MODULE-5

CONTRACT MANAGEMENT POST AWARD

Contents:

Contract Management- Post Award: Basic understanding on definitions, Performance security, Mobilization and equipment advances, Secured advance, Suspension of work, Time limit for Completion, Liquidated damages and bonus, measurement and payment, additions and alterations or variations and deviations, breach of contract, Escalation, settlement of account or final payment, claims, Delays and Compensations, Disputes and its resolution mechanism, contract management and administration.

Valuation: Definitions of terms used in valuation process, cost, estimate, value and its relationship, Capitalized value. Concept of supply and demand in respect to properties (land, building, facilities) freehold and leasehold, sinking funds Depreciation – methods of estimating depreciation, outgoing, Process and methods of valuation: Rent fixation, Valuation for mortgage, valuation of land

Contract Management- Post Award:

5.1 Performance security:

Performance security includes performance bonds provided by a bank or Insurance Company, retention funds and performance guarantee by a surety. In construction industry, a performance bond is used to provide security in various situations. Commonly, these performance points are used to provide security in respect to contractor's performance during contract period. Thus a performance Bond protects the client from the risk of a contractor failing to fulfil its contractual obligation to the client. Guarantee to the contractor that the project will be e satisfactorily completed.

There are two main types of performance Bonds.

1) On demand: This means that the bond, are the amount payable under the performance bond is payable to the client requesting such payment. There is no requirement to show that the contractor is in Breach of its obligation.

2) Conditional: This means that the bond is payable only after the occurrence of a prescribed event. Usually, this is triggered by a default committed by the contractor such as a delay by the contractor to complete the work by the stipulated period or a failure to rectify the defects after the completion of works.

The client is better protected if the performance Bond lasts until the end of the defects liability period when the final certificate is issued. Performance bonds may be represent around 5 to 10% of the contract value.

5.2 Mobilization and equipment advances:

Mobilisation advance payment are payments of funds to supplier or contractor before Anticipation of, and for the purpose of performance under the contract. The basic purpose is to extend financial assistance within the terms to the contractor to mobilize the man and material

resources for timely and take off the project or procurement of equipment material and other service contact.
Mobilization advance is a kind of payment to the supplier for contractor.

5.3 Liquidated damages and bonus:

Liquidated damage is an amount of compensation payable by a contractor to the owner or to the government due to delayed construction having no relationship with real damage. If the contractor fails to complete the works within the time prescribed in the tender then the contractor shall pay to the owner or to the government the sum stated in the tender as liquidated damages.

Liquidated damages or an amount of money, agreed upon by the parties at the time of contract signing that established the damages that can be recovered in the event a party e breaches the contract. The Amount is supposed to reflect the best estimate of actual damages when the party's Sign the contract. In construction, the damages frequently the failure to complete the work on time

Liquidated damage class can provide many benefits:

1) When setting a predetermined amount of damages, it allows both parties chance to negotiate and settle on a number they feel both its fair and reasonable.
2) In the event of breach the owner can immediately calculate the damage without going through to the trouble of actual damages.
3) This allows the contractor to chart out the level of risk involved, and schedule appropriately.
4) Amount must be used as compensation not as a penalty.
5) The amount must be liquidated that is agreed upon advance.

Time limit for completion:

If the contractor cannot complete the work due to you having some unavailable problem in the execution or any other ground the contractor shall give any immediate report of such incidence to the Engineer in charge .He can apply for extension of time in writing to the Engineer in charge. The Engineer in charge may grant such extension of time on reasonable grounds for few days.

Security Deposit:

It is deducted from the running account bills, as funds available to client for any repair of the work during the defect liability period (if the contractor fails to rectify the mistakes)

As the project is being executed, it has to be executed as per the procedure of contract. The contractor is responsible for ensuring the quality of the project and ensuring 30 need effect occurs the execution must be rectified by the contractor without any extra cost.

In order to ensure that the contractor as to rectified and if he would not able to do that the client must execute that but cost must be able to recover from the contractor and security deposit is the basis for that.

The money is refunded to contractor after this defect liability period has lapsed.

5.4 MEASUREMENT BOOK

Importance:

➢ Measurement book is the initial record of all kinds of works.

➢ Measurement books are the basis of all accounts of quantities of work done by contractor and materials purchased for specific work.

➢ They must be maintained accurate and kept carefully so that they may be produced in a court of law as evidence.

5.4.1THE RULES TO BE FOLLOWED IN RECORDING MEASUREMENT BOOK:

The following are important points kept in mind while taking, recording in measurement book:

a. The measurement should be recorded by engineer in charge to whom the measurement book has been issued.

b. The measurement of work should be taken accurately and recorded neatly for different items in respective columns.

c. Measurements should be recorded neatly and directly, in the Measurement book at the site of the work.

d. For materials supply, quantities received are measured by weighing or counting and recorded in the measurement book.

e. All measurement should be taken using the steel or metallic tape and entered in ink directly in the measurement book.

f. Copying the measurement book from the note book should be strictly avoided.

g. Erasing or reentering are not allowed, the mistakes should be crossed out and correct entry done should be attested by dated initials of Engineer who has taken the measurement.

h. When any measurement is cancelled, then cancellation should be attested by dated initials of officer and reason for cancellation should be mentioned.

i. All measurements should be done continuously without leaving any blank page. If blank page is left out by mistake that should be cancelled by drawing the diagonal lines attested with dated initials.

j. The person recording the measurement shall put his signature at the end of the measurements book certifying "measured by me".

k. Each measurement book should be provided with an index and kept up-to-date.

l. When measurements are entered for running contract, a reference to the last set of measurements, should be duly entered in the measurement book.

5.4.2 PRE-MEASUREMENT

Generally the measurement of the work is taken after the construction at the finishing stage, but for certain items of work the measurements are taken before their actual completion because it may not possible to check such items after the completion of the works, such measurements are known as premeasurement

Example:

i. Reinforced concrete work The Steel bars/reinforcement gets embedded inside the concrete hence it is necessary to premeasure the steel bars/reinforcement to know the size and spacing of bars provided in the form work before placing the concrete.
ii. Clearance of jungle the construction of road work, it is necessary to clear the shrubs of plants before the road work is started. So area of jungle to be cleaned is pre-measured before the clearance of site is started. iii. During the construction of road, the materials like the stone aggregate and the gravel can't be counted after spreading on the road surface. These materials are stocked at the site of the road and measurement is taken.

5.4.3PAYMENT OF BILLS

When a contractor has executed a work as per contract, he is paid with reference to the submitted bills. Bill: It is the account of work done or materials supplied. It contains full particulars like total amount, amount due and agreement number is also mentioned.

5.4.4 VOUCHER

It is the return document as a proof of payment. After the preparation of bill the payment is made and the bill is checked, duly acknowledged by payee who affixes his signature on a revenue stamp. After the payments are made a voucher becomes the document.

5.4.5 MODES OF PAYMENT

Payments to contractors are made in a variety elf modes:
i) Mobilization Advance
ii) First and Final payment
iii) Final payment
iv) Intermediate payment
v) Advance payment
vi) Secured advance payment

i) Mobilization Advance :

The mobilization advance is an amount paid to the contractor prior to the execution of work. Since these payments are not measured by contract performance, they differ from partial payments which are based on actual performance of tasks in furtherance of the contract. The basic purpose of mobilization advance payment is to extend financial assistance within the terms of contact to the contractor to mobilize the man and material resources for timely and smooth take off of the project or procurement of the equipment material or other services of contact. Mobilization advance is a kind of payment to the supplier or contractor, primarily extended as financial assistance within the terms of contracts.

ii) First and Final Payment:

This is the single payment made for a job on its completion. This is applicable only for small works. Small miscellaneous works can be given to a contractor by client without calling for tenders by executing a written understanding at rates within the schedule of rates. In such cases, he can pass the bill and make a single payment for the completed work/ contract. This is known as First and Final payment.

iii) Final Payment:

This refers to the payment made on running account to a contractor on the. Completion or termination of his contract and in full settlement of the account.

iv) Intermediate Payment: This is the payment made on a running account to the contractor for the work to be completed or materials to be supplied. This payment is done when only a part of the whole work or supply has been done and the work or supply is in progress. The contractor is paid time to time to the extent of completion of items of work. Running account bills of measured works or supplies made is known as intermediate payment.

v) Advance Payment:

This is a payment made on the running account to the contractor for the work done or supply of materials made by him, but not measured. The advance is adjusted through subsequent bills in which the actual measurements have been taken. Advance payment is not generally made to a contractor, but this can be done in exceptional cases when the work has sufficiently progressed (but, for which measurements cannot be taken) based on the certificate of the Assistant Engineer in charge of the work. The value of the work done shall not be less than the advance proposed to be made and detailed measurements shall be taken as soon as possible and the advance payment adjusted in the final bill.

vi) Secured Advance Payment:

This represents an advance payment made on security of materials brought to the site of work when the contract is for completed items of work. The advance amount not exceeding 70% of the value of materials brought to the site.

