

# **COURSE TITLE**

## **CONSTRUCTION ENGINEERING AND MANAGEMENT**

### **Chapter 3**

## **CONSTRUCTION CONTRACT AND DELIVERY METHODS**

### **Lecture 3 (week 3)**

**Method of work Execution, Construction Contract,  
Tendering, Qualification of Bidders, Opening and  
Evaluation of Bids, Award of Contract.**

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#### **Learning Objective**

The main objective of this lecture is to understand about:

- 3.1 Method of work Execution.
- 3.2 Construction Contract.
- 3.3 Tendering.
- 3.4 Qualification of Bidders.
- 3.5 Opening and Evaluation of Bids.
- 3.6 Award of Contract.

### **3.1 METHOD OF WORK EXECUTION**

A project can be executed by the department (owner), by contracting and by the local user committee. Construction methodology or project execution methodology is the planned method of construction, taking into account all contractual and legal requirement, constraints, risks and opportunities. [1]Construction work can be done for the supply of goods, construction works itself and services. Work can executed through contract with either through sealed bidding, sealed quotation or any other method.

#### **1. Sealed Competitive Bidding**

##### **(a) National Competitive bidding (NCB)**

It is sometimes called as local competitive bidding which is normally used for public procurement in a country. In this process all the domestic eligible bidders are invited to participate in bidding. For NCB in Nepal, tender notice is to be published in national newspaper and a period of at least 30 days shall be given. [2]

##### **(b) International Competitive bidding (ICB)**

If the amount of work is a large and national/domestic contractors cannot perform the job, eligible bidders are invited from all over the world. This process is often used by governments and international organizations to procure goods and services, intended to provide a fair and transparent way to award contract. [3] The objective of ICB is to provide all eligible bidders a timely and adequate notification about a buyer's requirements. ICB is the most appropriate procurement method that provides a level-playing field for eligible bidders.

#### **2. Sealed Quotation**

Sealed quotation means the description along with quoted price submitted in a sealed envelope by a person, firm, company or organization willing to carry out any construction work or make available goods or other services. A notice shall be published in a national or local level newspaper by giving a period at least of fifteen days. The sealed quotation, once submitted, cannot be withdrawn or amended.

#### **3. Direct Procurement [2]**

Direct procurement can be done. If only one supplier or consultant or service provider has the efficiency to fulfil the procurement requirements. If only one supplier has the exclusive right to supply the goods to be procured and no other appropriate alternative is available. If the service of a particular consultant with his unique qualifications is immediately needed for the concerned work.

#### **Delivery method**

Delivery method means the approach used to organize the project team so as to manage the entire designing and building (design-build) process. [4]Owner needs to decide which designers and construction professional to hire, when to hire them, and under which contract. Which organization gets hired first? Only one company is hired to manage the process? There are number of strategies that can be used to manage the process, each offering advantages and disadvantages. The most popular three approaches are:

