procurement, and which modify, adjust or supplement Section I, Instructions to Tenderers.

Section III: Evaluation and Qualification Criteria

This Section specifies the criteria to be used to determine the lowest evaluated tender and the requirements for the tenderer's qualification to perform the contract. In any event, criteria must be quantified in monetary terms except on rare occasions, where it is not practical.

Section IV: Tender Forms

This Section includes the forms which are to be completed by the tenderer and to be submitted as part of its tender.

Section V: Eligible Countries

This Section includes information regarding eligible countries.

Part 2 – Requirements

Section VI: This section contains the Specification (Project Manual-Bidding documents, Agreement, General Conditions, Supplementary Condition and Technical specifications), Plans (Drawings- Civil, Architectural, Structural and Electrical Mechanical), and Supplementary information that describe the works to be procured.

Part 3 – Conditions of Contract and Contract Forms

Section VII: General Conditions (GCC)

This Standard Bidding Documents (SBD) have been designed for use with the FIDIC Conditions of Contract for Construction for Building and Engineering Works Designed by the Employer, 1st edition, 1999.

Section VIII: Particular Conditions of Contract (PCC)

This section consists of Part A, Particular Conditions of Contract. The contents of this Section modify or supplement the General Conditions and shall be prepared by the Employer.

Section IX: Annex to the PCC - Contract Forms

This section contains forms which, once completed, will form part of the contract. The forms for Performance Security and Advance Payment Security, when required, shall only be completed by the successful tenderer after contract award.

Note

Contractors rarely submit their tenders early for two reasons (Brook 2008):

1. They might receive a lower quotation from a sub-contractor or supplier which could improve the bid, and
2. A tender price cannot be communicated to a competitor in time for him to better the price

The Invitation to Bid shall contain, among others (Ministry of Finance and Economic Development 2010):

- The name and address of the Public Body publicizing the invitation to bid
- The type and to the extent possible the quantity and place of delivery of the goods or services, or the nature and the site of the construction to be effected, or the type of the consultancy service to be rendered and the place where such service is rendered.
- A general statement on the criteria to be used by the Procuring Entity for the eligibility check,
- The place where the bidding documents can be obtained,
- The amount of the bidding security
- The price of the bid document and the means of payment
- The place and deadline of submission of bids, and the place, date and hour of the bid opening
- A statement that the Public Body reserves the right to reject any or all Bids
- Other matters that the Public Body deems necessary for bidders to know.

Samples can be:

- ✓ MWUD 1995 (Wubishet 2006)
- ✓ FIDIC White Book

3.4.2. Floating Period of Bids

The time it takes for bidders to obtain the bidding document, to prepare responsive bids, to gather information, to analyze the information, to establish joint venture as necessary, to obtain certificate of manufacturer's authorization including the power of attorney to sign and to fulfill other pre-conditions to participate in the bid.

Tender periods: The time for tendering should be determined by three factors: the size of the project, the complexity of the project and the standard of the documents (Brook 2008).

Figure 23: The minimum period for submission of bids (Source: Ministry of Finance and Economic Development 2010)

S.No	Procurement Type	Complexity	Mode of Procurement			
			ICB	NCB	Restricted Bidding	
					LIB	LNB
1	Works	Complex	45 days	30 days	45 days	30 days
		Non-Complex	35 days	21 days	35 days	21 days
2	Goods	Complex	45 days	30 days	45 days	30 days
		non-Complex	35 days	15 days	35 days	15 days
3	Other Services	Complex	45 days	30 days	45 days	30 days
		Non -Complex	35 days	15 days	35 days	15 days
4	Consultancy service (EOI) Request for proposal	Complex	14 days	10 days	-	-
		Non- Complex	10 days	7 days	-	-
		Complex	45 days	30 days	35 days	30 days
		Non- Complex	35 days	15 days	21 days	15days

Clarifications can either be requested by interested bidder or carried out using a pre - tender clarification meeting. In both cases, issues clarified shall be sent (written) to all bidders participating for the intended services or works. The bidders shall submit their offer on or before the submission date and time. Late bids are automatically rejected.

The Public Body shall not be obliged to respond to a request for clarification or modification submitted (Ministry of Finance and Economic Development 2010):

- Later than 10 days prior to the deadline for submission of bids, in respect of national competitive bidding for complex procurements
- Later than 21 days prior to the deadline for submission of bids in respect of international competitive bidding.
- Later than 5 days prior to the deadline for non-complex procurements.

3.4.3. Preparation and Submission of Tender (Receipt)

The steps generally taken by the tenderer on reading the notice inviting tenders, if he/she is interested in submitting a tender, include:

1. Purchase of blank tender form.
2. Study of tender drawings (if they are not attached to the blank tender form, at the office where they are kept).
3. Visit to the site of the work to ascertain:

(a) Nature of site, access to it, foundation conditions, if exposed or by taking exploratory holes or bores if so mentioned in the tender notice, extent of site available for site office, labor camp, material dumps, stores, storage of machinery, equipment or workshop shade and movement of men and machinery in general.

(b) Nearest bus station, petrol depots, banks, etc.

(c) Sources and prices of raw material required, suppliers with their addresses, transportation facilities and cost involved.

(d) Availability of local labor, skilled and unskilled, prevailing wages, piece rate workers and their addresses.

(e) Nearest sources of power, water, etc.

4. Rough verification of estimated quantities vis-à-vis drawings to ascertain if any item has been overestimated or underestimated or omitted from the BOQ. However, in the case of lump sum contracts, preparing a detailed estimate from the drawings is a must.
5. Analysis of rates or cost to ascertain the prime cost which includes: cost of materials, labor, machinery and equipment.
6. Deciding the percentage of the basic or the prime cost worked out in step (5) above to be added to it to cover overheads and profit expected.
7. Working out the lump sum or item rates or percentage rate to be tendered.
8. Checking of the rates so worked out for omissions, errors and units of measurement in particular.
9. Copies of documents required to be attached such as registration in a particular class, list of works executed, works in hand, list of machinery and equipment

available/proposed to be acquired, etc. are generally kept ready and are cross-checked with the notice requirements of the tender notice.

10. Earnest money to be paid in the form of a bank guarantee – Demand Draft to be obtained.
11. The final sum, rates or percentages to be actually tendered are a closely guarded secret and the person to submit it is given eleventh hour instructions as to what sum, rates or percentage is to be quoted so that the secrecy is maintained till the end.
12. Care must be exercised while submitting the sum, rates or percentage so that no error creeps into the rates, or in totaling.
13. The envelope(s) are sealed and handed over before the appointed time on the last date (general practice followed by many contractors, although early submission is not ruled out) or dropped in the box kept for the purpose.

With the advent and advancement of internet technology, tenders are nowadays invited and submitted on line (Woolhouse 2020).

Enveloping/Packaging: offers should be submitted in one or more envelops or packages. In general, procuring entities request one original document and one to five copies. ***Single-Envelop Method-*** both the commercial/legal and the technical part of the document are submitted in one package. Consequently, when the package is opened, all volumes are available.

Multi-Envelop Method- different parts of offers are contained in separate packages. The main point of this method is to separate the evaluation of the respective packages in space and/or in time. The rationale for this is to ensure independent, unbiased evaluation of different aspects of the offers by eliminating unnecessary cross-fertilization of the teams. Bids submitted after the deadline shall not be accepted (Kovächs 2004).

3.4.4. Opening of Bids

Open all bids at the time, date, and place specified in the bidding documents. The minutes of the bid opening shall be made available to the public upon written request. The following will be carried out during tender opening:-

The bid shall be opened in the presence of the bidders or their authorized representatives. However, the opening of the bid shall not be affected by the absence of the bidders on their own will. As far as possible, a representative of internal audit of the Public Body shall be present during the bid opening.

- Tender Attendee members shall take their place and be registered & Sign,
- Tender box opened and checked for faulty things,
- Bids will be opened one after the other,
- All necessary data which deem useful such as Project Name, Name of bidder, Bid Bond Amount, Tender Price, etc. will be read aloud and recorded at the opening of bids and the Tender documents signed by the Tender committee.
- Ceiling for Bid Prices shall be announced to the bidder during opening. Bid prices that exceed this ceiling shall be disqualified.
- To the extent that it doesn't interfere with the bid opening process and there is enough space, any representative of mass-media or any other interested observer may attend the bid opening ceremony

Bid Security: - shall serve as a guarantee that, after receipt of the Notice of Award, the winning bidder shall enter into contract with the Procuring Entity within the stipulated time and furnish the required performance security. Bid securities shall be valid for such reasonable period of time indicated in the Bidding Documents. The duration for each undertaking shall take into account the time involved in the process of Bid evaluation and award of contract.

3.4.5. Bid Evaluation

Preliminary Examination of Bids: - Prior to Bid evaluation, the Public Body shall examine first the technical components of the bids using "pass/fail" or eligibility criteria to determine whether all required documents are present. Under this section of the evaluation of tenders, the following parameters are checked:

Verification: Here, tenders are scrutinized to establish whether they were signed by the appropriate authority within the firm.

Tender Security: The PPA (2011) under Bidding Procedure- Section-1- Preparation of Bids requires that all tenders are provided with tender securities.

Eligibility: The bidder must be a national or a juridic entity from an eligible source country as defined in the Guidelines. All partners to a joint venture shall be from an eligible source country, and the joint venture shall be registered in an eligible source country.

Completeness of Tenders: tenders received are to ensure that they submit complete tendering documents and that all the items of the Bill of Quantities provided in the tendering documents are wholly priced. Unless bidders must accept adjustments according to specific standards. For instance Amhara Regional State Public Procurement Directive uses the lowest bidder price for unpriced items for comparison purpose but if that bidder is the winner for that bid evaluated, the price will be zero for that item.

Substantial Responsiveness: Tenders that meet the above requirements are determined to be substantially responsive and are taken through detailed examination.

The bids that passed the preliminary examination shall be ranked from lowest to highest in terms of their corresponding calculated prices (Ministry of Finance and Economic Development 2010).

The Public Body shall conduct the evaluation by applying either of the following methods; as indicated in the bidding document:

a) In respect of bids submitted in ***one envelope***, by selecting the bidder offering the lowest evaluated bid from among bidders submitting responsive technical proposals.

b) In respect of bids submitted in ***two envelopes***, by selecting the bidder scoring the highest point in the total sum of results of the technical and financial evaluation conducted on the basis of criteria applied to determine the functional value of the procurement.

Table 5: Preliminary Pass/Fail Examination of Applications

Names of Bidders	Country	Date of Submission of Application	Verification	Eligibility	Bid Security	Completeness of Bid	Substantial Responsiveness	JV Requirements	Eligibility for Domestic Preference	Acceptance for Detailed Examination
A		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
B		No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
C		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
D		Yes	Yes	Yes	Yes	Yes	No	No	Yes	No
E		Yes	No	No	Yes	Yes	Yes	Yes	Yes	No
F		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
G		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
H		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Discussion Point

Two Bidders get Equal Merit Points in the Evaluation.

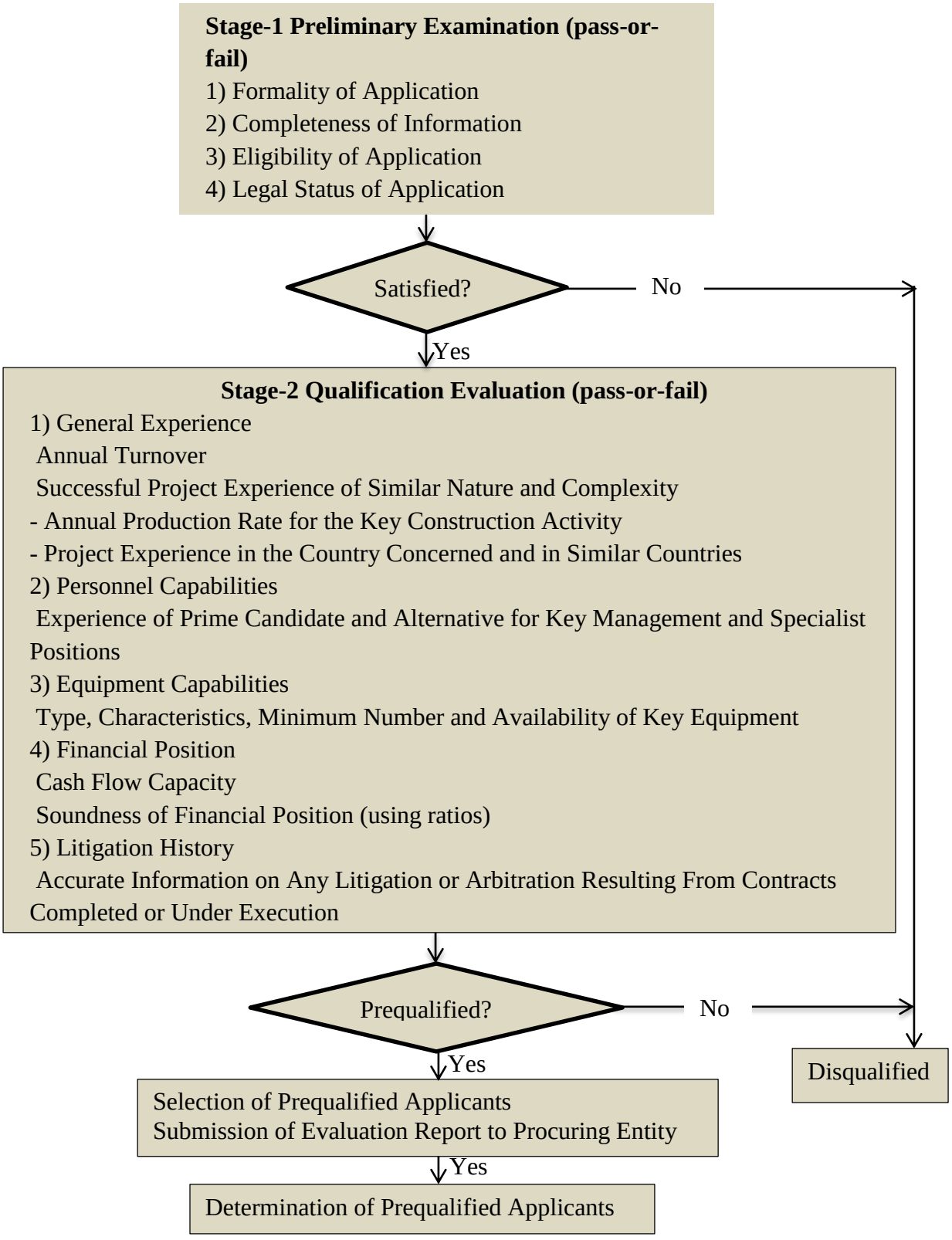


Figure 24: Prequalification Procedure for Contracts (Source: Cooperative Republic of Guyana 2009)

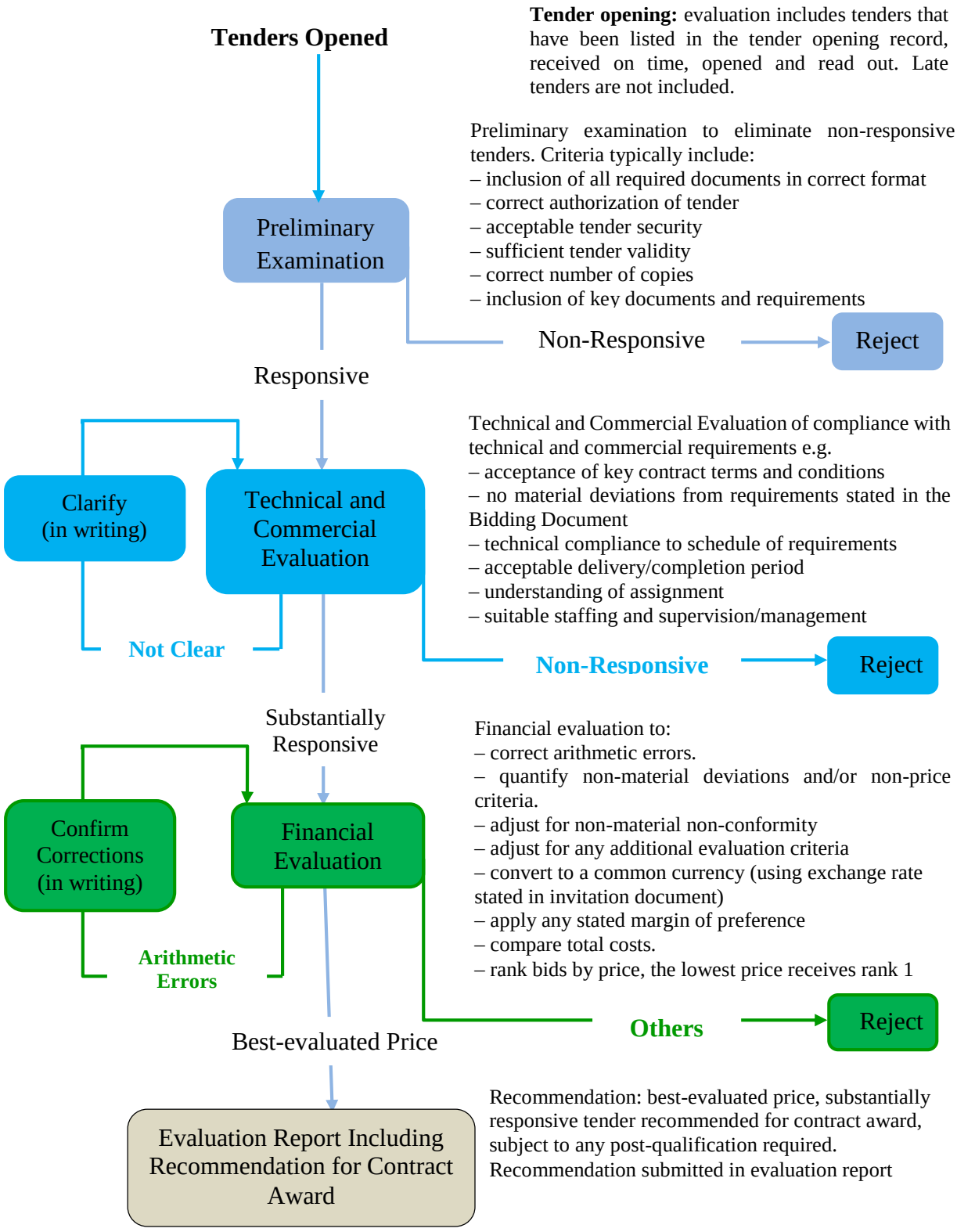


Figure 25: Evaluation Procedure for Works and Goods (Source: International Food for Agricultural Development 2019).

3.5. Source Selection Criteria

In choosing ***evaluation criteria***, the buyer seeks to ensure that the proposal selected will offer the best quality for the services required. The source selection criteria may include but are not limited to (Project Management Institute 2017):

- Capability and capacity;
- Ownership information
- Delivery dates;
- Technical expertise and approach;
- Prior work experience (General & Specific relevant experience);
- Adequacy of the proposed approach and work plan in responding to the SOW;
- Key staff's qualifications, availability, and competence;
- Financial stability of the firm (balance sheet, gross receipts summary, income statement);
- Management experience; and
- Suitability of the knowledge transfer program, including training
- Firm's legal status and history
- Names of authorized individuals
- Equipment available to the applicant

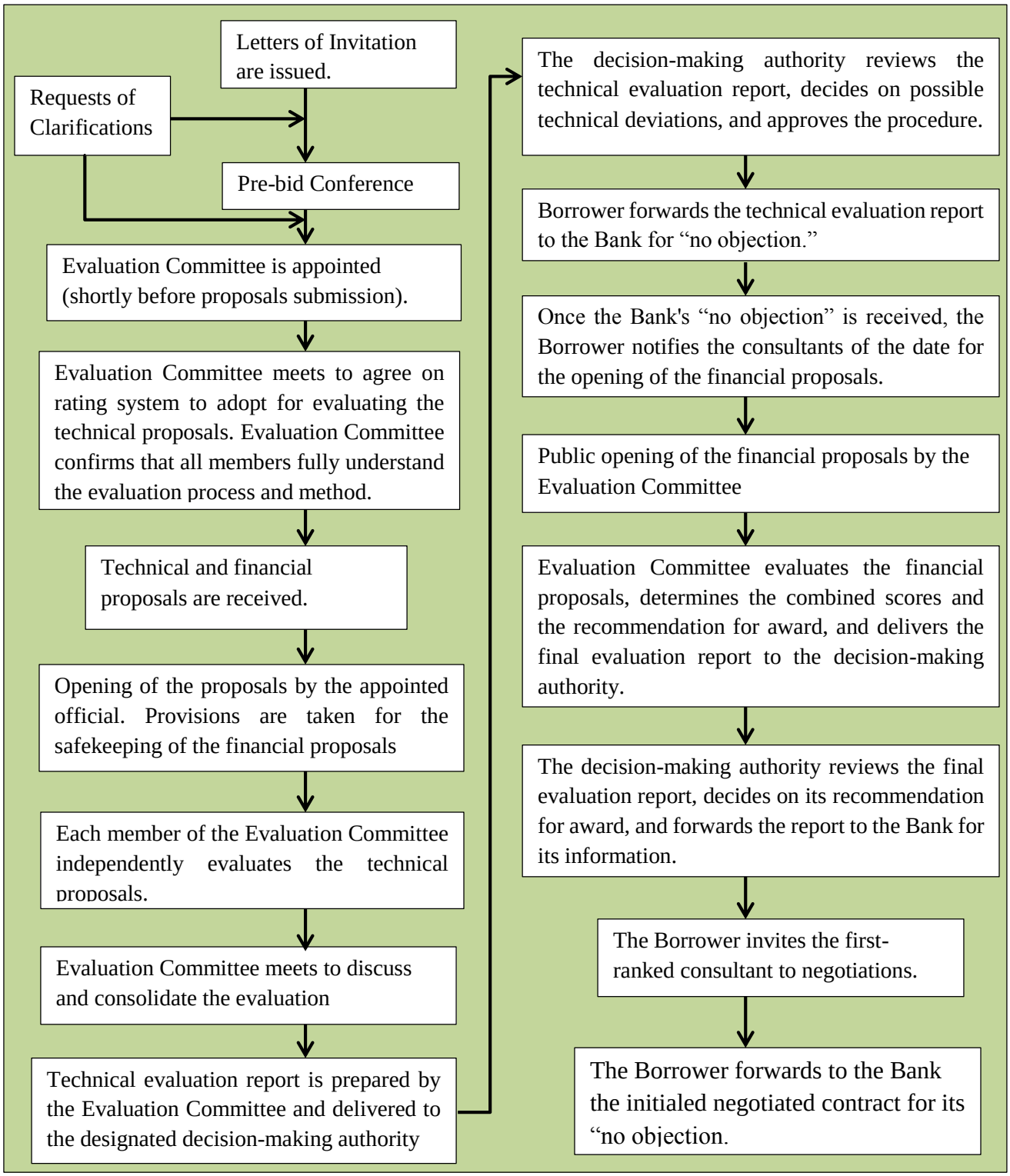


Figure 26: Preparation, Submission, and Evaluation of Proposals (QCBS Method)
(Source: Davenport, Fundamentals of Building Contract Management 2002)

The tendering process, which leads towards the award of a main or prime contract to the main contractor, is complex and generally follows four distinct stages (Davenport, Fundametals of Building Contract Management 2002).

Stage 1: Subcontractors and suppliers of materials prepare bid prices and quotations to be used by main contractors.

Stage 2: A main contractor compiles a tender either from the real subcontractors' bids or from target costs allowed for different trade items, or from both. Material costs, preliminaries and the markup costs are then added. A main contractor combines the best subcontract and supply bid prices with an estimate of preliminaries and mark-up to form a competitive bid price.

The total tender price is then a function of the main contractor's preliminaries, subcontractors' and suppliers' bid prices, the main contractor's mark-up, and the magnitude of the risk allowance. It can be expressed by the following equation:

$$TTP = f((GCP + SUM\ SCB + SUM\ SB) + GCMP + RA) \text{ ----------Eqn.1}$$

Where:

TTP = total tender price

GCP = main contractor's preliminaries

SCB = subcontractors' bid prices

SB = suppliers' bid prices

GCMP = main contractor's mark-up

RA = risk allowance

Stage 3: The principal evaluates submitted tenders, selects the 'best tender' and awards the main contract to the winning main contractor.

Stage 4: After the award of the head contract, the successful main contractor will select subcontractors and suppliers on the basis of meeting or bettering the real or target cost provisions for different trades made in the tender.

NOTE: When we prepare technical bid document, we must check the requirements.
Must Meet requirement (Mandatory criteria) are rated as pass/fail, responsive/non-responsive or comply/non-comply.
Weighting Requirement- used to select the Most Advantageous Bid/Proposal, mostly have numerical values.

The following prequalification criteria shall be applied to Bidders:

Factor	Criteria					
	Require	Bidder				Documentation Required
		Single Entity	Joint Venture, Consortium & Association			
			All partners combined	Each partner	At least One	
1. Legal Qualification of the Bidder						
1.1. Nationality	Nationality in accordance with ITB Clause 4.2	Must meet criteria	Must meet criteria	Must meet criteria	n/a	Bid Submission Sheet
1.2. Conflict of Interest	No conflict described in ITB Clause 6.	Must meet criteria	Must meet criteria	Must meet criteria	n/a	Bid Submission Sheet
1.3. Registration in the FPPA's Suppliers List	Contractors grade should be GC-4 and/or BC-3 & above from minister of federal construction and urban development .& Certificate of competence for 2011E.C/2019GC (MUDC)	Must meet criteria	Must meet criteria	Must meet criteria	n/a	Bid Submission Sheet
1.4. Debarred by decision of the FPPA	Not having been debarred by decision of the Public Procurement Agency from participating in public procurements for breach of its obligation under previous contracts in accordance with ITB Clause 4.3	Must meet criteria	Must meet criteria	Must meet criteria	n/a	Bid Submission Sheet
1.5. Valid trade license or business organization registration certificate	P	Must meet criteria	Must meet criteria	Must meet criteria	n/a	Bid Submission Sheet with attachments
1.6. VAT registration certificate	Contractors must have VAT Registration Certificate.	Must meet criteria	Must meet criteria	Must meet criteria	n/a	Bid Submission Sheet with attachments
1.7. Valid tax clearance certificate	Contractors s itted Tax Clearance certificate of 2010 E.C issued by the tax auth	Must meet criteria	Must meet criteria	Must meet criteria	n/a	Bid Submission Sheet with attachments
1.8. Government Owned Entity	Contractors grade should b GC-4 minister of federal c	Must	Must meet	Must	n/a	Bidder ation of nce with ments

Legal Qualification of the bidder (1.1 up to 1.8, in this case) is eligibility Requirements that have Pass/Fail or must meet criteria point in the preliminary evaluation. Additionally Bid bond, Turnover, Appropriate Packaging & Submission, Power of Attorney, Signature & Sealing, Completeness & Submittal, Requirement

You can get the information on: http//www.ppa.gov.et.

You can get the information on: http//www.ppa.gov.et.

When we prepare bidding document, if the engineering estimation is above ETB 200,000.00, VAT registration certificate is mandatory requirement

Factor	Criteria					
	Requirement	Bidder				Documentation Required
		Single Entity	Joint Venture, Consortium & Association			
			All partners combined	Each partner	At	
2. Professional Qualifications and Capability						
2.1. Number of staff	At least Two (2) staffs currently work for the Bidder. And must have been registered Professional and have a legal contractual agreement confirmed by the Agency of Employee and	Must meet	Must meet criteria	n/a		Certification of Compliance
2.2. Personnel for the key positions	Among the staff mentioned in Sub-C demonstrate that it will meet the following		Must meet criteria	n/a	n/a	Technical Proposal Form PER 1 with attachments
	No. / Position / Ye		nce in similar Projects			
	1 / Project Manager / 10					
	2 / Site Engineer / 6 y					
3. Technical Qualifications, Competence, and Experien						
3.1. General experience	Successful experience as a prime contractor in a construction sector in the last ten years.	Must meet criteria	n/a	Must meet criteria	n/a	Bid Submission Sheet with attachments
3.2. Specific experience	Successful experience as a prime contractor in a construction of at least each Two projects of the same nature and complexity of about 9**0,000,000(ninety million Birr)** in the last Five years. (The attached evidence must have information such as Date, nth and years in which the work is executed and total	meet criteria				Bidder Certification of Compliance with attachments like payment certificate, agreement forms and testimony from client. Unless it will not considered.

Sole proprietorship organization Compete for the work

See their meaning in the previous chapters

Attach Renewed License, Experience with Inland Revenue agency testimony (if the experience is from private company) Employment Agreement certified by concerned government body (or 3 month payroll certificate) Signed CV

Attach all works performed in the industry since its establishment

If the specific experience in similar works is < 90,000,000 decide NOT TO BID. Similar works, if the bid is about building construction, take building construction experience & if it is road, take road work experience of the company

3.3. Equipment for work	The Bidder must demonstrate that it will have available for t implementation of the contract the following equipment list hereafter: For Leased/rented Equipment the point of evaluation w be half of the specified point. No. | Equipment type and characteristics | Minimum No. 1 | Dump Truck -16m^3 | 2 2 | Mixer (500-700liter) | 2 3 | Vibrator |	Must meet criteria	Must meet criteria	n/a	n/a	Technical Proposal with ments.
4. Financial Standing of the Bidder						
4.1. Historical Financial Performance	Submission of audited bala with (The license of auditor must be attached & renewed for each years), and current ratio for the last five years. For each audited year. The audit must be confirmed by res collecting authority (inland revenue agency) must be	meet criteria		meet criteria		dder Certification of Compliance with nts
Annual Turnover 4.2. Average Annual Turnover or Peak Annual Turnover	The average annual turnover received for contracts in progress (>70%) or completed last five should ≥60 million, years The submitted va accepted only if it verified with supporting evidence by certified auditor a d revenue authority. submitting the contract agreement amount shall not be considered as executed amount.			Must		of e s
4.3. Financial Resources (Working Capital)	The Bidder must demonstrate access to, or availability of, financial resources such as liquid assets, unencumbered real assets, lines of	Must meet	Must meet criteria	Must meet %	Must meet % of the criteria	Bidder Certification of Compliance with attachments

Attach invoices and verifying ownership renewed documents (Title certificate). (Liberia), Inspection certificate (Bolo)
For leased equipment, attach latest agreements (guarantees) from the owner.
Ownership documents of the lessee are also required.

The company's financial status in the past years used to determine the companies insolvency (bankruptcy) using financial ratios such as current ratio to determine their strength. So that "Financial Status" of the company is used as pre-qualification criteria in determining the ability of the bidder to carry out the works.

Refer in Appendix B

To Get Average Annual Turnover Sum up the five year audited finance then divide it by 5, so you will get average annual turnover. If you asked Peak Annual Turnover, review the 5 year accomplishments then select the year with great achievement that must be ≥60 million. If the company can't perform this amount with in the last five year, decide NOT TO BID.

Annual turnover asked to the bidder will be calculated as

$$\text{Annual turnover} = \frac{\text{Engineering Estimation of the work to be performed}}{\text{Project duration (months),Round the days to the next month}} \times 12 \times 0.8 \text{ ----------Eqn.2}$$

The Bidder must demonstrate access to, or availability of, financial resources such as liquid assets, unencumbered real assets, lines of credit (from banks), and other financial means (Unconditional credit facility).

3.5.1. Arithmetic Review

Most tenders are often submitted hastily. As a result, tenders are not arithmetic error free. Any arithmetic errors must be rectified, as being described in the ITB. The PE should correct all arithmetic errors accordingly and notify each bidder of the detailed changes and ask the bidder to confirm the corrections. If a bidder refuses to accept such a correction, his bid should be rejected and excluded from further consideration. Arithmetic review can be done if and only when financial proposals are opened (Cooperative Republic of Guyana 2009).