The payment will be made only after clarifying the following

1) The quantities of materials actually being brought to the site.
2) The contractor has not received any advance for such materials.
3) The materials are in good condition and as per specification.

5.5 PREPARATION AND PAYMENT OF FINAL BILLS

Before a final bill is prepared, the entries in the 'M' book shall be scrutinized by the Engineer In charge and arithmetical calculations duly certified by the head clerk. The rates shall be checked with the contract document and the Engineer shall compare quantities in the bill with the 'M' book before signing the same for submission to the office. In the office, the auditors shall check the arithmetical accuracy again exercising the official formalities of checking recoveries, etc. by carefully scrutinizing contractor's ledger; T and P hire charges register, etc. The memorandum of payment is made up with all recoveries shown therein. Final bills in all cases shall be based on detailed measurements only.

5.6 ADDITIONS AND ALTERATIONS OR VARIATIONS AND DEVIATIONS

A variation (sometimes referred to as a variation instruction, variation order or change order), is an alteration to the scope of works in a construction contract in the form of an addition, alteration or omission from the original scope of works.

Almost all construction projects vary from the original design, scope and definition. Whether small or large, construction projects will inevitably depart from the original tender design, specifications and drawings prepared by the design team. This can be because of

technological advancement, statutory changes or enforcement, change in conditions, geological anomalies, non-availability of specified materials, or simply because of the continued development of the design after the contract has been awarded. In large civil engineering projects variations can be very significant, whereas on small building contracts they may be relatively minor.

Variations may include:

➢ Alterations to the design

➢ Alterations to quantities.

➢ Alterations to quality.

➢ Alterations to working conditions.

➢ Alterations to the sequence of work.

Variations may also be deemed to occur if the contract documents do not properly describe the works actually required.

➢ Variations may not (without the contractors consent):

➢ Change the fundamental nature of the works.

➢ Omit work so that it can be carried out by another contractor.

➢ Be instructed after practical completion.

➢ Require the contractor to carry out work that was the subject of a prime cost sum. In legal terms, a variation is an agreement supported by consideration to alter some terms of the contract. No power to order variation is implied, and so there must be express terms in contracts which give the power instruct variations. In the absence of such express terms the contractor may reject instructions for variations without any legal consequences. Standard forms of contract generally make express provisions for the contract administrator (generally the architect or engineer) to instruct variations. Such provisions enable the continued, smooth administration of the works without the need for another contract. Variation instructions must be clear as to what is and is not included, and may propose the method of valuation.

5.7 VALUATION OF VARIATIONS

Variations may give rise to additions or deductions from the contract sum. The valuation of variations may include not just the work which the variation instruction describes, but other expenses that may result from the variation, such as the impact on other aspects of the works. Variations may also (but not necessarily) require adjustment of the completion date.

Variations may be valued by:

➢ Agreement between the contractor and the client.

➢ The cost consultant. A variation quotation prepared by the contractor and accepted by the client. By some other method agreed by the contractor and the client.

Valuations of variations are often based on the rates and prices provided by the contractor in their tender, provided the work is of a similar nature and carried out in similar conditions. This is true, even if it becomes apparent that the rates provided by the contractor were higher or lower than otherwise available commercial rates. If similar types of works to those instructed by a variation cannot be found in the drawings, specification or bills of

quantities, then fair valuation of the contractor's direct costs, overheads and profit is necessary. Further, if the contract administrator omits work from contractor's scope, such an omission must be genuine: that is, the work omitted must be omitted from the contract entirely, it cannot be used to take work away from the contractor to give it to another. Similarly, the contract administrator is not empowered to order variations to help the contractor if the contract works are proving too difficult or expensive for them. Many construction contracts allow the construction period to be extended where there are delays that are not the contractor's fault. This is described as an extension of time (EOT). Variations may (but do not necessarily) constitute relevant events that can merit an extension of time and so adjustment of the completion date. See Extension of time for more information.

5.8 BREACH OF CONTRACT

The contract binds the contractor and owner or department legally. The contractor should follow the rules and regulations, by laws of the department and complete the work within the specified period in agreement as per drawings and specifications. He should also obey the instructions given by the department and it is also the responsibility of the department or owner to see that the work done in time as per drawings and specifications and quality is also maintained. If all the above specifications are not done by both the parties then it will lead to breach of contract.

5.9 PENALTY ON CONTRACTOR

Penalty is a sort of fine imposed on contractor for non-fulfillment of the terms of contract. Every contract agreement makes provision for penalizing a contractor whenever there is a breach in the terms of agreement.

Slow progress: For slow progress the contractor may be penalized with 1% of the cost of construction per week and the maximum penalty shall not exceed 10% of the cost of contract.

Damages: In case of damages to the tools and plants, equipment's, machinery, etc. taken by the contractor, he will be asked to pay the repair charges of the equipment or will be directed to replace the equipment.

Termination of Contract: The Executive engineer or the competent authority is empowered to terminate the contract in case of bankruptcy or default of the contractor. An amount up to 10% of the estimated cost is forfeited. If the contract is to be terminated a notice to that effect has to be served on the contractor.

5.10 BLACK LISTING OF CONTRACTOR

➢ when the contractor cheats the Government.

➢ If he fails to satisfy the conditions laid down in the contract agreement.

➢ Refuses to work or runs away during the execution of the work.

➢ Executing work in poor and unsafe manner, even instructions are given by Engineer in-charge.

➢ Not following labor laws. Then he will be disqualified from taking any further contracts in the department. Such contractors are referred to as black listed contractor.

5.11 TIME EXTENSION OF CONTRACT

If the contractor cannot complete the work due to having been unavoidably hindered in its execution or any other ground; the contractor shall give an immediate report of such hindrance to the Engineer-in Charge. He can then apply for extension of time in writing to the Engineer-in-Charge within seven days of the date of completion. The Engineer-in Charge may grant such extension of time on reasonable grounds.

5.12 TERMINATION OF CONTRACT

The contract agreement may be terminated in the following conditions:

➢ **Bankruptcy:** If both or one of the parties become bankrupt the contract may be terminated since the work cannot be completed due to lack of funds.

➢ **Breach of conditions**: If one party fails to follow the conditions mentioned in the contract then the other party has every right to terminate the contract and can also claim for damages done to him through court of law or through arbitration.

➢ **Impossibility to complete work:** Due to valid reasons it may not be possible to complete the job which is partially completed. For example, the land may be acquired by the government or floods may drown the land etc. In all such cases the contract is terminated as it is impossible to complete the work. The damages to the contractor shall be made good by the owner or the department as the case may be.

➢ **Agreement:** Due to extraordinary circumstances it may become necessary to terminate the contract by mutual agreement. For example the owner or contra... to: may expire and no other person may be there to fulfill the agreement.

➢ **Completion of the work:** If the work is completed satisfactorily as per the conditions in the agreement then also the contract is terminated after making the final payment to the contractor and releasing his security deposit.

To terminate a contract, a registered notice is served on the contractor framing; charges against him for violation of the clause or clauses of the terms and conditions of contract allowing a fixed time of usually 7 days or 14 days. In case, the contractor fails to defend him or the notice remains un replied the contract can be terminated by the owner.

5.13 ESCALATION

The completion period for big project works is usually long and the cost of materials and labor becomes more and more day by day. It is therefore difficult for a contractor to predict the future cost of materials at the time of submission of his tender. The result is that a contractor does not find interest to carry out the work-due to high rise of basic cost. Thus, progress of many important works is hampered. In order to overcome such drawbacks many departments, provide the price escalation clause in the tender. On the other-hand, many contractors incorporate such a condition at the time of submission of their tenders. Escalation clause includes basic price of the important materials (such as Cement, Steel, Wood, etc.) which directly affect the cost of construction and excess amount to be paid by owner if cost of materials increased above basic price.