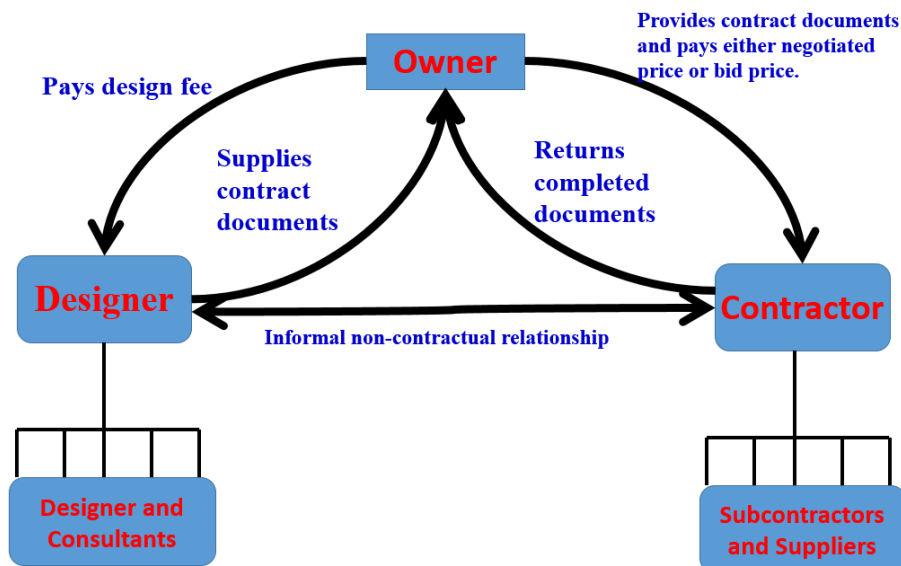
##### **3 Traditional Method**

##### **4 Design-Build Method**

##### **5 Construction Project Management**

## 1. Traditional Method

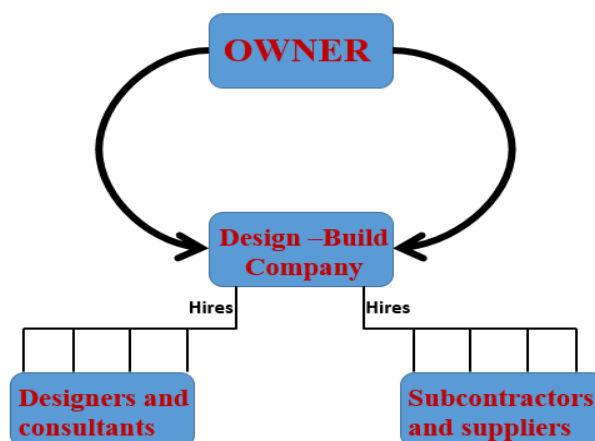
In this, the owner hires a design professional who prepares a complete set of contract documents for the owner for a design fee. With complete set of documents in hand, the owner either negotiates a price with a general contractor or bids out the work. The general contractor is totally responsible for delivering the completed project as spelled out in contract documents. The designer may be involved in overseeing the construction work in the field. No direct formal relationship exists between the designer and builder.



Source: [4]

## 2. Design-Build Method

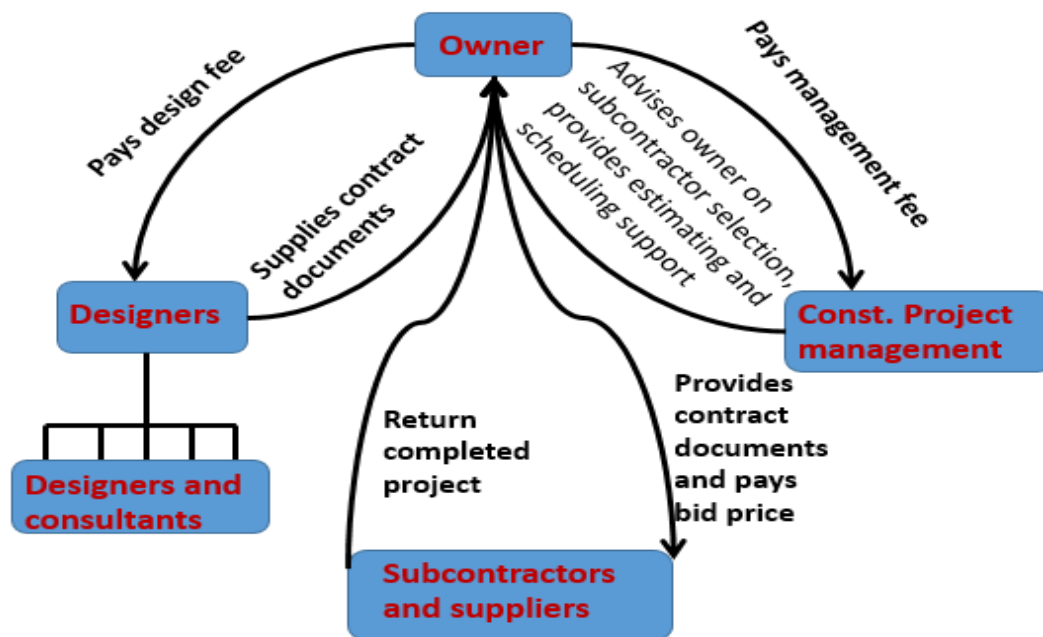
In this arrangement, the designer and the construction professionals are either from the same company or through joint venture form a single company for the duration of the project. The owner contracts with a single company early in the pre-construction stage, and this company takes the project from conceptual design right through construction. The term “Turn-Key” is also used to describe this approach. It has been used on large, privately funded industrial sector project, commercial building project.