Corrections for Errors: *The methodology for correction of computational errors is described in the ITB.*

Corrections for Provisional Sums: *Bids may contain provisional sums set by the Borrower for contingencies or for nominated subcontractors, etc. As these sums are the same for all bids, they should be subtracted from the readout prices to allow for a proper comparison of bids in subsequent steps.*

Evaluation Currency: *The remaining bids as corrected for computational errors and as adjusted for discounts should be converted to a common evaluation currency, as described in the ITB.*

Detail Evaluations include Technical, Commercial and Financial Qualification requirements. Evaluations at this stage should first and foremost critically see the technical and commercial offers and establish system that can ensure common bases for comparison. Finally, the financial offer will be updated using Absolute Results from Commercial comparisons (Wubishet 2006). For more practical aspects, please refer Appendix-A

Table 6: The ranking in order of the lowest bid price is as follows (Source: Asian Development Bank 2018)

Sr. No.	Name of Bidder	As Opened (LC)	Arithmetically Corrected (LC)	Ranking	Variation
1	Bidder No. 6	120,801,821	120,804,798	1	-
2	Bidder No. 3	133,049,215	133,087,644	2	10.17%
3	Bidder No. 4	140,260,769	140,267,692	3	16.10%
4	Bidder No. 8	154,064,446	154,064,446	4	27.53%
5	Bidder No. 1	161,190,283	161,191,644	5	33.43%
6	Bidder No. 9	161,388,798	161,388,797	6	33.77%
7	Bidder No. 5	168,443,268	168,467,180	7	39.46%
8	Bidder No. 7	172,807,355	172,807,355	8	43.05%
9	Bidder No. 2	196,915,693	196,958,318	9	63.30%

3.5.2. Front-Loading

Is one way of unbalancing the tender wherein the tenderer quotes high rates for those items of works that will be completed at an early stage and low rates for items that will be tackled at the end of the project (Woolhouse 2020). This is done with a view to generating excess cash-flow to start with and terminates after doing the first part of the work that generates excess cash-flow, so that, it can be a MUST MEET CRITERIA. And Errors must have numerical limit that lead to rejection.

If the quantities shown in the BOQs are expected to vary, the tenderer will quote high rates for underestimated quantities and low rates for overestimated quantities with the aim to generate excessive profit, if the "***gamble succeeds"***. In such a case, the lowest tender is likely to be higher than the highest tender received (Woolhouse 2020).

DISCUSSION POINTS

Genuine errors /Errors of computation, Patent errors and Inking-in errors

3.5.3. Commercial Evaluation

Commercial evaluation is concerned mainly with the issues of tender price, but other issues such as financial status of tenderers, their market share, commitment to training of personnel, risk assessment plan, availability of resources, professional reputation, 'hidden' cost, and so on will be considered.

The tenderer should again be required to expressly respond to the commercial evaluation parameters, which will be set out in the form of tender. Each tender submission will be rated against the stated commercial evaluation parameters and the total rated scores calculated (Davenport, Fundametals of Building Contract Management 2002).

According to Wubishet Jekale's Teaching Material, commercial evaluation includes Benefit Forgone due to Completion Time; Additional Costs due to differences in Foreign Currency Exchange and Advance Payment requirements; and Provisions of Domestic or Regional Preference Margins.

- **Benefit Forgone due to Completion Time**

When tenders are offered with different completion times, comparisons are made to determine the benefit forgone taking into account the least acceptable completion time as a basis for competitions. The Benefit Forgone (BF) due to additional completion time can be computed using the following expressions:

$BF = (FV - TO) / (1 + i)^n$; $FV = TO\ (1 + i)^n$----------Eqn.2

TO = Tender Offer after Arithmetic Check; n = Completion time in days

i = Discount Rate = 0.05 % per day = 1.5 % per month; FV = Future Value

- **Additional cost due to**
  - ✓ **Foreign Currency Exchange requirements**

When tenders have provisions to quote different currencies, their comparison will be made based on determining their effects due to the additional cost incurred from variations in currency exchange requirements. It is then recommended to convert all tender prices into one currency; often the Financiers' or other widely used and accepted Currency called Common Currency. For currency conversion, selling rates of Bank published by an official source and applicable for transactions shall be used.

Additional cost due to Foreign Currency Exchange requirements can then be determined using selling rates at

- 15 days prior to tender submission date
- Tender Opening Date
- Decision for Award or Expiry of Tender Validity date

  - ✓ **Advance Payment**

When different amounts of advance payment are requested as part of the tender offer, one could not directly evaluate the tender price and determine the lowest evaluated bidder. This violates the principle of competition on the same bases. Therefore, the evaluation should take minimum advance payment request as a basis and consider others for additional cost incurred due to different mobilization advance requirements.

The Additional Cost due to differences in mobilization advance requirements can be computed from the following expressions:

$AP_{AC} = \{(AP \times TO) / 100\} - PV$; $PV = A \times PWF$; $A = \{(AL\ \%) \times TO\}/n$;

$PWF = \{(1 + i)^n - 1\} / \{i(1 + n)^n\}$ ----------Eqn.3

AP = Advance Payment Requirement in %; TO = Tender Offer after Arithmetic Check;

i = Discount Rate = 0.04 % per day; n = Completion time in days

PWF = Present Worth Factor; PV = Present Value

- **Domestic and / or Regional Preference**

Domestic or regional preference margin is a provision to give preference to local companies even if their bid offer is not over by a percentage often equals 7.5 - 10 % for construction works. This implies that domestic or regional companies can be awarded the tender even if they are not lowest in tender price of the evaluated bidders using all the other criteria.

A contractor can be eligible for such preference margin if and only if;

- ✓ Its legal constitution is in accordance with the Employers' Country / Region
- ✓ It is registered according to rules and regulations of the Employers' Country / Region
- ✓ It has proof that its majority of works are undertaken in the Employers' Country / Region
- ✓ Its majority of capital shares are held by the Employers' Country / Region
- ✓ Its majority of the board of directors members are the Employers' Country / Region nationals
- ✓ Its 50 % key personnel are nationals of the Employers' Country / Region
- ✓ Its arrangement to execute the work should not involve major part of its work or net profit other than the Employers' Country / Region Nationals or Co - Companies

3.5.4. Financial Offer Comparison

After all commercial comparisons are considered on the same bases; the Tender offer will be adjusted based on the Cost - Benefit principle which involves adding costs and benefits foregone. Besides, the preference margin will also be deducted and Least evaluated Bidder is Determined. That is:

$$TO_{evaluated} = (TO + BF_{CT} + AC_{AP} + AC_{FE} + AC_{PM}) \text{ ----------Eqn.4}$$

Besides, Financial offers per groups of trades of works are compared in order to evaluate whether tenders are front loaded or not. Front loading often cause disruption of projects or overzealous contractual negotiations.

Rejection of All Tenders though is solely the power of the employer to decide, for the sake of fairness it is recommended that such rights shall be exercised in the following cases:

- All Tenders are found non – responsive during the Preliminary evaluations
- Evidences of lack of competitions such as collusion among bidders, monopoly
- Lowest responsive offer is found unreasonably high.

Sample for Bid Recording Format for Basic Data during tender opening (Wubishet 2006)

Project: _____

Employer: _____

Bid Submission Date: _____

Bid Opening Date: _____

Bidders' Name	Tender Offer	Completion Time	Currency Requirements	Performance Security	Alt. Offer w/Amount	Tender Security	Advance Payment	Rebate	Other Remarks

Procurement Team

Name	Signature

Bidders Who Choose to Attend

Others

For currency conversion use Table 7 or Table 9

Table 7: Adjustments- Currency Conversion- Evaluated Prices

Bidder's Name	**Proposals' prices**		**Adjustments[1]**	**Evaluated price(s)**	**Conversion to currency of evaluation**		**Financial scores[2]**
	Currency	Amount (1)	(2)	(3) = (1) + (2)	Exchange rate(s)[3] (4)	Proposals' prices (5) = (3)(4)	(6)

Table 8: Domestic Preference for Works

Bidder (a)	Domestic Preference Group[4] (b)	Total Price[5] (c)	Exclusions for Preference [6] (d)	Revised Total (e) = (c) – (d)	Preference [7] (f)	Total Comparison Price (g) = (c) + (f)

[1] Arithmetical errors and omissions of items included in the technical proposals.
[2] 100 points to the lowest evaluated proposal
[3] Value of one currency unit in the common currency used for evaluation purposes
[4] Column b refers to Group A (eligible domestic bidders) or Group B (others) as indicated by bidder, subject to verification by Borrower.
[5] Corrected/Discounted Bid Price + Additions + Adjustments + Priced Deviations. If the lowest priced bid is from a Group A bidder, it is the lowest evaluated bidder, and the remainder of the table need not be filled out.
[6] Adjustments + Priced Deviations. An attachment should be provided to explain the significant components of column d. Columns d and e may be left blank for Group A bidders.
[7] Column f for Group A bidders is zero. For Group B bidders, column f is 7.5 percent of column e.

Table 9: Currency Conversion

Specify Evaluation Currency: _____

Bidder	Corrected/Discounted Bid Price (in specified currency)	Payment Composition			Exchange Rate Used by Bidder	Amounts in Currency of Payment	Exchange Rate for Evaluation	Evaluation Currency	
		Currency of Payment	Percent of Total Bid	Amount in Evaluation Currency				Bid Prices	Total
(a)	*(b)*	*(c)*	*(d)*	*(e) = (b) x (d)*	*(f)*	*(g) = (e) x (f)*	*(h)*	*(i) = (g) x (h)*	*(j)*

Table 10: Combined Technical/Financial Evaluation-Award Recommendation

Bidder's Name	**Technical Evaluation**			**Financial Evaluation**		**Combined Evaluation**	
	Technical scores S(t)	Weighted scores S(t) × T[8]	Technical rank	Financial scores S(f)	Weighted scores S(f) × F[9]	Scores S(t) T + S(f)	Rank

[8] As per RFP
[9] F as per RFP

3.5.5. Overall Weighted Ranking (Consolidated Scores)

The tender evaluation team will need to decide if rated scores for both technical and commercial evaluations contribute equally to the overall rating of each tenderer. If they do, then the technical and commercial scores are sum-up for each tenderer and a ranking order established. However, it is likely that commercial evaluation might be seen as contributing more substantially and consequently might be given a greater weight than technical evaluation; say 60 per cent for commercial and 40 per cent for technical evaluations. The rated scores of each tender submission are then recalculated and the order of tenders re-ranked (Davenport, Fundametals of Building Contract Management 2002).

Evaluated Proposal Score (B) will be calculated for each responsive Proposal using the following formula, which permits a comprehensive assessment of the Proposal price and the technical merits of each Proposal:

$$B = \frac{C_{low}}{C} X + \frac{T}{T_{high}} (1 - X)$$----------Eqn.5

Where, C = Evaluated Proposal Price

C_{low} = the lowest of all Evaluated Proposal Prices among responsive Proposals

T = the total Technical Score awarded to the Proposal

T high = the Technical Score achieved by the Proposal that was scored best among all responsive Proposals

X = weight for the Price as specified in the BDS

The Proposal with the best evaluated Proposal Score (B) among responsive Proposals shall be the Most Advantageous Proposal provided the Proposer is qualified to perform the Contract (The World Bank 2016).

Before calculating the consolidated score of an offer, each constituent score should be normalized, since now values of different kind are first compared between the offers, otherwise no common measurement unit would be available to add quality to price. Relative scores are established as follows (Kovächs 2004):

T_r = the relative technical score of the offer, $T_n = T_n/T_{max}$, ----------Eqn.6 where:

T_n = the absolute technical score of the offer;

T_{max} = the absolute technical score of the technically best offer;

C_r = the relative commercial score, $C_r = C_n/C_{max}$, ----------Eqn. 7 where:

C_n = the absolute commercial score of the offer;

C_{max} = the absolute commercial score of the commercially best offer;

R_r = the relative realization score, $R_r = R_n/R_{max}$, ----------Eqn. 8 where:

R_n = the absolute realization score of the offer;

R_{max} = the absolute realization score of the best offer from realization point of view;

P_r = the relative price score of the offer, $P_r = P_{min}/P_n$, ----------Eqn. 9 where:

P_n = the evaluated price of the offer;

P_{min} = the lowest evaluated price;

The normalized scores can be combined into a consolidated score, for example, as follows:

$S_n = a \times T_r + b \times C_r + c \times R_r + d \times P_r$; ----------Eqn.10 where:

S, = the consolidated score of the offer; c = a weighting factor of R, (up to 0.1);

a = a weighting factor of T, (0.3 to 0.7); d = a weighting factor of P, (0.3 to 0.7).

b = a weighting factor of C, (up to 0.1);

The final assessment of each compliant tender will be based on the aggregated score for the Quality or technical/Price submission based on a ratio of 70:30. But the quality Score must be above 70 percent out of 100 percent and then use (Quality score x 70% + Price score x 30%).

Figure 27: Final Evaluated Score

	Quality Marks	**Best Quality Score (Q)**	**Price score**	**Combined Score (Q x 0.7) + (P x 0.3)**	**Winning Rank**
Bidder A	63.03% < 70%				
Bidder B	65.90%	86.71%	46.85%	74.75%	❹
Bidder C	71.90%	94.61%	100.00%	96.23%	❶
Bidder D	75.50%	99.43%	68.60%	90.18%	❸
Bidder E	76.00%	100.00%	82.30%	94.69%	❷

Tender C is the successful submission in the example

3.5.6. Choosing the best tender

A process of rated evaluation of technical and commercial aspects of tenders provides an objective measure for ranking of tenders. It identifies and rates all the key technical and commercial factors pertinent to the project in a disciplined, fair and impartial manner. However, it needs to be clearly understood that it is only a management tool assisting in decision-making (Davenport, Fundametals of Building Contract Management 2002).

3.6. Selection Methods

Once the owner determines which project delivery method and corresponding competition criteria they will use, the framework for the actual selection process has been set. There are basically three selection methods utilized for purchasing construction and construction management services.

Selection Method	Solicitation Instrument to Advertise
Low-bid selection	Invitation for Bids (IFB)
Best-value selection (BVS)	Request for Proposals (RFP)
Qualifications-based selection (QBS)	Request for Qualifications (RFQ).

In the past several years, owner preferences have shifted from the traditional low-bid selection method to more frequent use of the best-value selection method (design-build and at-risk CM). However, traditional design-bid-build is still the selection method of choice for a majority of owners.

3.6.1. Low-Bid Selection

The low-bid selection method is all about price, and it is still the most common way for contractors to get their work. It all starts with a set of contract documents.

The lowest responsive bidder methodology consists of (United Nations 2009): Determining which bidders are responsive, and reject non responsive bid. Only bids offering works or services meeting or exceeding the requirements in the specifications

should be considered responsive. Follow the steps (http://aof.uwh.diif.r.mil.uk or http://www.gov.uk/acquisition-operating-framework n.d.)

1. This is where you accept the lowest priced tender that is technically and commercially compliant. The technical and commercial elements are a simple PASS / FAIL test. You must not use any other scoring method, and any considerations such as quality, security etc. must be part of the minimum technical requirement.

2. After you have identified the compliant tenders, the lowest priced tender is chosen. This method of evaluation is used for simple requirements typically goods and services where you have a standard technical performance, such as **C**ommercial **O**ff **T**he **S**helf (COTS) items.

Choosing the successful tender

3. The successful tender is the least expensive tender classified as ‘commercially compliant’ and ‘technically compliant’ during the tender evaluation.

4. Table 1 demonstrates the evaluation results based on ‘lowest price’ where the winning tender is Tender D.

Table 11: Evaluating Lowest Price

Tender	Technically Compliant	Commercially Compliant	Price (Birr)	Outcome
A	Yes	Yes	1,235,732.00	Unsuccessful tender, technically and commercially compliant but with higher price
B	No	Yes	950,000.00	Unsuccessful tender, technically non-compliant
C	Yes	Yes	1,356,721.00	Unsuccessful tender, technically and commercially compliant but with higher price
D	Yes	Yes	1,189,621.00	Successful tender, lowest priced, technically and commercially compliant tender
E	Yes	No	1,798,598.00	Unsuccessful tender, commercially non-compliant

3.6.2. Best value

Any selection process in which proposals contain both price and qualitative components, and the award is based upon a combination of price and qualitative considerations. It is the process of assessing bids to identify the most economically advantageous tender (MEAT) submitted for a project. MEAT may not be the lowest cost bid and is determined by evaluating bids against published award criteria to get the right contractor/consultant/ supplier to deliver works, services or goods (Government Commercial Function 2021).

Financial Offer

The financial proposal should be opened only for those proposals where the technical evaluation scores above a stated threshold, usually above 70 percent of the points allocated to the technical proposal (PPA 2011). For those proposals where the technical proposal does not reach the minimum specified score, the corresponding financial offer is not eligible for further consideration, and the financial proposal should be returned to the contractor/consultant/supplier unopened, accompanied by a letter notifying the them.

The maximum number of points allocated to the financial offer is given to the lowest priced proposal. All other financial offers receive points in inverse proportion, e.g. according to the following formula:

$$p = y * \mu/z \text{ ----------Eqn. 11}$$

Where: p = points for the financial proposal being evaluated, y = maximum number of points for the financial proposal, μ = price of the lowest priced proposal and z = price of the proposal being evaluated

The proposal obtaining the overall highest score after adding the score of the technical proposal and the financial offer is the proposal that offers best value for money.

Table 12: Sample evaluation points table

Names of Bidders	Bid price	Price (60 max)	Experience (15 max)	Staff/equipment (15 max)	Work program (5 max)	Location (5 max)	Total points (100 max)
	Lowest	60	Calculate	Calculate	Calculate	Calculate	Add from calculations in columns to the left
	Next lowest and so on	Calculate >> >>	>> >> >>	>> >> >>	>> >> >>	>> >> >>	

1. You must state in the tender documentation that the commercial element is a simple PASS / FAIL test with regard to whether the tender meets the minimum commercial requirements as was stated in the tender documentation.
2. The technical elements are marked against the individual award criteria and totalled. Anything below the minimum total technical mark will be considered technically non-compliant, and will not be allocated a technical score. The technical score is the score given in comparison to the best compliant technical tender.
3. Where a tender is commercially non-compliant you will not allocate a technical score. During the tender evaluation as the commercial and technical evaluations are carried out at the same time bids may receive a technical mark.
4. The evaluation is out of 100 (as this represents 100% of the total score) and in this example the split is 60/40 technical / pricing. You allocate a score of 60 to the best technically compliant tender and calculate the technical scores of the other tenders using a percentage (%) difference method. You allocate a score of 40 to the lowest price and calculate a score for the price on the remaining tenders using a percentage (%) difference method. This ensures that you treat the technical and pricing scoring in the same way and produce a consistent result.

Scoring Technical

Technical Score = Total Available Marks x $\frac{[Tender\ Technical\ Mark]}{[Highest\ Technical\ Mark]}$ ----------Eqn. 12

Table 13: The technical and pricing scores

Tender	Technical Mark	Technical Score	Commercial Compliance	Price	Pricing Score
A	176	60	Yes	£1,235,732	38.5
B	112	0	Yes	£950,000	Not scored, technically non-compliant
C	153	52.2	Yes	£1,356,721	35.1
D	151	51.5	Yes	£1,189,621	40
E	196	0	No	£1,798,598	Technically compliant but not allocated a score as commercially non-compliant

Technical Score = 60 x $\frac{[153]}{[176]}$ = 60 x 0.869 = 52.16 ≅ 52.2

Scoring Price

Price Score = Total Available Marks x $\frac{\left[\begin{matrix}Lowest\ Priced\ Technically\ and \\ Commercially\ Compliant\ Tender\end{matrix}\right]}{[Tender\ Price]}$ ----------Eqn. 13

Price Score = 40 x $\frac{[1{,}189{,}621]}{[1{,}356{,}721]}$ = 40 x 0.877 = 35.07 ≅ 35.1

Table 14: Percentage score method for the 'Best Value Method - combined technical and price' evaluation.

Tender	Technical Score	Price (Birr)	Pricing Score	Total Score	Outcome
A	60	1,235,732	38.5	98.5	Successful tender, technically and commercially compliant, highest total score
B	0	950,000	0	0	Unsuccessful tender, technically non-compliant so cannot be awarded the contract
C	52.2	1,356,721	35.1	87.3	Unsuccessful tender, technically and commercially compliant, lower total score
D	51.5	1,189,621	40	91.5	Unsuccessful tender, technically and commercially compliant, lower total score
E	0	1,798,598	0	0	Unsuccessful tender, commercially non-compliant so cannot be awarded the contract

Best Value Selection using Technical, Commercial and Price using a Percentage Score

1. You must state in the tender documentation that the commercial element is split into two parts, the mandatory element as a PASS / FAIL test (i.e. it has met the minimum commercial requirements stated in the tender documentation) and the non-mandatory element receives a score in the same way as the pricing and technical elements scoring.
2. The technical elements are marked against the individual award criteria and totalled. Anything below the minimum total technical mark (in this example 140) will be considered technically non-compliant, and will not be allocated a technical score. The technical score is the score given in comparison to the best compliant technical tender.
3. Where a tender is commercially non-compliant you will not allocate a technical score. During the tender evaluation as the commercial and technical evaluations are carried out at the same time bids may receive a technical mark.
4. The evaluation is out of 100 and in this example the split is 50 / 30 / 20 technical / commercial / pricing. The technical elements are marked against the individual award criteria and totalled. Anything below the minimum total technical mark will be considered technically non-compliant.
5. You must take care to ensure that the scoring method you use is fair and reasonable, proportionate and does not discriminate in favor of any tenderer. Scores for price should be directly proportional to percentage price difference.
6. For a 50 / 30 / 20 split, a score of 50 is allocated to the best technically compliant tender and the technical scores for the other tenders are calculated using a percentage (%) difference method. A score of 30 is allocated to the best commercial score and the commercial score for the other tenders is calculated using a percentage (%) difference method. The lowest priced tender is allocated a score of 20 and the pricing score for the remaining tenders is scored using a percentage (%) difference method. This method ensures that you treat the technical, commercial and pricing scoring in the same way and produce a consistent result.

Table 15: Technical, Commercial and Price Scoring

Tender	Technical		Commercial		Price (Birr)	Pricing Score
	Mark	Score	Mark	Score		
A	176	50	168	30	1,235,732	19.3
B	112	0	90	0	950,000	Not scored, technically non-compliant
C	153	43.5	149	26.6	1,356,721	17.5
D	151	42.9	167	29.8	1,189,621	20
E	196	0	0	0	1,798,598	Technically compliant but not allocated a score as commercially non-compliant

Technical Score = 50 x $\frac{[153]}{[176]}$ = 50 x 0.869 = 43.47

Scoring Commercial = Total Available Marks x $\frac{[Tender\ Commercial\ Mark]}{[Highest\ Commercial\ Mark]}$

Scoring Commercial = 30 x $\frac{[149]}{[168]}$ = 30 x 0.887 = 26.61

Scoring Price = 20 x $\frac{[1{,}189{,}621]}{[1{,}356{,}721]}$ = 20 x 0.877 = 17.54

Table 16: combined technical, commercial and price' evaluation

Tender	Technical Score	Commercial Score	Price (Birr)	Pricing Score	Total Score	Outcome
A	50	30	1,235,732	19.3	99.3	Successful tender, technically and commercially compliant highest total score
B	0	0	950,000	0	0	Unsuccessful tender, technically non-compliant so cannot be awarded the contract
C	43.5	26.6	1,356,721	17.5	87.6	Unsuccessful tender, technically and commercially compliant but with lower total score
D	42.9	29.8	1,189,621	20	92.7	Unsuccessful tender, technically and commercially compliant but with lower total score
E	0	0	1,798,598	0	0	Unsuccessful tender, commercially non-compliant so cannot be awarded the contract

3.6.3. Qualifications-based selection

QBS may be appropriate for complex or highly specialized assignments, or those focusing on innovations for which the best available expertise is required without considering the price. When using QBS, most of the steps in preparing the evaluation criteria are the same as for QCBS, the primary difference being that there is no requirement to provide weighting for financial and technical scores, as the award is based purely on the highest technical score.

Discussion Points: Selection Methods for Consulting Services

Quality- and cost-based selection (QCBS)
Quality-based selection (QBS)
Fixed budget selection (FBS)
Least-cost selection (LCS)
Consultant qualification selection (CQS)
Sole-source selection (SSS)
Individual consultant selection (ICS)

3.7. Contract award and contract signing

A formal acceptance of the contractor's tender/offer (whether in writing or not) is sufficient to bind the parties in contract. Although the start of the contract is not conditional on the formal signing (usually called a Formal Instrument of Agreement), every effort should be made to have the contract signed before construction. This will ensure certainty of the knowledge of the conditions of contract under which the project will be executed (Davenport, Fundametals of Building Contract Management 2002).

3.8. Statistical Approach to Tendering / Procurement

3.8.1. The Competition Ratios

Optimistic Ratio builds on the hypothesis that firms do not collude; ***Pessimistic Ratio*** firms are prone to implementing 'share-the-lots' collusive agreements as soon as favorable

circumstances arise (Nicola Dimitri 2006). The competition ratios are based on the following variables:

Adjusted number of individual participants (n): this is the expected number of individual firms in the tendering process, where each firm is counted as many times as the number of lots for which it can bid given its capacity;

Number of distinct participants (N): this is the absolute expected number of individual firms in the tendering process. Each individual firm is counted only once, independently from the number of lots it can bid for.

Number of lots (L): this variable counts the number of lots the supply contract is divided in. And The Optimistic ratio, OR, is defined as the ratio between the adjusted number of participants (n) and the number of lots (L):

$$OR = \frac{n}{L} \text{ ----------Eqn.14}$$

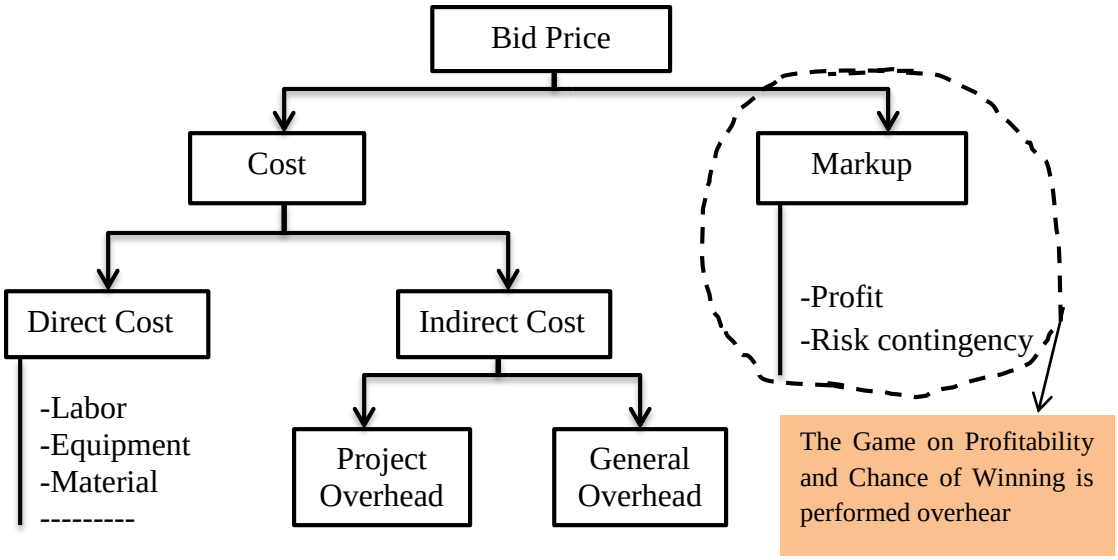
OR implicitly assumes that tendering process participants behave competitively for each lot, without colluding or making agreements with others to share the lots at high prices. If OR increases, the level of expected competition is higher and vice versa. In OR, if a firm is large enough to bid for two lots, it is counted twice in the numerator.

The Pessimistic ratio, PR, is defined as the ratio between the number of distinct participants (N), and the number of lots (L):

$$PR = \frac{N}{L} \text{----------Eqn.15}$$

PR assumes that bidders have high propensity to collude; that is, that they try to share the lots without competing for them whenever possible. If PR increases the expected level of competition is higher and vice versa.

3.8.2. Bid Price/Cost Anatomy



3.8.3. Profitability vs. Chance of Winning

To sustain success in the construction business, you have to be the lowest bidder for a sufficient number of projects while the bid price is not too low in order to make a reasonable profit. It is important therefore, to strike a balance between profitability and the chances of winning.

Winning Requirements

- To establish a winning bidding strategy we need to:
- Keep track of our past bids and analyze their information; and
- Depict any bidding pattern for our key competitors.

Required Information, Information we have:

Cost estimate (C = direct + indirect) for any past bid is known for us. Since we cannot know the cost estimate of other competitors, let's assume that the cost estimates for all bidders are the same. This assumption is not true but can be realistic if we assume that all bidders have access to the same subcontractors, suppliers, and follow standard construction technology. The bid prices of competitors in past bids are known to us as public information published by most owners after the bid is let.

Bid Price, Cost, & Markup

The relationship between the bid price and the cost estimate in any bid is as follows:

Bid Price (Bi) of competitor i = C x (1+markup) ---------Eqn. 16

Bi / C = 1 + markup →markup = (Bi / C) – 1

The Bi / C is a representation of the markup used by competitor i in one bid.

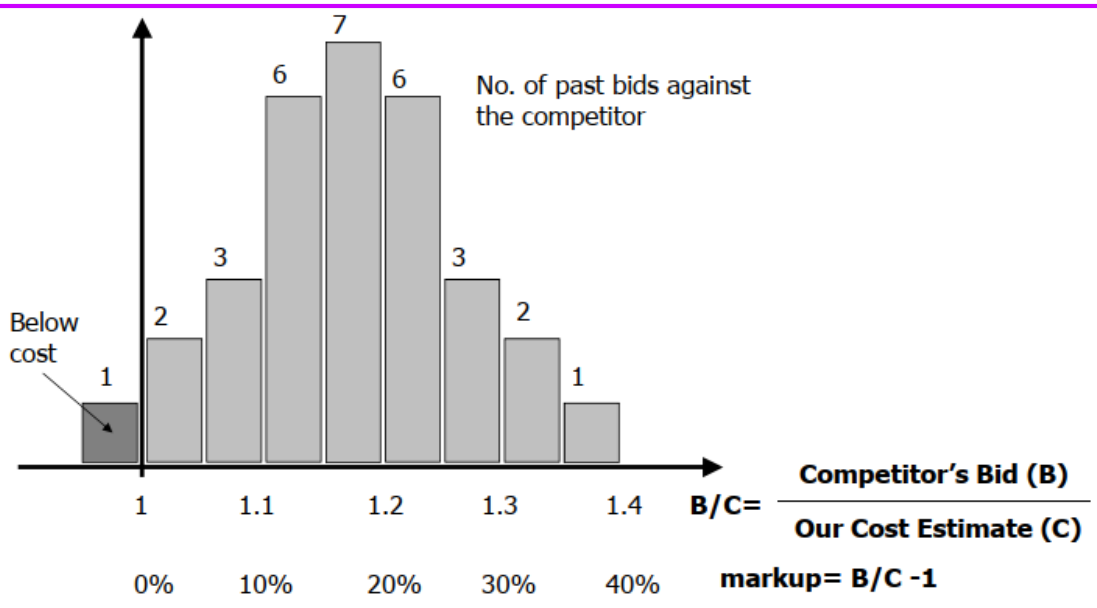
For Example, in a past bid that we lost, our cost estimate was Birr 1,000,000. For that project, we submitted a total bid of Birr 1,150,000 while our key competitor "Company A" bid was Birr 1,100,000.

- Assuming cost estimate is constant. We used a markup of [(1,150,000/1,000,000) -1] = 15%
- "Company A" used a markup of [1,100,000/1,000,000) -1] = 10%

It is important to analyze if the 10% markup used by "Company A" is a policy that is repeated in other bids.

Analyzing "Company A" Bidding Behavior

Let's expand our analysis of "Company A" by retrieving all our records of past bids in which we competed against them. Let's assume we found 31 past bids and we have all the information regarding our cost estimates and the bid prices. We can create a histogram as follows:



Estimating Optimum Markup

We have two conflicting objectives in Statistical Approach; that is to **reduce markup** to **improve the probability of winning**, and to **increase markup** to **improve profitability**. The probability of winning is unit-less and profit is in dollars. Multiply the two components to get the Expected Profit that is to be used as a measure for optimality.

Expected Profit of a given markup =

[Profit value Birr] X [Probability of winning all competitors using the specified markup]

↓ Markup % x Cost

↓
1. Calculate the probability of winning individual competitors, then
2. Combine these probabilities to determine the probability of winning all of them simultaneously.