5.14 SETTLEMENT OF ACCOUNT OR FINAL PAYMENT

After the works are completed in all respects, the engineer accurately prepares the final amount of the works and then, after deducting all previous payments, the owner pays the final amount to the contractor.

The usual provisions to be made under this clause will be as follows:

1. The period to be given to the engineer for the preparation of the final bill is usually a fortnight to one month.
2. The period to be given to the owner for paying the final amount is usually a fortnight to one month
3. There is mention of certain percentage of amount during maintenance period, if any. A typical clause can be framed as follows: After acceptance of the works under this contract, the engineer shall prepare a final estimate of the works as soon as practicable but within one month from the date of such acceptance and the engineer shall give a certificate of final payment to the contractor. The owner, after receipt of such certificate from the contractor, shall pay the entire sum within one month after deducting all previous payments, other dues, etc. One-half of the retained amounts shall be paid along with the final payment while the other half shall be paid at the end of the maintenance period.

5.15 CLAIMS

In the context of a civil engineering contract normally a claim means a demand by a contractor for payment of an item or items of work carried out by him on behalf of the employer for which a readily identifiable amount cannot be ascertained under the terms of the contract. Such a claim is always made upon the employer but under standard forms of contract it is first considered by the engineer and, should his decision be disputed, it is adjudicated by arbitration or in the courts of law.

5.16 DELAY'S AND COMPENSATION

Delay in construction projects can be defined as the time difference between the date of project completion stated in the contract and the date of the actual completion.

A fundamental specification of the construction contract is the project period or time of project execution, which is established prior to bidding.

The successes execution of construction projects and keeping them within estimated cost and prescribed schedules depend upon a methodology that requires expert engineering judgment.

Project completion for the owner means that he can make use of his new assets on time by habitation; renting, or selling. Any delay in project completion will disturb his plans. The client will not be able to make use of the property, and his business will be affected in almost all areas, especially finance.

For the contractor, any delay in completion of the project gives rise to indirect overhead expenses and additional payments to the project staff and workforce. It also means that he will possibly be subjected to compensation claims. .His next project might be cancelled as a result of delays in the present project, and loss of future opportunities will be made more likely by damage to his reputation and credibility. Construction contracts generally allow the construction period to be extended where there is a delay that is not the contractor's fault. This

is described as an extension of time (EOT). When it becomes reasonably apparent that there is, or that there is likely to be, a delay that could merit an extension of time, the contractor gives written notice to the contract administrator identifying the relevant event that has caused the delay. If the contract administrator accepts that the delay was caused by a relevant event, then they may grant an extension of time and the completion date is adjusted.

Relevant events may include:

➢ Variations.

➢ Exceptionally adverse weather.

➢ Civil commotion or terrorism.

➢ Failure to provide information.

➢ Delay on the part of a nominated sub-contractor.

➢ Statutory undertaker's work.

➢ A delay in giving the contractor possession of the site.

➢ Force majeure (such as an epidemic or an 'act of God').

➢ Loss from a specified peril such as flood.

➢ The supply of materials and goods by the client. ➢ Strikes. ➢ Changes in statutory requirements.

5.17 ARBITRATION

The actual conditions encountered in practice cannot always be foreseen by the parties involved in a contract.

The problems may be technical, managerial, or financial in nature and they may be caused by various factors such as follows:

➢ Accidents

➢ Delayed payments

➢ Faulty contract documents

➢ Inadequate programming

➢ Inefficient execution

➢ Late issue of drawings

➢ Poor communications

➢ Procurement delays

➢ Over-zealous supervision, etc.

Definition: The process by which the parties under a contract get their disputes and differences settled through the intervention of an impartial person or a committee of experts in a judicial manner is known as the arbitration. The impartial person or persons are known as the arbitrators.

Thus, the definition of arbitration includes the following three concepts:

1. It is the reference of disputes and differences by parties which are at least two in number.
2. Such reference is made to a person or persons other than court of law of competent jurisdiction.

3. The person or persons determine the award in a judicial way after hearing the concerned parties. In case of building contracts, a condition of contract pertaining to the arbitration is invariably added for the settlement of disputes. The proceedings of arbitration are controlled in India by the provisions of the Arbitration Act of 1940.

5.18 CONTRACT MANAGEMENT AND ADMINISTRATION

Construction projects in India are worth crores of rupees per year. It is the most competitive and risky business: The money involved in this sector is from public fund, so it becomes very important to see that such projects get successful to avoid any type of blockage of funds.

In addition it is equally important to complete the project in time to avoid obsolescence loss of the product. In almost all construction projects, there is a contract between owner (client) and contractor for desired product after successful completion of the construction project. Each construction contract is unique and need unique understanding and interpretation as per the contractual requirements.

Each contract carries a set of obligations to be performed by the parties involved in the contract, so there is a need of contract administration. In current time, the projects are becoming giant in size and more complex due to technological development, joint ventures and foreign collaboration, specified needs, time constraints, special infrastructural requirements and parallel involvement of various agencies in project.

Today construction industry is operating under high level of competition-and profitability became the prime concern for all the contracting organizations.

The real strength of successful contracting parties lies in cooperation of the owner and contractor as partners of the same team with common goal laying more stress on their mutual trust and understanding, their positions are rarely equal and contracts are left open to multiple interpretations. Hence, study of Contract Administration is necessary tool for completion of project. It is said that efficient and effective contract administration will reduce the cost of project by 10%.

Contracting is an integral part of construction projects. Managing the contracts therefore is equally important for the success of any business process due to rapid increase in multiple contracts.

The appropriate procedures of settlement of dispute in a civil engineering contract are as follows:

1. **Appointment of the Arbitrator:**

The contractor should submit his/her settlement of facts containing in detail his/her grievances and claims against the respondent within the period of limitation of 90 days. On receipt of request from a contractor for the appointment of an arbitrator, the Executive Engineer /Superintending Engineer should examine the above facts and also whether the claim of the contractor is time barred and falls within the preview of the arbitration clause. The Superintending Engineer should then send his/her report to the chief engineer for his/her final orders. The Chief Engineer shall then appoint an arbitrator. In the absence of the chief engineer the administrative head of the department, the chief engineer should process the case so as to appoint an arbitrator within at least 30 days from the receipt of such a request.

2. Preparation and Submission of a Case for Arbitration:

(a) When an arbitrator is appointed he/she usually calls a preliminary meeting. In the meeting, the arbitrator directs the claimant or contractor to submit his/her statement of facts containing in detail his/her grievances and claims against the respondents, within a specified date. This statement is accompanied with copies of all documents, correspondences, agreements, bills, drawings, vouchers, etc., which the claimant wants to highlight in justifying his/her claims. One copy of the statement of facts is also forwarded to the respondent. Next, the arbitrator, directs the respondent to submit his/her counter statement of facts within a specified date.

(b) The respondent who is usually the Executive Engineer takes prompt action to prepare the defense duly supported by adequate documentary evidence and witness to the Superintending Engineer and the department counsel, as may be necessary, expeditiously so as to reach the arbitrator by the date and within the time specified by him. One copy of the counter statement of facts is also forwarded to the claimant.

3. Hearing of the Case:

The case thereafter proceeds as per the provision in the Act. In conduction, the case sittings are held one after another. The statement facts are read by the claimant's representative, mainly a legal practitioner elucidating salient points in the claim. Certified copies of letters, agreements, documents, bills, drawings, site instruction book, etc., are produced by the claimant to make the case strong.

If the respondent so wants, the arbitrator can give permission to cross examine the witness. After the claimant completes his/her pleading against the statement of facts filled by him, the arbitrator directs the respondent to proceed with his/her pleadings as per counter statement filed by him.

In course of the pleadings, the respondent's representative too also produces copies of documents, agreements, and drawings, correspondence, etc., conductive to his/her counter statement for strengthening his/her case. He/She also produces witnesses to support the counter statement if deemed necessary.

After completion of the pleadings of both the parties, each party is given the permission to argue his/her case on the basis of the findings in course of the sittings held in the case.

The arbitrator hears the pleadings and the argument of both the parties and scrutinizes and examines all documents and papers produced in course of the sittings. He/She then closes the case and publishes the award. In accordance with the relevant clause, the case has to be completed within a period of four months from the date the arbitrator first entered into reference.

