

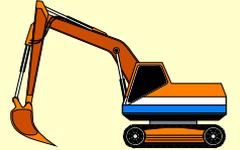
## **Chapter 8**

# **CONSTRUCTION CONTRACTS**

**CE 420**

**November 2007**

# CONSTRUCTION CONTRACTS



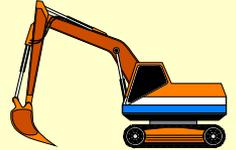
## 8.1 INTRODUCTION

### TWO BASIC TYPES OF CONSTRUCTION CONTRACTS

- 1) Competitive Bidding
- 2) Direct negotiations



# CONSTRUCTION CONTRACTS



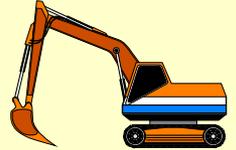
## 8.1.1 Competitive Bidding

- Almost all public contracts as well as much private work
- Customarily prepared on a fixed-price basis
  - Lump sum that covers all aspects of the work, or
  - Unit price where quantities are difficult to establish with certainty.

## 8.1.2 Direct Negotiations

- Can be on any mutually agreeable basis:
  - a) Lump-sum
  - b) Unit-price
  - c) cost-plus-fee
- Most negotiated contracts are on a cost-plus-fee basis
- The provision regarding compensation of the contractor are the major differences between negotiated contracts
- The contractor's fees can be designated as a fixed percentage of the cost of the work, a sliding-scale percentage of the cost of the work, a fixed fee, a fixed fee with a guaranteed top price, a fixed fee with bonus, or a fixed fee with an arrangement for sharing any cost saving.

# CONSTRUCTION CONTRACTS

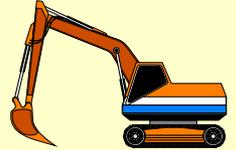


## 8.2 LUMP SUM

(Stipulated lump sum price contract) – CCDC #2 and #12

- One in which the contractor agrees to carry out a stipulated job of work in exchange for a fixed sum of money (**Low risk to owner**)
- The satisfactory completion of the work for the stated number of dollars remains the obligation of the contractor, regardless of the difficulties and troubles that may be experienced, even though the total cost of the work may turn out to be greater than the contract price.
- Contractor may be relieved of his contractual responsibility because of **impossibility of performance** i.e. Changed conditions.
- This type of contract popular from owners standpoint  
However, not all that common since it is difficult to know the entire scope of the project at the time of bidding.

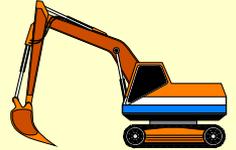
# CONSTRUCTION CONTRACTS



## 8.3 UNIT PRICE (Stipulated unit-price contract) – CCDC #4

- Unit price contracts offer advantages where quantities cannot be accurately predicted (moderate – low risk to owner)
- Example-excavation of foundations or roadways  
Based on estimated quantities of certain well defined items of work, and costs of each item.
- The estimated quantities are calculated by the engineer
- unit costs are those bid by the contractor for carrying out the work.
- The total sum of money paid to the contractor for each work item remains an indeterminable factor until completion of the project.
- Thus ultimate cost unknown until completion of project.

# CONSTRUCTION CONTRACTS

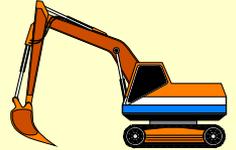


## 8.3 UNIT PRICE (Con't)

### (Stipulated unit-price contract) – CCDC #4

- In addition, the owner must provide frequent support, either directly or indirectly through the engineer for **measurement**
- The contractor is obligated to perform the quantities of work actually required in the field at the quoted price, whether they are greater or less than the engineer estimates **(Higher risk for Owner)**
- This is subject to any provisions in the contract for readjustment of unit prices when substantial deviations occur **(typically 15%)**.
- Contractor may also be relieved of responsibility due to **changed conditions**.
- Specifications must be complete enough for the contractor to assess the overall magnitude of the project and the general nature and complexity of the work.
- Primary disadvantage for the Owner lies in the possibility of serious **inaccuracies in the approximate quantities** of work and **unbalanced bids**.