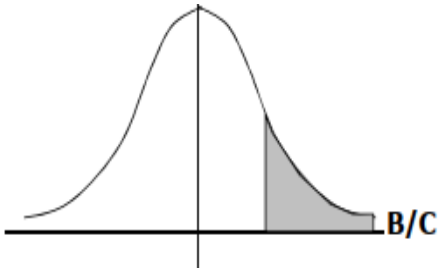
Winning a Single Competitor

Example: You have kept good records of the bidding behavior of one competitor "Company B". The mean and standard deviation of the company's B/C ratio are calculated to be 1.1 and 0.1, respectively. Answer the following:

a) What is the probability of winning "Company B" in a new bid, using a 20% markup? Your cost estimate for the new project is Birr1, 000,000.

b) What is the expected profit at this markup?

Solution:



a) At 20% markup, B/C = 1 + markup = 1.2

Using the standard normal distribution table,

$z = (X-\mu) / \sigma = (1.2-1.1)/0.1 = 1.0$

From the table (provides left side area), Probability = 0.8413, then the probability of winning "Company B" at 20% markup = 1 - 0.8413 = 0.1587 (the shaded area)

b) Expected profit = Probability of winning x Profit

= Probability of winning x Cost x markup

= 0.1587 x Birr 1,000,000 x 0.2 = Birr 31,740

Winning All Competitors Simultaneously

How to combine: $P_{win}(A)$, $P_{win}(B)$, $P_{win}(C)$, @ a certain markup level, to get $P_{win}(All)$, at that markup

- Two models are available:
- Friedman (1956): The basic assumption is that different competitors' probability distributions are mutually independent.

Accordingly, he suggested a multiplicative model to combine the probabilities; i.e.,

$P_{win}(All) = P_{win}(A) \times P_{win}(B) \times P_{win}(C) \times$ ----------Eqn.17

- Gates (1967): criticized the independence of Friedman and offered his model as follows:

$$P_{win}(All) = \frac{1}{\frac{1-P_{win(A)}}{P_{win(A)}} + \frac{1-P_{win(B)}}{P_{win(B)}} + \frac{1-P_{win(C)}}{P_{win(C)}} + \cdots + [1]}$$ ----------Eqn. 18

Initialization: m = 0%, increment j = 1%

- ✓ **LOOP**
  - ✓ m = m + j
    - ✓ LOOP
      - ✓ Calculate P win (competitor i) @ markup m
    - ✓ DO LOOP for all competitors
  - ✓ P_{win} (all)
  - ✓ Profit = m x Cost
  - ✓ Expected Profit (EP) = Profit x P win (all)
  - ✓ j = j + j
- ✓ **DO LOOP** till m = M (e.g. 20%)

$m_{optimum}$ @ $EP_{maximum}$

Example: A contractor wants to determine the optimal bid to submit for a job with estimated cost $1,000,000, bidding against 3 key competitors with the following historical data.

Competitor	B/C (mean μ)	B/C (standard deviation σ)
A	1.081	0.052
B	1.032	0.044
C	1.067	0.061

Solution

- **At markup = 1%**
  - ✓ Probability of winning the 1st competitor, "A"
    - X = B/C = 1+markup = 1+0.01 = 1.01
    - ZA = (X-μA)/σA = (1.01 -1.081)/0.052 = -1.365
    - From normal Distribution table - value = 0.086
    - Then Probability P win A =1 – 0.086 = 0.914
  - ✓ Probability of winning the 2nd competitor, "B"
    - X = B/C = 1+markup = 1+0.01 = 1.01
    - ZB = (X-μB)/σB = (1.01 -1.032)/0.044 = -0.500
    - From normal Distribution table - value = 0.309
    - then Probability P win B = 0.691
  - ✓ Probability of winning the 3rd competitor, "C"

- X = B/C = 1+markup = 1+0.01 = 1.01
- ZB = (X-μC)/σC = (1.01 -1.067)/0.061 = -0.934
- From normal Distribution table - value = 0.175
- then Probability P_{win} C = 0.825

➢ **Probability to win All @ 1% markup:**

✓ Friedman Model:

- P win All-F = 0.914 x 0.691 x 0.825 = 0.521
- EP-F (expected profit) = Birr1,000,000 x 0.01 x 0.521 = Birr 5,213.3

✓ Gates Model:

- P_{win} All-G = 0.571
- EP-G (expected profit) = Birr 1,000,000 x 0.01 x 0.571 = Birr 5,705.9

Important Bidding Relationships

When σ of Benefit/Cost ratio of a competitor is small, it indicates this competitor uses a consistent markup policy (easy to win). In case of high project risk, it is wise to use higher markup as an allowance for unforeseen conditions. The use of Gates model in this case is more advisable. When the level of competition is high (large number of bidders) and the economic conditions are not favorable, winning bids becomes difficult and bidders reduce their bids.

Chapter -4. Contract Management

4.1. Introduction

Under the general law of contract, when a party makes an ***offer*** to provide goods or services and/or do work voluntarily for some certain ***consideration*** and the party to whom the offer is made ***accepts*** it, then, provided it does not involve any illegal act, a contract which is *enforceable* at law exists (Jack Ramus 2006). The sequence of contract is as follows: Enquiry →Offer →Acceptance →Agreement →Contract (Soota 2005).

Due to the complexity of large construction projects, the use of standard forms of contract provides certain confidence of contract terms to the contract parties. In addition, use of standard forms of contract also saves legal fees during contract drafting and also reduces contract negotiation time which then speeds up the contract agreement.

Standard forms of contract used in construction projects, including Institute of Civil Engineering (ICE) contracts, FIDIC forms of contract, New Engineering Contract (NEC) forms, Joint Contracts Tribunal (JCT) forms, the PPC2000 contract, the FAC-1 contract, the CIOB Time and Cost Management Contract, the GC/Works contract, the Royal Institute of British Architects (RIBA) contract, the RICS contract, ICC conditions of contract, American Institute of Architects (AIA) contract, Vergabe- und Vertragsordnung für Bauleistungen (VOB) is the standard contract for public construction projects in Germany (Tan 2020). In Ethiopia PPA has Standard Bidding Documents for National Competitive Bidding and International Competitive Bidding.

A written contract provides the document by which the risks, obligations, and relationships of all parties are clearly established, and ensures the performance of these elements in a disciplined manner. In the owner situation, the contract is the means by which the contractor can be controlled and ensures that the work and end product satisfy the owner's requirements (Thumann 2003). Contract administration is all about managing the business details and relationships.

The Contract Management Process



Figure 28: The Borrower's Contract Management Process (Source: Asian Development Bank 2018)

The contract management plan sets out how this is to be achieved, by addressing (Federal Transit Administration 2007):

- Types of contracts to be used; choice of contract type depends on the nature of service/product purchased and choices on the division of risk between the owner and contractor;
- Who estimates the expected contract price.
- Who develops the scope of work statement for the contract.
- Use of standardized procurement documents and any special documents needed.
- Integration of procurement lead times into the project schedule.
- Incorporating contractual delivery dates into contracts that coordinate with the project schedule.
- Use of performance bonds and/or insurance contracts to meet the project's risk management objectives, including liability and insurance conditions and minimum limits to be met by the contractor.
- Establishing evaluation criteria to assess the selection of contractors;
- Definition of the procurement procedures for: preparation of procurement documents, advertising, bidder conferences, any bidder prequalification, receipt of proposals/bids, bidder interviews, selection, contract price negotiation, contract

award and handling of protests. (In many instances the procedures used for project procurements will be those the Agency already has in place.)

4.2. Essentials of a Valid Contract

A valid contract thus requires the following elements:

There must be *proper subject matter* of *definite agreement* or meeting of minds between *competent parties* with their *free consent* (*offer & acceptance*) that supported by *consideration*, which must also be lawful (Jr. 2007).

Discussion Point

Who Are Competent to Enter into a Contract? (Minor's Agreement, Agreement by a Person of Unsound Mind & Agreement by a Person of Unsound Mind – When Binding) Free Consent?

Use B. S. Patil and S. P. Woolhouse (2020), B.S. Patil's Building and Engineering Contracts, 7th Edition as Reference

4.3. Types (Forms) Contract

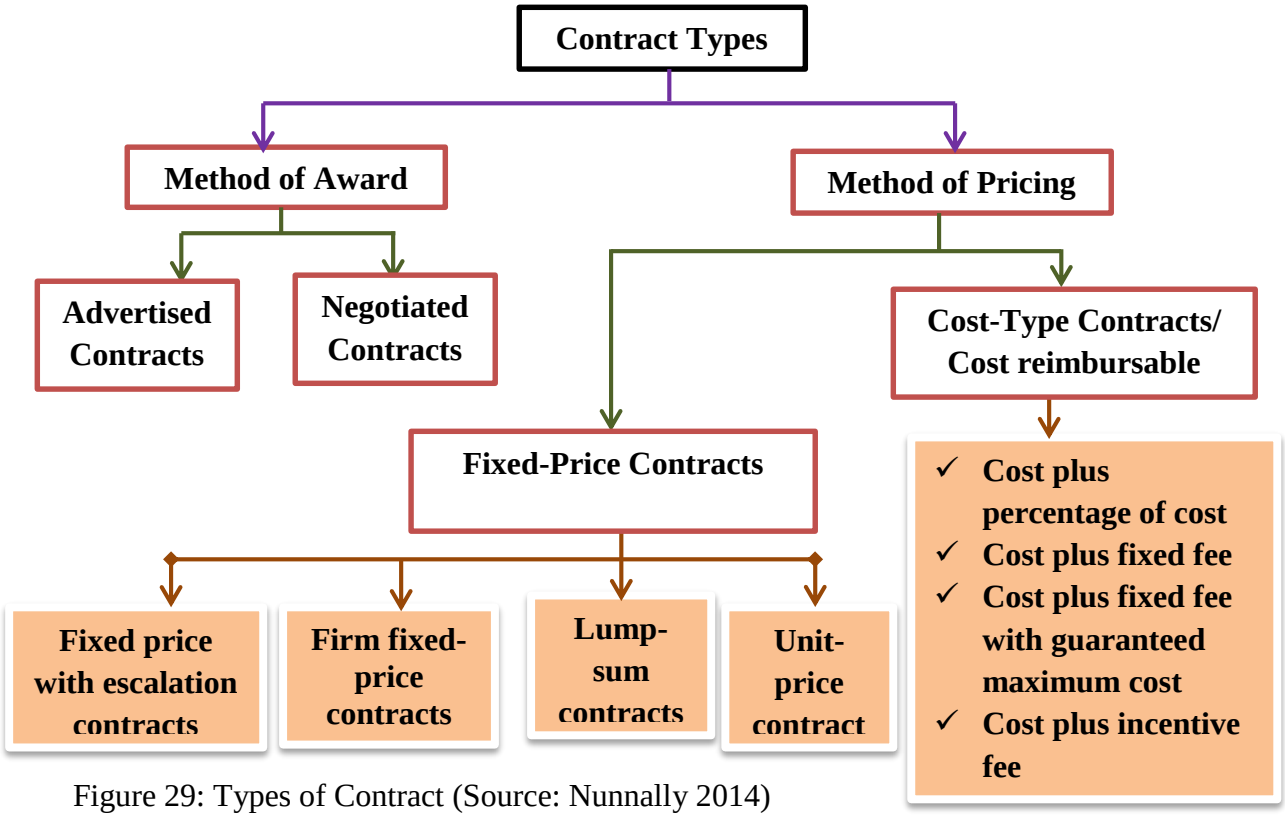


Figure 29: Types of Contract (Source: Nunnally 2014)

Table 17: Typical Contract Types (Source: Marsh 2000)

Contract Types	Delivery Methods	Description
Lump Sum (Fixed Price)	D-B-B	A single stipulated sum of payment for the agreement of goods and services. (Does not include change orders by client)
Unit Price	D-B-B	A payment system made in terms of costs per specified unit. (Sometimes used in combination with Lump Sum contracts)
Guaranteed Maximum Price (GMP)	D-B, DBOM, CM, & DBFO	This is the maximum price paid for goods and services. Usually used in D-B and CM methods.
Cost Plus a Fixed Fee	CM	Contractor is paid for all actual costs plus an agreed upon fee. (Also Can be capped to GMP)

The choice of which way to ask the contractor to price the work will depend very largely on the amount of information regarding the job, and the conditions under which it will be carried out, which the buyer can provide to the contractor in the time available for tendering (Marsh 2000).

They differ in two fundamental ways (Jackson 2004):

- How the contractor's price is quoted to the owner
- How risk is allocated to each of the parties

Fixed price with economic price adjustments - Fixed price with escalation contracts: This type is used whenever the seller's performance period spans a considerable period of years, or if the payments are made in a different currency. It is a fixed-price contract, but with a special provision allowing for predefined final adjustments to the contract price due to changed conditions, such as inflation changes or cost increases (or decreases) for specific commodities.

Firm fixed price (FFP): The most commonly used contract type is the FFP. It is favored by most buying organizations because the price for goods is set at the outset and not subject to change unless the scope of work changes.

Fixed price incentive fee (FPIF): This fixed-price arrangement gives the buyer and seller some flexibility in that it allows for deviation from performance, with financial incentives tied to achieving agreed-upon metrics. Typically, such financial incentives are related to

cost, schedule, or technical performance of the seller. Under FPIF contracts, a price ceiling is set, and all costs above the price ceiling are the responsibility of the seller (Project Management Institute 2017).

Unit Price Contract: Unit price contracts are used when the work to be performed cannot accurately be measured ahead of time. Unit pricing is common for heavy civil and highway type projects. Even though engineered site plans and specs are prepared for this type of work, it is very difficult to make exact quantity estimates because the material we are working with is not something we can physically count off like bricks or steel beams. The material quantities are much more imprecise (such as dirt or the removal of dirt).

For this reason, the owner typically provides fixed quantities for the contractors to apply their unit pricing to. This arrangement provides for a competitive bid situation via unit prices even though the exact quantities cannot be accurately determined from the plans and specs. If the owner's quantities vary greatly from the actual requirements of the job, then the owner will be responsible for the additional costs. The final price for the project is not known until the work is complete. The only sure thing about this approach is that the unit costs for each item of work remain the same throughout the project.

Table 18: Unit Price Contract

Work Item	Estimated Quantities*	Contract Unit Prices	Bid Amount	Actual Quantities	Final Cost
Trench Excavation	14,000m3	Birr 5.25	Birr 73,500	13,500m3	Birr 70,875
8" Pipe	1,750m	Birr 18.24	Birr 31,920	1,750m	Birr 31,920
Engineered fill	4,500m3	Birr 22.50	Birr 101,250	4,700m3	Birr 105,750
Backfill	9500m3	Birr 4.00	Birr 38,000	9, 800m3	Birr 39,200
TOTAL			Birr 244,670		Birr 247,745
* Provided by owner					

Lump Sum Contracts: this contract is the most common type of contract, especially for building construction. Under this arrangement, the contractor agrees to complete the work specified in the plans and specs for a single fixed amount of money. From the owner's standpoint, this is probably one of the safest contracts because cost is known up front.

However, that is assuming that the plans and specs from which the contractor's estimates are made are accurate. Once the contract is signed, both parties must live with the terms of the contract, and any flaws, errors, or omissions in the plans and specs will result in a change order. Change orders result in extra work and/or extra time, both of which result in extra cost to the owner. And although most owners are adamant about "no change orders" when they bid the job, it is completely unrealistic to assume that the contract documents will be flawless; change orders should always be anticipated for design-bid- build work utilizing a lump sum contract.

Table 19: Lump Sum Contract

Contract Amount	Actual Cost	Contractor Impact	Owner Impact
Birr 2,000,000	Birr 2,029,000	Contractor suffers a Birr 29,000 loss.	No impact, as the contract amount remains the same.
Birr 2,000,000	Birr 1,990,000	Contractor earns an additional Birr 10,000	No impact, as the contract amount remains the same.

Cost-Plus-Fixed Fee Contract

Time and materials: Another name for a cost-plus-fee contract. These are the two cost factors that are reimbursed under a cost-plus-fee contract. Time equates to the cost of the labor, and materials equates to the cost of the building products used in the construction.

The seller is reimbursed for all allowable costs for performing the contract work and receives a fixed-fee payment calculated as a percentage of the initial estimated project costs. Fee amounts do not change unless the project scope changes

For the contractor, this type of agreement guarantees a profit on the job regardless of project cost. However, the owner is at significant risk under this arrangement because there is no limit set for the project cost and the contractor really has no incentive for minimizing that cost. For this reason, it is very important that the owner clearly spells out upfront exactly which costs will be reimbursed and which costs will be viewed as part of the contractor's fee.

Another important consideration for both the owner and the contractor with a cost-plus-fee contract is the amount of paperwork involved. Each billing requires a full accounting of exact project costs with receipts. This adds a tremendous administrative burden to both parties. The construction manager must prepare the bill and the owner or architect must

review and approve the bill. All of this extra work adds overhead expense on both sides and must be accounted for. Table 6 illustrates this scenario for a Birr 2,000,000 budget.

Table 20: Cost-Plus-Fee Contract

Actual Cost	Fee as % of Cost*	Contract Amount	Contractor Impact	Owner Impact
Birr 1,994,500	Birr 99,725	Birr 2,094,225	None. The contractor still earns a 5% fee.	Birr 94,225 over budget amount of Birr 2,000,000
* Presuming a 5% fee				

Guaranteed Maximum Price Contract

The guaranteed maximum price (GMP) contract is a variation of the cost-plus-fee contract and has become very popular, particularly with owners using design-build project delivery. This contract contains the best features of the lump sum and cost-plus-fee contracts. (See Table 12). The guaranteed maximum price offers a firm cap on the overall contract price and at the same time stipulates that the owner is obligated to pay only actual costs plus a fee. Under this scenario, the owner is protected by the guarantee of a maximum price and yet receives the benefit of any realized savings. It also allows for an early start of construction because the pricing of the job can occur before plans and specs are 100 percent complete.

Guaranteed maximum price (GMP)
A contract methodology in which the contractor is reimbursed for actual costs of materials, labor, equipment, subcontracts, overhead, and profit up to a maximum fixed price amount. Any costs over the maximum price shall be borne by the contractor. Any savings below the maximum price will revert to the owner. This type of contract is often implemented when design is less than 100 percent complete.

> *If the project costs the owner less than the guaranteed maximum price, the owner and contractor are to split the difference between the costs and the guaranteed maximum price; typical splits are 50/50 percent and 60/40 percent (owner/contractor)* (Reynolds 2010).

DISCUSSION POINT
Pros. and Cons. of all Contract forms or Types

Table 21: GMP Contract

GMP Contract Amount	Actual Cost Plus Fee	Contractor Impact	Owner Impact
Birr 2,000,000	Birr 2,029,000	Contractor suffers Birr 29,000 loss	No impact. The contract amount remains the same
Birr 2,000,000	Birr 1,990,000	No impact	Owner receives benefit of Birr 10,000 savings.

Cost plus incentive fee (CPIF): The seller is reimbursed for all allowable costs for performing the contract work and receives a predetermined incentive fee based on achieving certain performance objectives as set forth in the contract. In CPIF contracts, if the final costs are less or greater than the original estimated costs, then both the buyer and seller share costs from the departures based upon a pre-negotiated cost-sharing formula, for example, an 80/20 split over/under target costs based on the actual performance of the seller (Project Management Institute 2017).

Cost plus award fee (CPAF): The seller is reimbursed for all legitimate costs, but the majority of the fee is earned based on the satisfaction of certain broad subjective performance criteria that are defined and incorporated into the contract. The determination of fee is based solely on the subjective determination of seller performance by the buyer and is generally not subject to appeals (Project Management Institute 2017).

How the final contract price is arrived at under the cost-type contracts, and the unit price form of contract, can best be illustrated by Figure 27.

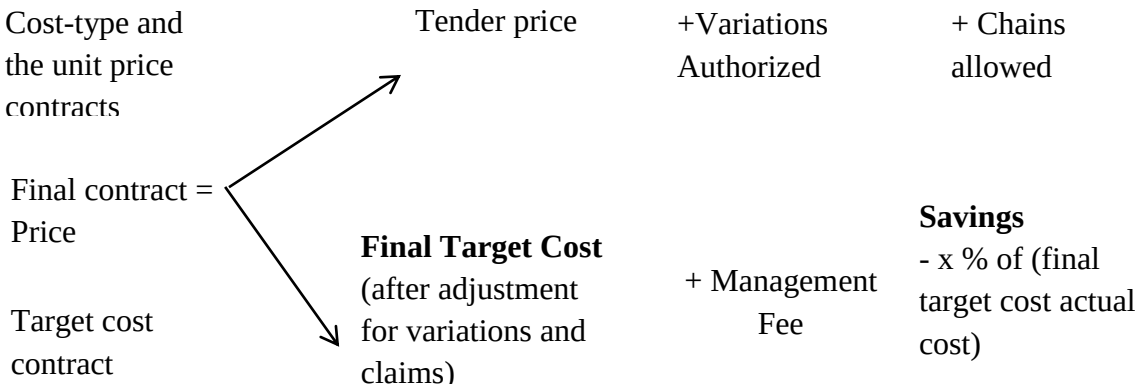


Figure 30: How the final contract price is arrived at (Source: MARSH 2000)

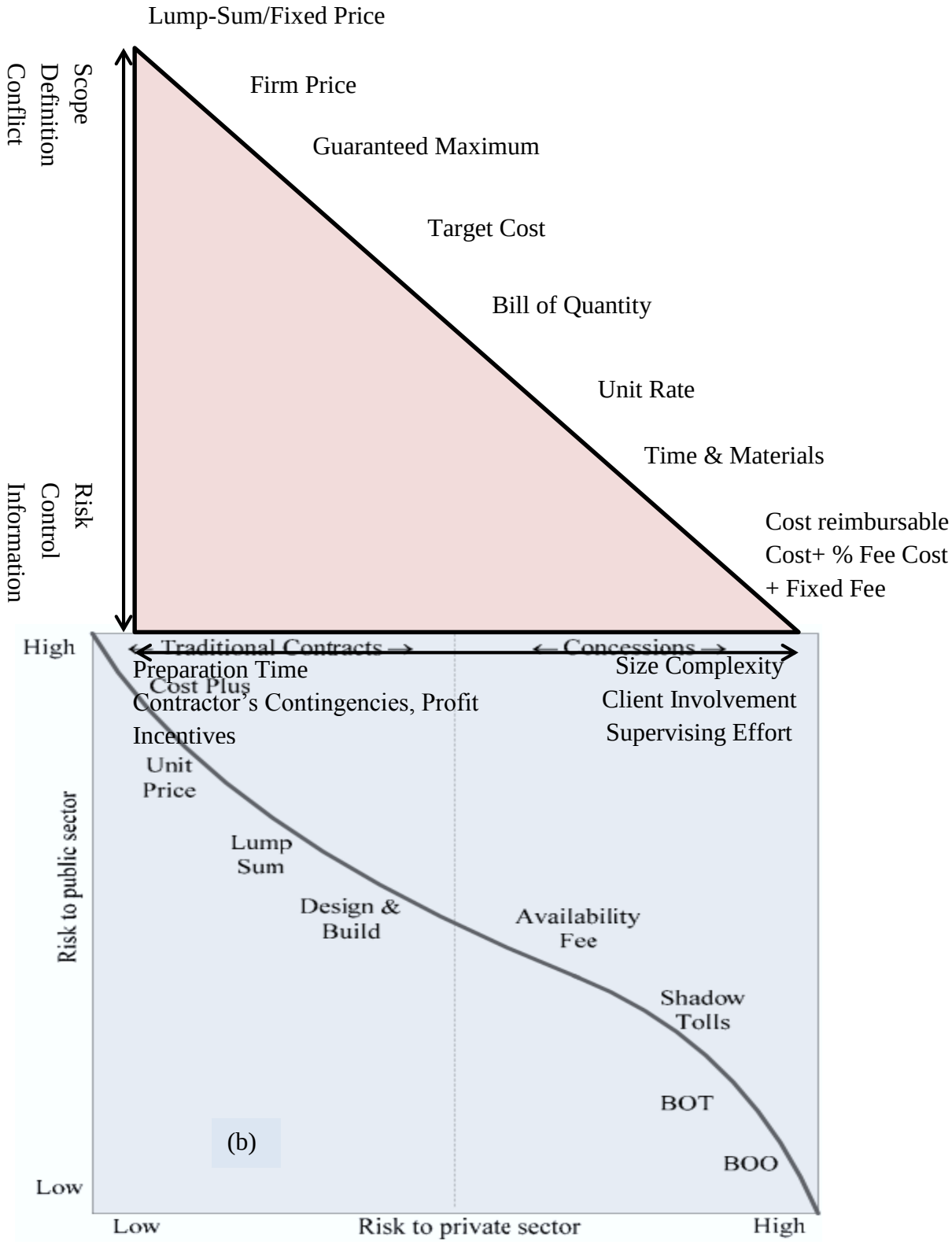

Lump-Sum/Fixed Price
Scope
Definition
Conflict
Firm Price
Guaranteed Maximum
Target Cost
Bill of Quantity
Unit Rate
Time & Materials
Cost reimbursable
Cost+ % Fee Cost
+ Fixed Fee
Risk
Control
Information
High
Traditional Contracts
Concessions
Preparation Time
Cost Plus
Contractor's Contingencies, Profit
Incentives
Size Complexity
Client Involvement
Supervising Effort
Unit
Price
Lump
Sum
Design &
Build
Availability
Fee
Shadow
Tolls
BOT
BOO
(b)
Low
Risk to public sector
Low
Risk to private sector
High

Figure 31: (a) Contract characteristics (Source: Ward 2008) (b) Schematic allocation of risks by type of procurement contract (Source: Carbonara 2012).

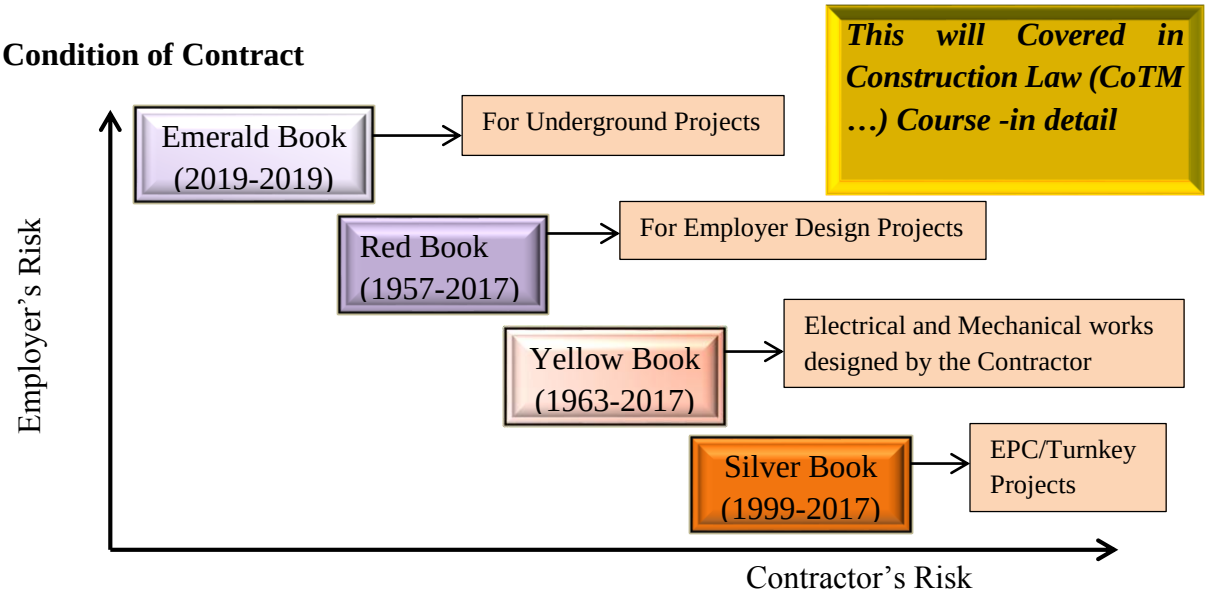


Figure 32: Financial risk and Selection of FIDIC forms of contract (Source: Tan 2020)

4.4. Contract Administration

4.4.1. Introduction

The building and construction contract, like our adversarial legal system in which it has its foundations, correctly assumes that individuals who are associated in a business enterprise may well have different and often conflicting objectives. Even when they have shared objectives, they will probably have different and conflicting interests.

So how can the owner and the contractor safeguard their respective interests during the contract? How can the owner be certain that the contractor is meeting the project objectives? How can the contractor protect the carefully planned work program from the interference of a naive but enthusiastic owner? In most instances, the owner has neither sufficient expertise nor time to ensure that the work will be constructed as designed, of the required quality, completed on time and within the budget. In any case, it would be an unequal contest in most instances, since there are many experienced builders but very few experienced owners!

The solution to this dilemma is found in the contract administrator, an experienced professional consultant person or firm, which is engaged by the owner to supervise the work. The contract administrator's role is to ensure that the project objectives are met, while at the same time dealing fairly between the owner and the contractor (Goldfayl 2004)

Contract administration is managing interfaces among the various stakeholders in the construction or it is the process of ensuring that the contractor's performance meets contractual requirements (Project Management Institute 2003).

The administration of construction contracts is typically a complex process involving the management of a great deal of contract documentation, which invariably changes throughout the course of a project, and the flow of a vast amount of information amongst a large and diverse group of individuals and organizations.

It essentially involves the administration of progress and change on projects. In addition to a main head contract agreement between a client and a contractor, contracts that require administration on a project can include agreements with sub-contractors, suppliers, project and construction managers, designers, consultants and other participants in the process. On large projects there may be hundreds or even thousands of individual contracts, each with its own administrative peculiarities. Effective contract administration is a vital part of business success in construction.

The contract administrator is an expert and experienced person or firm appointed by the owner to administer the work of the project on the owner's behalf.

The role of the contract administrator is two-fold, representing the owner's interests as agent, while also exercising an independent function in matters that require the exercise of professional judgment. In the first role – as the owner's agent – the contract administrator looks after all aspects of the project on behalf of the owner, including all direct contact and communication with the contractor. In this role, the contract administrator issues instructions to the contractor as to the scope, quality, time and cost of the work, and all other relevant matters under the contract.

In the second role – as independent assessor, valuer and certifier – the contract administrator periodically assesses the quantity and quality of work done, values the work done, and issues certificates for payment by the owner to the contractor. In this role, the contract administrator acts in a 'quasi-judicial' capacity: one which requires the exercise of professional independence and integrity.

The contract administrator's instructions to the contractor must be in writing. However, the initial and urgent instruction to be given orally, and then confirmed in writing; while some specified instructions must be given in writing in the first instance. All 'notices' given by either party are, naturally, required to be in writing, and the verb 'notify' is used in the text to mean 'give a notice'.

Any instruction or notice to the contractor should quote the provision of the contract under which it is given, and should name any other pertinent document. The instruction or notice should also specify the time frame within which the instruction is to be performed or a response is to be given, irrespective of whether the time frame is one that is prescribed by the provision of the contract being quoted or is being set by the contract administrator as a reasonable time for this particular activity (Goldfayl 2004).

The engineer's instructions to the contractor must be in writing and may be given at any time during the contract. The engineer may give the contractor an 'urgent instruction' if:

- the circumstances are urgent
- the contractor requests an urgent instruction (the contractor may first make the request orally, and must confirm it in writing within 24 hours); or
- the architect is ratifying the contractor's urgent action, taken to protect the works.

The engineer may first give an urgent instruction orally, and must then confirm it in writing within 24 hours.

The works: are defined as the work to be executed under the contract; specifically, and probably redundantly, includes variations in its definition and qualifies this further with

the rider that the works also introduces the concept of ‘work under the Contract’, which comprises both the works and temporary works.

Temporary works include major structures such as shoring, coffer dams and sheet piling, without which the works could not be constructed but which must be removed on completion of the works. Temporary works can also be construed to include other, more common structures such as planking and strutting to sides of excavations, scaffolding, formwork to sides and soffits of concrete, and centers or supports to brick arches.

4.4.2. Main forms of administration

Due to the large number of different contracts that typically exist on construction projects, administration can take many forms. The following are the main forms:

Head contract agreement – designated project administrator

This form relates to traditional lump sum contracts between a client and a contractor whereby a third party is appointed as the Project Administrator (referred to as the Superintendent), that has three main roles:

- Agent: supervise and inspect the works and give instructions
- Certifier: assess, value and certify contractual claims submitted by the contractor
- Adjudicator: make decisions on any disputes between the parties.