Source: [4]

### 3. Construction Project Management

It treats the project planning, design, and construction phases as integrated task. This approach unites three parties team consisting of owner, designer, and construction manager. The team works together from the beginning of design to project completion, with common objective of best serving the owner's interest. This delivery has a number of variations such as program management, professional management, and construction management. This method is commonly used by real estate developers in the commercial building industry.



Source: [4]

### 3.2 CONSTRUCTION CONTRACTS

Construction contracts are the written agreements signed by the contracting parties (mainly an owner and a contractor), which bind them, defining relationships and obligations. [5] Contract is an agreement between two or more than two persons to do or not to do something, which can be enforceable by law.

#### Legal Definition

- Mutually binding agreement that obligates the seller to provide the specified product or services and obligates buyer to pay for the same.
- An agreement that affects the legal relationship between the two or more parties.

*"All contracts are agreements but all agreements are not contracts."*

**Agreement + legality = Contract**

Agreement is the acceptance of the offer (proposal) with or without any condition. It may not have legal obligation. But contract is an agreement concluded between two or more parties for performing or not performing any work enforced by law.

## **WHY USE CONTRACTS IN CONSTRUCTION?**

- Describe Scope of work.
- Establish timeframe.
- Establish cost and payment provision.
- Set forth obligations and relationships.
- Manage multiple risks.
- Establish control mechanism
- Minimize disputes.
- Improve economic return on investment.

## **Elements of a Contract**

- Offer and acceptance
- Free consent (offer should be accepted freely without coercion)
- Legal relationship
- Written (verbal agreement cannot be a contract)
- Competent parties (age below 18 years or out of self-control cannot enter into a contract)
- Lawful purpose (both parties agree to perform against country law, contract is invalid)
- Possibility of performance
- Certainty (should not be ambitious vague)
- Consideration (both parties should be benefited)

## **Factors to be considered in Preparing Contract Document**

- The contract must be fair and clear
- Contract language must be consistent
- No repetition (say it once, say it in proper place)
- Use each part of contract for its proper purpose
- Contract information must be retrievable
- Use foresight (try to foresee any possible area of confusion and clear them up in advance)
- If you want to it, get it in the contract.

## **TYPES OF CONTRACT**

### ***A. Contract as per enforceability***

**1. Valid Contract** - If all the elements of contract are present, the contract is valid.

**2. Voidable Contract** - As per contract act, following contracts are voidable, i.e. if the party desire to make it void (invalid).

- Forceful contract or contract against free consent or contract involving fraud.
- Entered due to undue influence
- Contract involving fraud or misstatement.

**3. Void Contract** - As per contract act the following contracts become null and void.

- Contrary to statutory law
- Not possibility of performance
- Contrary to public policy and welfare.
- Signed by incompetent parties.

### ***B. As per method of payment***

#### **1. Lump Sum / Fixed Price Contract**

Contractor is free to use any method & means to complete a project. Contractor is responsible for proper work performance. Project scope and limits are defined prior to the start of construction. Before the start of construction, the total construction cost is defined and a definite contractual commitment between the owner and contractor is established. Contractor has greater ability to earn profit.

#### **2. Item rate Contract**

Require sufficient design definition to estimate quantities of unit. Contractors bid on unit of works. Payment is made of the contractor by detail measurement of the work actually executed by the contractor. Final contract price is not known until the last item of work is measured and invoiced by the contractor. The risk for the owner is if estimated quantities are significantly different from the reality of the situation, the financial commitment of the owner may be greater than planned. [4]

### ***C. Reimbursable or Cost Plus Contract***

Final cost is owner responsibility and less design definition is required. Can contract in early stages of project and can mix fixed cost with reimbursable cost. Contractor's overhead & profit can be determined at fixed rate. Reimburse labor, material and equipment at cost. Owner has more control over contractor and Contractor has little risk and no incentive to control costs. Reimbursable Contract may be *Cost + Fixed Fee*, *Cost + percent of cost Fee*, *Cost + Fixed Fee + Profit Sharing* and *Cost + sliding Fee*.