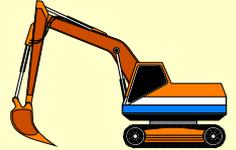
# CONSTRUCTION CONTRACTS



## 8.4 COST- PLUS CONTRACTS    CCDC #3 AND #13

- Used where in the judgment of the owner, a fixed-sum contract is undesirable or inappropriate. Cost-plus contracts are normally negotiated between the owner and the contractor.
- Most cost-plus contracts are open-ended in the sense that the total cost to the owner is not known until completion of the work.
- When the drawings and spec's are not complete at the time of contract negotiations, the owner and contractor negotiate what is commonly called a "scope contract".
- Based on preliminary drawings and outline specifications, the contractor arrives at a project "target estimate". The contract provides that the original contract documents shall be subsequently amplified "within the original intent of the preliminary drawings and specifications."
- When negotiating contracts of the cost-plus type, the contractor and the owner must pay particular attention to four important considerations.

# CONSTRUCTION CONTRACTS



## 8.4 COST- PLUS CONTRACTS (Con't)

### 8.4.1 Subcontracting

A definite and mutually agreeable subcontract-letting procedure required.

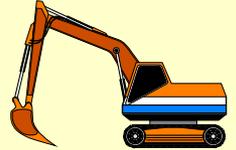
- Competitive bid subcontracts are generally preferred by both parties.
- If this is not possible, a mutually agreeable negotiation procedure is needed.

### 8.4.2 Payment

Need a clearly understood agreement concerning the determination of payment of the contractor's fee.

- Fees may be determined in different ways.
- Method of payment must also be worked out.
- A statement concerning any variation with major changes should also be included.

# CONSTRUCTION CONTRACTS



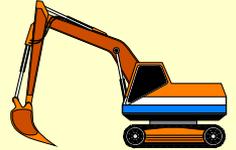
## 8.4 COST- PLUS CONTRACTS (Con't)

### 8.4.3 Accounting Methods

A common understanding regarding the accounting methods to be followed is essential.

- Problems avoided by working out details of record keeping purchasing, and reimbursement prior to start up.
- Some owner-clients have need of accurate and detailed cost information for tax, insurance, and depreciation purposes. – If owners requirement made known In advance, **CONTRACTOR CAN PROVIDE BETTER ASSISTANCE.**

# CONSTRUCTION CONTRACTS



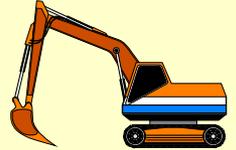
## 8.4 COST- PLUS CONTRACTS (Con't)

### 8.4.4 Reimbursable Costs

#### a) Contractor's Office

- Costs associated with preparation of payrolls, purchasing, record keeping, engineering, preparation of working drawings, and similar office functions.
- On large projects contractors establish field offices to perform all necessary office functions directly on the site.
- All expenses, including salaries, incurred by the project office are directly assignable to the job, and considered costs for reimbursement.
- On small projects office functions usually carried out in contractors head office, overhead for these operations difficult to assess.
- Overhead usually omitted in this situation, and the fee is adjusted accordingly.

# CONSTRUCTION CONTRACTS



## 8.4 COST-PLUS CONTRACTS (Con't)

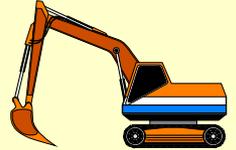
### 8.4.4 Reimbursable Costs (Con't)

#### b) Construction Equipment

- When equipment is loaned or leased by the contractor, it is usual that rental rates for the various equipment types be established, which the owner will pay to the contractor for the time the equipment is required on the job.
- It is important that specific rates be established on an hourly, weekly, or monthly basis, and that it be clearly understood where these rates included the costs of overhauls, operating labor, and operating expenses.
- The costs of move-in (mobilization), erection, dismantling, and move-out (demobilization) are normally reimbursable costs.
- In the event that equipment is to be required that the contractor does not own or lease, provision must be made for its purchase by the owner or for rental from a third party.
- When the project is large or the useful life of the equipment limited, it is common practice for the contractor to purchase the equipment for the owner on a reimbursement basis.-- At the end of the project, owner gets the salvage value.