Designated project administrator – multiple contracts

This role is filled by a person or organization under a managed (construction or project management) arrangement or design and construct arrangement. The roles are very similar to those outlined above except that the Administrator is required to administer the many and various sub-contracts and supply and/or consultancy agreements on the project.

Internal administration (client/contractor/sub-contractor/ supplier/consultant)

This relates to administration carried out by each of the organizations involved on a project for their own internal purposes.

Time

1. **Commencement of work on the site:** Time, or the duration of the construction phase of a contract, is one of the key project parameters. In recognition of this, the date by which the owner must give the contractor possession of the site, or the date of acceptance of tender (from which the date by which the owner must give the contractor possession of the site is calculated.
2. **Working hours and working days:** Time is an inflexible resource. It passes irrespective of the use to which it is, or is not, put. If you don't use it, you lose it! However, the allocation of resources during a given period of time, such as a day, a week or indeed the entire time allocated to construction, is flexible. So it is important for the contractor to know the days on which work may be done at the site, the number of hours per day that may be worked, and the time of day during which those hours may be worked.

> *Meaning of "Working Days" The term "working days" means the days on which it is possible to carry out the work or the work is carried out. The reason for not carrying out the work could be any, such as Sundays, holidays, bad weather, acts or omissions of the owner or his engineer/architect necessitating suspension of work, etc. Where the word working is not used, days will mean calendar days* (Woolhouse 2020).

Working days are Monday to Friday, excluding statutory or public holidays and rostered days off and any industry shut-down periods applicable to the state or territory in which the site is located. Working hours and working days are as stated in the Contract or as notified by the Contractor before commencing work at the site and must not be varied without the Engineer's prior approval.

Within ten working days of being given possession of the site, the contractor must give the contract administrator and/or the architect a program (of the sequence in which the works are to be constructed), including (Goldfayl 2004):

- start and finish dates of major stages of the project and of any separable parts of the works

- the date for practical completion
- start and finish dates of all trades
- the critical path.

Whenever the date for practical completion is adjusted by five or more working days or an agreed period, the contractor must give the contract administrator and/or the architect an updated program. The updated program must show the changes to the previous program

Administration of time involves the notification, quantification, submission and assessment of time extension and delay cost claims and concomitant adjustments to contractual completion dates. It may also include the application of Liquidated Damages provisions in contracts that compensate the client for late completion by the contractor (Goldfayl 2004).

Cost

The contract sum: The 'contract sum or contract price', is the amount to be paid by the owner to the contractor for constructing the works. It is adjusted from time to time to account for events that take place during the life of the contract and is, therefore, a progress report of the owner's total financial commitment at any time during the currency of the contract. It is common practice for a contract administrator, when directing an adjustment to the contract sum, to state the adjusted contract sum both before and after the adjustment. The contract sum may be subject to adjustment due to any of a list of provisions in the contract, including variations to the works and adjustments for the respective provisional sums. Thus the contract sum varies throughout the duration of the contract, since every contract sum adjustment is incorporated in the contract sum as and when the adjustment is approved.

Contract sum adjustments are additions to or deductions from the total amount of money which is payable by the owner to the contractor under the contract. The most common causes that give rise to contract sum adjustments include:

- routine and urgent variations
- errors or discrepancies in the contract documents

- adjustment of provisional and prime cost sums
- adjustment of time costs
- deductions for uncorrected work
- costs arising from (unforeseen) site conditions.

The adjustments are made to the contract sum strictly for budgetary purposes, and the amounts by which the contract sum is adjusted are not paid to the contractor until the relevant work has been carried out.

There are three categories of contract sum adjustments:

- variations
- adjustments that are not variations but are also required to be assessed by the contract administrator
- Costs which are already established and do not, therefore, need to be valued.

Administration of cost includes the notification, quantification, submission and assessment of contractual claims for cost adjustments due to variations to the contract requirements, and progressive payments to contractors during the course of the works and financial reporting.

Quality

Materials and workmanship: The owner may require the contractor to establish and maintain a quality assurance system in accordance with the owner's requirements.

All materials and workmanship must, by definition, be in accordance with the contract. The contract administrator may instruct the contractor to replace or otherwise rectify any defective or unsuitable materials or work at its own expense. The contract administrator, as an alternative, may accept defective materials or work at a discounted value. The contract administrator may also order the testing of any materials or work, and may order the opening up, for inspection and testing, of any materials or work that may have been covered up. Where testing is not provided for in the contract, then the costs of opening up and testing are borne by the owner if the result of the test is satisfactory, and by the

contractor if it is not. Where work to be tested was covered up without the contract administrator's approval, the cost of opening up is also borne by the contractor. The Contractor must use suitable and new materials, and proper and tradesman like workmanship, unless otherwise stated in the Contract.

If the Contract requires quality assurance, the Contractor must plan, establish and maintain a quality system in accordance with those requirements, and must allow the Contract administrator and/or the engineer to monitor and audit the system, and those of subcontractors. However, the quality system is only an aid to the Contractor, which remains responsible for complying with the Contract. The Engineer may bring to the Contractor's attention as soon as practicable (as a prelude to rectification) any defective material or work discovered. (It should be noted that, at this stage, the Engineer is not required to direct rectification of a defect, nor is any time frame for rectification stated.) If the Contractor does not rectify the defective material or work, the Superintendent may direct the Contractor to:

- remove the material from the site
- demolish the work
- reconstruct, replace or correct the work; or
- not deliver the material to the site.

Contract administration can also include the supervision and management of the project to ensure that the finished product complies with the quality requirements as specified in the contract documentation. Defective work is commonly rectified during the Defect Liability Period which is the period after Practical Completion and before the issue of the final certificate.

Notification: Most standard contracts place obligations on contractors to notify the client (or their representative) when any events occur that might result in a claim from the contractor within a reasonable time frame. The contractor must notify the architect within five working days of discovering on the site:

- a 'latent condition' which may cause the contractor to incur additional cost or delay; or any condition on, below or adjacent to the site which could not have been

foreseen by a competent contractor after examining the site information and inspecting the site

- a ‘valuable item’ includes minerals, money, treasure, fossils, archaeological remains, historic objects or relics. All valuable items remain the property of the owner and the contractor must ensure that they are not removed, lost or damaged

If the contractor discovers that:

- a neighboring structure encroaches on (that is, is partly located on or overhangs) the site; or
- carrying out the necessary work will prejudice the ‘right of support’ of (that is, it will undermine and destabilize) a neighboring property

and the contract documents do not envisage such a situation, then the contractor:

- must ensure that any adjoining structure is stable without adversely affecting the situation
- must immediately suspend the necessary work in the vicinity of the situation
- must promptly request the architect to issue an instruction
- may treat the situation as a latent condition for the purpose of making a claim to adjust the contract.

Mitigation: To take reasonable measures to mitigate the client’s potential loss in the event of problems occurring on the project. In other words, contractors cannot take advantage of the situation to maximize financial gain (Valence 2002).

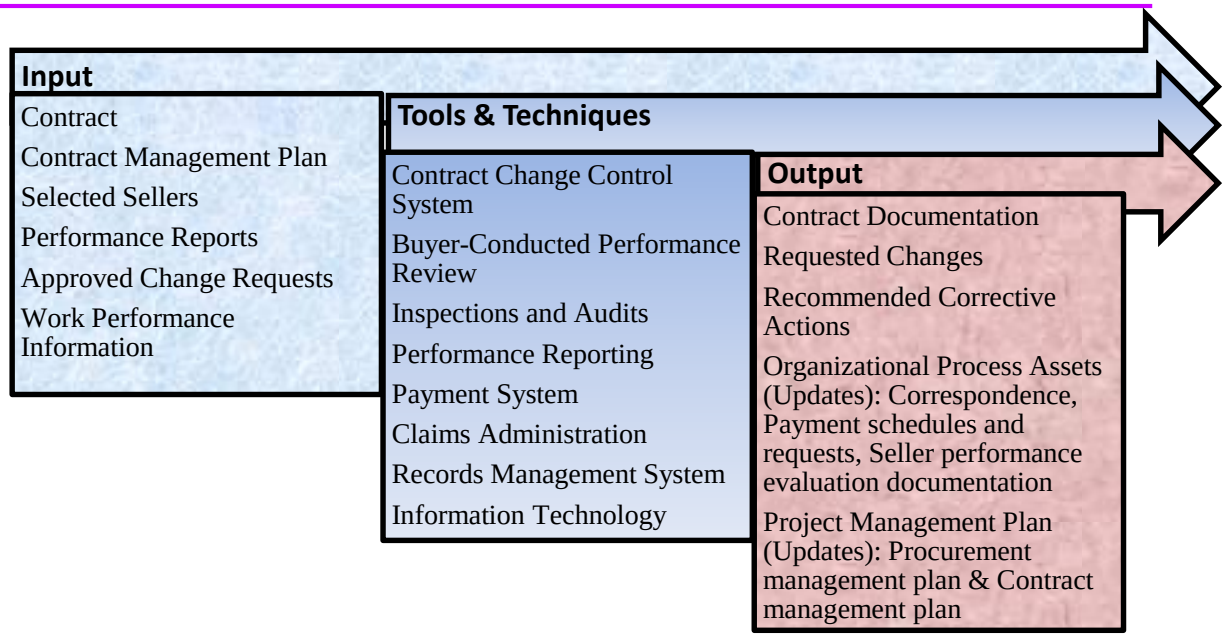


Figure 33: Contract Administration: Inputs, Tools & Techniques, and Output

DISCUSSION POINTS

Key Areas: Supervision/Instruction/Direction, Claims management, Negotiation and dispute resolution, Final accounts?

Generally, contract administration relies on detailed record keeping using construction contract administration records, including logbooks, correspondence, status reports, and any other project-related construction site activity document. All records should be kept on file and easily available for reference to protect Owner interests should disputes arise with Contractors or vendors (Phillips 2009).

4.5. Terms of Payment

4.5.1. Policy Considerations

Terms of payment are a matter on which the commercial, technical and financial sides of the employer's business may find themselves pulling in opposite directions. The employer may attain the best commercial and technical result if he offers to the tenderers terms of payment which, while providing the employer with reasonable contractual safeguards,

impose the minimum strain on the contractor's financial resources. By so doing the employer will:

1. Avoid having to restrict the tender list to large firms possessing the resources to finance the contract, whose overheads and prices will be higher than those of smaller companies.
2. Ensure that the tenderers do not have to inflate their tender prices by financing charges. In many instances the rate of interest which the contractor has to pay when borrowing will be higher than that paid by the employer.
3. Give encouragement to, and be able to take advantage of, firms possessing technical initiative who would otherwise be held back from expanding by lack of liquid cash.
4. Minimize the risk of being saddled with a contractor who has insufficient cash with which to carry out the contract and of having, therefore, either to support the contractor financially or terminate the contract

4.5.2. Contractual Safeguards

In order to safeguard the interests of both parties the contract should:

1. Define precisely the events against which payment becomes due.
2. Relate those events to the achievement of some particular objective.
3. State the amount due at each stage or provide a mechanism by which such amount can be determined.
4. Establish a time limit within which payment must be made.
5. Provide the contractor with an effective remedy should the employer default in payment.
6. Provide the employer with means by which he can obtain or recover the value of payments made before completion should the contractor default and be unable to complete.

The contract should also clearly establish the method of payment for variations and price escalation.

Variations

Variations are changes in the scope, quality, time and cost of a project. It is suggested that variations should be paid without any down payment and that the down payment is recovered therefore only against the original value of the contract. Retention money, however, would normally be deducted from the value of the variations executed.

Escalation

If the contract is subject to contract price adjustment then it is essential to establish the data necessary for the calculation of the amount of escalation due on the variation unless for simplicity the price for the variation can be settled on a fixed price basis. Payment for escalation, it is proposed, should be made with each monthly certificate at 100per cent of the value properly claimed. There seems no justification for involving escalation payments with either the recovery of any down payment or percentage deductions for retention.

Use for cost adjustment to compensate either the owner or the contractor for any rises or falls in the market price of labor and/or materials. A simple, single-factor formula which might be used under a rise and fall provision (Goldfayl 2004):

$$\text{Rise \& fall \%} = \frac{New\ index - Base\ index}{Base\ index}\ x\ 100 \text{ ----------Eqn. 19}$$

4.5.3. Recovery of Payments Made

Where payments are made in advance of delivery to site the two rights which an employer will usually seek to have included are (Marsh 2000):

1. A bond to be lodged for not less than the amount of the down payment.
2. That where progress payments are made during manufacture:
    - work to the value of the payment made is identified, becomes the property of the purchaser and is marked as such
    - such work remains, however, at the sole risk of the contractor and is insured by them accordingly.

4.5.4. Payment Request Process

Requests for payment are made by the contractor, to the owner via the architect, on a monthly basis. The project manager or contract administrator is usually responsible for compiling the request. The payment request is due by a certain day each month, usually at the end of the month. That means that the project manager must determine a cutoff date by which he/ she must receive all bills (Priced BoQ-Takeoff) from quantity surveyor, (and if joint bank account is used for security purpose, payroll data for self-performed work), in order to meet the submittal deadline. The contract price shall include the total cost for performing the Services and shall include payments for all Personnel, materials and supplies used for the Services and any other overhead or incidental costs.

After the payment request is submitted, the architect reviews the application and either recommends it for payment by the owner or sends it back to the contractor for revisions. You do not want a payment request returned. Even the simplest revision can result in a missed payment, and not many contractors can absorb the financial hit. However, if everything goes well, the contractor should receive payment according to SCC-34.5 up to 34.7 of SBD. Unfortunately, this is not always the case, and some owners are notoriously late with their payments. Consistently late payments not only put a financial strain on the contractor, but also put a real strain on the contractor/owner relationship.

Once the payment is received from the owner, the contractor is obligated to promptly pay their subcontractors and vendors. Many subcontractors run relatively small operations and cannot afford to wait longer than just a few days before receiving payment. In instances where the owner's payment to the contractor is delayed, it is important that the contractor go ahead and pay their subcontractors and vendors anyway. Delaying payments to smaller subcontractors can add a significant burden to an already stretched payroll and end up damaging this very important working relationship.

The official payment request requires the assemblage of three specific documents: the **schedule of values, the pay request continuation sheet, and the application for payment.**

Schedule of Values (Summary Sheet)

The first step in the progress payment process is to complete a document called a schedule of values. This schedule represents the project budget derived from the original project estimate.

Line Item	Description	Contract Value*	% of Total
1	Earth work and Excavation Work	ETB 800,000	34.8
	Concrete Work	ETB 1,500,000	65.2
	TOTAL CONTRACT AMOUNT	ETB 2,300,000	100

Pay Request Continuation Sheet (Bill of Quantity)

This form is simply a continuation of the schedule of values, tracking previous payments and change orders as well as identifying the current payment due. An updated continuation sheet must accompany the application for payment form each month.

A	B	C	D	E	F (D+E)	G (F/C)	H (C-F)
(Item)	(Description)	(Contract Value)	Previous Completion	Complete This Month	Complete to Date	% Complete	Contract Balance
1	Excavation & Earthwork	ETB 800,000	ETB 699,000	ETB 101,000	ETB 800,000	100.00	ETB 0.00
2	Concrete Work	ETB 1, 500,000	ETB 595,000	ETB 800,000	ETB 1,395,000	93.00	ETB 105,000
	Current Total	ETB 2,300,000	ETB 1,294,000	ETB 901,000	ETB 2,195,000	95.40	ETB 105,000

4.5.5. Application for Payment (Payment Certificate)

This form summarizes the actual payment amounts and provides the official approvals required before the payment can be released.

Application and Certificate for Payment

Project: Dormitory Building	Billing Period: 05/01/21 – 05/31/21
Application Date: January 1, 2021	Payment Request: No. 5

Contractor's Application for Payment:

Application is made for payment as shown below, in connection with the Contract Continuation Sheet attached.

1.	Original Contract Sum	Birr 2, 300,000
2.	Net Change by Change Orders	Birr 0
3.	Contract Sum To Date (1 + 2)	Birr 2,300,000
4.	Total Completed to Date (Column F)	Birr 2,195,000
5.	Retainage: 5% of Completed Work	Birr 109,750
6.	Total Earned Less Retainage (4 – 5)	Birr 2,085,250
7.	Less Previous Payments (Column D)	(Birr 1,294,000)
8.	**Current Payment Due**	**Birr 791,250**
9.	Balance to Finish, Including Retainage (3 – 6)	Birr 214,750

CHANGE ORDER SUMMARY:	Additions	Subtractions
Total Changes Approved in Previous Month	Birr 0	Birr 0
Total Approved This Month	Birr 0	Birr 0
Totals	Birr 0	Birr 0
NET CHANGES by Change Order:	**Birr 0.00**	

The undersigned Contractor certifies that to the best of the Contractor's knowledge, the work covered by the Application for Payment has been completed in accordance with the Contract Documents.

CONTRACTOR:

By: _____ Date: _____

CONSULTANT'S CERTIFICATE FOR PAYMENT:

In accordance with the Contract Documents, based on on-site observations and the data composing this application, the Architect certifies to the Owner that to the best of the Architect's knowledge, the Work has progressed as indicated, the quality of the Work is in accordance with the Contract Documents, and the Contractor is entitled to payment of the AMOUNT CERTIFIED.

AMOUNT CERTIFIED: ***Birr 791,250***

CONSULTANT:

By: _____ Date: _____

Retainage (Retention) is an amount of money that is commonly withheld from each payment as an incentive for the contractor to complete the project, including all of the final paperwork and submittals at the end of the job. The retention amount is typically calculated as 5 percent of the contract payments for the duration of the job. Release of the retention is tied to substantial completion. Once substantial completion is achieved, the entire amount of retention is paid to the contractor.

> ***Retention:*** *a certain percentage of money owed to the contractor for work progress that is held back by the owner to encourage completion of the project.*

> *It is a common practice for the general contractor to impose retention on their subcontractors as well. Once again, though, consideration is often given to the smaller contractors, especially the ones who complete their work very early on in the construction. It seems quite unfair to withhold 10 percent of a subcontractor's money for the entire duration of the project when their work was completed in the first 30 days or so. Most general contractors try to work with their subcontractors as best they can to see to it that they receive all of their money upon completion of their work.*

Generally, payment certificate forms can differ from organization to organization.

The exclusions from the application of the Retention Percentage

a) additional insurance premiums payable by the contractor as a result of the Employer making early use or occupation of the site or works;
b) statutory fees and charges;
c) costs relating to patent rights;
d) the cost of opening up work which has been covered up and/or the cost of testing materials, goods or executed work;
e) increase in terrorism insurance premium
f) insurance premiums which should have been paid by the Employer
g) loss or expense due to the regular progress of the Works having been affected by specified matters;
h) insurance payments for restoration work

Certificate of Payment 01

Date of Agreement:

Project:
Location:
Owner:
Consultant:
Contractor:

	Amount
Main Contract	2,300,000
Supplementary Contract	-
Variation Order	-
15% VAT	345,000
Total Sum with VAT	2,645,000

Name of Supervisor: _____

As per the attached statement the value of work executed and/or material supplied with VAT up to date is

S/No.	Pay No.	Amount (Birr) W/out VAT	Amount (Birr) With VAT
Advance		690,000	793,500
1	1st	1,294,000	1,488,100
2	2nd		
3	3rd		
4	4th		
5	5th		
Total		1,294,000	1,488,100

	Amount (Birr) 2.195.000	
Previous Payment	1,294,000	
Rebate	-	
Retention (5%)	109,750	
Penalty		
Advance Repay. (30%)	-	
Material Supplied		
Total	658,500	
Net Sum before VAT		
VAT 15%	-	
15% Retention VAT		
Total 15% VAT	2,062,250	20,362.50
		6,757.50
Net Sum with VAT		27,120.00
Net Sum with VAT		**162,870.00**

It is calculated by deducting retention
VAT deducted from 1st payment certificate → 1,294,000 x 5% = 64,700
Retention VAT 64,700 x 15% = 9,705
109,750 x 5% = 16,462.5
Net Retention VAT 16,462.5-9,705.0
= 6.757.5

We certify that the contractor is now entitled to the sum of Birr 162,870.00 (One Hundred Sixty Two Thousand Eight Hundred Seventy Birr) only.

Checked By	Certified By	Approved By
Name: _____	Name: _____	Name: _____
Signature: _____	Signature: _____	Signature: _____
Date: _____	Date: _____	Date: _____

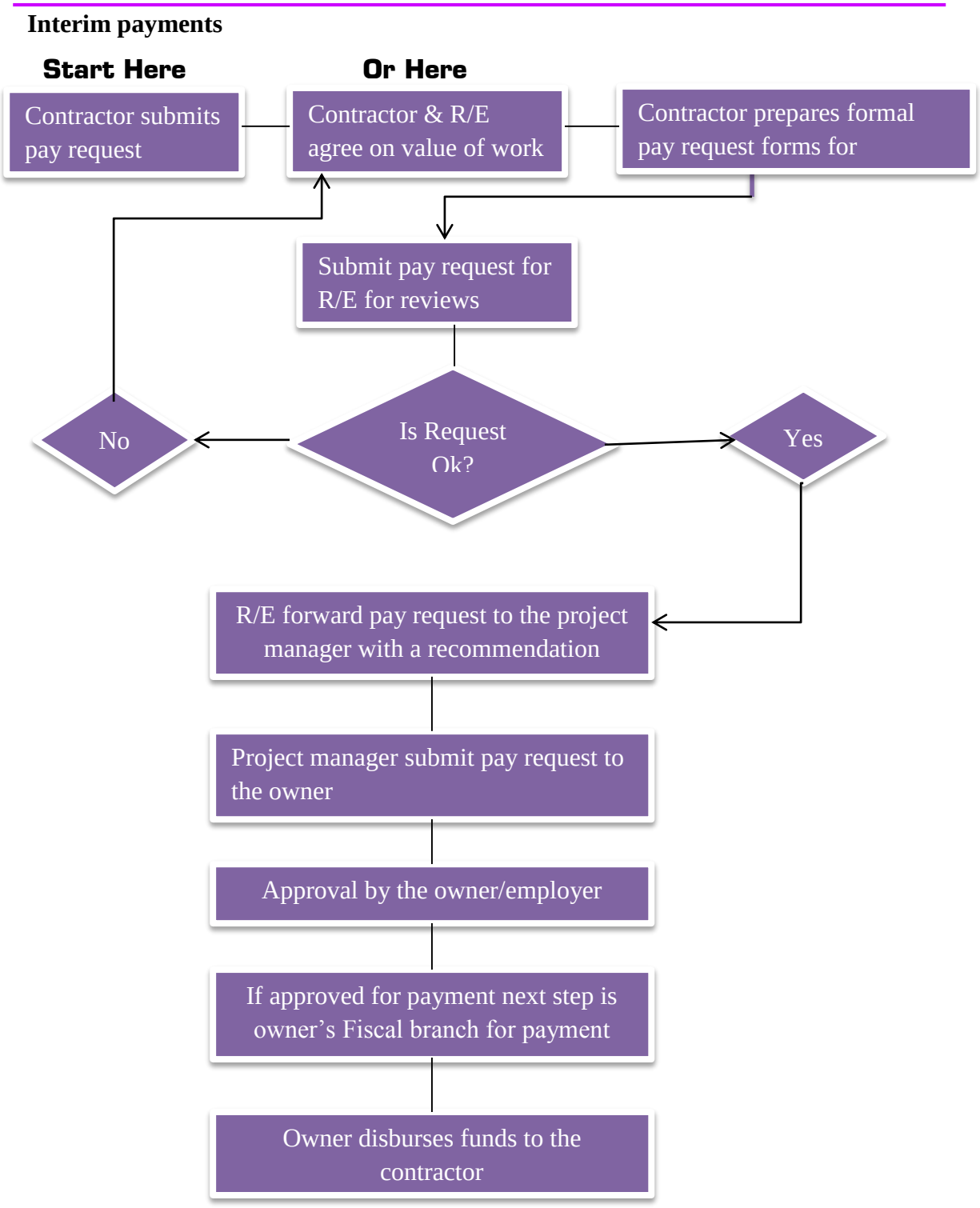


Figure 34: Progress Payment Flow Diagram (Source: Reynolds 2010)

Project Title		Project No.
Contractor	Address	
Estimate No. Period: 26-05-2021 to 26-06-2021	Contract or Spec No.	Date 26 June,2021

Description	Amount		
	Previous	This Month	To Date
Total Earnings for works & Materials Installed-	2,328,796.17	160,643.90	2,489,440.07
Plus 80% of invoice Amt for materials stored---	1,416.07	155.79	1,571.86
Less Adjustment for previous matl's invoice---	<-0.00>	<-1,416.07>	<-1,416.07>
Sub-Total----------	2,330,212.24	159,383.62	2,489,595.59
Less 10% Retainage ----------	<-233,021.22>	<15,938.36>	<-248,959.59>
Net Earnings ----------	2,097,191.02	143,445.26	2,240,636.27
Less Previous Payments ----------			<-2,097,191.02>
Plus reduction of retainage ----------			0.00
Net Payment this Estimate ----------			143,445.25

Percent of Time Elapsed 40%		Percent of Work Completed 4[illegible]	
Contract Completion Data		Contract Cost Data	
Notice to Proceed Date	15 Dec.2020	Amount of Orig. Contract	4,671,360.00
Orig. Contract Completion Time	527 Days	Approve Change Order	138,785.00
Approved Time Extension	42 Days	Total Contract Amount	4,810,145.00
Contract Completion Date	5 June. 2022		
Submitted by (Signature & Title)		Administrative Review-Final Payments	
Approved by (Signature & Title)		Approved by- Final Payments	

Completion of the Work

Completion of the works can occur in three instances as follows:

- practical completion;
- sectional completion (if applicable) or partial possession;
- Completion of making good defects.

Read more on the Course: Construction Planning and Scheduling (CoTMM3211)

4.5.6. Final Payment

The typical contract documentation needed to wrap up the job includes (Jackson 2004) :

- As-built drawings
- Operation and maintenance manuals
- Product and equipment warranties
- Test reports
- Surplus materials
- Permits

4.5.7. Fluctuations

Fluctuations amounts are recoverable until the date of actual completion, which is, including the period after the date by which the contract should have been completed. Fluctuations should be calculated up to the date of actual completion; such calculations should be made on the basis of the changes in costs and prices occurring up to, but not after, the Completion Date (Joint Contracts Tribunal 2017).

According to Ethiopian Procurement directive price adjustments are allowed in respect of works contracts, after 12 months from the effective date of such contracts and in respect of procurement made under a ***framework contract***, after 3 months from effective date of such contract. Where it is verified that, in respect of works contracts, the performance of the contract requires more than 18 months, and in respect of a framework contract, where the performance of the contract requires more than 6 months (Ministry of Finance and Economic Development 2010).

Retention: The fluctuations amounts calculated are subject to retention deductions. The reason for this is that what the formula method really does is to effect an updating of the rates and prices in the contract bills. The original rates and prices when included in valuations are subject to retention and it is logical, therefore, that the updated ones should be also.

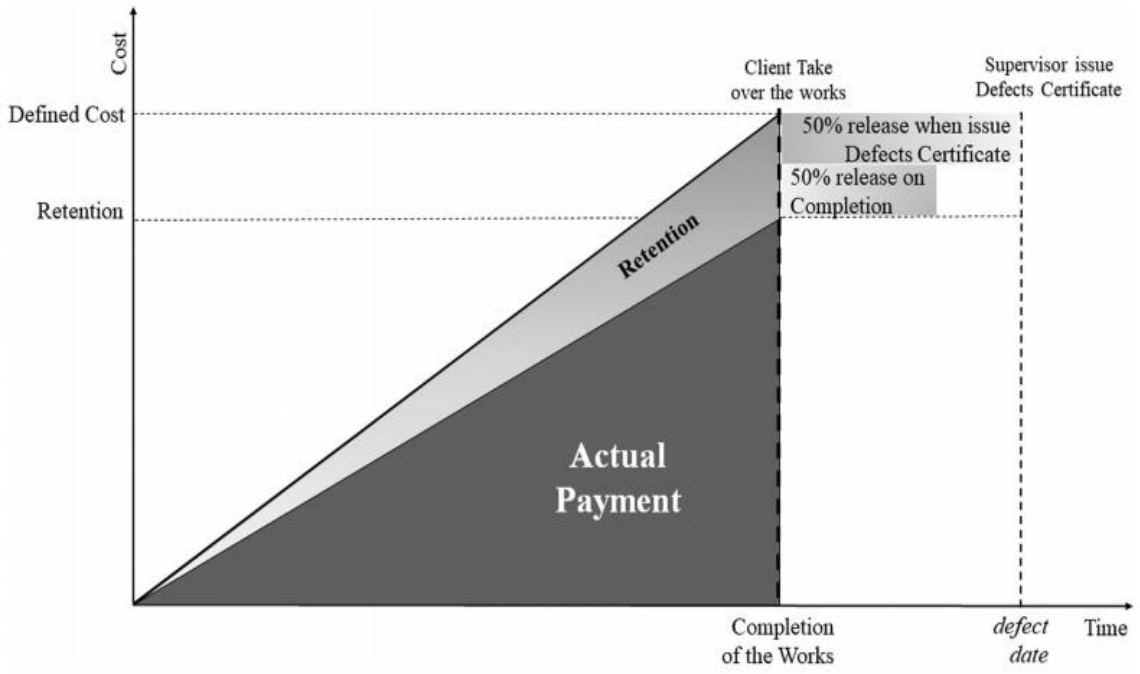


Figure 36: NEC Retention

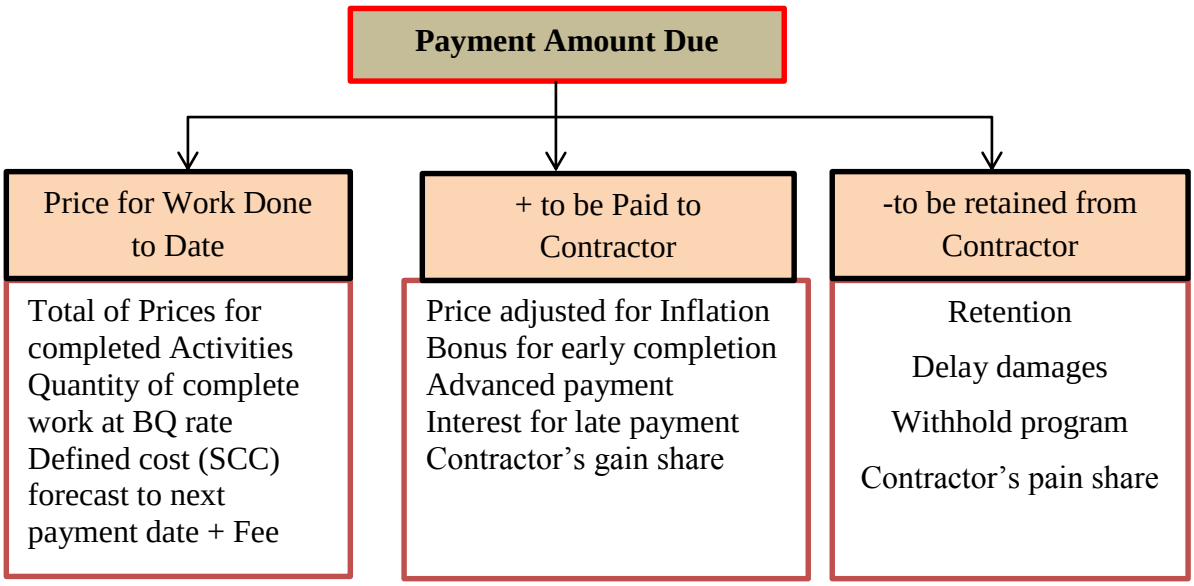


Figure 37: Payment component under NEC4 contract (Source: Tan 2020)

4.6. Contract Change Management

4.6.1. Introduction

Construction contract changes are defined as any modification, addition, or deletion directed by the Owner and authorized in the contract documents. Extras cover additional work directed by the Owner but not within the original scope of work. Either may disrupt a Contractor's plan for the work, and because it is rare for a construction contract to be completed without a single change, this issue requires close attention to prevent disputes (Phillips 2009).