#### ***D. As per method of selecting contractor***

- 1. Competitively tendered contract*
- 2. Negotiated contract*

#### ***E. As per traditional approach***

- 1. Owner – Builder approach* (owner performs own design and construction with own forces)
- 2. Design Build (DB) contract* (main contractor is responsible for both design and construction for agreed lump sum price)
- 3. EPC* (engineering procurement and construction) contract
- 4. Turnkey contract* (real state)

#### ***F. As per project finance [6]***

##### **BOOT (Build Own Operate Transfer)**

Project Company constructs the project. Owns and operates it for a set period of time. During ownership earns revenues from the project. At the end ownership is transferred back to the public sector. Example: the project company builds hydropower plant, own it for 20 years during which time the power is generated is sold to an off-taker (Electricity office) , and at the end of that time ownership is transferred to the Public sector.

##### **BOT (Build Operate Transfer)**

Also called design-build-finance-operate (DBFO). Project Company never owns the assets used to provide the project service. Project company constructs the project and has right to earn revenues from operation. It is also known as “Build-Lease- Transfer” (BLT) or “Build- Lease- Operate-Transfer” (BLOT). Ownership remains with the public sector. Example: a road, bridge, or tunnel.

##### **BTO (Build Transfer Operate)**

These are similar to a BOT project, except that the public sector does not take over the ownership of the project until construction is completed.

##### **BOO (Build Own Operate)**

These are the projects whose ownership remains with the Project Company throughout its life. Example: mobile phone network.

## **CONTRACT CHANGES**

Contract changes occur for three main reasons:

1. Because of changes in owner requirements, the scope of the project changes.
2. Because of conditions at the time the contract is signed, the work must be performed differently.
3. Due to omissions or design features that cannot be built as specified, the design must be adjusted.

### 3.3 TENDERING

Tender is a written offer presented before an owner (or department) showing interest to perform the specified works within the specified time under agreed condition. [7] Tender is an offer in written form by the tenderer (who offers the tender) to execute same specified work or to supply some specified goods at a certain rate/amount within a fixed time frame under certain conduction of agreement. It is the first step in the formulation of contract.

Tender notice is a means of an expression through which contractors know where they have to bid a tender. Tender notice is published widely in important daily newspaper. Tender notice should include:

1. The name and address of the public entity inviting bids.
2. Nature of work and its location
3. The place of delivery of the goods to be supplied, services to be delivered.
4. The amount of bid security, validity period of bid.
5. Date time and place, where and when the tender document is available.
6. Cost of tender document
7. The place, manner and deadline for the submission of bidding document
8. Provision of e-bidding process and its process.
9. The place and time for opening the bids.
10. Expected date of acceptance of successful bids.

#### WHY TENDERING?

1. To select best contractor
2. To get quality work
3. To get work at competitive price
4. To maintain transparency
5. Public Private Partnership  
(encourage contracting procedure)

#### Preparation before Inviting Tenders

1. Project Preparation
2. Estimation of Quantities
3. Cost Estimate
4. Approval of estimate
5. Resource Planning
6. Tender document Preparation

#### Bidding Stages

Bidding refers to the process of submitting a proposal or offer to provide goods or services at a certain price.

##### 1. Single Stage Single Envelope Bidding Procedure

In this procedure, bidders submit bids in one envelope containing both the Financial Proposal and Technical Proposal.

##### 2. Single Stage Double Envelope Bidding Procedure

In this procedure, bidders submit two sealed envelopes simultaneously, one containing the Technical Proposal and the other the Financial Proposal, enclosed together in an outer single envelope.

#### Bidding/Tender Document

It is a document prepared by the concerned firm making invitation to bid for submission by bidders by filling up the price or rate.

### **Earnest Money/Bid Bond/Bid Security**

It is the amount of money deposited while bidding a tender as a guarantee of the party's willingness of carrying out the work awarded to him. Bidder shall have to submit the bid along with bid security of 2 to 3% of the estimated amount of the bid in cash or a bid security of equivalent to that amount in a commercial bank.

### **E bidding**

Electronic bidding is a process using an electronic procurement tool to view, build, respond and submit and evaluate public tenders. It saves time and money by eliminating the need drop off paper copies to the procurement office and also reduces the influence of third parties while evaluating.

