B.Sc Civil Engineering

Project & Contract Management CE 206

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Civil Engineering Contracts

Why should we know types of contract?

- Whether you’re managing a small project or a large complex program you need a basic understanding of the different types of contract you’re likely to encounter when buying from external organizations and 3rd parties.

What is a Contract?

- *The word **"Contract"** is derived from the **latin** word **"Contractum"** meaning drawn together.*
- A legally binding agreement. In other words…

  "A promise or set of promises which the law will enforce".
- A simple ***contract*** consists of an agreement between two or more parties under certain terms and conditions whereby one party undertakes to ***execute works*** or to supply materials at specified rates and the other party undertakes to make necessary ***payments*** for the work completed by the first party.

What is a Contract?

- In the project context, contracts typically involve the exchange of money in return of goods or services.
- The parties must have entered into the agreement freely.
- The agreement will create rights and obligations that may be enforced in the courts.
- If the contract terms are set out in writing in proper documents, which the parties subsequently sign, then, both parties are bound by these terms.
- The normal method of enforcement is an action for damages for breach of contract, though in some cases the court may order performance by the party in default.

Why Use contract in construction?

- To describe scope of work
- To establish time frame
- To establish cost and payment provision
- To set fourth obligations and relationship
- To minimize disputes
- To improve economic return of investment

Essential elements of a Contract:

1) **Agreement**
   One party make the offer, another party accepts the offer and both achieve consensus ad idem (meeting of the minds)

2) **Consideration**
   Both parties must have provided consideration, ie, each side must promise to give or do something for the other.

3) **Intention to create legal relations**
   The parties must have intended their agreement to have legal consequences. The law will not concern itself with purely domestic or social agreements.

4) **Capacity**
   The parties must be legally capable of entering into a contract.

5) **Absence of Vitiating factors**
   Absence of factors that are going to invalidate a contract, i.e. duress or undue influence, mistake, misrepresentation, illegality

Factors Influencing the Choice of the Type of Contract

- The appropriateness for providing an adequate incentive for efficient performance by the contractor
- The ability to introduce changes
- The allocation of risks
- The start and completion date of the project

TWO BROAD CATEGORIES :

1. Price Given in Advance Contracts (Price-based Contracts)

2. Cost Reimbursement Contracts (Cost-based Contracts)

Lump Sum Contract:

- A lump sum contract is the most common form of construction contract.
- Involves a single **total fixed or 'lump sum' price** for all construction related activities.
- It is generally appropriate where the project is already well defined when tenders are sought and changes are unlikely. This means that the contractor is able to accurately price the risk they are being asked to accept.
- Lump sum contracts apportion more risk to the contractor that some other forms of contract and give the client some certainty about the likely cost of the works

Lump Sum Contract:

- Can include incentives or **benefits for early termination**, or can also have penalties, called **liquidated damages**, for a late termination.
- Lump sum includes costs plus overheads and profits
- Lower financial risk to Employer.
- Higher financial risk to Contractor.
- Price quoted is a guaranteed price as per contract documents.
- Payment may be staged at intervals of time on the completion of milestones (monthly progress claims).

Advantages

- The final price is known, by the owner, before the work commences i.e. Cost known at outset.
- The contractor has more incentive to reduce his cost to increase the profit.
- The contractor hopes to complete the job as quickly as possible, to minimize overhead, to maximize profit and to move to the next Job.
- Contractor selection is easy.
- When level of risks is low and quantifiable, and
- When the client does not wish to be involved in the management of his project.
- That can be accurately and completely described at the time of bidding such as residential and building construction.
- When limited variation is needed.

Disadvantages

- Changes in drawings and specifications can be very expensive and source of trouble. In other words the contract has very limited flexibility for design changes.
- Contractor is free to use the lowest cost of material equipment, methods.
- The contractor carries much of the risks. The tendered price may include high risk contingency.
- Competent contractors may decide not to bid to avoid a high-risk lump sum contract.
- Lump sum contracts might be less appropriate where speed is important, or where the nature of the works is not well defined.