Change management is the process by which changes to the project scope, deliverables, timescales or resources are formally requested, evaluated and approved prior to implementation. A core aspect of the project manager's role is to manage change within the project. This is achieved by understanding the business and system drivers requiring the change, identifying the costs and benefits of adopting the change, and formulating a structured plan for implementing the change (Westland, The Project Management Life Cycle 2006).

4.6.2. Types of Changes

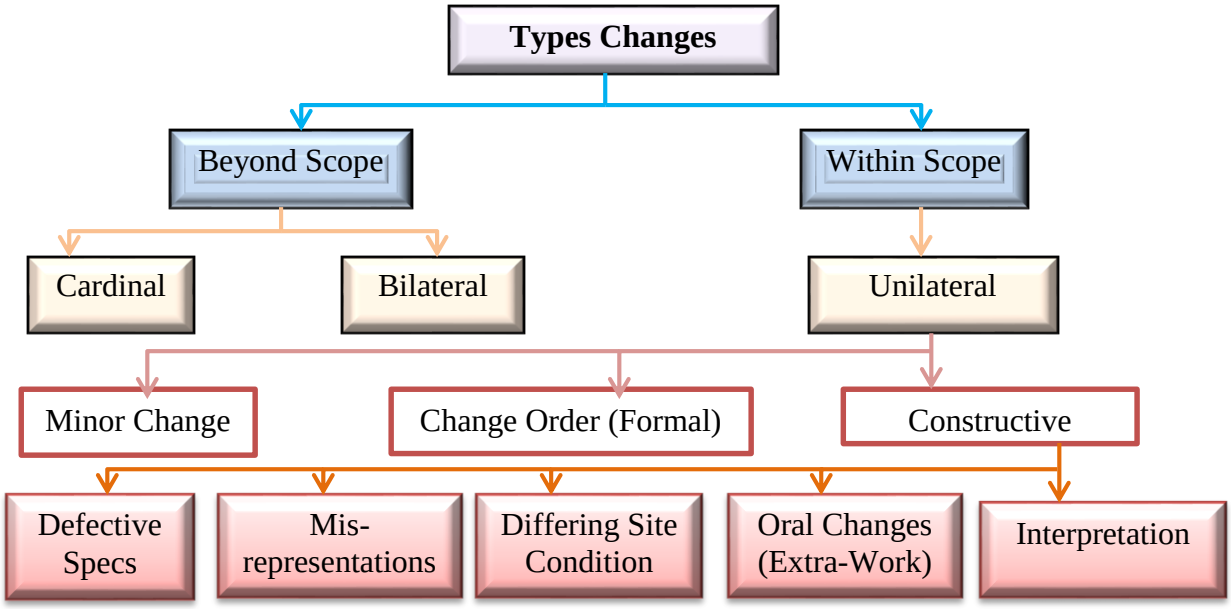


Figure 38:Types of Changes (Source: Jr. 2007)

Within scope changes (i.e., for conflicts of existing documents) or out-of-scope changes (i.e., adding more space to the project); thus, depending on the complexity of the project a change order contingency of between 3 and 10% should be considered (Eschemuller 2009).

Formal changes are those directed by an Owner using authorization written in the contract documents. The change order proposal only covers the direct cost of the change. ***Constructive changes*** refer to those not initially documented as a change. An example would concern the "hold" on a portion of a contract drawing awaiting new instructions or material. A "hold" that is not resolved before it delays the Contractor's work plan may end up requiring a formal contract change. ***Cardinal changes*** are those that propose major alterations outside the original scope of work and often require that the entire contract be renegotiated.

The AIA in their General Conditions contract identifies three basic types of change orders: (1) a formal change order signed by both owner and contractor; (2) a construction change directive (CCD) signed only by the owner, with the contractor's signature not required; and (3) field orders signed by the architect for minor changes in the work (Levy 2018).

Contractors bidding for construction contracts study and analyze the Owner's bid package documents to develop their plan of what work must be done and how they would do it. Detailed plans, schedules, and estimates of time and cost are then made for each element or task. These are assembled to establish a proposed work schedule and bid price. Any change or extra proposed by the Owner after contract award may disrupt the planned and orderly progress of work and must be fully evaluated by Owner and Contractor to establish a fair evaluation of the schedule and cost. Possible "ripple effects" on other tasks resulting from changes or extras must also be considered (Phillips 2009).

Minor changes are changes that can be ordered by the owner or owner's representative and do not affect the time or cost of the project.

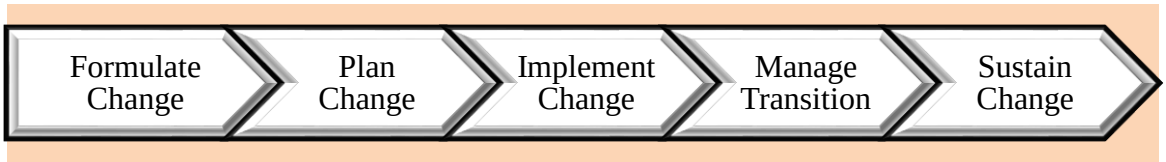


Figure 39: The five Stages of Project level change management process (Source: Phillips 2009)

The tools and techniques used in PRINCE2 change management include: change control approach, configuration item record, product status account, daily log, issue register, and issue report (Tan 2020).

Change management can be classified as elective and required change. The required change comes as the result of an unforeseen even. The elective change is a choice and may emerge from the need to do things better. This may be as a result of a VM or RM exercise or as the result of changing circumstances such as market forces (Fewings 2005).

There are a number of reasons for the introduction of changes on building works including: inadequate briefing from the client, inconsistent and late instructions from the client, incomplete design, lack of meticulous planning at the design stage, lack of coordination of specialist design work and late clarification of complex details (Potts, Construction Cost Management Learning from case studies 2008).

Changes are also the leading cause of cost overruns and delays. The project manager must have tough control of changes that affect the project's scope, time, and costs (Ottosson 2013)

Integrated change control is the process necessary for controlling factors that create changes to make sure those changes are beneficial, determining whether a change has occurred, and managing the approved changes, including when they occur (The Project Management Institute 2004).

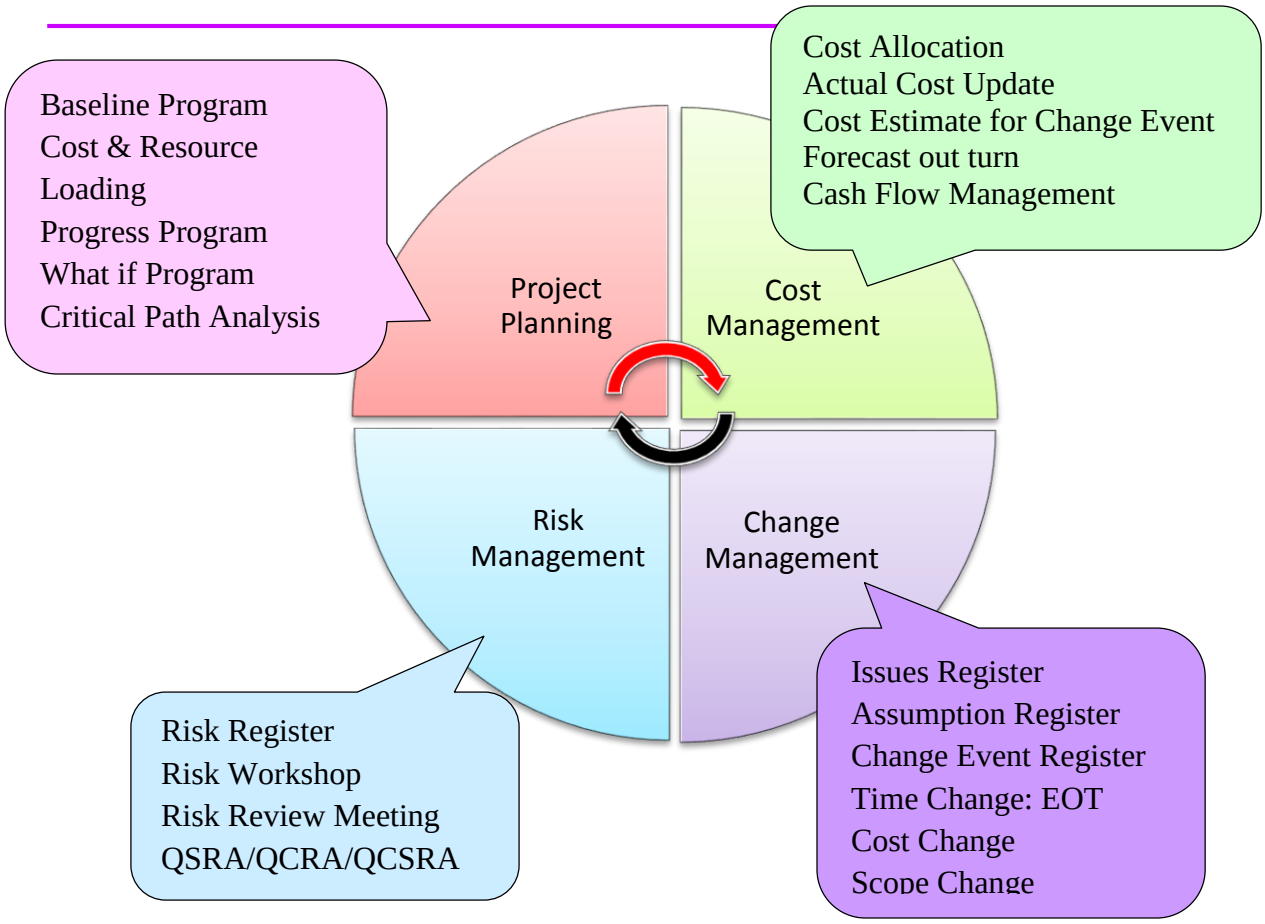


Figure 40: Integrated project control: key components and responsibilities (Source: Tan 2020)

Table 22: Integrated Change Control: Inputs, Tools & Techniques, and Outputs (The Project Management Institute 2004)

Input ⇨	**Tools & Techniques**	⇨ **Outputs**
✓ Project Management Plan ✓ Requested Changes ✓ Work Performance Information ✓ Preventive Actions } Recommended ✓ Corrective Actions } Recommended ✓ Defect Repair ✓ Deliverables	✓ Project Management Methodology ✓ Project Management Information System ✓ Expert Judgment	✓ Approved Change Requests ✓ Rejected Change Requests ✓ Project Management Plan (Updates) ✓ Project Scope Statement (Updates) ✓ Approved Corrective Actions ✓ Approved Preventive Actions ✓ Approved Defect Repair ✓ Validated Defect Repair

4.6.3. Variation

Variations are defined as changes in (Goldfayl 2004):

- the scope of the works
- changes in the levels, lines, positions or dimensions of any part of the work (increases or decreases in or omissions from the work) under the Contract
- the materials, workmanship or quality of any part of the works
- details of the works; or
- the order of precedence of the contract documents.

Variations may be valued in any one of four ways (Goldfayl 2004):

- by agreement
- at contract rates, bill of quantities rates, or schedule rates
- as day-work
- at reasonable rates.

4.6.4. Delay

Delay means to make something happen later than expected; to cause something to be performed later than planned, or to not act timely. There are four basic ways to categorize delays (Trauner 2009):

- Critical or Noncritical
- Excusable or Non-excusable
- Compensable or Non-Compensable
- Concurrent or Non-Concurrent

The principal dimension measured by schedules is delay. Delay is a very problematic area, because owners have tighter budgets and contractors staying on a job longer than planned incur real costs. There are no winners in delay because losers are attempting to mitigate their losses (Plotnick 2006).

Table 23: Delay for private, public owner and contractor

Private Owner	**Public Owner**	**Contractor**
a loss of revenues through the resulting lack of production facilities and rentable space, as well as through a continuing dependence on present Facilities	A building or facility is not available for use at the proper time. The service revenues lost through delay can never be recovered.	Higher overhead costs resulting from the longer construction period, higher prices for materials due to inflation, and escalation costs due to labor cost increases.

Contractors may be delayed in completing the contractual obligations by Owner negligence, voluntary acts or omissions, changes in the Work, or events not otherwise avoidable, when using accepted industrial practices, and over which the Contractor has no control. Additional compensation for those actual direct field cost excesses for such delays with no allowance for profit shall be considered by the Owner. Other delays, including but not limited to, floods, fire, explosions, earthquakes, extraordinary weather, or other Acts of God (Force Majeure), strikes, or labor problems shall be considered for time extensions.

Delay claims for compensation or for time extensions shall be provided to the Owner's Site Manager for consideration, in writing, within forty-eight (48) hours of start of such delay, together with all supporting evidence, and a revised Construction Schedule (Plotnick 2006).

1. Excusable delays. Acts of God (Force Majeure), war, fire, floods, and other abnormal events which neither Owner nor Contractor can prevent by exercising due diligence. Such delays do not qualify for added compensation; but time extensions may be given to complete the contract on submittal of acceptable supporting data.

2. Compensable delays. Delays caused by Owner changes, neglect, or failure to cooperate (Time extension + monetary compensation). Contractors must provide supporting data promptly.

3. Unacceptable delays (unexcused delay). Included are events causing delays over which the Contractor does have control, such as late delivery of Contractor-supplied material or failure to supply an adequate number of employees as needed to do the work. No time extensions or added compensation would be allowed for these delays.

Notification of Delays - Extension of Time

Delays may be caused by the contractor, or by the principal, or by some other means. The last are frequently called 'neutral delays' or 'delays caused by neutral events'. Examples of delays caused by the contractor are:

Table 24: Delays caused by the contractor, principal and neutral

Contractor	Principal	Neutral Events
– financial problems – poor management – job-related industrial disputes – late subcontract letting – materials-handling delays – subcontract problems – poor management of resources	– unavailability of site – late instructions – variation orders – late approvals – design changes – Consultant-related problems	– Weather – industry-wide strikes – latent conditions – acts, regulations – statutory and other bodies – Suppliers of materials

There are four general categories of responsibility to analyze delay:

1. Owner (or owner's agents) is responsible.
2. Contractor or subcontractors are responsible.
3. Neither contractual party is responsible.
4. Both contractual parties are responsible.

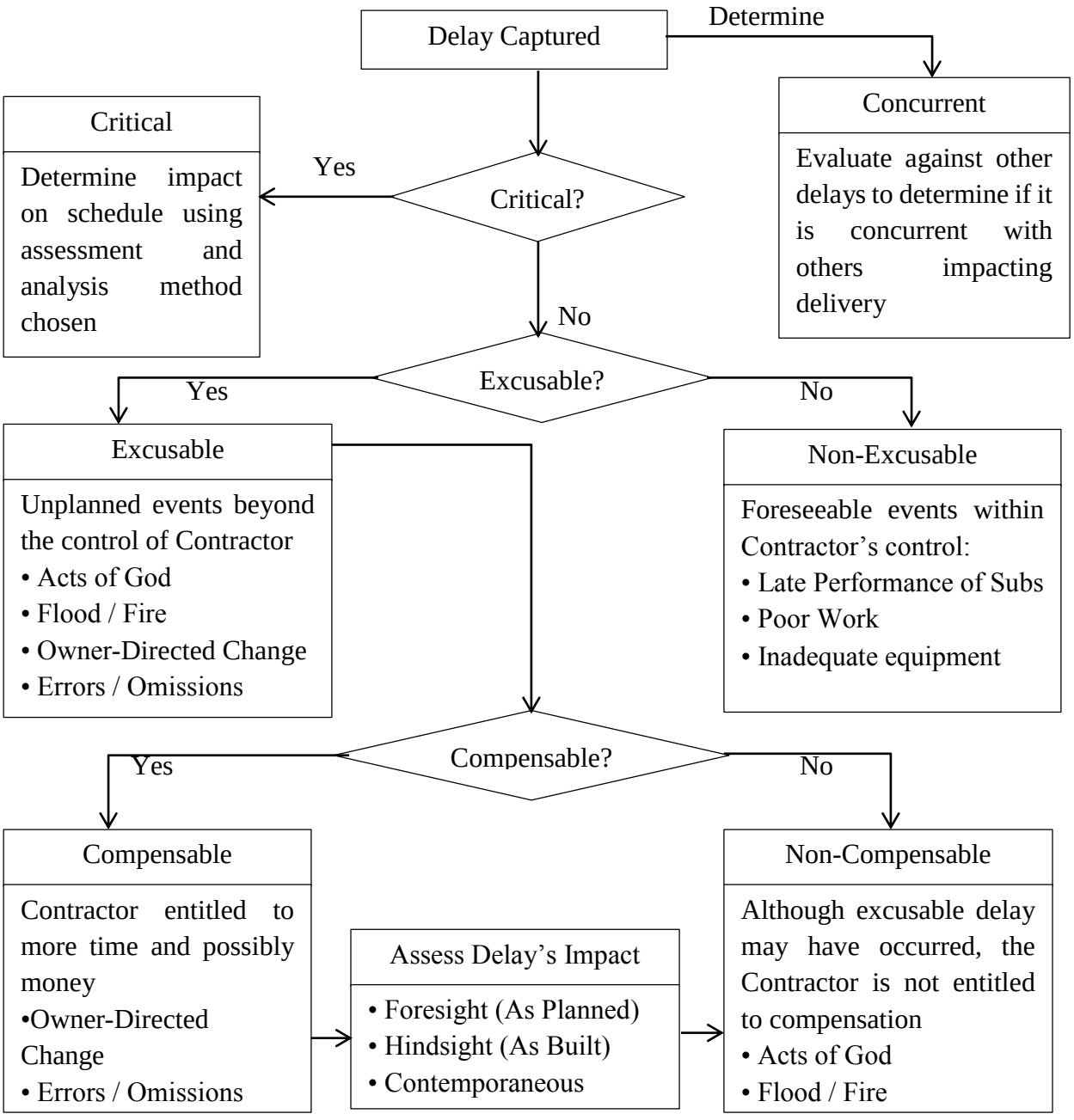


Figure 41: Delay Categorization (Source: Construction Delays Efficiency Notes – Project Controls Series. Also Available on: www.industrialaudit.com/efficiency-notes 2016)

Delays are typically captured and reported on a delay log. Below is an example:

#	Description	Start	Cause	End	Excusable	Critical?	Resp.
001	Waiting on permit	9/1/2015 2:00 PM	Owner Rep Not Available	9/1/2015 4:00 PM	Yes	Yes	Owner

4.6.5. Liquidated Damages

There are two major categories of monetary damages:

Compensatory damages are meant to put the victim in the same monetary position as though the violation had not occurred. The purpose with punitive damages is to punish the breaching party, not to compensate. Contracts are normally limited to compensatory damages.

Liquidated damages allow for compensation for damage where the sums are agreed on in advance. Late deliveries are often connected with liquidated damages.

Liquidated Damages is the sum a party to a contract agrees to pay if he breaks some promise, and which, having been arrived at by a good faith effort to estimate in advance the actual damage that will probably ensue from the breach is legally recoverable as agreed damages if breach occurs (Jr. 2007).

The liability of the contractor/supplier for delay in performing his/its obligation under the contract shall be as follows (Ministry of Finance and Economic Development 2010):-

a) He/it shall pay a penalty of 0.1% or 1/1000 of the value of undelivered item for each day of delay,

b) The cumulative penalty to be paid by the contractor/supplier shall not exceed 10% of the contract price.

c) If the delay in performing the contract affects its activities, the Public Body may terminate the contract by giving advance notice to the contractor/supplier, without any obligation to wait until the penalty reaches 10% of the value of the contract.

The rate of liquidated damages (LD) stated in the contract particulars has to be proportionally revised as follows (Statham 2016):

$$\text{Revised LD} = \frac{\text{Original LD} \times (\text{Contract sum} - \text{Value of Relevant Part in Contract sum})}{\text{Contract Sum}} \text{ ---------Eqn.20}$$

An owner should consider the following items when preparing an estimated delay damages (Trauner, Construction Delays Understanding Them Clearly Analyzing Them Correctly 2009)

- Cost for project inspection
- Cost for continued design service
- Cost for the owners' staff
- Cost for maintaining the current facilities
- Cost for additional Rentals
- Cost for additional Storage
- Lost revenue
- Cost to public for not having the facilities
- Additional moving expense
- Escalation costs
- Financing costs

A contractor should consider the following items when preparing an estimated delay damages (Trauner, Construction Delays Understanding Them Clearly Analyzing Them Correctly 2009)

- Extended field costs
- Idle labor
- Escalation of labor cost
- Equipment costs
- Material costs
- Storage costs

Other Delay Costs (Trauner, Construction Delays Understanding Them Clearly Analyzing Them Correctly 2009)

- Temporary utility facility costs
- Extended warranties
- Maintaining and protecting work during delays
- Inefficiencies
- Increased bond costs

Formula for calculating the delay for which a contractor is liable after an extension of time.

	actual period of time taken to complete work
minus:	contract time or period for completion
	= delay in completion
minus:	allowable period for circumstances beyond contractor's control
	= delay for which contractor is liable

4.6.6. Claims

Where it appears to the contractor that he is entitled to be paid some additional money in respect of additional costs incurred by him, he should set out the facts giving rise to the claim, identify the clause of the contract entitling him to payment, and calculate the amount of the claim, including where appropriate allowances for on costs and for profit. In general such a claim should be lodged as soon as possible after the events from which it originates but, where necessary, information should be given piecemeal, as it becomes available (A.Stephenson 2009).

Claim may be inside the contract (Express terms and Implied terms) or outside the contract (claim under tort, misrepresentation, frustration and relevant statues).

There are three types of Contractor's claim under the contract provisions, namely claims for extension of time, claims for additional cost, or claim for both additional time and cost. These claims are usually provided with the entitlement under the contract such as variations in general term, Relevant Events under JCT, compensation events under NEC, and Engineer's instruction of variation and/or Contractor's claims under FIDIC (Tan 2020).

Settling delay claims is a challenge to the parties, as claims management requires (1) knowledge of construction technology, construction law, (2) project-planning systems (understanding of programming techniques) (3) contractual awareness (the conditions of contract, contract administration, and the psychology of negotiation) (Potts, Construction Cost Management Learning from case studies 2008).

Claims are defined as requests for compensation (either time or money) due to, or believed to be due to, or owed by an Owner, a Contractor, or a vendor for damages or losses (Phillips 2009).

Legal requirements of claims submission

Delay analysis is necessary for two main reasons:

1. to demonstrate entitlement to extension of time and hence relief from liquidated damages;
2. to demonstrate entitlement to the costs of prolongation.

Proving the delay/ Delay Analysis

When a claim or dispute arises associated to the late completion, the delay analysis is often used to establish the damages and/or the settlement for the claim. Figure 3.6 classifies the different delay analysis methods based on their specific features.

According to the point of time, which determines the impact of the delay, the analysis can be classified as prospective analysis which is undertaken prior to the delay event occurring and retrospective analysis which is performed after the delay event. The retrospective analysis can then be classified into the observation method and the modeling method.

> *Activities are not subject to "delay" but rather to "disruption." If the disruption is to an activity that is on the current critical path of the project at the time the disruption occurs, then the project is subjected to a delay. Delay analysis for large project takes a long time. Using software makes it easy. This software includes Computer-Aided Schedule Evaluation (CASE), Primavera, Ms-Project, Claim Digger, Excel, etc. (Trauner 2009) and (Plotnick 2006).*

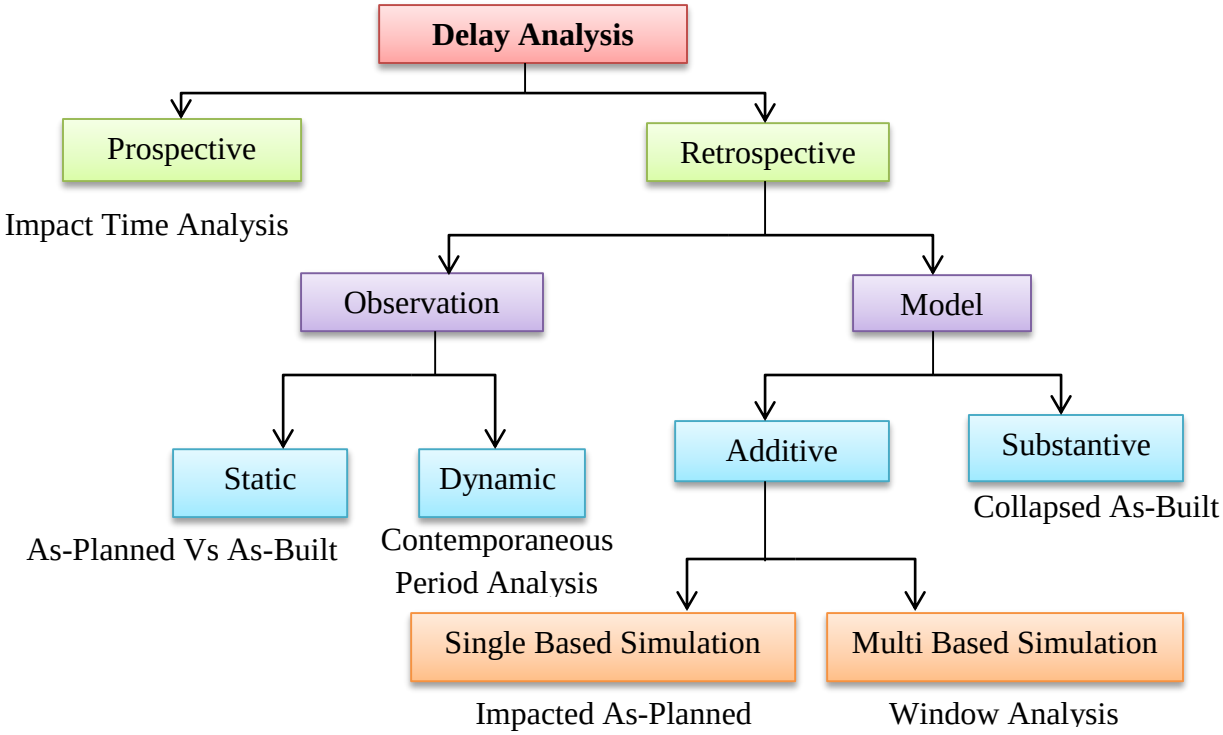


Figure 42: Delay analysis methods *(Source: Plotnick 2006)*

There are basically four commonly used techniques in order to prove the entitlement to a delay, as cited by (Phillips 2009) and (Tan 2020)

1. **As planned versus As-built (Effect = > Cause):** This is the most simplistic technique, which involves comparing the planned sequence and timing of the project with the actual sequence and timing. It does not require a critical path program or separate the events or make any allowance for the contractor's inefficiency.

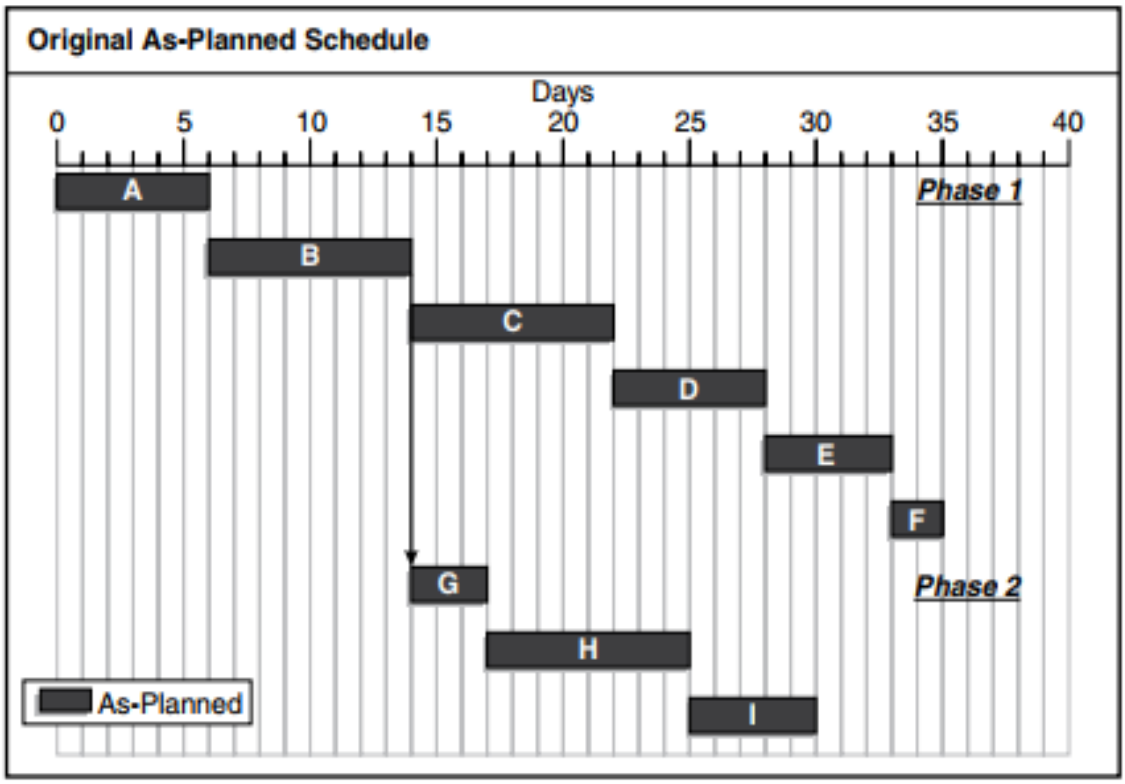


Figure 43: As Planned Schedule (Source: Trauner, Construction Delays Understanding them clearly, Analyzing them Correctly 2009)

2. **As planned impacted (Cause = > Effect):** This technique takes the contractor's initial planned program then adds the delays for which the employer is responsible. In theory the contractor should be entitled to an extension of time for their effect and will themselves be responsible for the difference between the impacted finish date and the actual finish date. This approach is highly theoretical and may bear no relationship to what the contractor did on site.

For more practical examples please refer

Braimah, Nuhu. 2013. "Construction Delay Analysis Techniques - A Review of Application Issues and Improvement Needs." Buildings 506-531. Also Available on: www.mdpi.com/journal/buildings/.