4. Issue of the Award:

When the arbitrator has made his/her award, he/she shall sign it and shall give notice in writing to parties of the making and signing thereof and the amount of fees and charges payable in respect of the arbitration and the award. The award should always be obtained on the non judicial stamped paper. The authority of an arbitrator ceases as soon as the award is made and no action of the parties by way of consent or otherwise would give the arbitrators to make a second award. When some money is payable to the party, he/she should first supply, to the

arbitrator, a stamped paper of appropriate value as may be asked for by the arbitrator according to amount of the award, as per the rules of the state.

5. Filing of Award:

After the award is written on the stamped paper, it should be examined for its acceptability by the party. Once it is decided to accept the award, immediate action should be taken to have the award made a rule of the court by taking necessary steps before the court by either party. If the reference was made by the court, the arbitrators or umpires should file the award in the court. In case the reference made by the parties is out of court, the arbitrators or the umpires should give notice of the same to the parties as soon as the award is made. They shall file the award in court if so requested by the parties. If the arbitrators do not file in court, any of the parties may move the court requiring the arbitrators or the umpires to file the award in the court. An application for this purpose should be made within thirty days from the date of service of the notice of making the award. An award will not be bad if it was made before, but filed after the date fixed by the court. In arbitrations out of court the award need not necessarily be filed in court to give validity to it.

6. Effect In Case the Award is not Filed:

A party can enjoy the effect of an arbitration award determined by moving an application to that effect in the court. But no suit can be filed for a decision upon the extensity, effect, or validity of an award. An arbitration award cannot be set aside, amended, modified or in any way affected otherwise than as provided in the Act. A suit cannot therefore be filed to enforce an award or to obtain a relief on the basis of an award, in case the award has been acted upon by the parties, even though it was filed in court. The party in house favor the award is given will take steps to get it made the rule of the court. In case the award is not acceptable to a party, steps should be taken to file objections against the application for filling of the award in the court according to law.

5.19 CONTRACT MANAGEMENT AND ADMINISTRATION

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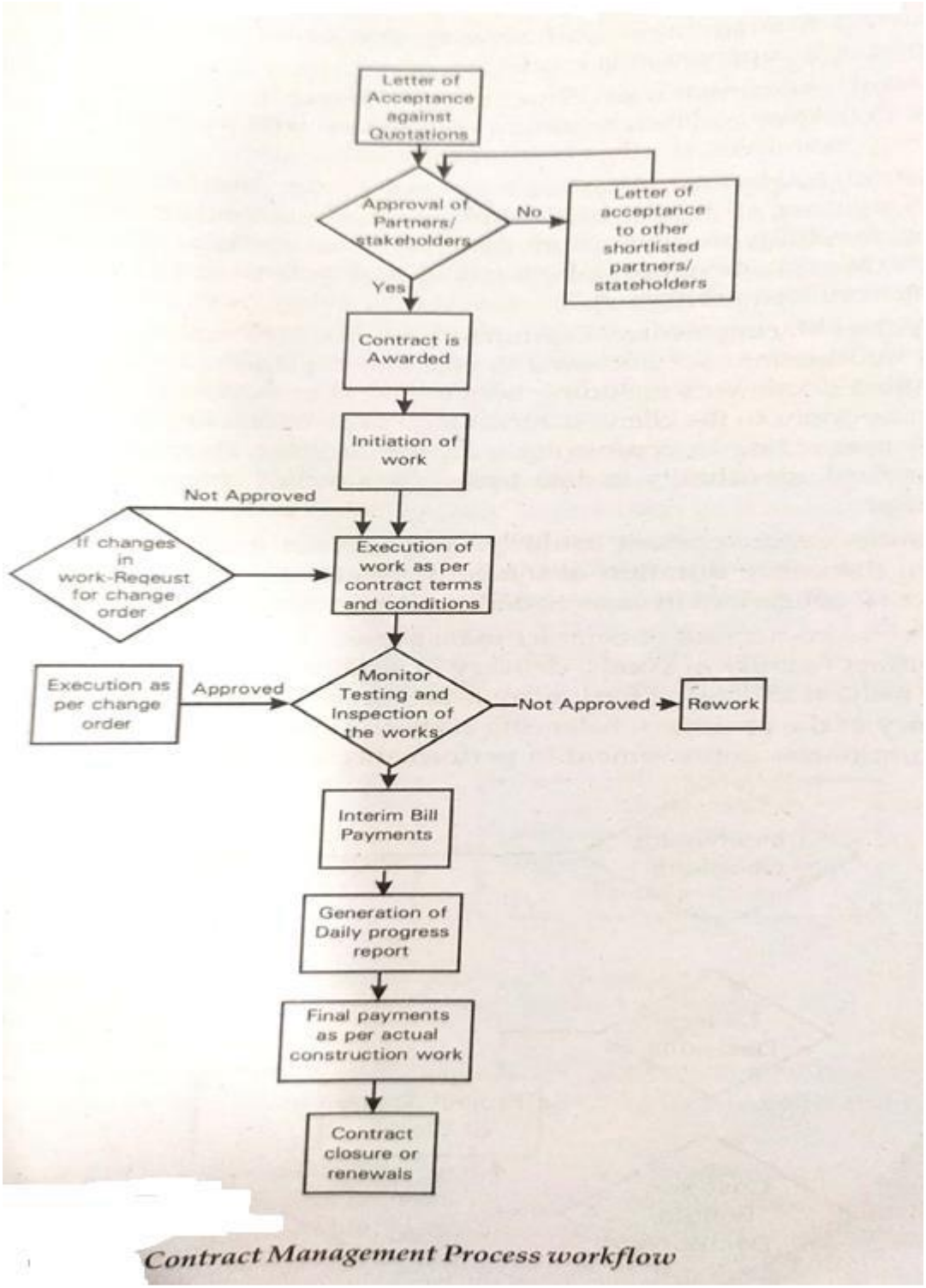
In addition it is equally important to complete the project in time to avoid obsolescence loss of the product. In almost all construction projects, there is a contract between owner (client) and contractor for desired product after successful completion of the construction project. Each construction contract is unique and need unique understanding and interpretation as per the contractual requirements.

Each contract carries a set of obligations to be performed by the parties involved in the contract, so there is a need of contract administration. In current time, the projects are becoming giant in size and more complex due to technological development, joint ventures and foreign collaboration, specified needs, time constraints, special infrastructural requirements and parallel involvement of various agencies in project. Today construction industry is operating

under high level of competition and profitability became the prime concern for all the contracting organizations.

The real strength of successful contracting parties lies in cooperation of the owner and contractor as partners of the same team with common goal laying more stress on their mutual trust and understanding, their positions are rarely equal and contracts are left open to multiple interpretations. Hence, study of Contract Administration is necessary tool for completion of project. It is said that efficient and effective contract administration will reduce the cost of project by 10% Contracting is an integral part of construction projects. Managing the contracts therefore is equally important for the success of any business process due to rapid increase in multiple contracts.



Contract Management Process workflow

Contract Management: All activity that occurs in the contracting process. Monitoring and supervision is crucial

Contract Administration: The management of all actions, after the award of a contract that must be taken to assure compliance with contract. The act of managing duties, responsibilities, or rules is administration.