Measurement or Unit Price Contract:

- Measurement contracts (sometimes called 're-measurement' or 'measure and value' or unit price contracts) can be used in situations where the design (or type of works) can be described in reasonable detail, but the amount cannot. For example, excavation works where the quantity of excavation required is difficult to assess until after the works have begun.
- The actual contract sum cannot be determined when the contract is entered into, but is calculated on completion, based on 're-measurement' of the actual work carried out and the rates tendered.

Measurement or Unit Price Contract:

- Generally tenderers rates will be based on drawings and approximate quantities.
- Measurement contracts can allow an early start on site, before design is complete.
- This allow changes to be made to the works relatively easily.
- There is inevitably some risk for the client as the cost of the works is not known. In effect,
  the client is taking the risk for any ‘unknowns’, and that means measurement contracts are rare.

Advantages:

- Early start is possible
- Saves the heavy cost of preparing many bills of quantities by the contractor
- Changes can be made easily by the owner
- Lower financial risk for the contractor

Disadvantages:

- Final cost not known from the beginning
- Staff needed to measure the finished quantities and report on the units not completed.
- Unit price sometime tend to draw unbalanced bid. (*For Unit-Price Contracts, a balanced bid is one in which each bid is priced to carry its share of the cost of the work and also its share of the contractor's profit.*

  Contractors raise prices on certain items and make corresponding reductions of the prices on other items ,without changing the total amount of the bid)

Schedule of rates term contract:

- Such a contract is normally used when the nature of work is known but cannot be quantified, or if continuity of programme cannot be determined.
- In the absence of an estimate, tenderers quote unit rates against a document that is intended to cover all likely activities that might form part of the works.
- Indicative quantities may or may not be given to tenderers but do not form part of the contract.
- As the extent of the work is unknown the unit rates include overhead and profit.
- Used for repair and maintenance works or under conditions of urgency.

Advantages:

- As a fully detailed design is not required the client can obtain tenders at the early stages of a project and begin construction activity before completion of the design. So to this extent it is 'fast track'.
- Variations are easy to estimate and normally cheaper than on fixed price traditional contracts.
- The client can stop and start work at a pace that might be determined by cash flow or funding.

Disadvantages:

- The client does not have a final price when committing to starting work.
- There is no real incentive for contractors to treat such work with any sense of urgency and its best staff will be placed on the projects where the contractor is carrying more risk.
- Additional resources are required to measure work and certifying payments.

Cost reimbursable or Cost Plus Contracts:

- A cost reimbursable contract (sometimes called a cost plus contract) is one in which the contractor is reimbursed the actual costs they incur in carrying out the works, plus an additional fee.
- A cost reimbursable contract might be used where the nature or scope of the work to be carried out cannot be properly defined at the outset, and the risks associated with the works are high, such as, emergency work (for example urgent alteration or repair work, or if there has been a building failure or a fire requiring immediate reconstruction or replacement of a building so that the client can continue to operate their business).
- Tendering may proceed based on an outline specification, any drawings and an estimate of costs.

Cost reimbursable or Cost Plus Contracts:

- This is a high risk form of contracting for the client as the final cost is not known when the contract is entered into (ie there is no contract sum).
- The costs for which the contractor is entitled to be reimbursed must be set out very clearly in the contract.
- This is a complex procedure that needs to be carefully considered, as whilst some direct costs may be relatively straight forward to determine, whilst other ‘shared’ costs, might not.

Cost reimbursable or Cost Plus Contracts:

- Direct costs that are clearly attributable to a single project could include:
  - Labour.
  - Materials.
  - Hired plant.
  - Sub-contractors.
- Other costs that might be spread across more than one project could include:
  - Head office costs.
  - Staff costs.
  - Manufacturing facilities.
  - Owned plant.

Cost reimbursable or Cost Plus Contracts:

- Costs are calculated based on the contractor's accounts and other records, which are made available to the client on an 'open book' basis.
- The client may also monitor activities on site to verify that costs are legitimate (for example checking whether plant that is being charged is actually being used) and that costs are not excessive.
- This can become complex where the contractor is thought to be operating inefficiently or incompetently.
- The contractor can be incentivised to operate efficiently by the introduction of a target cost.