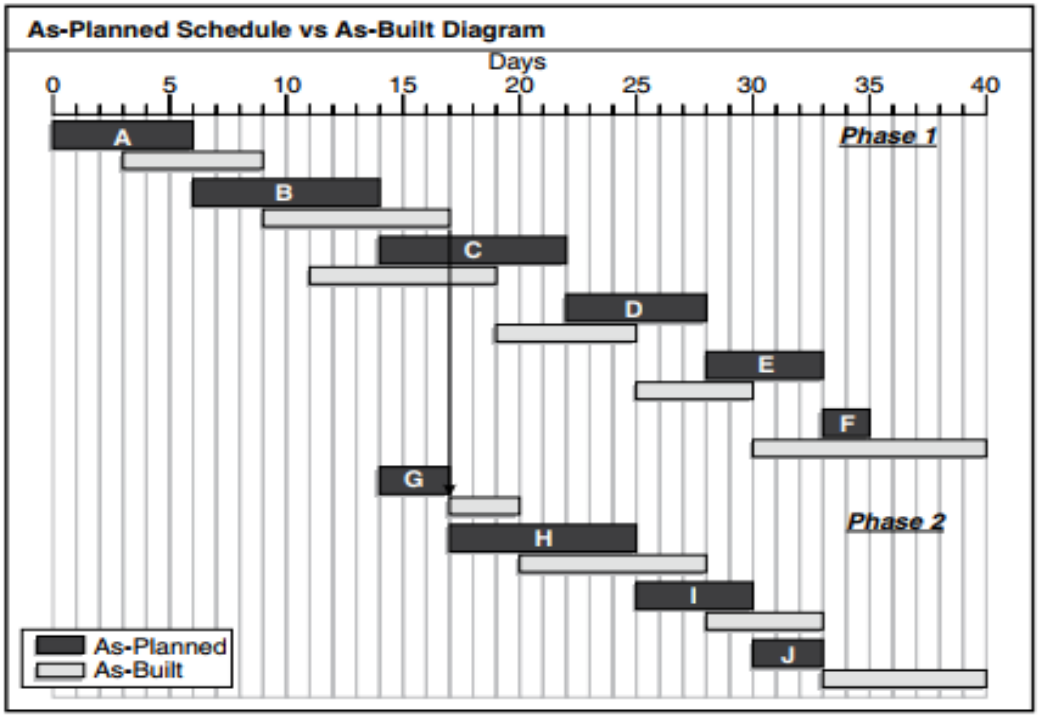
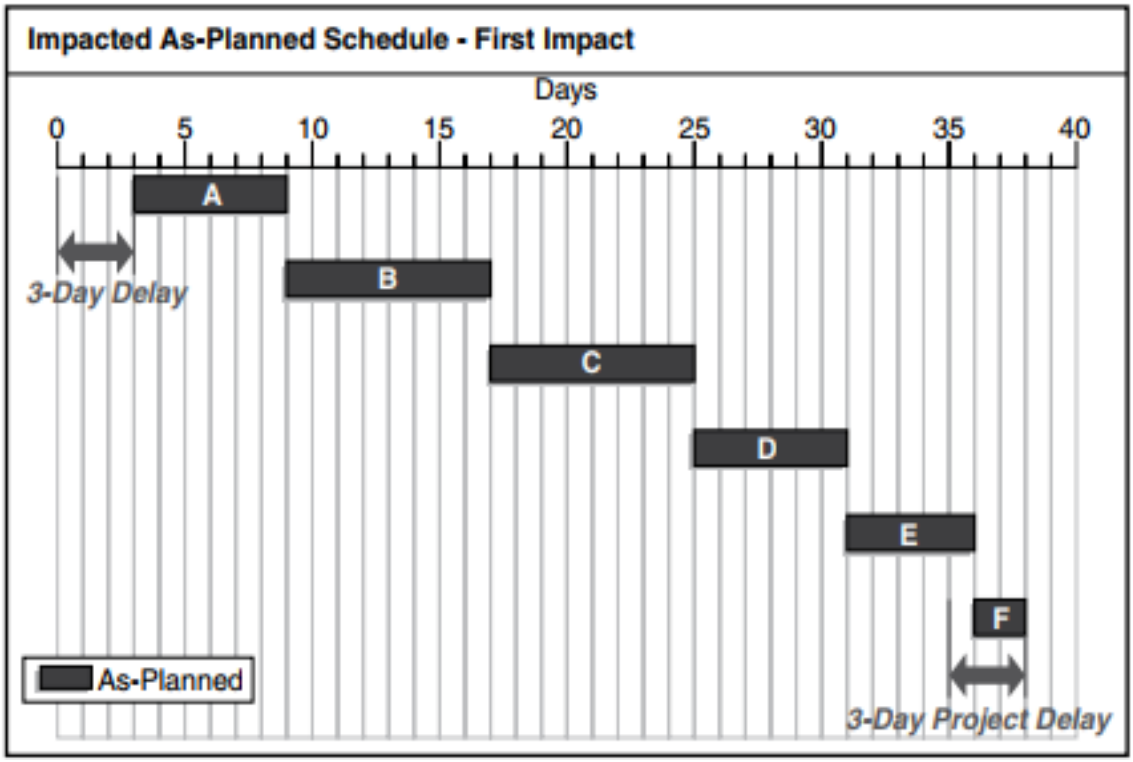
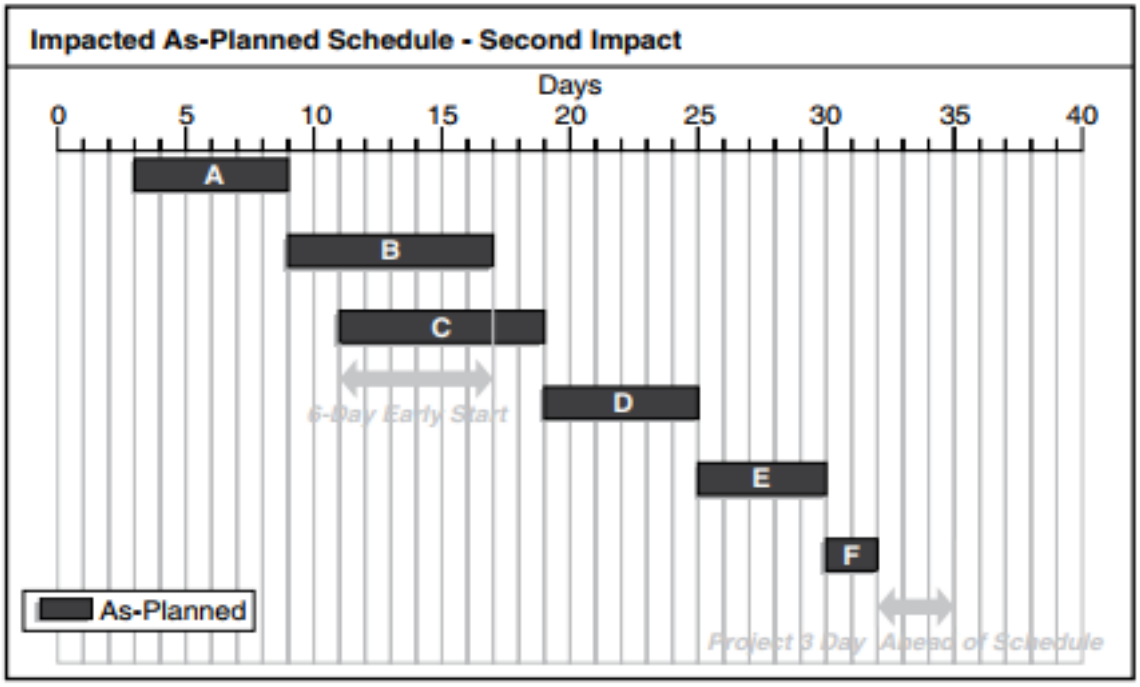


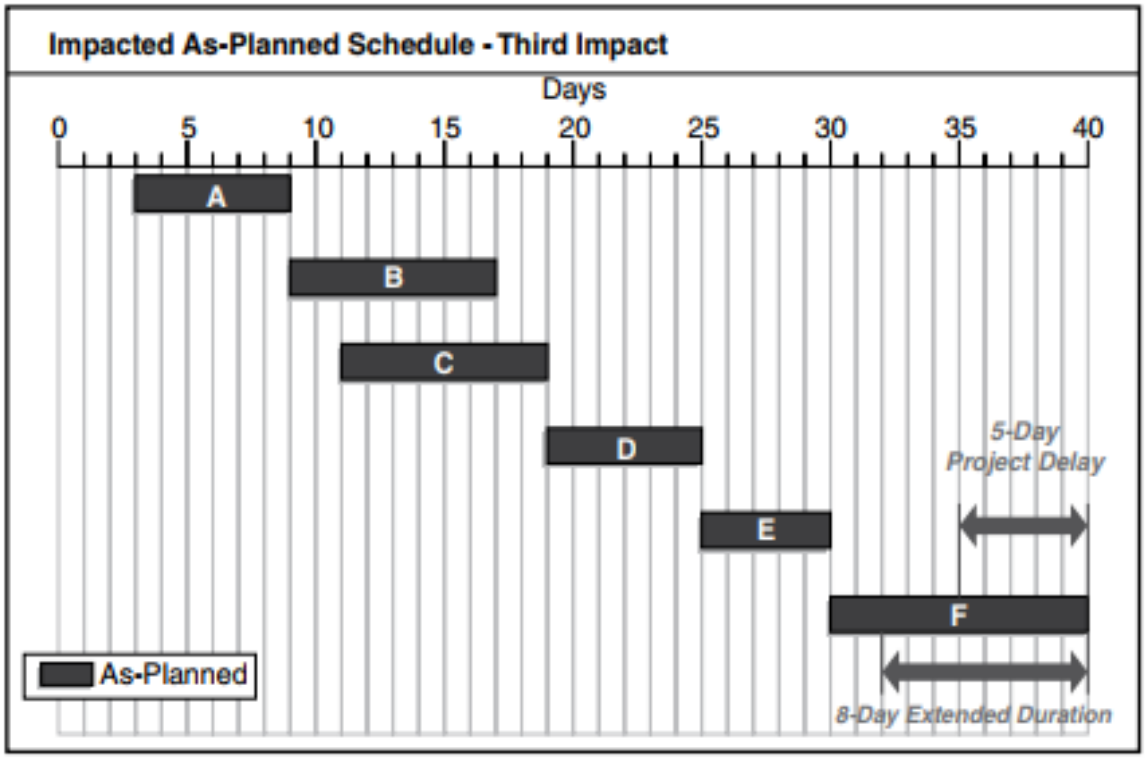
Figure 44: As-Planned vs. As-Built Analysis (Source: Trauner, Construction Delays Understanding them clearly, Analyzing them Correctly 2009)



Project delayed by three days because of the late start of activity A



Project ahead of Schedule by three days because of the early start of Activity C



Project delayed a total of five days due to the extended duration of activity F

Figure 45: Impacted As-Planned Analysis (Source: Trauner, Construction Delays Understanding them clearly, Analyzing them Correctly 2009)

3. **Time-impact or 'time slices' or 'snapshot' analysis (Cause = > Effect):** This technique takes a snapshot looking at the effect of the delay on the planned program at the time the event occurs. The planned program obviously needs to take account of the progress at the time the delay occurs, with the effects of the events then plotted on an updated planned program. The disadvantage of this approach is that the snapshot approach may not embrace significant factors occurring between the snapshots.

4. As built but for analysis (Effect = > Cause): This approach involves identifying the actual sequence of the works. Events that are the employer's risk under the contract are identified and extracted from the as-built program to show how long the work would have taken but for the events at the employer's risk.

The Assessment of Damages Payable to the Contractor and Due to Matters Affecting Regular Progress

The loss and/or expense, to be recoverable, must have been a direct consequence of the matter(s) referred to in the claim without there having been any intervening cause. Thus, if the Employer fails to provide materials for the Works which he has agreed to provide and the contractor is asked to obtain them, then the contractor is entitled to recover the expense incurred in so doing, as well as the loss due to delay in obtaining them.

Home Office Overhead (HOO)

When claiming costs associated with delays, the indirect cost of home office overhead should also be considered. Heads of claim may be any or all of the following during the stipulated and extended period (Tan 2020):

(i). insufficient use of labor and/or plant;
(ii). increases in cost of labor, materials etc. during the period of disruption;
(iii). site running costs;
(iv). head office overheads;
(v). finance charges and interest;
(vi). loss of profit

Because of the complexity of trying to sort out overhead costs, a formula is often used as a means of evaluation. Three in common use are Hudson's, Emden's and the Eichleay formula (Gibson 2008). *And please refer the book by Roger Ginson "Construction Delay Extensions of time and prolongation claims (2008)" for worked out examples.*

The Hudson formula

It uses the percentage allowance made by the contractor in his original contract sum for head office overheads and profit as the basis for the loss of contribution to overheads.

Weekly Rate Recoverable =

$$\frac{\text{HO Overhead per Profit \%}}{100} \text{ x } \frac{\text{Contract Price}}{\text{Contract Period (weeks)}} \text{ x Period of Delay (Weeks)} \text{ -----Eqn.21}$$

Emden's formula

It involves a two-stage calculation that applies the percentage that the contractor's total overheads and profit bear to the total revenue of the company. The second stage applies this percentage to the contract price, contract period and the period of delay to determine the weekly cost recoverable (Tan 2020).

Stage 1

$$\frac{\text{Company Overhead Cost / Profit}}{\text{Company Revenue}} = \text{Z\% ----------Eqn.22}$$

Stage 2

Weekly Rate Recoverable =

$$\frac{\text{Z \%}}{100} \text{ x } \frac{\text{Contract Price}}{\text{Contract Period (weeks)}} \text{ x Period of delay (weeks)} \text{ ----------Eqn. 23}$$

The Eichleay formula

It uses this proportion to compute an amount of overhead cost per week or per month and applies this to the period of delay. The Eichleay formula is a three-stage calculation shown below:

Stage 1

Allocable Overhead Cost /Profit=

$$\frac{\text{Total Value of Project (incl.Variation)}}{\text{Company Revenue for Contract Period}} \text{ x Company Overhead Cost / Profit --------Eqn. 24}$$

Stage 2

$$\text{Weekly Rate Recoverable} = \frac{\text{The Allocable Overhead for the Project}}{\text{Actual Project Period,incl.Delay (weeks)}} \text{---------Eqn.25}$$

Stage 3

Head office's overhead costs= Weekly rate recoverable x Period of delay (weekly) ----eqn.26

Termination: The amount payable to or payable by the Contractor, D, is to be calculated as follows:

$$D = a_0 + a_1 + a_2 - A \text{ ----------Eqn.27}$$

where: a_0 = total amount paid or otherwise discharged to the Contractor before the termination; a_1 = the amount of expenses properly incurred by the Employer in completing the Works; a_2 = direct loss and/or damage caused to the Employer and for which the Contractor is liable; A = total amount that would have been payable to the Contractor if he had completed the Works in accordance with the Contract. Where the Works are abandoned after termination by the Employer for Contractor's default, insolvency or corruption. The amount payable to or payable by the Contractor, D, is to be calculated as follows:

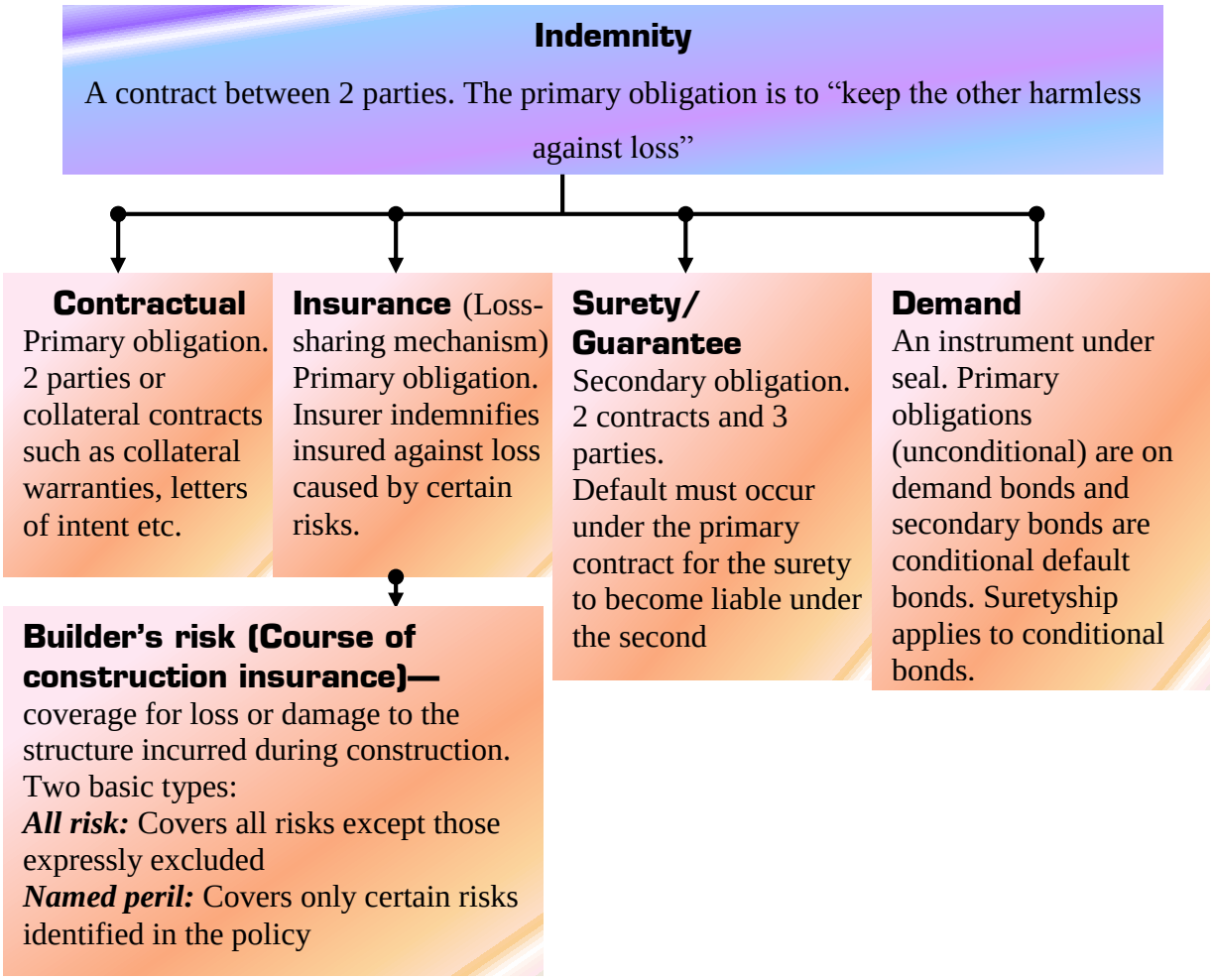
$$D = a_0 + a_2 + a_4 - a_3 \text{ ----------Eqn.28}$$

where: a_0 = total amount paid or otherwise discharged to the Contractor before the termination; a_2 = direct loss and/or damage caused to the Employer and for which the Contractor is liable; a_3 = the total value of work executed by the Contractor before termination plus any other amount due to the Contractor under the Contract; a_4 = the amount of expenses properly incurred by the Employer before the abandonment as a result of the termination. If D is positive the amount is to be paid by the Contractor. However, if it is negative it has to be paid to the Contractor.

Discussion Point: What Triggers Delays and Claims?

Chapter-5. Contract Securities

5.1. Introduction



5.2. Insurance

The risks of damage and injury associated with construction projects are often high. Insurance provision is therefore an essential requirement in construction contracts to protect the interests of those involved. It is, without question, necessary for those engaged in advising clients and administering contracts to have a basic knowledge of the principles of indemnity and insurance, together with an understanding of the provisions and operation of the associated clauses in standard forms of building contract.

1) Clients are informed about the responsibilities for insuring risks under a contract, thus enabling them to comply with any obligations imposed upon them by the contract conditions and to arrange additional cover where necessary.
2) The most suitable insurance clauses for individual projects are used and an adequate level of financial cover is stipulated within contract conditions.
3) The insurance policies put in place for a contract comply with the requirements for insurance cover in the contract conditions.
4) The correct procedures are adopted in the event of an insurance claim associated with loss or damage.

5.2.1. Principles of Insurance

There are two basic types of insurance

1) Liability insurance, providing financial cover for legal liabilities owed to others.
2) Loss insurance, providing cover for losses, which fall directly on the insured parties.

A contract of insurance is a legal contract, and therefore the general criteria relating to the existence of a contract pertain. To take out insurance cover, a person or organization must have an insurable interest. The principle of utmost good faith requires the insured to disclose to the insurers all material information in respect of the risks being insured. The principle of indemnity means that insurance will put the insured back into the position they would have been in, had the risk not occurred (i.e., no loss and no gain). Subrogation is the insurers' right to pursue claims that the insured may have against third parties in respect of the insurers' indemnification (Jack Ramus 2006).

Workers' compensation insurance

Premiums are established using the following formula (Levy 2018):

WCIP = EMR × manual rate × payroll units----------Eqn.29

WCIP stands for workers' compensation insurance premiums

EMR is experience modification risk, the multiplier determined by the previous work experience of the contractor, which is used to forecast future benefit payments to employees who have filed claims.

Manual rate is the rate structure assigned to each type of work performed. Various trade crafts are classified into "families" based on their potential exposure to injury.

Payroll units are a number determined by dividing the contractor's annual direct labor costs by 100. A poor accident record can increase workers' compensation insurance premiums to the point where the company's overhead must be increased to compensate for these costs, making them less than competitive on hard-bid projects.

Indemnity

"An agreement by one person to keep the other entirely protected or immune against the kinds of liabilities set out in the document".

Indemnities are frequently encountered in their most simplistic form in primary contractual obligations, but also in on demand bonds, demand guarantees, documentary bonds, standby letters of credit, contracts of suretyship and insurance contracts. These latter two categories, of suretyship and of insurance are contracts of indemnity but with more refined or special characteristics. They are, therefore, a branch of indemnity

Indemnity is provided by a contractor only with regard to injury or damage to property due to negligence, breach of statutory duty, omission or default on the part of the contractor (or those for whom that contractor is responsible).

The situation could arise, however, whereby property is damaged as a consequence of construction work but not as a result of negligence, etc., on the part of the contractor. An Employer could be held liable for such damage. If insurance is required, the architect must instruct the contractor to take out a Joint Names Policy for the amount of indemnity stated in the Contract Particulars. The policy is required to indemnify the Employer (although it is in joint names) for any expense, liability, loss, claim or proceedings against the Employer resulting from injury or damage to property (excluding the Works and materials on site)

'caused by collapse, subsidence, heave, vibration, weakening or removal of support or lowering of ground water' as a result of the construction work.

The following items are specifically excluded from the above insurance – injury or damage, which is either

a. a contractor's liability; or
b. caused by design error; or
c. an inevitable consequence of the construction work; or
d. is the responsibility of the Employer to insure under clause Insurance (i.e., damage caused by Specified Perils to existing structures); or
e. to the Works and site materials, except where a practical or sectional completion certificate has been issued; or
f. arising from war, invasion, act of enemy hostility, civil war; or
g. arising from Excepted Risks; or
h. arising directly or indirectly from pollution or contamination, with some exceptions; or
i. the result of any costs being incurred by the Employer by way of damages for breach of contract, except where such costs would still have arisen in the absence of any contract.

The cost of this insurance should be added to the Contract Sum. The insurers used by a contractor to provide the cover required by this clause must be approved by the Employer. Policies and premium receipts are to be sent by the contractor to the architect for depositing with the Employer.

Insurance of the Works

The general obligation is that All Risks insurance must be provided, giving cover for physical loss or damage to work executed and site materials (but with some exclusions).

The policy of insurance of the Works must be in joint names to ensure that protection is provided to the parties against subrogation. The all risks policy is to make provision for sub-contractors but only to the extent of the Specified Perils element of the policy. Sub-

contractors will have to arrange their own insurance for loss or damage caused other than by Specified Perils.

All Risks insurance must be maintained up to the date of issue of the certificate of Practical Completion or the date of termination of the employment of the contractor, whichever is the earlier. It is essential at this point to ensure that clients are aware of the date on which insurance of the Works ceases to enable them to arrange insurance cover for the buildings to take effect on the cessation of the Works insurance.

Insurance Option A- All Risks insurance of the Works by the contractor – New buildings

Used for projects involving the construction of new buildings and in situations where the Employer does not have (or does not wish to arrange) insurance cover for the work in progress.

The Contract Particulars are to state what percentage is required to cover professional fees associated with the reinstatement of the Works, if this is left blank then a figure of 15% is to apply and the insurance cover should include this percentage. The policy must be maintained until the earlier of either

I. the date of issue of the certificate of Practical Completion; or
II. the date of termination of the employment of the contractor.

There are two alternative ways that cover may be provided by the contractor, either:

(i) a bespoke policy for the project, placed with insurers approved by the Employer. The contractor is required to send the insurance policy and premium receipts to the architect to be deposited with the Employer; or
(ii) if the contractor has an annual insurance policy which provides All Risks insurance then it may be used, provided it complies with the requirements of the contract concerning the provision of All Risks insurance. The contractor must make the policy documentation available for inspection by the Employer if requested. The renewal date of annual policies must be stated in

the Contract Particulars, thus enabling the continuity of cover to be checked by the Employer at the appropriate times.

If a contractor fails to take out or maintain insurance in accordance with the requirements of the contract, the Employer is empowered to take out Joint Names cover in respect of the default. The cost of this insurance can either be deducted by the Employer from sums owing or recovered from the contractor as a debt.

If loss or damage occurs as a result of an insured risk, the following action should be taken:

1) The contractor must give written notice to the architect and the Employer, providing details of the extent, location and nature of the loss or damage.
2) No account should be taken of the loss or damage when calculating payments due to the contractor, e.g., where a fire may have substantially damaged work carried out by the contractor the full value of the original work is to be included in any subsequent interim valuation.
3) Once the insurers have finished their inspections of the loss or damage, the contractor should restore, replace and repair as necessary and proceed with the Works. It is advisable to obtain express notice from the insurers that they have finished inspections before starting the restoration of damage.
4) The contractor must authorize the insurers to pay all sums due under the insurance claim to the Employer.
5) The contractor is paid for the reinstatement work by the Employer in installments as certified by the architect. These certificates should be issued at the normal period of interim certification. The contractor is entitled to receive the full sums received from the insurers (excluding sums for professional fees), but is not entitled to receive any sums beyond those received under the insurance for reinstatement. Therefore, any shortfall must be made good by the contractor.

Insurance Option B – All Risks insurance of the Works by the Employer– New buildings

If Insurance Option B is used, All Risks insurance is to be arranged by the Employer in ***Joint Names***. The clause requires the Employer to provide documentary evidence of the insurance when reasonably required to do so by the contractor. If the Employer defaults in taking out or maintaining insurance, the contractor can take out Joint Names cover in respect of the default and the cost is added to the Contract Sum.

Payment is not therefore governed by the limit of the monies received from an insurance claim. If the insurance monies do not adequately cover the cost of repairs, etc., then the Employer is responsible for any shortfall.

Insurance Option C – Insurance of existing structures and insurance of the Works in, or extensions to, existing structures

This clause is to be used when construction involves work to an existing building (for example, refurbishment, repair, fitting out, extensions, etc.). There are two separate issues to deal with here:

1) Insurance of the existing structure and its contents.
2) Insurance of the Works

The Employer is required to arrange a Joint Names Policy in respect of the existing structure and its contents. The insurance must provide cover for the full cost of reinstatement, repair and replacement of loss or damage caused by the Specified Perils. This insurance must be maintained until either the date of issue of the certificate of Practical Completion or the date of termination of the employment of the contractor, whichever is the earlier. In the event of a claim, the contractor is required to instruct insurers to pay all sums to the Employer.

Professional indemnity insurance

Professional indemnity insurance, as its name implies, is designed to provide cover for those who provide a professional service. Such insurance is normally associated with professionals, such as architects, chartered surveyors, engineers, etc.

A professional indemnity policy will indemnify the policyholder against claims made for a breach of professional duty, i.e., failing to exercise reasonable skill and care in designing the works or in the choice of materials and components. The policy will not, in the case of a contractor, provide cover for bad workmanship or faulty materials. It is also unusual for the policy to cover a 'fitness for purpose' liability, therefore it is important for any design and build contractor to carefully examine the contract documentation to identify the level of liability imposed, i.e., fitness for purpose or reasonable skill and care.

If a contractor were to sub-let the design work to an outside professional organization, he would still be required to maintain professional indemnity insurance as he is contractually liable to the employer for the adequacy of that design. However, although the initial responsibility for the design work will rest with the contractor he may be able to pass the responsibility down the line to the professional design team, in which case it is essential that the contractor checks to ensure that the designer has adequate insurance and maintains it for as long as necessary.

Professional indemnity insurance is annually renewable and will have a monetary limit imposed upon the level of indemnity it provides. The limit may be for the aggregate of claims made during the year or for each individual claim. One of the problems with this type of insurance is that it operates on the principle of claims made. This means that it is the insurer who is currently providing cover for a professional or contractor on the date when a claim is made who will be responsible for the costs, and not the insurer who provided the cover at the time the negligent work was carried out. Therefore, although it is important for the client to know that a designer has professional indemnity insurance at the time the work is executed, it is perhaps even more important for him to know that the insurance will be maintained for perhaps a further 12 or 15 years after completion. It is

difficult for the client to enforce this requirement, although it can prove to be a very expensive mistake for any professional to ignore this requirement (Jack Ramus 2006).

5.2.2. Surety Bond and Construction

Surety ship has far reaching applications in business and commerce today, particularly in the construction industry. Surety bonds play a major role in allocating particular risks within the tangled web of parties to a construction project.

A surety bond is a guarantee against failure to perform. Construction project owners often require their prime contractors to purchase surety bonds as a means of providing themselves protection against contractor failure.

Sureties agree to indemnify the bond "obligee" (project owner) from losses it may sustain as a result of the bond "principal's" (contractor's or "obligor's") failure to perform its obligation.

The amount of the penal sum bid bond by surety is usually based on the probable range of bid prices, typically between five and fifteen percent of the amount of the contractor's bid or proposal (Openshaw 1992).

The characteristics of suretyship are (Gould 2013):

1. That there are two contracts. A contract of guarantee, and the underlying primary contract which is to be guaranteed.

2. That there are three parties. The guarantor (surety), the beneficiary (employer) and the contractor (principal). The guarantor and beneficiary are parties to the contract and the guarantee. The beneficiary and the contractor are parties to the underlying primary contract.

5.3. Warranties

Warranties can be Explicit (express), implied, or both warranties; both express and implied warranties provide legal relief for the purchaser in the event of a breach of contract. An express warranty is one in which the seller explicitly guarantees the quality of the good or

service sold. Warranties create contractual agreements between parties where they would otherwise not exist. A warranty that is spelled out in writing in a construction contract is called an explicit warranty (Friedlander 2012).

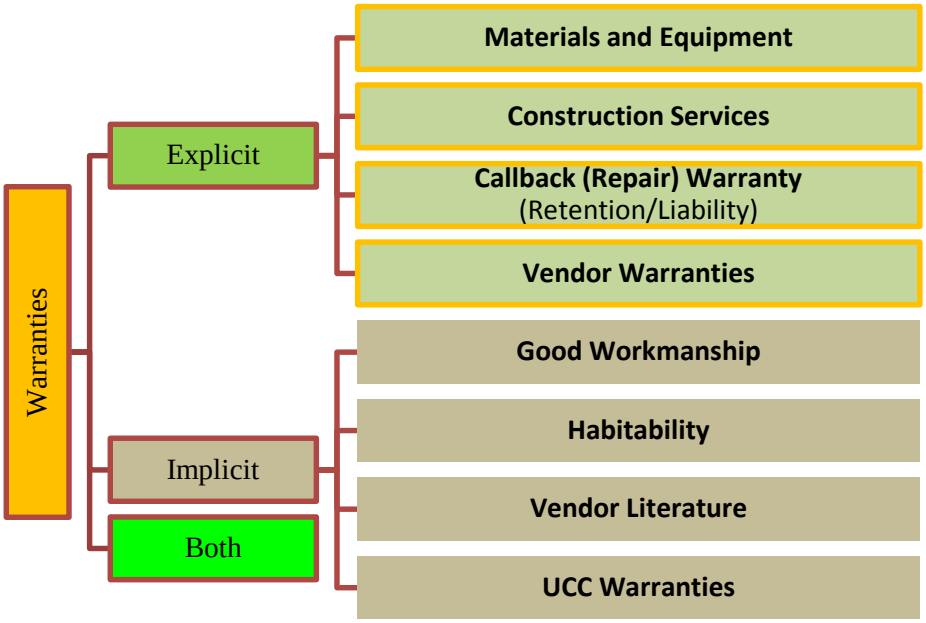


Figure 46: Types of Warranties (Source: Friedlander 2012)

5.3.1. Guarantees and Bonds

A bond is usually contained in a document given by a third party in support of the obligations of another party, containing a promise to pay money immediately or on a future date. Bonds are normally issued by banks, insurance companies or specialist surety companies. Collectively these are known as bondsmen.

Conditional bonds

Conditional bonds are sometimes referred to as “default” or “proven default" bonds and are predicated on a breach of the underlying contract by the contractor. They are conditional in the sense that there has to be sufficient proof by the employer of the default of the contractor and of damage having been suffered by the employer before the bondsman is obliged to make any payment under the bond.

On-demand bonds

On-demand bonds are commonly used in international project finance. They are usually given by banks rather than insurance companies.

The objectives of guarantees and bonds are to encourage performance and to provide financial recompense in the event of failure.

Guarantees and bonds are arrangements whereby the obligations that one party owes to another under an agreement are guaranteed by a third party. The third party, usually an insurance company or a bank, promises to pay a sum of money in the event of nonperformance. The following types of bonds and guarantees are often used on construction projects.

Situations where a bond may be particularly appropriate would include:

- to protect the interests of a 'one-off' developer;
- where a new or unproved contractor is involved in a project;
- tender bonds in respect of nominated sub-contracts;
- where a bond is thought appropriate for the risks inherent in a project.

Tender Bonds/Guarantees/Bid Bond/Bid Security

These are obtained to ensure that a successful tenderer will enter into a contract. Their value varies, but is usually somewhere between 1% and 5% of the tender sum; but in Ethiopia procurement directive, it is 0.5%-2% of the total estimated contract price and not more than Five Hundred Thousand Birr (500,000.00). One of the purposes of tender bonds/guarantees is to provide financial recompense for the costs associated with the refusal by a tenderer to honour a tender.