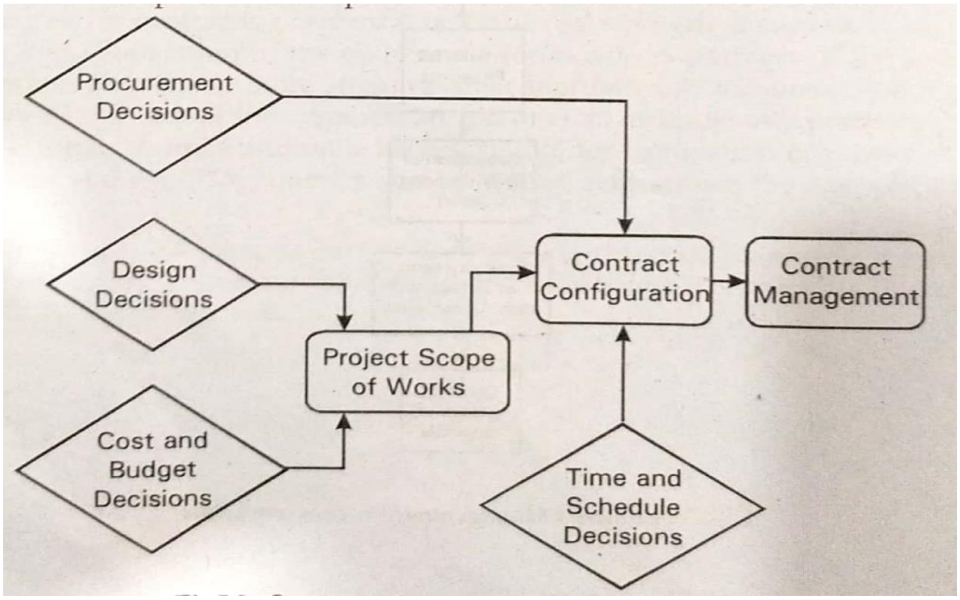
"Contract Administration" is a process of carrying out construction work in a planned manner on behalf of the appointee. Construction work includes detailed planning, feasibility study etc. from the every stage of project.

The objective of Contract Administration is developing better relationship between owner and contractor by reducing conflicts/arbitration.

Contract Management and administration involves making decisions and the timely flow of information and decisions to enable completion of the project as required by the contract documents including review and observation of the construction project. This is important to the client, contractor and consultant not only to determine that the work is proceeding in conformity with the contract documents, but also because it allows a final opportunity to detect any inaccuracies, ambiguities or inconsistencies in the design.

Contract Management could be defined as a multi-stage process that goes on through the entire duration of the contract and ensures that the parties meet their contractual obligations in order to deliver the specific objectives provided in the contract.

The main purpose of contract management is to make sure that the objectives of the contract (supply of goods, delivery of services or execution of works) are met in a timely fashion and value for money is achieved. In practice this means optimizing the efficiency of the processes, balancing costs and risks against returns and ideally aiming for a continuous improvement in performance over the life of the contract. Figure below shows the contract administration and management process.



VALULATION:

5.20 Technical terms

1. **Expenditure:** The whole amount can be spent during the financial year or not.
2. **Capital cost:** Total cost including all the expenditure incurred from beginning to the completion of a work.
3. **Provisional sum:** Estimate of bill quantities for some special work to be done by a specialist firm whose details are known at the time of preparation of estimate.
4. **Rate of cost:** The cost per unit of subhead which is arrived at by dividing the up-to date final charges on a sub-head by its up-to-date progress.
5. **Premium:** The tendered percentage rate above the notified rates.
6. **Rebate:** The tendered percentage rate below the notified rates.
7. **Plinth area:** It is a covered area of a building measured at floor level. It is measured by taking external dimensions excluding plinth offset if any.
8. **Rates:** Rates followed are of sanctioned schedule of rates or non-scheduled, this Fact is to be mentioned under this sub – head.
9. **Contingencies:** Incidental expenses of miscellaneous character which cannot be classified approximately under any distinct sub-head, but is added in the cost of construction necessarily.
10. **Valuation:** Valuation is the technique of estimating or determining the fair price or value of a property such as building, a factory, other engineering structure of various types, land…etc.
11. **Salvage value:** it is the value at the end of its useful life without being dismantled. This is generally accounted by deducting the depreciation from its new cost.
12. **Sinking fund:** The fund is gradually accumulated by way of periodic on annual deposit for the replacement of the building or structure at the end of its useful life.
13. **Depreciation:** Depreciation is the gradual exhaustion of a usefulness of a property. Decrease or loss in the value of a property due to its structural deterioration use, life wear and tear, decay and obsolescence.
14. **Scrap value:** Scrap value of dismantled material. For a building when the life is over at the end of its utility period the dismantled materials such as steel, brick, Timber etc. will fetch a certain amount which is the scrap value of the building. The scrap value of a building maybe about 10% of the total cost of construction.
15. **Market Value:** The market value of a property is the amount which can be obtained at any particular time from the open market if the property is put for sale. The market value will differ from time to time according to demand and supply.

The market value also changes from time to time for various miscellaneous reasons such as changes in industry, changes in fashions, means of transport, cost of materials and labour etc.

16. **Book Value:** Book value is the amount shown in the account book after allowing necessary depreciations. The book value of a property at a particular year is the original cost minus the amount of depreciation allowed per year and will be gradually reduced year to year and at the end of the utility period of the property, the book value will be only scrap value.
17. **Capital cost:** Capital cost is the total cost of construction including land, or the original total amount required to possess a property. It is the original cost and does not change while the value of the property is the present cost which may be calculated by methods of Valuation.

18. Capitalized Value of a Property: The capitalized value of a property is the amount of money whose annual interest at the highest prevailing rate of interest will be equal to the net income from the property. To determine the capitalized value of a property, it is required to know the net income from the property and the highest prevailing rate of interest.

Therefore, Capitalized Value = Net income x year's purchase

19. Annuity: Annuity is the annual periodic payment for repayment of the capital amount invested by a party.

20. Obsolescence: The value of property structure becomes less by it's becoming out of date in style, in structure, in design etc. and this is termed as obsolescence. An outdated building with massive walls, arrangements of rooms not suited in present days and for similar reasons become absolute even if it is maintained in a very good condition and its value becomes less. The obsolescence maybe due to the reason such as progress in Arts, changes in functions, changes in Planning ideas, new inventions improvement in design techniques.

Obsolescence may be"

1. Internal obsolescence due to:
   - i) Poor, odd or eccentric original design
   - ii) Change in kind of construction
   - iii) Change in utility demand.
2. External obsolescence is:
   - i) Poor original location,
   - ii) Change in the character of the district,
   - iii) Specific detrimental influences, such as due to construction of factories, stock-yard, traffic locations and noises, etc.
   - iv) Zoning laws.

21. YEAR'S PURCHASE (Y.P): Year's purchase is defined as the capital sum required to be invested in order to receive an annuity of '1.00 at certain rate of interest.

$$\text{Year's purchase} = \frac{100}{\text{Rate of interest}} = \frac{100}{i}$$

5.21 OBJECTS / PURPOSE OF VALUATION

1. Buying or Selling Property: When it is required to buy or sell a property, its valuation is required.

2. Taxation: To assess the tax of a property, its valuation is required. Taxes may be municipal tax, wealth tax, Property tax etc., and all the taxes are fixed on the valuation of the property.

3. Rent Function: In order to determine the rent of a property, valuation is required. Rent is usually fixed on the certain percentage of the amount of valuation which is 6% to 10% of valuation.

4. Security of loans or Mortgage: When loans are taken against the security of the property, its valuation is required.

5. Compulsory acquisition: Whenever a property is acquired by law; compensation is paid to the owner. To determine the amount of compensation, valuation of the property is required. Valuation of a property is also required for **Insurance, Betterment charges, speculations** Etc.

5.22 SINKING FUND: The fund which is gradually accumulated by way of periodic or annual deposit for the replacement of the building or structure at the end of its useful life is termed as Sinking fund.

A certain amount of gross income is set aside periodically or annually normally as sinking fund to accumulate total cost of construction when the life of the building is over.

The calculation of Sinking fund depends on the life of the building and scrap value of the building. The cost of land is not taken into account in calculating Sinking fund as land remains intact.

The amount of annual instalment of the Sinking fund may be found out by the formula

$$I = \frac{Si}{(1+i)^n - 1}$$

S = Total amount of Sinking fund to be accumulated
n = Number of years required to be accumulate the sinking fund
i = rate of interest in decimal (E.g.: 7% = 0.07) and
I = annual instalment required.

5.23 DEPRECIATION

Depreciation may be defined as the decrease or loss in the value of a property due to structural deterioration, use, life wear and tear, decay and obsolescence. The value of a building or structure will be gradually reduced due to its use, life, wear & tear, etc., and a certain percentage of the total cost may be allowed as depreciation to determine the present value.

The present value of a property can be calculated after deducting the total amount of depreciation from the original cost.

Types of depreciation:

1. Physical depreciation:
    i. Wear and tear from operation.
    ii. Decrepitude i.e. action of time and the elements.
2. Functional depreciation:
    i. Inadequacy or suppression.
    ii. Obsolescence.
3. Contingent depreciation: .
    i. Accidents (due to negligence, the elements and structural defects).
    ii. Diseases (parasites, pollution of water, etc.).
    iii. Diminution of supply (natural gas, water, etc.).