When rental of equipment from a third party is involved, it is best to be as explicit as possible concerning item

# CONSTRUCTION CONTRACTS

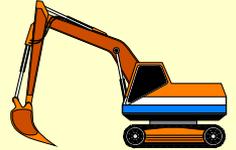


## 8.5 COST-PLUS PERCENTAGE OF COST CONTRACTS

- The percentage may be fixed or may be based on a sliding scale.
- Well suited to projects whose scope is not clearly defined.
- Work of emergency nature (war, etc.) – no time to prepare documents
- Cleanup and repair of damage such as the resulting from fire, storm, and flooding afford many examples of this type of work.



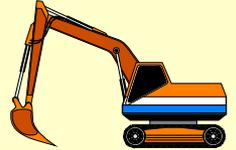
# CONSTRUCTION CONTRACTS



## 8.5 COST- PLUS PERCENTAGE OF COST CONTRACTS (Con't)

- Remodelling, expansion of facilities where services must be maintained, underpinning, and certain classes of demolition work occasionally done under this form of contract.
- No incentive to minimize construction costs.
- Public owners are prohibited from using this type of contract except in emergency situations.
- There has been increased use of this contract in the private arena, particularly where it is accompanied by a maximum or “upset limit”.
- Contractor must practice strict economy in the interest of their owner-client and be satisfied with a reasonable profit if they are to enjoy continuing success with this type of contract.

# CONSTRUCTION CONTRACTS



## 8.6 COST- PLUS FIXED- FEE CONTRACT

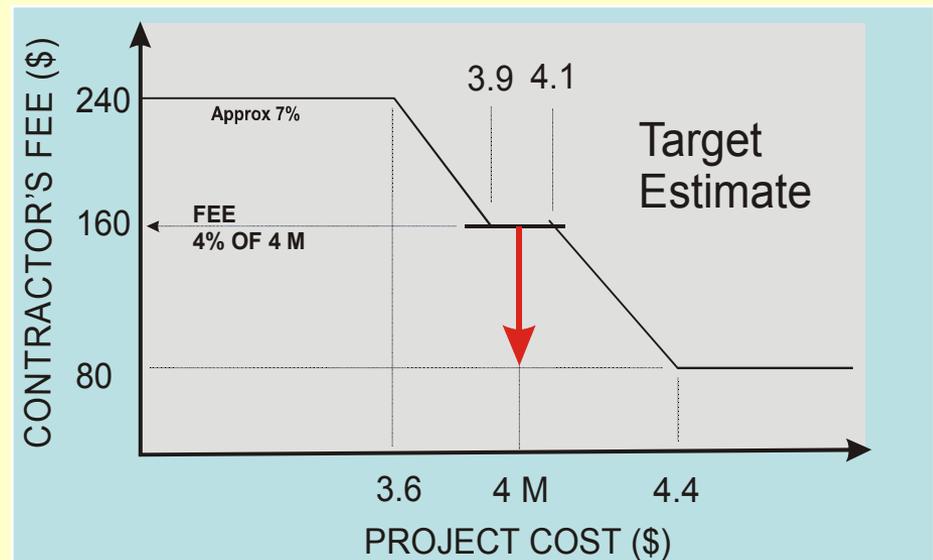
- A popular type of contract is one in which the contractor's fee is fixed.
- When this contract is used the work must be **well defined**.
- Contractor computes size of fee based on size of the project, estimated time of construction, nature and complexity of the work, hazards involved, location of the project, equipment and manpower requirements, and similar considerations.
- Under this arrangement, the contractor's fee is fixed and does not fluctuate with the actual cost of the project.
- Thus, of advantage to the contractor to do the work diligently.
- Failure to do so will cause extra overhead and expense to the contractor.
- A variant of the fixed-fee arrangement is what is often referred to as cost-plus-award-fee, sometimes used on public projects.
- Contractor paid fixed fee, however, is afforded the opportunity of additional fee (award) through superior performance.