Bid bonds are submitted to the project owner at the time of bid submission. Payment bonds and performance bonds are usually submitted by the winning contractor prior to the start of work. They are generally referred to collectively as "contract bonds." (Openshaw 1992)

A new sub-contractor will have to be found and appointed, which may cause delays to the program resulting in liquidated damages becoming payable to an Employer and/or acceleration costs for the completion of the project. It is requested by a contractor to ensure a subcontractor's commitment to enter into

a sub-contract agreement. It may also not be possible to obtain such a competitive tender the second time around (and, probably, at short notice), and thus the project costs will increase, leading to a reduction in profit. A tender bond/guarantee may discourage withdrawal by a sub-contractor, or at least provide some financial recompense to a contractor in the event of withdrawal.

A bid bond is a form of bid security. It accompanies a bid and guarantees the bidder will either enter a contract with the project owner within a specified period of time, furnishing whatever bonds may be required by the contract, or pay for any additional costs the owner may incur in contracting with the next lowest qualified bidder. The bond's stated limit is referred to as the penal sum, and is the limit of the surety's liability under the bond.

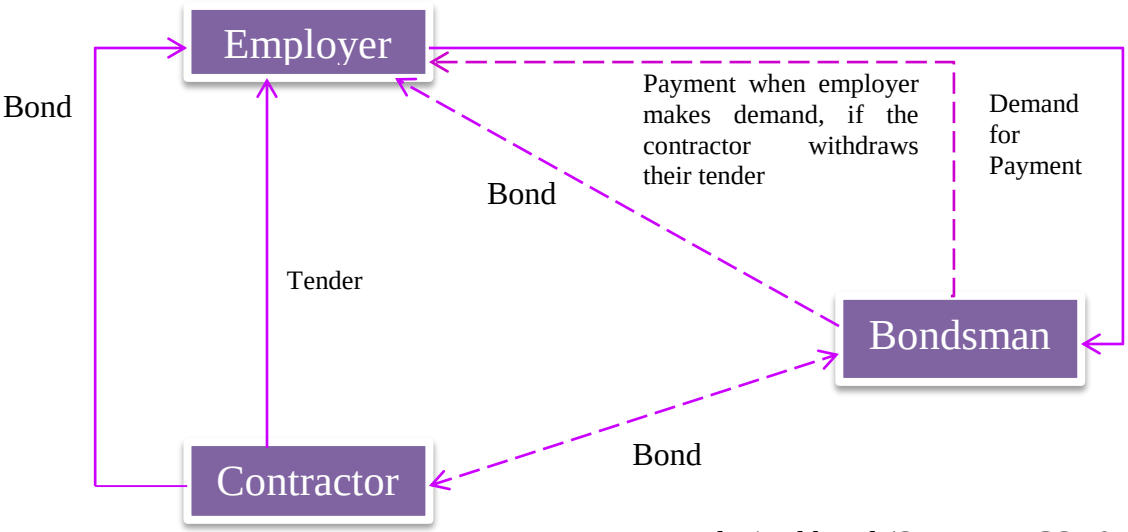


Figure 47: Tender/Bid bond (Source: RICS 2013)

Performance Bonds/Guarantees

These are, as the name implies, aimed at ensuring the satisfactory performance of a party to a contract. They are the most commonly used type of bond/guarantee used in the construction industry. They may be required by an Employer to ensure the performance of a contractor, or by a contractor to ensure the performance of a sub-contractor. In the event of non-performance, the guarantor or bondsman provides financial compensation. The usual limit of compensation is 10% of the contract sum.

Performance bonds are three-party agreements between a surety (or bondsman or guarantor), a beneficiary and a principal debtor.

In essence, the surety guarantees the performance of the principal debtor. In the event of a default by the principal debtor, the surety will make good the loss caused to the beneficiary up to the financial limit of the bond. Performance bonds will usually be provided jointly and severally in the name of the principal debtor and the surety; the surety would, therefore, rely first on the principal debtor satisfying any claim before becoming involved. The principal debtor receives no protection from the surety under the bond; it is not an insurance policy. Thus, the only situation where a surety is likely to be required to make payment would be in the event of the insolvency of the principal debtor.

Performance bonds are written for the owner's protection. If the construction contractor fails to complete the project in accordance with its contract, a performance bond guarantees the surety will either (1) complete the contract themselves, (2) arrange for another firm to complete the contract, or (3) pay for the cost of completion. However, the surety will not be responsible to pay more than the penal sum or limit of liability stated in the bond. The penal sum is usually equal to 100% of the contract amount (Openshaw 1992).

Performance bonds are usually issued by insurance or surety companies. Surety companies will, therefore, usually undertake extensive checks to ascertain the risk associated with providing a bond. The cost of the bond, together with the knowledge that an organization is able to obtain a bond, will often provide some comfort to a beneficiary that a principal debtor is sound.

Performance bonds are often required by Employers in respect of a contractor’s obligations under a construction contract. Similar protection may be required by contractors from their sub-contractors.

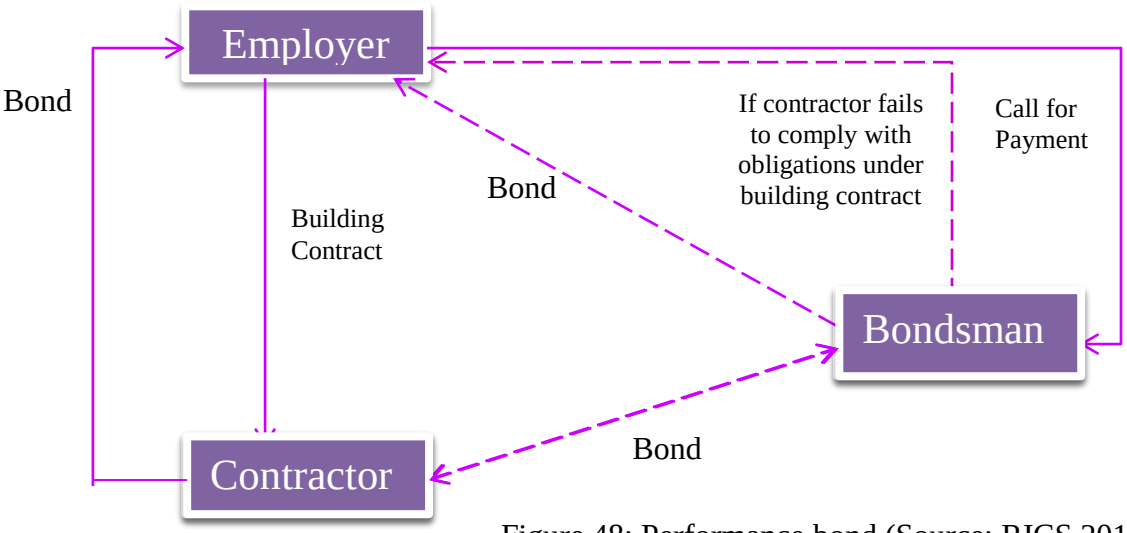


Figure 48: Performance bond (Source: RICS 2013)

Payment Bonds/Guarantees/ Advance Payment Bond

These ensure the obligation to make payment. They may be requested by contractors to guarantee an Employer's duty to make payments or by sub-contractors to ensure payment from a Contractor. In most situations, the protection afforded by guarantees and bonds will be required in the event of insolvency.

Where the Employer has agreed to provide an advance payment(s) to the contractor it may be advisable to request the contractor to obtain an Advance Payment Bond (a tripartite agreement between the Employer, contractor and a surety). The value of the advance payment(s) is inserted into the bond and this determines the maximum financial liability of the surety. The surety's liability starts on the date an advance payment is made to the contractor, and continues until the advance payment is repaid or until a 'longstop' date (inserted into the bond) has been reached. Whichever event occurs first signifies the end of the surety's liability.

The Advance Payment Bond is a tripartite agreement between the Employer, contractor and a surety.

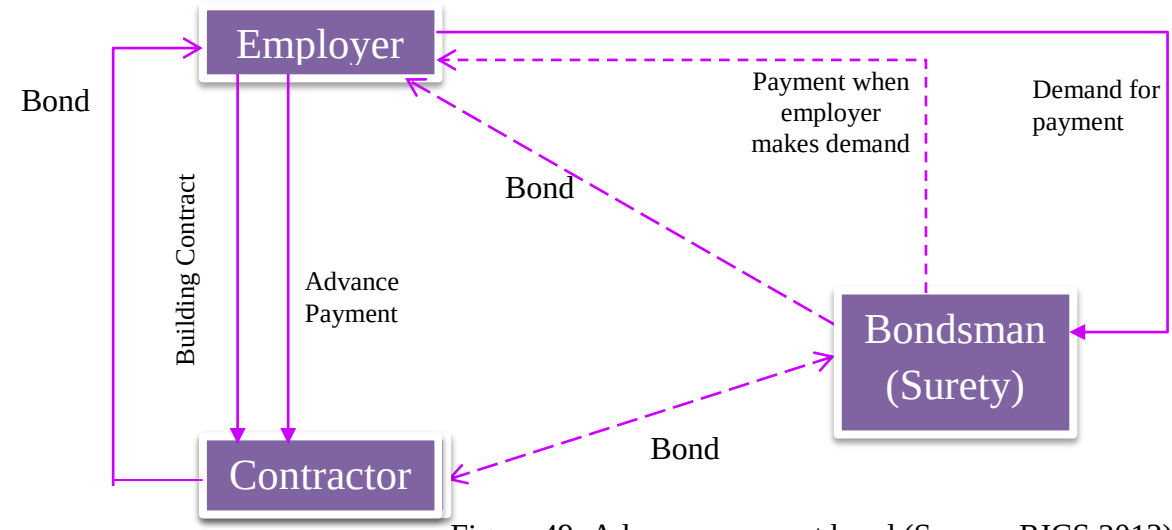


Figure 49: Advance payment bond (Source: RICS 2013)

In fact the default position is that where the Contract Particulars show that an advance payment is to be made then an Advance Payment Bond is automatically required unless the option is deleted in the Particulars.

Bond in Respect of Payment for Off-site Materials and/or Goods

Within the standard form of contract the Employer may signify his willingness to pay the contractor for materials held off site. These materials are subsequently categorized as listed items which are uniquely identified or listed items which are not uniquely identified. The operation of the bond is similar to the Advance Payment Bond. The surety's liability is to reimburse the Employer for monies the Employer may have paid to the contractor for listed materials off site. The Employer is to insert a maximum value for which the surety may be liable. The surety's liability ends on the date all the listed items have been delivered to site or by a specified 'longstop' date; whichever occurs first.

Retention Bond

Retention bonds cover the risk of the contractor's failure to perform the contract. Retention monies are normally viewed as a security for the cost of rectifying defective works (Openshaw 1992).

The bond, in favor of the Employer, is to be executed before or on the date of possession and be given to the Employer. The value of the bond is stated in the Contract Particulars

and comprises a maximum aggregate sum. It is anticipated that this sum will be equal to the maximum amount of retention that would have been held by the Employer if the bond were not in existence. If the contract sum increases, because of variations or fluctuations, the original bond may not be sufficient to cover the amount of retention that would have been due. In this instance the contractor has the choice of increasing the value of the bond or allowing the employer to deduct retention from the monies not covered by the bond.

As long as the surety is not in receipt of a written demand on the bond, then their liability under the bond ends after the earliest of the following events:

- the date of issue of the certificate of making good defects; or
- payment has been made against the bond up to the maximum aggregate amount;
- the expiry date inserted in the contract appendix

Retention percentage is inserted in the Contract Particulars and the architect, or quantity surveyor, is still required to prepare a statement of the contractor's retention to show what retention would be deducted if it were not for the bond. The reasons for this calculation are:

- to maintain a check that the nominal retention does not exceed the value of the bond;
- to allow the employer to inform the surety of the amount of retention that would have been held at the time a written demand is submitted.

The latter point is important because the surety's liability is not greater than the value of the nominal retention calculated at the time of the employer's demand against the bond. The surety's liability gradually increases each month as it matches the nominal retention calculation, until the maximum aggregate sum is reached.

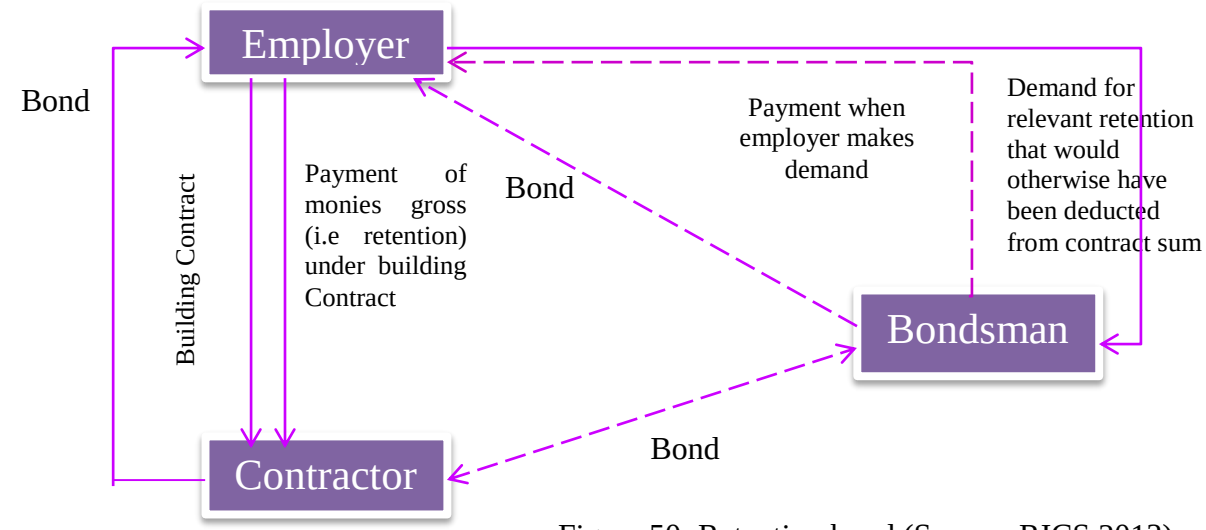


Figure 50: Retention bond (Source: RICS 2013)

5.3.2. Sources and Formats of Bonds

The two most commonly used sources of protection are bank guarantees and surety bonds. The terms ‘guarantee’ and ‘bond’ are used synonymously within the industry. There is, however, a difference in the definition of the two terms.

Demand guarantees are documentary covenants made by a guarantor to indemnify a beneficiary, subject to the conditions in the covenant. The guarantee is an agreement between the guarantor and the beneficiary. Thus, if an Employer is given a demand guarantee by a bank in respect of the obligations of a contractor, the contractor is not a party to the guarantee agreement. The beneficiary is therefore in a strong position should there be a default. Demand guarantees are contracts and can be created by either a simple contract or executed as a deed.

Demand guarantees are usually given by banks. There are two basic types: on demand guarantees (often referred to as on demand bonds) and documentary demand guarantees. On demand guarantees basically require a guarantor to make payment to a beneficiary upon request to do so. In the case of documentary demand guarantees, payment will only be made on the furnishing, by the beneficiary, of the documents required by the terms of the guarantee. These, for example, may be documents proving a court judgment. Banks favor

demand guarantees because they do not need to get involved in legal arguments and disputes following a default; their position is generally straightforward (Jack Ramus 2006).

Bank Bonds: Not Recommended, but Why?

Banks are in the business of lending money. When a bank issues a bond it treats it as a form of loan.

No money changes hands but collateral security (a duty of care deed) will be required by the bank (in support of bond facilities) and consequently, the contractor's ability to raise further finance is affected.

Chapter-6. Dispute Resolution

6.1. Introduction

Disputes are a common occurrence within the construction industry. Many disputes are resolved before they reach this stage, either on 'the courtroom steps' or through arbitration or by some other method of resolution. Disputes are damaging both to the industry and to the clients of the industry. The costs associated with resolving disputes are often high, and the time involved can be very long. The overall impact of disputes on individual projects can jeopardize the objectives of all involved in them. A preventative approach would obviously be the best situation, that is, removing the causes of disputes altogether. However, such an environment could only be created by radically changing the processes, attitudes and structures that lead to dispute (Jack Ramus 2006). Most contract disputes arise from ambiguous or poorly written documents and design, poor judgment, and poor record keeping. Ill-defined words and phrases continue to be used in construction contract documents and cause an excessive number of disputes. Among these words and phrases are reasonable, in the area of or near to, and to the owner's satisfaction. Such vague phrases need to be replaced with quantifiable descriptions such as a number of days, a distance in meters or feet, or a reference to an article, standard, or code in the specification (Phillips 2009).

6.2. Non-binding

In non-binding processes, the dispute resolver helps the parties to agree their differences. These are entirely private processes, conducted without prejudice to the rights of either party, and there is nothing stopping either party from shifting its ground during the process. Indeed, if it is to be successful, it is essential that they do. If they do not succeed in reaching a settlement, there is nothing to prevent either party from dealing with the same dispute through another forum at a later date and nothing that has been discussed in the ADR process may be used in evidence can usually be used elsewhere. The dispute resolver will agree with both parties a procedure; he will read the parties' respective position statements and any documents provided in support. He will consult with the parties privately, and with both together.

Although essentially a non-binding process, it is always open to both parties to agree that the final settlement should be binding. The parties agree to share the costs of the dispute resolver and to pay their own. This is an excellent method of dealing with disputes because it encourages the parties to talk to each other, if successful it helps to preserve working relationships and, even if unsuccessful, it helps the parties to focus on the real matters in which they are in dispute (The Chartered Institute of Building 2014).

The advantages of alternative dispute resolution are often referred to as the four Cs. These are (Jack Ramus 2006):

- ***Consensus*** – this approach requires the agreement of all parties to a resolution of the dispute.
- ***Continuity of business relations*** – without permanently damaging, ongoing business relations.
- ***Control*** – resolution of the dispute remains in the control of the parties to it.
- ***Confidentiality*** – the proceedings are not published, and therefore the damage resulting from adverse publicity is avoided.

6.2.1. Mediation

Without express permission, the mediator will never disclose what has been said to him by either party to the other. A mediator does not have to have a detailed understanding of the facts or the law of the matters in dispute but it often helps. He will not advise the parties of their rights nor generally will he advise the parties of the strength of their case but he will help each to see the weaknesses of their own and the strengths of their opponent's position. In doing so, he will draw them closer together with a view to executing an agreement to settle their differences. In general, mediation can be completed in two to three days. In very large cases with many issues, it might take a week or more but that is unusual (The Chartered Institute of Building 2014).

6.2.2. Conciliation

Conciliation as a similar process to mediation but the conciliator takes a more active role in the settlement of the dispute than does the mediator. A conciliator necessarily has to

have to a detailed understanding of the facts and law of the matters in dispute. The conciliator will express an opinion on the relative merits of the parties' respective cases. He will try to persuade them of his views and, in doing so, will attempt to guide the parties into an agreement compatible with the parties' rights under the contract. Conciliation can be expected to be a little shorter than mediation simply because the conciliator is able to focus the parties' attention on the issues and drive the process in a way that is unavailable to a mediator. In general, conciliation can be completed in one or two days. As with mediation, in very large cases with many issues it might take a week or more but that is unusual (The Chartered Institute of Building 2014).

6.3. Non-binding or final and binding

Unlike ADR in which the parties make their own decision, the essence of these decision-making processes is that a third party is introduced to make the decision for them. Because the process is consensual, it is always a private process. However, depending upon the rules of engagement agreed between the parties, the information that becomes available may not be privileged and the decision made may not be binding on the parties, leaving them free to revisit the dispute in another forum. The parties are free to agree who should pay the dispute resolver's costs and how the party's costs should be dealt with, although it is usual for each side to pay their own costs (The Chartered Institute of Building 2014).

6.3.1. Expert determination

Expert determination is quite different from any other method of dispute resolution. In this forum, the expert is appointed for his knowledge and understanding of the particular issues in dispute in the field in which he is an acknowledged expert. The expert will agree with both parties a procedure; he will read the parties' respective position statements and any documents provided in support. There is usually no provision for the parties to change their position or amend their case during the process. He will consult with the parties privately and may consult with both together, but he is under no obligation to do so unless it is made a term of his appointment. He is given the role of investigator. He is required to find the facts and law in relation to the issues in dispute, to make his own inquiries, tests and calculations and to form his own opinion and decide upon the merits of the parties' position.

Depending upon the issues, expert determination can involve much research and a hearing and can take anything from a week to several months (The Chartered Institute of Building 2014).

6.3.2. Adjudication

In England and Wales and in several Commonwealth countries, adjudication has recently been given statutory authority. Under the law of those countries that adopt this process, it is generally the rule that either party to a specified type of construction contract has the right at any time to submit any dispute or difference to the adjudication of a third party. However, even where the statutory right is limited to particular types of contract, there is nothing stopping the parties from agreeing by contract to follow the same process in regard to contracts which are outside the Act and that is common.

Adjudicators are often appointed for their knowledge and experience of the type of matters in dispute, although it is not essential. Although the idea of adjudication is that there should be a decision, in the event that the parties do not like the result there is nothing to prevent them from running the case again in another forum; the rule of res judicata does not apply to adjudication. The adjudicator will agree with both parties a procedure; he will read the parties' respective referrals and any documents provided in support. He may also require a hearing and will often conduct conference calls with the parties. The adjudicator's decision is binding until either party decides to refer the same dispute to arbitration or litigation, in which case the decision is binding until an award or judgment is handed down. When the legislation was first enacted, the adjudicator was empowered to make his own inquiries of the facts and law. It was thought that he might act pretty much like an architect or engineer under a construction contract and that few parties would take the adjudicator's decision as final and binding, so it was not initially thought necessary for the adjudicator to act within the rules of natural justice (The Chartered Institute of Building 2014).

6.4. Final and Binding

In the sense that in the following tribunals the facts once found cannot be re-opened by any court, the matters are res judicata. Appeal on a point of law is always available from a

domestic arbitral tribunal to the court and from a lower court to a higher court. However, statute has tended to limit the right of appeal from an arbitrator's award in other than a point of law of public importance in order to give the parties a greater sense of finality (The Chartered Institute of Building 2014).

6.4.1. Arbitration

An arbitration agreement is written into all standard forms a building and civil engineering contract. It is a private process and nobody is permitted to know of the matters in dispute or the decision unless the parties agree otherwise. The arbitrator's decision is final and binding and can be enforced in many countries of the world. Arbitrators, like judges, must be independent and impartial. They must scrupulously follow the law of the contract and the rules of natural justice to provide a speedy and efficient decision on all the issues submitted to jurisdiction. The arbitrator may not go outside that limitation to decide things that were not part of the reference. Subject to the arbitration agreement, the parties may adopt specific procedural rules which dictate the powers of the arbitrator or the procedure to be followed. Otherwise, the powers of the arbitrator are set out by statutory instrument. In domestic disputes, it is normal for the reference to be to a single arbitrator, but in international disputes it is more common for each party to appoint their own arbitrator and for the arbitrators to appoint a chairman or umpire, forming a three-man tribunal.

Arbitration can be very time consuming and expensive or it can be quick and cheap depending upon the parties and the case management skills of the arbitrator. There is usually nothing to stop a party from amending its case subject to paying the costs of the other side thrown away. Generally, the arbitrator has the powers of a High Court judge in regard to the taking of evidence on oath, subpoenas for evidence, discovery and so on. He can order a party to pay the costs of interlocutory matters and can determine who should pay his fees and whether the losing party should pay the winning party's costs, in whole or in part, with or without interest and on what basis. The arbitrator must give reasons for his decision if either party requests it (The Chartered Institute of Building 2014).

The advantages of using arbitration as opposed to litigation for resolving disputes include (Jack Ramus 2006):

- ***Cost*** – arbitration is generally much cheaper.
- ***Speed*** – arbitration is generally much quicker.
- ***Flexibility*** – the parties have more control over the timing and the format of the proceedings.
- ***Technical expertise of the arbitrator*** – the Arbitrator will be selected by the parties on the basis of technical expertise and suitability to resolve the dispute in question.
- **Privacy** – arbitration hearings are normally held behind closed doors.

6.4.2. Litigation

Litigation is the dispute resolution process run by the civil courts of the state. It is free to every individual who has a grievance to resolve. Judges tend not to be technical people, although in some courts they are specifically selected for their technical. On the other hand, judges often have the power to appoint technical assessors or experts to assist them and will almost always do so if the parties request it.

Notwithstanding that the court and the judge are provided by the state, litigation is often a very expensive process. This is often simply because of the complicated rules of procedure, which a reluctant but wily litigant can often exploit to put off the hearing of the case for years, including amending its case from time to time. There are also restrictions on who can appear in the courts on behalf of a litigant. In large cases, the costs can run to many thousands of pounds per day during a hearing, which may take many months or even years before the dispute reaches that stage.

Litigation is a public process (justice must be seen to be done), and the public are encouraged to sit in on the proceedings to hear of the matters in dispute. Judges must give reasons for their decisions, and important decisions are published and recorded in law reports (The Chartered Institute of Building 2014).

A More Detail Discussion Was Given In Construction Law Course

Discussion Point: Difference between Litigation & Expert determination

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Appendix-A. Sample Bid Evaluation

Record of Bid Opening

Project: Dormitory Building Employer: University of Gondar

Location: Gondar Bid No. 20/xxx/06 (ICB)

1. The following bids were received by the close of bidding on 1 August 2006 at 10 a.m. (local time) and were publicly opened and read at 10:30 a.m. on the same date.

No.	Name of Bidder and Nationality	Bid Security Amount	Foreign Currency (FC)	Local Currency (LC)	Discounts Offered	Signature of Bidders' Rep.
1	Bidder No. I	$1,650,000.00	$29,755,563.00	93,377,354.90		Signed
2	Bidder No.2	$1,950,000.00	FF239.793.677.40	82,150,439.50		Signed
3	Bidder No. 3	Y126,000,000.00	Y1,904,999,010.00	82,989,651.40		Signed
4	Bidder No. 4	MK3.150,000.00	$27,041,671.80	78,632,798.60		Signed
5	Bidder No. 5	Y145.000,000.00	Y2,984,560,000.00	90,015,000.00		Signed
6	Bidder No. 6	Y125.000,000.00	Y1,477,007,041.00	81,989,030.40		Signed
7	Bidder No. 7	$1,950,000.010	$36,354,010.00	89,956,566.50		Signed
8	Bidder No. 8	MK3,010,000.00	$40,168,801.00	62,519,748.80		Signed
9	Bidder No. 9	$1,800,000.00	FF160,632,595.10	84,510,037.50		Signed

Attendance Sheet for Opening of Bids

Project: Dormitory Building — Bid No. 20/xxx/06 (ICB)

Location: Gondar — Place: Meeting Room Fourth Floor, xxxxxx

Employer: University of Gondar — Date: 1 August 2006; Time 10:30hrs.

The following bidders' representatives attended the public opening of bids.

No.	Bidder	Representative	Designation	Signature
1	Bidder No. 3	Mr. xxxxxx	Area Manager S.E. Asia Office	Signed
2	Bidder No. 1	Mr. xxxxxx	Chief Engineer	Signed
3	Bidder No. 6	Mr. xxxxxx	Vice President	Signed
4	Bidder No. 4	Mr. xxxxxx	Manager International Marketing	Signed
5	Bidder No. 5	Mr. xxxxxx	Vice President Asia Pacific Operations	Signed
6	Bidder No. 2	Mr. xxxxxx	General Manager	Signed
7	Bidder No. 9	Mr. xxxxxx	Chief Engineer Construction	Signed
8	Bidder No. 7	Mr. xxxxxx	Manager Regional Office	Signed
9	Bidder No. 8	Mr. xxxxxx	Deputy Director Operations	Signed

Basic Data Sheet

1. Project Title XXXXXX
2. Loan Number xxxx-xxx
3. Bid/Contract Title LOT 1Civil Works
4. Bid/Contract Number 20/xxx/06 (ICB)
5. Estimated Value/Engineer's Estimate LC 152,917,466.00
6. Date Invitation For Bids Issued 30 April 20xx
7. Method of Procurement International Competitive Bidding

Bidding Procedure Single-Stage: One-Envelope

8. Bid Closing Date and Time 10 a.m.. on 1 August 20xx
9. Bid Opening Date and Time 10:30 a.m. on 1 August 20xx
10. Number of Bids Received Nine (9) bids
11. Bid Validity Expires on 28 November 20xx
12. Bid Security Amount Not less than 2% of the Bid Price
13. Bid Security Validity Expires On 26 December 20xx
14. Date for Determining Applicable

Exchange Rates 1 August 20xx (Date of Bid Opening)

15. Exchange Rates for Evaluation US Dollar 1 = LC (Birr) 2.2790
    Japanese Yen 100 = LC (Birr) 2.6278
    French Franc 1 = LC (Birr) 0.4786
16. Except bidder 2 and bidder 6, all are single entity, and all are eligible as well as not government owned.

Source: The selling exchange rates of National Bank of Ethiopia.