5.23.1 Methods of calculating depreciation:

The various methods of calculating depreciation are as follows:

1. Straight-line method.
2. Constant percentage method or declining balance method.

3. Sinking fund method.
4. Quantity survey method.

1.**Straight line method:** In this method the property is assumed to lose value by a constant amount every year, and thus a fixed amount of original cost is deducted every .year, so that at the end of utility period only the scrap value is left.

$$\text{Annual depreciation} = \frac{C - S_c}{n}$$

Where C = original cost, Sc. = scrap value, n = life of the property in years.

2. **Constant percentage method:** In this method the property is assumed to lose value annually at a constant percentage of its value.

$$\text{The percentage rate of annual depreciation } p = 1 - \left(\frac{S_c}{C}\right)^{\frac{1}{n}}$$

By constant percentage method at the end of the first year the value of the property = C (1-p), at the end of second year = C (1-p) ^{2} and so on.
The above formula does not hold good .for the scrap value, S is zero.

3. **Sinking fund method:** In this method the depreciation of property is assumed to be equal to the annual sinking fund plus the interest on the fund for that year, which is supposed to be invested on interest on interest bearing investment.

$$\text{Annual Sinking fund to provide '1/- in 'n' years} = \frac{i}{(1+i)^n - 1} = x \text{ say}$$

$$\text{An amount of ₹.1/- per annum in 'n' years} = \frac{(1+i)^n - 1}{i} = y \text{ say}$$

$$\text{Therefore Rate of depreciation in '}n\text{' years} = x \times y\%$$

i = Rate of interest expressed in decimals.

4. Quantity survey method: In this method the property is studied in detail and loss value due to life, wear and tear, decay, obsolescence, etc. worked out. Only experienced valuer can work out the amount of depreciation and present value of a property by this method.

Difference between Depreciation and Obsolescence

Sl. No	Depreciation	Obsolescence
1	This is the physical loss in the value of the property due to wear & tear, decay, etc.	The loss in the value of the property is due to change of design, fashion, in structure of others, change in utility, etc.
2	Depreciation depends on its original condition, quality of maintenance and mode of use.	Obsolescence depends on normal progress in the arts, inadequacy to present or growing needs, etc.
3	This is variable according to the age of the property. More the age, more will be the amount for depreciation.	This is not dependent on age of the building. A new building may suffer in its usual rent due to obsolescence.
4	There are different methods by which the amount of depreciation can be calculated.	At present there is no method of calculation of obsolescence.

5.24 Year's Purchase

Year's purchase is defined as the capital sum required to be invested in order to receive a net receive a net annual income as an annuity of rupee one at a fixed rate of interest.

The capital sum should be 1×100/rate of interest.

Thus to gain an annual income of Rs x at a fixed rate of interest, the capital sum should be x (100/rate of interest).

But (100/rate of interest) is termed as Year's Purchase.

The multiplier of the net annual income to determine the capital value is known as the Year's Purchase (YP) and it is useful to obtain the capitalized value of the property.

5.25 VALUATION OF BUILDING

Valuation of a building depends upon the type of the building, its structure and durability, size, shape, width, width of roadways, the quality of material used in construction, etc. A building located in the market area will have higher value than similar building in the residential area. Building area having sewer, water' supply and electricity will have increase value.

The valuation of building is determined on working out its cost of construction at present day rate and allowing a suitable depreciation. Before valuation, the age of the building should be obtained from record or by enquiries or from visual inspection and its future life should be ascertained.

5.25.1 METHODS OF VALUATION

The following methods are usually followed for determination of Fair Market Value of the property

i) Land and building method
ii) Composite rate method
iii) Rent capitalization method
iv) Development method

v) Profit method
vi).Depreciation Method of Valuation

i. Land and Building Method

As the name indicates, in this method the value of land is added to the value of structure to arrive at the fair market value of the property.

The method is generally adopted in the following situations:

➢ In the case of self-occupied property.

➢ In the case of property partly self-occupied (i.e. more than 60%) and balance tenanted.

➢ In the case where it is not possible to obtain fair and maintainable rent.

➢ In case where there is no direct evidence of rent such as schools and hospitals etc.

➢ In the case where the property is not fully developed, or the return from the property is not commercial.

In this method, fair market value of land and depreciated value of the building on it together gives the final value of property.

ii. Composite rate method

Composite rate method represents rate per unit area of building along with the proportionate share of land. This method is used for residential apartments and commercial complexes. Composite Rate has two components, i.e. proportionate land components and building component. Land component is the deciding factor in apartment's valuation. Location land value, amenities provided by developer and specifications of land are necessary in computation of composite rate. Further in case of old building/flat land component is added to depreciated value to calculate the composite rate.

iii. Rent Capitalization Method

In this method the net rental income is calculated after deducting all outgoings from the gross rent and year's purchase is calculated after adopting the current bank interest.

Thus to determine the fair market value of the property gross income per annum is to be determined. From this income all the outgoings which are essential to be incurred for maintenance are to be deducted to find out the net rent or annual letting value.

Then valuation of a property is worked out by multiplying the net rental income by year's purchase.

This method is generally adopted to in the following situations : -

➢ In case the land is fully developed i.e. it has been put to full use legally permissible and economically justifiable and the income out the property is normal commercial and not a controlled return or a return depreciated on account of special circumstances.

➢ In the case of fully tenanted property and statutory control or terms and conditions of tenancy.

➢ In the case of a property small portion of which is self-occupied and balance large portion is tenanted.

➢ In the case of commercial establishment like cinemas and hotels, if the building is given on outright lease / rental basis and rent fetched is reasonable.

iv. Development Method

This method of valuation is used for the properties which are in the undeveloped stage or partly developed and partly undeveloped stage. The valuation in such a case depend on initial investment, development cost and expected profit.

This method of valuation of large extent of land is adopted in the following situations.

➢ when the comparable sales of large tracts are not available but sales of small plot are available.

➢ When the land is ripe for use for building purpose it possess necessary potentialities for urban use.

The complete procedure to determine the fair market value of the large tracts of land, under this method can divided into the following steps.

➢ Ascertain the demand for small plots in the area.

➢ Determine the area of land required for development work as per municipal bye laws.

Deduct this area from the total area of the plot so as to ascertain the area available for development of small size plots. By rough estimation it works out to 20 to 25% of the total area.

➢ Determine the number of small plots which can be legally formed out from the large tract of land with necessary provisions for infrastructure facilities.

➢ Determine the cost of development works such as cost in of construction of road as per municipal specifications with street lights, cost of laying parks, underground drains, water supply lines, sewer lines, electric lines and substation, earth fitting or cutting, cross drainage works and municipal taxes on open land. As the total amount of development is not paid to the contractor at the commencement of work so defer it for half of the period of construction at certain rate of interest say to 12%. Let the value be (A).

➢ Ascertain the total sale price of all the small plots of scheme on the valuation date from the comparable sales of small developed plots. As all these small plots cannot be sold at one time, so estimate the time of disposal of all the plots and defer the total sale price for half of the period of the sale @ 10% to 12%. Let it be of (B).

➢ From the sale price (B) deduct the following.

(i) Present value of the cost of development for half of the period of development (A) along with architect or engineers fee for his supervision and getting the scheme approved.

(ii) Incidental charges such as cost of stamps, registration legal cost, cost of advertisement etc.. Normally it is 8 to 10% of (B). If the cost of stamp, registration and legal cost is to be borne by the purchaser then this percentage should be modifier accordingly.

(iii) Developer's profit and risk 15% of (B).

➢ This amount available after above deductions from (B) will represent the fair market value of the large undeveloped plot on the date of valuation.

V.Profit method:

In the case of Hotels, Motels, Cinemas, Public houses which falls under the category of the Licensed premises, the fair market value (F.M.V) depends primarily on the earning capacity of the property. The F.M.V. of such properties is determined by applying profit method provided.

➢ The owner runs Hotel, Cinema himself.

➢ The owner gives Hotel or Cinema on conducting agreement to a conductor. The F.M.V. of the property is determined by capitalizing the net profits (70% tangible + 30% intangible) at certain rate of expenses, owners risk and other outgoings from the gross income.