### **Liquidated Damages**

It is a remedies available to any contracting party to compensate for the financial loss suffered as the result of a proven breach of contract. It may also be known as contractual penalties designated during the formation of contract for the injured party to collect as compensation upon a specific breach. [2]

## **3.4 QUALIFICATION OF BIDDERS**

It is a kind of short listing of eligible bidder to avoid crowding of bidder. Contractors are required to undergo some form of pre-qualification in order to be selected for inclusion on a tender list. [8]It ensures that the invitation to bids extended only to those perspective bidders who have adequate capability and resources to perform the particular contract satisfactory taking in to account their-

- Experience and past performance on similar contract
- Capabilities w.r.t. personnel, equipment and construction facilities
- Financial position
- Litigation history

### **Post Qualification**

In this process, no pre-qualification is adopted and all the eligible bidders participate in the bidding process. It may include:

- (a) Single envelope system (Financial and Technical proposal in a single envelope)
- (b) Double envelope system (Financial and technical proposal in separate envelope)

In Double envelope system, bidders are selected by adopting

- Short list from technical proposal
- Select the lower bidder first and check technical proposal.
- Giving weightage to both technical and financial proposal.

### **3.5 OPENING AND EVALUATION OF BIDS**

A Public Entity shall have to open a bid in the presence of the bidder or his/her representative. Bids shall be opened immediately after the deadline for submission of bids and in public. The bid opening process starts after the receipt of bids and concludes when the bids are collected for further evaluation. Before opening competitive bids, make certain the place designated for the bid opening is ready and available.

#### **Preliminary Examinations of Bids**

The purpose is to identify and reject bids that are incomplete as required by the bidding documents before further detailed evaluation. The principal areas to be covered are: Verification of signature, registration, Joint Venture (J/V) agreement; Eligibility of bidders; Bid Security; Completeness and qualifications. The bid evaluation committee established by the implementing agency shall evaluate bids.

#### **Determination of Substantial Responsiveness of Bids**

The purpose is to reject bids which are not substantially responsive to major commercial and technical requirements. Commercial reason for rejecting bids are:

- Bid security/validity not in accordance with bidding documents.
- Inability to meet critical work schedule.
- Failure to comply with minimum experience or financial capability.
- Conditional bids.

Technical reason for rejecting bids are

- Failure to bid for the required scope of work.
- Failure to quote for each item in Bill of Quantity.
- Failure to satisfy major requirements in the specification.

#### **Detail evaluations of Bids**

The detailed evaluation shall be based on the evaluation criteria as specified in the bidding documents. The purpose is to determine the evaluated cost of each bid. The basis for award of contract shall be the bidder with the lowest evaluated substantially responsive bid subject to:

- If bidders are pre-qualified,
- If the bid contains no substantial deviations from the specifications (Technical Responsiveness),
- If the lowest evaluated cost is well within the cost estimate
- If rate analysis submitted by the bidder is logical and realistic.

### **3.6 AWARD OF CONTRACT**

Contract award is a process whereby an entity procures goods or services from a supplier.

The contract can be awarded to the lowest bidder, as determined by a competitive bidding process, or it may be granted to the most qualified bidder. Contract award helps ensure that the best possible product or service is provided at the best possible price. Awarding a contract refers to the process of notifying a tenderer that they have been formally chosen as the supplier for a particular contract upon acceptance of their bid or proposal. [9]

## Letter of Intent

Within 7 days of the approval of the recommendation of the bid evaluation committee, the employer issues the letter of intent to accept lowest evaluated responsive bidder. This information is to be given to all bidders through public notice in newspaper. If no other bidders / concerned persons submitted any complain about this selection, the contract is awarded to the selected bidder and called for agreement with required performance bond within 15 days.

## Performance Security

It is the amount of money deposited by a successful bidder as a security for satisfactory performance. In Nepal, security deposit is equal to 5% of contract amount for Nepalese firm where as it is 10% of contract amount for foreign contractor. This is refunded after completion of Defect Liability Period (maintenance period). If the work is unsatisfactory or contractor fails to perform his duty, this fund is forfeited.

There are various steps that must be followed in order to award a contract properly. These steps include: [10]

1. Conducting due diligence on all potential bidders.
2. Screening potential bids based on price, quality and other factors.
3. Evaluating proposals against established criteria.
4. Focusing on key objectives and goals of the project.

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