Examination of Bids

Item	Description	Bidder No								
		1	2	3	4	5	6	7	8	9
1	**Bid Document**									
1.l	One original and two copies	Y	Y	Y	Y	Y	Y	Y	Y	Y
1.2	Form of Bid	Y	Y	Y	Y	Y	Y	Y	Y	Y
1.3	Appendix to Bid	Y	Y	Y	Y	Y	Y	Y	Y	Y
1.4	Priced Bill of Quantities	Y	Y	Y	Y	Y	Y	Y	Y	Y
1.5	Bid Security (amount and validity period)	Y	Y	Y	Y	Y	Y	Y	Y	Y
1.6	Schedule of Particular Information									
	1) Construction Time Schedule	Y	Y	Y	Y	Y	Y	Y	Y	Y
	2) Construction Method	Y	P	Y	Y	Y	Y	P	P	Y
	3) List of Construction Equipment	Y	Y	Y	Y	Y	Y	Y	Y	Y
	4) Organization and Field Personnel	Y	N	Y	Y	P	Y	P	Y	P
	5) Subcontracting	Y	Y	Y	Y	N	Y	Y	N	N
	6) Mobilization and Temporary/	Y	Y	Y	Y	Y	Y	P	Y	P
	7) Cash Flow	Y	Y	Y	Y	Y	Y	N	N	Y
1.7	Drawings and Documents (to be submitted with bid).	Y	Y	Y	Y	P	Y	P	Y	P
1.8	Joint Venture Agreement or Formal Intent to Enter into an Agreement	NA	Y	Y	Y	Y	Y	NA	NA	Y
2	**Propriety of Signature and Completeness**									
2.1	Power of Attorney submitted or not	Y	Y	Y	Y	Y	Y	Y	Y	Y
2.2	Bid Form properly signed or not	Y	Y	Y	Y	Y	Y	Y	Y	Y
2.3	Completeness of Bids	Y	Y	Y	Y	Y	Y	Y	Y	Y

Y = Yes; N = No; P = Partial; NA = Not Applicable

Note: Provide details if “P,” “N,” or “NA”

Time for Completion of Major Work Items and Assessment of Construction Methods

Item No.	Particulars	Periods for Completion (months)			
		Employer Program	Bidder No.3	Bidder No.4	Bidder No.6
1	Intake Dam	37	37	Y	27
2	Intake Facilities	47	47	Y	32
3	Headrace Drain Tunnel	55	55	Y	45
4	Penstock Tunnel	45	45	Y	45
5	Tailrace Chamber and Outlet	56	56	Y	53
6	Deregulation Dam	38	38	Y	31
7	Powerhouse O.H. Crane Installation	45	45	Y	45
8	Powerhouse for Turbine/Generator Installation	51	NC	-	47
9	Powerhouse for Transformer Installation	51	NC	-	51
10	Control Room for Control Equipment Installation	50	50	Y	NC
11	Cable Tunnel	51	51	Y	51
12	Outdoor Switchyard	48	48	Y	48
13	Main Control House	50	50	Y	50
14	Intake Dam Control House	51	50	Y	51
15	Regulating Darn Control House	55	54	Y	54
16	Completion of Whole Works	60	60	Y	60

Item No.	Construction Methods	Findings		
1	Logic of Construction Schedule	A	A	A
2	Feasibility of Achieving Schedule	A	AA	AA
3	Assessment of Construction Method	A	A	A

Note: Y = Within Specified months NC = Not Shown Clearly

A = Acceptable AA = Marginally Acceptable

Substantial Responsiveness of Bids (Commercial)

Sr. No.	Requirements	Bidding Doc. Reference	Bidder No								
			1	2	3	4	5	6	7	8	9
1	Power of Attorney		C	C	C	C	C	C	C	C	C
2	Signature on Documents		C	C	C	C	C	C	C	C	C
3	Joint Venture Agreement or Letter of Intent to Enter into an Agreement		NA	C	C	C	C	C	NA	NA	C
4	Eligibility (a) Bidder and Sub contractor (b) Bidder Affiliated with Consultant (c) Material and Equipment		C C C	C C C	C C C	C C C	C C C	C C C	C C C	C C C	C C C
5	Bid Validity(120 days)		C	C	C	C	C	C	C	C	C
6	Bid Security (a) Amount and Validity (b) (b) Format and Terms		 C C	 C C	 C C	 C C	 C C	 C C	 C C	 C C	 C C
7	Time for Competition										
8	Terms of Payment (a) Advance Payment (15%) (b) Retention Money (5%) (c) Price Adjustment		 C C C	 C C C	 C PC C	 C C C	 C PC C	 C C C	 C PC C	 C C C	 C C C
9	Liquidated Damages (a) Rate (0 .5% per week) (b) (b) Maximum Limit (10%)		 C C	 C C	 C C	 C C	 C C	 C C	 C C	 C C	 C C
10	Defects Liability Period (12 months)		C	C	C	C	C	C	C	C	C
11	Performance Security (10%)		C	C	C	C	C	C	C	C	C
	FINDINGS		R	R	R	R	R	R	R	R	R

C = Complied

NA = Not Applicable

NC = Not Complied

PC = Partially Complied (State reasons)

R = Substantially Responsive

Prices for Sections of the Work as Percentages of the Total Bid Prices (in Local Currency)

Section No	Description	Engineers Estimate		Bidder No. 3		Bidder No. 4		Bidder No. 6	
		Value	% of Total Est	Value	% of Total Est	Value	% of Total Est	Value	% of Total Est
0	General	9,209,130	6.0	12,316,101	9.2	13,513,615	9.6	7,973,646	16.6
1	Intake Dam	18,333,401	12.0	17,983,937	13.5	22,600,249	16.1	16.068,377	13.3
1.1	Intake Dam	9,809,193	6.4	9.497,751	7.1	12,260,671	8.7	8,548,845	7.1
1.2	Intake Facilities	7,553.862	4.9	7,621,343	5.7	9.420,896	6.7	6,784,408	5.6
1.3	Check Dam and Drainage	970,346	0.7	864,843	0.7	918,682	0.7	735,124	0.6
2	Waterway	75,957,706	50.4	60,439,350	45.5	60,312,394	43.1	59,690,421	49.4
2.1	Headrace Tunnel	21,559,538	14.1	16.497,668	12.4	16,867,186	12.0	16,271,529	13.5
2.2	Work Adit No.	838,812	0.5	652,234	0.5	677,142	0.5	714,353	0.6
2.3	Headrace Drain Tunnel	1,866,197	1.2	1.417.677	1.1	1,375 ,131	1.0	1,569.841	1.3
2.4	Penstock Tunnel	7,021,007	4.6	7,407,554	5.6	6,359,329	4.6	5,497,266	4.5
2.5	Work Adit No. 3	4,535,495	3.0	3,559,082	2.7	3,601,876	2.6	3,558,086	2.9
2.6	Tailrace Chamber	2,770,884	1.8	2,643,825	2.0	2,526,599	1.8	2,139,076	1.8
2.7	Tailrace Tunnel	28,376,299	18.6	20,913.339	15.8	20,226,765	14.4	21,623,286	17.9
2.8	Work Adit No. 4 and 5	3,948,435	2.6	2,716,744	2.0	2,816,024	2.0	3,310,349	2.7
2.9	Tailrace Outlet	1,614,839	1.1	981,769	0.7	1,210,571	0.9	1,407.1656	1.2
2.10	Deregulating Dam	4,426,200	2.9	3,644,458	2.7	4,651,771	3.3	3,598.999	3.0
3	Power Station	37,821,071	24.7	30,793,505	23.1	3,587,834	23.9	28,507,341	23.6
3.1	Powerhouse	20,264,298	13.3	16,414,159	12.3	19,758,437	14.1	15,538,506	12.9
3.2	Access Tunnel	8,445,012	5.5	6,198.076	4.7	6,150,387	4.4	6,139,315	5.1
3.3	Drain Tunnel	1,002,915	0.7	813,393	0.6	840,007	0.6	6,647,457	0.5
3.4	Cable Tunnel	2,569,843	1.7	3,389,238	2.5	2,630,7 33	1.9	2,089,904	l.7
3.5	Work Tunnels 1 and 2	2,648,020	1.7	1,874,008	1.4	2,127,978	1.5	1,947,299	1.6
3.6	Outdoor Switch yard and Measuring Apparatus	2,890,983	1.8	2,104,629	1.6	2,080,292	1.4	2,194,860	1.8
4	Architectural and Utility Work	7,299,148	4.8	8,364,182	6.3	6,490,238	4.6	5,684,203	4.7
5	Electrical Work	2,328,949	1.5	2,467,616	1.9	2,527,930	1.8	1,699,743	1.4
6	Day-work	968,061	0.6	722,953	0.5	1,235,432	0.9	1,181,067	1.0
Total		**152,917,466**	**100.0**	**133,087,644**	**100.0**	**140,267,692**	**100.0**	**120,804.80**	**100.0**

Appendix-B: Economic and Financial Ratios Proposed to Evaluate the Financial Capacity of Contractors (Source: Maria 2015)

Type	Ratio	Numerator	Denominator	Use	Recommended Minimum Value
Liquidity	GL	CA	Current Liabilities	Capacity to honor short-term financial obligations	1.25
	RL	CA – I	Current Liabilities	Capacity to honor short term financial obligations using the liquidity of current assets	1.00
	IL	Cash	Current Liabilities	Immediate liquidity to cover short-term commitments	0.10
Debt	FA	Equity	Net Assets	Measures the company's solvency	0.35
	DC	Equity	Permanent equity	Assesses whether the company may use borrowed funds	0.5
	S	Equity	Liabilities	Determines the relative proportion of company assets financed by equity versus those financed by borrowed capital	0.30-0.50
Profitability	FCC	Operating Income	Financial Charges	Number of times the operating income covers the financial costs	

Legend:

CA = Current Asset
CL = Current Liabilities,
GL = General liability,
RL = Reduced Liability,
IL = Immediate Liability,
FA = Financial Autonomy,
DC = Debt Capacity,
S= Solvability,
I = Inventories,
FCC = Financial Charges Coverage

Appendix – C: Delay Analysis (Computational questions)

A contract for the construction of a Bridge at Addis Ababa was signed b/n the Employer and the Contractor on September 19, 2007 with the following facts:

- Project Cost = 8,400,000 Birr
- Site hand over date = Oct.13, 2007
- Mobilization = 7 days
- Completion time = 6 months
- Liquidated damage = 1/1000 per delay of calendar day
- Limit of liquidated damage = 10% of the project Cost
- Interest on delayed payments = 11% per annum comp. Semi annually
- Retention = 10% of the executed work

During construction phase of the following variation Orders (VOs) and Change orders (Ch.O) had been given.

- ✓ **VO1:** during the abutment 1, the soil was found to be weak and a variation order is given for a masonry wall and Rock fill up to the design level. This activity takes 29 working days and during this time the contractor executes the excavation of Abutment 2 which amounts 200,000.
- ✓ **VO2:** the soil besides the Abutment was found unstable and the consultant orders to excavate and cart away.
- ✓ **VO3:** the masonry construction for the abutment was omitted.
- ✓ **ChO1 (extra works):** A Change order was given for the abutments from the Stone Masonry to Reinforced Concrete works.
- ✓ The work is suspended by the consultant for 16 Cal. Days for considering new design change.
- ✓ The actual progress of work on 25th June 2008 is 75%.

The characteristics of the VOS and Ch.O.1 are indicated in the table below:

Description	Variation Amounts			Change Order
	Additions	Excess in quantities	Omission	
Variation Order 1	110,000	-	-	-
Variation Order 2		80,000	-	
Variation Order 3			500,000	
Change Order 1				4,600,000

The following payment certificates are paid to the contractor as given in the table below.

Payment Certificate Nos	Amount Approved	Delay in months	Work executed amount during payment delay	Remark
P.C.N.02	500,000	3 months	85,000	
P.C.N.03	325,000	4 months	300,000	

Attempt the following Questions taking in to consideration non concurrent activities above as critical activities:

1. As a contract administrator determine
    a. The justified delay of the project
    b. The liquidated damage entitlement of the employer
    c. Payments Delay Compensations

Solution in Ethiopian calendar

1. Total Delay of the project

   Total delay of the project:

   Contract Date = september19, 2007.

   Handing over site Date = Octuber13, 2007 = Commencement Date

   Mobilization Time = 7 Cal. days.

   Starting Date = Commencement Date + Mobilization Time

   = octuber13, 2007 + 7 Cal. Days = **Oct. 20, 2007.**

Contract Time = 6 month **= 180cal days**

75% *180/100% = 135cal day for 75% work completion.

Completion Date as per the contract = Starting Date + Contract Time.

= Oct 20, 2007 + 6 month

= Oct 20, 2007 + 180 days

= April. 18, 2007 for 100% but

The given work is 75% completion date Oct 20, 2007 + 137 days

= March 08, 2007 for 75%

Actual Completion Date = 25 June. 2008 is 75%.

The project reached 75% only at June 25, 2008

Total delay of the project for 75% = Actual Completion Date of 75% - Completion Date as per the contract 75%. = June 25, 2008–March08, 2007.

= 472 Cal. days.

Total contract amount for 75% work =75%*8,400,000/100% = 6,300,000 birr

Therefore; the total delay of the project was 472 Cal. days.

2. Liquidated Damage

Before proceeding into this calculation, we have to find the justified delay of the contractor.

A. Claims Due to Alterations:

Alterations = Additions + Executed Excess Quantities – Omissions + change order

110000 + 80000 – 500000 + 4600000 = 4,191,000

4191000*135/6300000 = 89.8 = 90cal day but there is executed amount of work for abatment2 vo1 (200,000 /6,300,000)*135 = 4.28= 5cal days

i.e. alteration = 90 cal days – 5 cal days = 85cal days

Therefore, claim shall be valued due to alterations is 85cal days.

B. Claims Due to Payment Delay:

Payment delay days for payment P.C.N2 = 90cal. Days

Work Execution amount during the payment delay = 85,000

Delay recovered during payment delay:

(85,000 – 10%*85,000)*135/6,300,000 = 1.63 = 2 cal days

Effective Payment Delay P.C.N2= Total Payment Delay – Delay recovered – Employer payment issuance period = 90 – 2 - 30 = 58 cal. Days

Payment delay days for P.C.NO3 = 120 cal days

Work executed amount during p.c.n3 = 300,000

Delay recovered during payment delay,

= (300,000 – 10%*300,000) *135/6,300,000 = 5.78 = 6 days

Effective payment delay p.c.n3 = 120 – 6 – 30 = 84 days

Total effective payment delay = p.c.n2 + p.c.n3

= 58 cal day + 84 cal day

= 142 cal day

C. Claims due to Design change:

The work is suspended by the consultant for 16 Cal. Days for considering new design change.

Justified delays = 85 + 142+ 16 = 243 cal. days

Unjustified delay = Total Delay - Justified Delay = 472 – 243 = 229cal. days

Therefore, Liquidated damage would become:

LD= 1/1000 *Unjustified delay of that part of contract amount

LD = 229/135*0.1%*6,300,000 = 10,686.67Birr

Limit of Liquidated damage = 10 %(6,300,000)

= 630,000

630,000 > 10,686.67 ok

i.e. the liquidated damage of the project is 10,686.67

3. Unpaid sum compensation

Amount of delayed payment certificate and delayed days:

P.C.N. 02 = Birr 500,000 and delayed for 90 -2 - 30 = **58 Cal. days.**

P.C.N. 03 = Birr 325,000 and delayed days for 120 -6 - 30 = **84 Cal. days.**

Unpaid sum compensation for P.C.N. 02 is computed as:

= 500,000 * (58 / 365) * (11 / 100) = **8,739.73**

Unpaid sum compensation for P.C.N. 03 is computed as:

= 325,000 * (84 / 365) * (11 / 100) = 8**,227.40**

The total unpaid sum = 8,739.73 + 8,227.40 = **16,967.13**

Therefore, the total unpaid sum compensation = Birr 16,967.13

Solution in Gregorian calendar

a. Total delay of the project:

Contract Date = september19, 2007.

Handing over site Date = octuber13, 2007 = Commencement Date

Mobilization Time = 7 Cal. days.

Starting Date = Commencement Date + Mobilization Time.

= october13, 2007 + 7 Cal. days. = Oct. 20, 2007.

Contract Time = 6 month = 182 cal days for 100% $\rightarrow$ 75*182/100=137

Contract Time =137 cal days for 75% $\rightarrow$ 75% *182/100 = 137 cal day

Completion Date as per the contract = Starting Date + Contract Time.

= Oct 20, 2007 + 6 month

= Oct 20, 2007 + 182 days

= April. 20, 2008 for 100%

But the given work is 75% completion date Oct 20, 2007 + 137 days

= March 06, 2008 for 75%

Actual Completion Date = 25 June. 2008 is 75%.

The project reached 75% only at June 25, 2008

Total delay of the project for 75% = Actual Completion Date of 75% - Completion Date as per the contract 75%.

= June 25, 2008–March06, 2008. = 111 Cal. days.

Therefore; the total delay of the project was 111 Cal. days.

b. Liquidated Damage

Before proceeding into this calculation, we have to find the justified delay of the contractor.

A. Claims Due to Alterations:

Alterations = Additions + Executed Excess Quantities – Omissions + change order

110000 + 80000 – 500000 + 4600000 = 4,191,000

4191000*137/6300000 = 90.8= 91 cal day but there is executed amount of work for abatment2 vo1 (200,000 /6,300,000)*137 = 4.33= 5cal days

i.e. alteration = 91cal days – 5 cal days = 86 cal days

Therefore, claim shall be valued due to alterations is 86 cal days.

Claims Due to Payment Delay:

Payment delay days for payment P.C.N2 = 90cal. Days

Work Execution amount during the payment delay = 85,000

Delay recovered during payment delay:

(85,000 – 10%*85,000)*137/6,300,000 = 1.66 = 2 cal days

Effective Payment Delay P.C.N2= Total Payment Delay – Delay recovered – Employer payment issuance period = 90 – 2 - 30 = 58 cal. Days

Payment delay days for P.C.NO3 = 120 cal days

Work executed amount during p.c.n3 = 300,000

Delay recovered during payment delay,

= (300,000 – 10%*300,000) *137/6,300,000 = 5.87 = 6 days

Effective payment delay p.c.n3 = 120 – 6 – 30 = 84 cal. days

Total effective payment delay = p.c.n2 + p.c.n3

= 58 cal day + 84 cal day

= 142 cal day

Claims due to Design change:

The work is suspended by the consultant for 16 Cal. Days for considering new design change.

Justified delays = 86 + 142+ 16 = 244 cal. days

Note: As we have observed from the calculation Justified delay is greater than the total delay of the project, Since 244 cal. Days greater than 111 cal. Days so there is no Unjustified delay and Liquidated damage

C. Unpaid sum compensation

Amount of delayed payment certificate and delayed days:

P.C.N. 02 = Birr 500,000 and delayed for 90 -2 - 30 = 58 Cal. days.

P.C.N. 03 = Birr 325,000 and delayed days for 120 -6 - 30 = 84 Cal. days.

Unpaid sum compensation for P.C.N. 02 is computed as:

= 500,000 * (58 / 365) * (11 / 100) = 8,739.73

Unpaid sum compensation for P.C.N. 03 is computed as:

= 325,000 * (84 / 365) * (11 / 100) = 8,227.40

The total unpaid sum = 8,739.73 + 8,227.40

= 16,967.13 birr

Therefore, the total unpaid sum compensation = Birr 16,967.13

Appendix-D: Sample Bonds and Insurances

Bid Bond

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BERHAN INTERNATIONAL BANK S.C.

Series number GR 07545
LAF number: BRCC/012/011/16

Reference: BRIB/GN/GL/284/16 Date: 25/10/2016

Guarantee Type: **Bid Bond Guarantee** Guarantee Seeker (Contractor):- **EYAYOU ESHETIE CHEKOL B.C**

Guarantee issued in favor of (Employer): **ETHIOPIAN TRADING BUSINESSES CORPORATION GRAIN & COFFEE TRADING BUSINESS UNIT**

Amount of Guarantee: **260,000.00**

Purpose of Guarantee: TO PARTICIPAT IN THE BID Date issued: **26/10/2016**

Issuing Bank: Berhan International Bank– Number of validity days: **90 Days**

GONDAR Branch Expiry Date: **25/01/2017**

At the request and for the account of **EYAYOU ESHETIE CHEKOL B.C** (hereinafter referred to as the Bidder) we guarantee to pay you on your written demand if presented within the validity date of this guarantee Birr **260,000.00 (TWO HUNDRED SIXTY THOUSAND BIRR ONLY)**.

This grantee is given by to enable the Bidder to participate in the Bid for **BUILD MOJO WAREHOUSE.**

Your claim if any, under this guarantee is payable against your signed receipt, accompanied by your statement certifying that the bidder has failed to comply with the tender requirement and that the bidder's offer has been accepted and the bidder has declined to respond to the invitation to negotiate the contract.

Your claim if duly received by us on or before the expiry date of this guarantee, after which date this guarantee will automatically become null and void and no claim whatsoever shall be entertained by us thereafter irrespective of the return or none return of this original.

With Best Regards

Ashenafi Akele Adugna Shimekaw

Branch Manager-Name and signature Bank's Seal 19 Accountant-Name and signature

This guarantee is valid only when duly signed by both officials and stamped with the bank's seal and if confirmation required, please use telephone line number: +2516623443, 0116630127/011685732, Ext 136, Credit Department.

Tel. +251 11 663 0127
+251 11 618 5732
e-mail: berhanbank1@ethionet.et
SWIFT BERHETAA
P.O.Box 387 Code 1110

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NILE INSURANCE COMPANY s.c.

PERFORMANCE BOND

Preformanc Bond No : P/15/070/08/8004/20/73

Amount of Performance Bond Birr : 5,301,036.29

KNOW ALL MEN BY THESE PRESENT that M/S ***EYAYU ESHETIE BUILDING CONTRACTOR*** OF ***,TEL. 0918-35-00-70***
(hereinafter called the "CONTRACTOR") and
NILE INSURANCE COMPANY SC of P.O. Box 12836, Addis Ababa, Ethiopia, (hereinafter Called the "SURETY") are held and firmly bound unto M/S ***FDRE -MINISTRY OF SCIENCE AND HIGHER EDUCATION***

(hereinafter called the "EMPLOYER") in the full and just sum of ET Birr ***5,301,036.29(Five Million Three Hundred One Thousand Thirty-Six And CENT Twenty-Nine Only***) for the payment of which sum well and truly to be made, the CONTRACTOR binds itself, its successors and assigns and the SURETY binds itself, its successors and assigns jointly and severally firmly by these presents.

WHEREAS THE CONTRACTOR has entered into a certain CONTRACT in writing with the EMPLOYER dated ***06/07/2020*** relating to ***TO CONSTRUCT DORMITORY CYT TYPE 2 AT INJIBARA UNVERSITY***

which Contract with all its covenants and conditions, except those covenants and conditions which render this Bond in any way unconditional, is hereby made a part of this BOND to all intents and purposes as though the CONTRACT had been incorporated herein, including any duly authorized modifications of the said CONTRACT that may be made hereafter.

NOW THEREFORE, the conditions of the foregoing obligations are such that if the CONTRACTOR shall well and truly and faithfully comply with all terms, covenants and conditions, of the said CONTRACT, on its part to be kept and performed according to the tender, of the said CONTRACT or if in default by the CONTRACTOR the SURETY shall satisfy and discharge the damage sustained by the EMPLOYER thereby up to ET Birr ***5,301,036.29(Five Million Three Hundred One Thousand Thirty-Six And CENT Twenty-Nine Only***) then this obligation shall be null and void otherwise it shall remain in force and virtue for a period of ***365*** calendar days plus 365days defect liability period effective from 05-JUL-21.

THIS BOND is executed by the SURETY upon the following express conditions, which shall be conditions precedent to the right of the EMPLOYER to recover hereunder.

PROVIDED ALWAYS THAT:

1. Upon the discovery by the EMPLOYER or by the EMPLOYER'S agent or representative, of any act or omission that shall or might involve a loss hereunder, the EMPLOYER shall give immediate written notice hereof with the fullest information obtainable at the time to the SURETY at its Head Office or Branch concerned.
2. If the CONTRACTOR shall fail to comply with the provisions of the CONTRACT to such an extent that the CONTRACT shall be forfeited, the SURETY shall have the right and opportunity to assume the remainder of the CONTRACT and at its option, to perform or subcontract the same.

PERFORMANCE BOND

3. In the event of any breach of the provisions of the CONTRACT, the SURETY shall be subrogated to all the rights and properties of the CONTRACTOR arising out of the CONTRACT. All deferred payments and any and all monies and properties, that are then, or that may thereafter, become due to the CONTRACTOR under or by virtue of the contract shall be credited upon any claim that the EMPLOYER may make upon the SURETY.

4. Legal proceedings for recovery hereunder may not be brought unless begun within twelve months from the time of the discovery of the act or omission of the CONTRACTOR on account of which claim is made; but If the SURETY shall assume the performance of the contract the period within which legal Proceedings for recovery hereunder may be brought shall be deemed to be extended twelve months beyond the date of failure of the SURETY to perform the said contract .

5. The SURETY shall not be liable for any damage resulting from Strikes, or labor difficulties, or from Mobs, Riots, Fire, the Elements, or Acts of God or for the repair or reconstruction of any work or material damaged or destroyed by any such causes, nor for damages for injury to persons, nor for the non-performance of any guarantees of the efficiency or wearing qualities of any work done or materials furnished or the maintenance thereof or repairs thereto, nor for the furnishing of any bond or obligation other than this instrument.

6. No change shall be made in the plans and specifications forming part of the contract that shall increase the amount to be paid to the CONTRACTOR by more than 5% unless the SURETY's consent thereto shall be secured in writing.

7. With the exception of the Instances Where differences may not be submitted to arbitration according to Article 315 (2) of the Code of Civil Procedure, all differences arising out of this Bond Guarantee shall be referred to the decision of an Arbitrator to be appointed In writing by the parties in difference or if they cannot agree upon a single Arbitrator to the decision of two Arbitrators one to be appointed in writing by each of the parties within one calendar month after having been requested in writing so to do by either of the parties or In case the Arbitrators do not agree of an Umpire appointed In writing by the Arbitrators before entering upon the reference. The Umpire shall sit with the Arbitrators and preside at their meeting and making of an award shall be a condition precedent to any right or action.

IN WITNESS WHEREOF the CONTRACTOR and the SURETY have duly executed this Bond, this ***06TH*** day of ***July, 2020***

THE CONTRACTOR

(SEAL)

THE SURETY

(SEAL)

Witnessed by

1. Worku Alemu
2. Degol

Signature

1. _____
2. _____

Third Party Insurance



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NILE INSURANCE COMPANY S.C.

RECEIPT VOUCHER No. RV15/12052

Branch Gondar Date 16 JUN 2020

G/L A/C No.	S/L A/C No.	Policy No.	Class Of Business	Sector
4006-0106-06	016007	P/15/010/06/6007/20/196	Motor Commercial- Tp	

NAME : EYAYU ESHETIE BUILDING CONTRACTOR TIN No. 000000679

Customer TIN No. *Port From* *To*

Policy No./Cert No. P/15/010/06/6007/20/196 Endorsement No.

Claim No. *Promoter :*

Period Of Insurance : 17-JUN-2020 TO 16-JUN-2021

Sum Insured Birr : .00

Premium:	First	Renewal	Additional
	X		-

DESCRIPTION	AMOUNT IN Birr
Being Premium on Motor Commercial- TP Policy No. P/15/010/06/6007/20/196	1,235.40
Levy on TP Pay	122.90
STAMP DUTY	5.00
ONE THOUSAND THREE HUNDRED SIXTY-THREE AND CENTS THIRTY ONLY TOTAL	1,363.30

Cash : YES

Cheque No. :

User : ADENO

Name Of Cashier : DEGIEC

Cashier's Signature :

NILE INSURANCE CO. (S.C.) Gondar Branch PAID VOUCHER NO. DATE

Distribution :- Original -For Customer ,Copy 1 - For Finance & Accounting Dep't & Copy 2 - For File

Motor Commercial Own Damage + BSG

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NILE INSURANCE COMPANY s.c.

ENDORSEMENT No. E\15\513\06\6018\2020\280

BRANCH : Motor Commercial Own Damage

Attached to and forming part of

POLICY No. P/15/010/06/6018/19/137

The Insured : EYAYU ESHETIE BC
Address : GONDAR, KEBELE 16 TEL. 0918-35-00-70
Effective date : 17/06/2020
Expiry date : 16/06/2021

Type of Cover : Motor Commercial Own Damage + BSG
Plate No : 03-A69943 A.A
Sum Insured : 1,500,000.00
Excess : 5,000.00 or 5%

It is hereby agreed and understood that the above mentioned Policy is renewed for a further period of twelve Months effective from (17/06/2020) to (16/06/2021).

If the insured vehicle or any of its accessories or spare parts are lost or damaged whilst the vehicle is being driven by or in charge of a person who is young (below age 21) or inexperienced (whose driving license is provisional or below one year from the date of issue), the stated compulsory excess will be DOU.

In view of the above a renewal Premium of Birr 13,446.22 and Revenue Stamp of Birr 5.00, i.e. a total amount o Birr 13,451.22 (Thirteen thousand four hundred fifty one birr and 22/100 cents). is collected from the Insured.

Subject otherwise to the terms, conditions and exceptions of the Policy or endorsed thereon.

Issued at Gondar on '16/06/2020'

THE INSURED

FOR THE COMPANY
Gonder Branch Manager

Personal Accident



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NILE INSURANCE COMPANY s.c.

RECEIPT VOUCHER No. RV15/12054

Branch Gondar Date 16 JUN 2020

G/L A/C No.	S/L A/C No.	Policy No.	Class Of Business	Sector
4007-0107-07	017001	P/15/070/07/7001/19/3	Personal Accident	

TIN No. 0000006795

NAME . EYAYU ESHETIE BUILDING CONTRACTOR

Customer TIN No. *Port From* *To*

Policy No./Cert No. P/15/070/07/7001/19/3 Endorsement No. E\15\513\07\7001\2020\2

Claim No. *Promoter :*

Period Of Insurance : 17-JUN-2020 TO 16-JUN-2021

Sum Insured Birr : 60,000.00

Premium:	First	Renewal	Additional
		X	-

DESCRIPTION	AMOUNT IN Birr
Being Renewal Premium on Personal Accident Policy No. P/15/070/07/7001/19/3. vide Renewal Endorsement No. E\15\513\07\7001\2020\2	442.00
STAMP DUTY	5.00
FOUR HUNDRED FORTY-SEVEN ONLY TOTAL	447.00

Cash : YES Cheque No. :

User : ADENO

Name Of Cashier : DEGIEC Cashier's Signature :

NILE INSURANCE CO.(S.C.) Gondar Branch PAID VOUCHER NO. DATE

Distribution :- Original -For Customer ,Copy 1 - For Finance & Accounting Dep't & Copy 2 - For File

Third Party Risks Schedule



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NILE INSURANCE COMPANY s.c.

The Schedule (ሠንጠረዥ)

Attaching to and forming an integral part of Vehicle Insurance against Third Party Risks
ከተሽከርካሪ አደጋ ሶስኛ ወገን የመድን ዋስትና ውል ጋር አንድ አካል ሆኖ የሚያገለግል

Policy No (የመድን ዋስትና ውል ቁጥር) P/15/010/06/6007/20/196

Name Insured (የመድን ገቢው ስም) : EYAYU ESHETIE BUILDING CONTRACTOR

Address Name Insured (አድራሻ):**Region**(ክልል):GONDAR, KEBELE 16 **Sub-city** (ክ/ከተማ): TEL. 0918-35-00-70 **Keble** (ቀበሌ):

H.No.(የቤት/ቁ)_____ **TIN No.** (የታክስ ከፋይ መለያ ቁጥር):_____ **Tel**(ስልክ): _____ **P.O.Box** (ፖ.ሣ.ቁ): _____

Occupation (የመድን ገቢ ሥራ): _____

Period of insurance :From 17 day of Jun, 2020 to midnight of 16 of Jun, 2021
መድን የተገባለት ጊዜ : ከ _____ እስከ _____ እኩለ ሌሊት

Geographical Area (የመድን ሀሉ ተፈፃሚ የሚሆንበት አካባቢ) : ኢትዮጵያ ብቻ

Use of Vehicle (የተሽከርካሪው አገልግሎት) : OWN SERVICE **Premium** (አረቦን) :Birr 1,363.30

Description of Vehicle(s)(የተሽከርካሪው ዝርዝር)

Plate.No የሰሌዳ ቁጥር	Chasis No. የቻሲስ ቁጥር	Engine No. የሞተር ቁጥር	Make and Type of Vehicle የተሽከርካሪው ስሪት	C.C የፊሪስ ትልበት	Year of Manufacture የተሰራበረከበት ዘመን	Carrying Capacity የመጫን አቅም	
						Goods ሸቀ	Passengers including the driver ተሳፋሪ (ሾፌሩን ጨምሮ)
03-A69943 AA	KMJWA37KBGU 751497	D4CB-E780BB7	Toyota	2497	2015		8

Persons Entitled to Drive (ተሽከርካሪው ለመንዳት የተፈቀደላቸው) : _____

Third Party liability limit (የሶስተኛ ወገን ኃላፊነት ገደብ) :

A. In respect of death or bodily injury(ሞትና የአካል ጉዳትን በተመለከተ)
1. Emergency Medical Treatment ..... up to Birr 2,000.00/person)
ለአስቸኳይ ህክምና አገልግሎት በሰው እስከ ብር 2,000
2. Death ..... Not exceeding Birr 40,000.00/Person
ለሞት በሰው እስከ ብር 40,000 ያልበለጠ
3. Bodily Injury ..... Not exceeding Birr 15,000.00/Person
ለአካል ጉዳት በሰው ከብር 15,000 ያልበለጠ
B. In respect of property damage ..... Not exceeding Birr 100,000.00/accident
የንብረት ጉዳት/ኪሣራ በተመለከተ በአደጋ ከብር 100,000 ያልበለጠ

Signed at _____ on _____
በተሰጠበት ቦታ _____ በቀን ዓ.ም :
Prepared By (ያዘጋጀው) : _____
Examined by(የመረመረው): _____

Authorized Signature
Nile Insurance Company S.C
Manager
ናይል ኢንሹራንስ ኩባንያ

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Personal Accident Policy Schedule



ናይል ኢንሹራንስ ኩባንያ አ.ማ.
NILE INSURANCE COMPANY s.c.

PERSONAL ACCIDENT POLICY SCHEDULE

Customer Name	EYAYU ESHETIE BUILDING CONTRACTOR	**Account Code**	15EC0006
Policy Number	P/15/070/07/7001/19/3	**Premium (ETB**	442.00
Insured Name	EYAYU ESHETIE	**Stamp Duty(ETB)**	5.00
Insured Code	15EC0006	**Total (ETB)**	447.00
Address	GONDAR, KEBELE 16 TEL. 0918-35-00-70	**Debit Note No**	RV15 / 12054

Policy Period a) **17/06/2020** To **16/06/2021** (Both Dates Inclusive)

b) Any subsequent period for which the insured shall pay and the company shall agree to accept a renewal premium.

Coverage PA/GPA

PA DETAILS

Name Of The Individual	Occupation.	Death Limit(ETB)	Permanent Total Disability Limit(ETB)	Temporary Total Disablement Limit(ETB)	Medical Expense Limit due to Accident	Net GPA Premium Birr
ABUSH EYAYOU	DRVER	60000	60000	1000	2000	442.00
	Total :	60000	60000	1000	2000	442.00

Geographical Area Ethiopia

Issue Date 13/06/2019

For and on behalf of
Nile Insurance Company S.C , Branch Gondar
Gonder Branch
Manager

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Print Date : 25/07/2011