VI. Depreciation Method of Valuation

According to this method of Valuation, the building should be divided into four parts:

1. Walls
2. Roofs
3. Floors
4. Doors and Windows

And the cost of each part should first be worked out on the present day rates by detailed measurements.

The present value of land and water supply, electric and sanitary fittings etc. should be added to the valuation of the building to arrive at total valuation of the property. Depreciation is the gradual exhaustion of the usefulness of a property. This may be defined as the decrease or loss in the value of a property due to structural deterioration, life wear and tear, decay and obsolescence.

Basis of Valuation and Its Suitability

Method	Basic of Valuation	Suitability
Land and building method	Fair market value of land component + Depreciated value of building	(i) Residential properties (ii) Self -occupied properties (iii) To certify the present worth (value) of an asset
composite rate method	Depreciated value of the flat plus proportionate share of flat divided by FSI achieved	(i) For apartment and valuation (ii) Valuation of commercial complexes.
Development potential method	Vast stretches of under developed or undeveloped land is developed and divided into small size plots and valued at market rates.	To estimate the fair market values of underdeveloped and undeveloped vast stretches of land.
Rent capitalization method	Net rent is capitalised. Depreciation is ignored.	(i) Tenanted commercial properties. To estimate the fair market value. (ii) Residential building under rent control Act. (iii) Old tenanted buildings. This method is not suitable if deference unbuilt area and the specified area exceeds 20% aggregate area.
Profit capitalization method	Net profit is capitalized	Commercial properties used as business ventures such as cinema hall, hotel, etc.
Market-Rent-Profit approach	On the basis of rent capitalization and pro method and prevailing market	Service properties, Special purpose properties, Cost of producing substitute properties.

5.25.2. Factors affecting valuation

The valuation of property varies from time to time. Factors affect the market value of property are as follows.

1. Forces of Demand and Supply: When there are few buyers as compared to a number of properties available for sale in a locality, it will result in low prices for the property and vice-versa.

2. Rise in Population: The rise in population is due to the growth of new industries in a particular area or influx or manipulation i by brokers will result in a heavy demand for land, building, and property.

3. Cost of Construction: The present cost of construction affects the value due to rapid changes in price index in comparison with the rate of depreciation.

4. Rent Control Act: The value of a property is calculated from its probable income through rent. But the rental value of a tenanted property in areas subject to Rent Control Act may not

reflect the value of a similar property unencumbered by tenancy as rents are artificially freeze while the price of land, labour, and building materials rise continuously. This may cause a slump in property values.

5. Imposition of Control of Prices of Building Materials: The imposition of control of prices of building materials will cause violent fluctuation in the prices of building materials and the value of the building will vary by an appreciable amount from time to time.

6. Rent Restriction Act: The value of a property is calculated from its probable annual income through rent and so due to certain enactment of the Rent Restriction Act by the government, it may cause the slump in the property values.

7. Improvement by Public Schemes: Taking up any public service scheme such as sewer line, water line, means of transport, etc., to an area lacking in modern. Amenities will tend to make that area more attractive and will be closely followed by an increase in land value. Even a proposal to bring a sewer line to an unanswered area or even before the roads are made and services installed, a mere proposal will cause rise in the value of property in that area.

8. Interest on Schedule Banks or. Government Securities: Lower the schedule bank interest or government security, higher may be the interest for making more money available for investment in property and vice-versa.

9. Abnormal Socio-Political Condition: Due to insecure conditions such as riots, war, etc., values may drop and remain so for, a considerable period.

5.26 MORTGAGE

An owner can borrow money against the security of his property, and for that purpose he is required to grant an interest to the party advancing the loan. The loan is required to be returned in specified time. The person who takes the loan is known as Mortgager and the person who advances the loan is known as Mortgage and the relevant document for the mortgage transaction is known as Mortgage deed.

5.27. FIXATION OF RENT

The rent of building is fixed on the basis of certain percentage of annual interest on the capital coast and all possible annual expenditures on outgoings. The capital cost includes the cost of construction of the building, the cost of sanitary and water supply work and the cost of electrical installations and the cost of subsequent additions and alterations if any.

Gross rent = Net rent +Outgoings

Dividing the gross rent by 12, rent per month can be calculated.

5.27.1 FIXATION OF RENT

Capitalized value of the property can be known by any of the methods discussed earlier and suitable value of year's purchase is adopted according to the admissible rate of interest (8% or any other fair rate).

Then,

Net income = capitalized value / year's purchase

All possible outgoings are added to this net income which will give gross income from the Property. Gross income or gross rent = Net rent + outgoings

The standard rent = (Gross Income / 12) per month.

Example:

(In Punjab / Haryana), standard rent is calculated on the capital cost of the residence and shall be either:

1. (a) A percentage equal to the rate of interest on the capital (which includes the cost on sanitary, water supply and electrical installation, fencing, boundary walls and service roads etc. as fixed from time to time) value of a building. In addition, municipal and other taxes and the expenditure for the maintenance of building are also realised, or

(b) 6%per annum of the capital value of a building constructed/ occupied after 1992 whichever is less. Interest Maintenance Depreciation Sanitary and Water 6 %, 6 1/2 %, Supply Installation 5 % ordinary repair11/2 % special repairs Electrical Installation 6 % 4 % 5 %

2. Municipal taxes etc. levied on the occupant will be payable to the occupant direct to the authorities concerned in addition to the above rent calculations.

3. Generally the value of the land is excluded. If value of land to be considered a little less percentage says 1 to 2 % on value of land be taken for calculation of standard rent.

PROBLEM: A building costing Rs. 3, 50,000/- has recently been constructed in a big city. The plot measuring 450 sq. m was purchased @ Rs. 150/- per square meter. Work out the rent of the property. Assume 8% as net return on the cost of the construction and 4 1/2 % on the land value. All expected outgoing are Rs. 10000/- per year.

Solution:

(1) Cost of construction= Rs.3, 50,000/-

Value of land = 450 150= Rs. 67500/-

Net return:

1. On cost of construction

= Rs. 28000/-

2. On value of land = = 3037.50

Net return = Rs.28000/- + 3037.50

= Rs. 31037.50

Outgoing = Rs. 10000/-

Gross income = Rs. 31037.50/12 = Rs. 4320/-

Rent / month = 41037.50 / 12 = Rs. 4320/- (approx.)

2 A govt. accommodation is built at the cost of Rs. 60,000/- . The water supply and sanitary and electrical installation expenditure is Rs. 15000/-. Calculate the standard rend of the building if the following rate of return are fixed:

i. 6% on construction cost.

ii. 1 1/2 % towards maintenance of building work,

iii. 4 1/2 % on installation expenditure.

iv. 4% on maintenance of installation.

v. Rs. 120/- as property tax per year.

vi. Cost of land is be neglected.

Solution:

(a) (i) Return on construction cost = = Rs. 3600/-

(ii) Return on installation cost = = Rs. 675/-

(iii) Cost of maintenance of building = = Rs. 900/-

(iv) Cost of maintenance of installations = = Rs. 600/-

(v) Property tax = Rs. 120/-
Gross return = Rs.5895/-
Standard rent = Gross rent / 12 =
= Rs. 491.25 P.M. (Per Month).
b) Standard rent is also equal to 6% of capital value
Capital value
(1) Construction cost = Rs. 60,000.00
(2) Installation cost = Rs. 15,000.00

Total = Rs. 75000.00
Standard rent =
= 4500/- per year
= Rs. 375/- P.M.
Because the standard rent by (b) method is less and, therefore, the standard rent shall be Rs. 375/- P.M.

WORKED EXAMPLES

1. The total cost of a new building is ₹1,50,000. Workout the depreciated cost of building after 20years by straight line method, if the scrap value is ₹15,000 assuming the life of the building is 80years.

Annual depreciation $= \frac{C - S_c}{n} = \frac{1,50,000 - 15,000}{80} = ₹1687.52$

Where C = original cost, S_c = scrap value, n = life of the property in years.

Depreciation for 20 years = 1687.50 × 20 = ₹33,750

Therefore depreciated cost of the building after 20 years = 1,50,000 – 33,750 = ₹1,16,250/-

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2. The present value of machine is ₹20000. Workout the depreciation cost at the end of 5 years, if the salvage value is ₹2000. Assume life of the machine be 16 years.