# CONSTRUCTION CONTRACTS

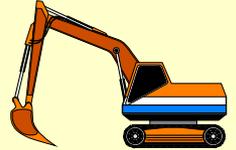


## 8.7 INCENTIVE CONTRACTS

- Provide the contractor with an incentive to keep the cost of the work and/or the time of construction to a minimum, various bonus and penalty provisions can be applied to the determination of the fee.
- Under this contract, the contractor and owner agree to a **target figure**.
- As an incentive for the contracting firm to minimize cost, a bonus clause can be written according which it shall receive, in addition to a fixed fee, a stated percentage of the amount by which the total actual cost is less than the target estimate.
  
- A figure of 50% is common for the contractor's share of the savings.
  
- There may also be provisions whereby the contractor's fee is reduced if the construction costs exceed the target estimate.
  
- When the time of completion is of great importance to the owner, the contract can be made to provide that the contractor shall receive, in addition to the base fee, .....



# CONSTRUCTION CONTRACTS



## 8.7 INCENTIVE CONTRACTS (Con't)

.....a fixed sum of money for each day of beneficial occupancy realized by the owner before the originally agreed-on completion date. This can be extended to provide that the contractor's fee will be reduced by the same amount for each day completion is delayed.

- When such a bonus-penalty arrangement is stipulated, the penalty need not be considered as liquidated damages but can be assessed strictly as a penalty.

## 8.8 GUARANTEED MAXIMUM COST

- Use of a guaranteed maximum of upset cost value.

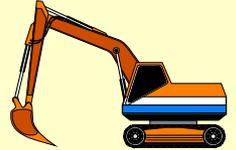
-Must be based on careful estimates made from **complete drawings and specifications.**

- Any costs in excess of upset value are the responsibility of the contractor.

These contracts combined with fixed fees for the contractors are often competitively bid.

- Successful bidder based on upset price and fee.

# CONSTRUCTION CONTRACTS



## 8.9 PROGRESS PAYMENTS

Periodic payments or reimbursements of contractors cost common practice on all but **very short duration projects**.

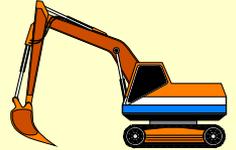
Since contractors often have to borrow money to operate, the terms of their reimbursement payments are very important.

Progress payments based on value of work completed, including subcontractors.

If periodic payments are prescribed in the contract, these are based on a fixed amount of money or a designated percentage of the contract.

Competitive contracts usually require contractor to make application for payment at the end of each month.

# CONSTRUCTION CONTRACTS



## 8.10 RETAINAGE

Percentage of progress payments **held back by the owner** .

A retainage of 10% of the total project is common

Retainage returned to the contractor in the final payment

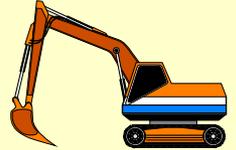
Owners see hold backs as a mean of further protection in the event of the contractors failure to correct faulty work, settlement of liens, and other claims.

Common practice today to hold back 10% on the first half of the project, with remaining payments made in full.

## 8.11 ACCEPTANCE AND FINAL PAYMENT

Construction contracts usually specify that the A/E (Consultant) **APPROVE** the final product before final payment is made.

# CONSTRUCTION CONTRACTS



## 8.12 THE WARRANTY PERIOD

One year commonly specified

## 8.13 CONTRACT TIME

Most contracts are explicit regarding construction time, designating either a completion date or a specific number of calendar days within which the work must be finished.

Calendar days include Saturdays, Sundays and holidays and is used rather than working days to eliminate possible controversy.

## 8.14 LIQUIDATED DAMAGES

Loss of revenue, hardship or expense for the owner caused by the contractors failure to complete the work within the time specified by the contract

Liquidated damages typically vary from \$50 to \$1000 per calendar day.

## 8.15 EXTENSIONS OF TIME

ACT OF GOD! - ???