Cost reimbursable or Cost Plus Contracts:

- A target cost is agreed at the beginning of the project.
- At the end of the project the actual cost is compared to the target cost (taking into account any changes that have been agreed).
- If the actual cost is lower than the target cost, the savings are shared between the parties to the contract on some pre-agreed basis (often a percentage).
- If the actual cost is higher than the target cost, the additional costs may also be shared.

Cost reimbursable or Cost Plus Contracts:

- Actual cost plus a negotiated reimbursement to cover overheads and profit.
- Different methods of reimbursement :
  - Cost + percentage
  - Cost + fixed fee
  - Cost + fixed fee + profit-sharing clause.
- Higher risk to owner
- Compromise : guaranteed maximum price (GMP) reduces risk to owner while maintaining advantage of cost plus contract for contractor.
- By using this type of contract the contractor can start work without a clearly defined project scope, since all costs will be reimbursed and a profit guaranteed.

Cost + % of Cost Contract:

- The contractor is reimbursed for all his costs with a fixed % age of costs to cover his services.

- Project/site overheads may be covered by the %age or computed as one of the costs.

Cost + % of Cost Contract:

Fee = percentage of the total project cost

Advantages	Disadvantages
profitable for the contractor	No incentive to finish job quickly
	Owner does not know total price
	Larger the cost of the job, the higher the fee the owner pays

Cost + % of Cost Contract - Advantages

1. Construction can start before design is completed.

2. If the contractor is efficient in the utilization of resources then the cost to the client should represent a fair price for the work undertaken.

Cost + % of Cost Contract - Disadvantages

- The project total cost is completely unknown before the project start.
- No incentive for the contractor to be efficient in his use of labors, materials or equipments.
- Minimum efficiency maximizes the profit.

Cost Plus Fixed Fee :

- Most common form of negotiated contracts
- COST = expenses incurred by the contractor for the construction of the facility
  - Includes: Labor, equipment, materials, and administrative costs
- FEE = compensation for expertise
  - Includes: profit

Cost Plus Fixed Fee:

- Fee = percentage of the original estimated total figure

Advantages	Disadvantages
Fee amount is fixed regardless of price fluctuation	Expensive materials and construction techniques may be used to expedite construction
Provides incentive to complete the project quickly	

Cost + Fixed Fee + Profit-Sharing Clause

- In this type of contract the contractor is reimbursed at cost with an agreed-upon fee up to the GMP i.e. guaranteed maximum price, which is essentially a cap; beyond this point the contractor is responsible for covering any additional costs within the original project scope
- An incentive clause is included which specifies that the contractor will receive additional profit for bringing the project in under the GMP.
- Percentage of cost under GMP is considered profit and shared with the contractor.

Guaranteed Maximum Price for construction contracts:

- A guaranteed maximum price (GMP) is a form of agreement with a contractor in which it is agreed that the contract sum will not exceed a specified maximum.
- Typically this is a mechanism used on **design and build contracts** where the contractor has responsibility for completing the client's design and for carrying out the construction works, so they are in a good position to control costs.

Guaranteed Maximum Price for construction contracts:

- If the actual cost of the works is higher than the guaranteed maximum price, then the contractor must bear the additional cost and his profit is reduced.
- If the cost is lower than the guaranteed maximum price, then the contract should set out whether the savings made go to the client, to the contractor or are shared.
- This can create a ‘pain / gain’, or a target cost agreement, where the contractor is incentivised to make savings, but the client has the security of a cost cap.

Advantages

- Greater price certainty for clients as the contractor normally includes a sum for future design development and for risks.
- GMP promotes pre-agreement of changes as its philosophy links neatly with a contractual requirement to pre-agree the cost and time implications of any potential changes.
- GMP provides greater control over spending as the contractor is bound to a maximum price. This alerts the team to any potentially expensive items of design development.
- Less administration is required as changes are limited.

Disadvantages:

- The client might pay too much as the contractor takes on greater risk and thus includes in the price an allowance for design development and risk.
- There is no standard form of contract for GMP so there is a greater possibility of errors and misunderstandings of liabilities between the parties that may result in conflict.
- Scope changes tend to cost more.


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