The percentage rate of annual depreciation $p = 1 - \left(\frac{S_c}{C}\right)^{\frac{1}{n}} = 1 - \left(\frac{2000}{20000}\right)^{\frac{1}{16}} = 0.134$

Therefore the value of the property at the end of

5 years $= C(1-p)^5 = 20000(1-0.134)^5 = ₹9741.35$

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3. The cost of construction of a new building according to present market is ₹3,00,000 having life of 70 years. But if the building is 15 years old, determine the depreciation amount which should be deducted from the cost of the new building at 6% compound interest.

Sinking fund coefficient for 70 years $I_c = \frac{i}{(1+i)^n - 1} = \frac{0.06}{(1+0.06)^{70} - 1} = 0.0010$

An amount of ₹1/- per annum in 15 years $= \frac{(1+i)^n - 1}{i} = \frac{(1+0.06)^{15} - 1}{0.06} = 23.25$

Therefore Rate of depreciation in 15 years $= 0.0010 \times 23.25 = 0.02326 = 2.326\%$

Total depreciation in 15 years on ₹3,00,000 $= \frac{2.326}{100} \times 300000 = ₹6978$

Therefore ₹6978 should be deducted due to depreciation from the cost of the new building.

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4. A building fetches a Gross Annual income of ₹50000. Total annual outgoings is ₹7500. Workout the capitalized value of the building, if the rate of interest is 5% per annum.

Gross annual income = ₹50000

Net annual income = gross income – outgoings = 50000 – 7500 = ₹42500

Year's purchase $= \frac{100}{5} = 20$

Capitalized value of the property = Net income $\times Y.P = 42500 \times 20 = ₹850000$

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5. The building fetches a gross income of ₹1500/- per month. Workout the capitalized value on the basis of 6% net yield, if all out going amount is equal to ₹3000/- per annum.

Gross annual income = ₹1500 per month $\times 12 = ₹18000$

Net annual income = gross income – outgoings = 18000 – 3000 = ₹15000

Year's purchase $= \frac{100}{6} = 16.67$

Capitalized value of the property = Net income $\times Y.P = 15000 \times 16.67 = ₹250050$

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6. Capitalized value of a property fetches a net annual rent of ₹1000.00 and the highest rate of interest prevalent is 8%. Find the capitalized value of the property.

Net annual rent = ₹1000 Year's purchase $= \frac{100}{8} = 12.5$

Capitalized value of the property = Net income $\times$ Y.P = $1000 \times 12.5 = ₹12500$

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7. A property produces a yearly income of ₹5250.00. The overall outgoings of the income of that property are ₹1250.00 p.a. Work out the capitalized value of the property, if the purchaser desires 8% of return on his capital.

Gross annual income = ₹5250

Net annual income = gross income-outgoings = 5250 – 1250 = ₹4000

Year's purchase $= \frac{100}{8} = 12.5$

Capitalized value of the property = Net income × Y.P = 4000 × 12.5 = ₹50000

8. **A three storied building is standing on a plot measuring 800sqm. The plinth area of each storey is 400sqm. The building is of RCC framed structure and the future life may be taken as 70 years.The building fetches a gross rent of ₹1500/ - per month. Workout the capitalized value of the property on the basis of 6% net yield. For sinking fund 3% compound interest may be assumed. Cost of land may be taken as ₹50/- per sqm. Other data required may be assumed suitably.**

Gross income per year = 1500×12 =₹18000

Sl. No	Outgoings per annum Assuming suitable datas	Calculation	Amount ₹
1	Repairs @ 1/12 of gross income	18000/12	1500
2	Municipal tax 20% of gross rent	$\frac{20}{100}\times 18000 = 3600$	3600
3	property tax 5% of gross rent	$\frac{5}{100}\times 18000 = 900$	900
4	Insurance premium@ ½ % of Gross rent	$\frac{0.50}{100}\times 18000 = 90$	90
5	Management charges@6% of Gross rent	$\frac{6}{100}\times 18000 = 1080$	1080
6	Other miscellaneous charges@2% of the gross rent	$\frac{2}{100}\times 18000 = 360$	360
7	Sinking fund required to accumulate the cost of the building in 70 years @ 3% (Which is at rate of ₹150/sqm = 400 × 3 ×150 = ₹180000)	I = 3/100, n = 70, S = 180000 $= \frac{Si}{(1+i)^n - 1} = \frac{180000\times 0.03}{(1+0.03)^{70} - 1} = 782$	782
		Total outgoings per annum =	**₹8312**

Net annual return = 18000 – 8312 = ₹9688

Year's purchase $= \frac{100}{6} = 16.67$

Capitalized value of the property = Net income $\times Y.P = 9688 \times 16.67 = ₹161499$

Cost of land @ ₹50 per sqm = $800 \times 50 = ₹40000$

Total value of the whole property = Capitalized value + Cost of land = ₹161499 + ₹40000 = ₹201499

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9. A residential building constructed on a plot measuring 525sqm. The construction cost of building is ₹175000.00. The land was purchased by the owner at ₹145.00 per sqm. The total outgoings including sinking fund is ₹11500.00. Workout the gross and net rent of the property, if the owner desires 6.5% return on the construction cost and 5% on the value of the land.

Cost of construction = ₹175000

Cost of land @ ₹145 per sqm = 525 × 415 = ₹76125

Net return:

On building @6.5% $= \frac{6.50}{100} \times 175000 = ₹11375$

On the land@5% $= \frac{5}{100} \times 76125 = ₹3806$

Total net return per year = 11375 + 3806 = ₹15181

Net rent per month $= \frac{15181}{12} = ₹1265$

Gross rent = Net return + Outgoing = ₹15181 + ₹11500 = ₹26681

Gross rent per month $= \frac{26681}{12} = ₹2223.41$ say ₹2230

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10. The building costing 8 lakhs has been constructed on a freehold site measuring 20m × 30m in a city. The land value may be taken as ₹600/- per sqm. The total outgoing expenditure is ₹35000.00 per annum. Workout gross rent of the property per month. Rate of interest on building is 6% and that on the land is 4%.

Cost of building = ₹ 800000

Cost of land @ ₹600 per sqm = $20 \times 30 \times 600 = ₹360000$

Net return: On building @6% $= \frac{6}{100} \times 800000 = ₹48000$

On the land@4% = $\frac{4}{100} \times 360000 = ₹14400$

Total net return per year = 48000 + 14400 = ₹62400

Net rent = $\frac{62400}{12} = ₹5200$

Gross rent = Net return + Outgoing = 62400 + 35000 = ₹97400

Gross rent per month = $\frac{97400}{12} = ₹8116.67$ say ₹8120

11. Prepare a preliminary estimate of a building project with the following extents of areas and details:

i. **Plinth rate including water supply and sanitary works installation @ ₹4500/sqm. Plinth area of building proposed -145.00sqm.**
ii. **Extra rate for roof projections & balcony @'2500/sqm. Roof projections & balcony areas to the building-25.00sqm.**
iii. **Extra for electrical installation work@5% of the plinth area cost.**
iv. **Extra for services-@6% of the plinth area cost.**
v. **Consulting & supervision charges-5% of the total cost.**

Sl.no	Particulars	Calculation	Cost (₹)
i	Plinth rate including water supply and sanitary works installation	₹4500/sqm × 145sqm = ₹652500	652500
ii	Extra rate for roof projections & balcony	₹2500/sqm × 25sqm = ₹62500	62500
iii	Extra for electrical installation work	5% of plinth area cost = $\frac{5}{100} \times 652500 = ₹32625$	32625
iv	Extra for services	6% of plinth area cost = $\frac{6}{100} \times 652500 = ₹39150$	39150
		Total cost=	786775
v	Consulting & supervision charges	5% of total cost = $\frac{5}{100} \times 786775 = ₹39339$	39339
		Total =	826114
		Contingencies 5% of the total=	41306
		Work charged 2 ½ % of the total=	20653
		Total estimated cost of building project=	**888073**

12. Prepare a preliminary estimate of a building project with total plinth area of all buildings of 1500sqm. Given that

i. **Plinth area rate - ₹4000/sqm.**

ii. **Extra for Architectural treatments - 1½ % of the building cost.**

iii. **Extra for water supply & sanitary installations - 5% of the building cost.**

iv. **Extra for electrical installations - 10% of the building cost.**

v. **Consulting & supervision & contingencies - 8% of total cost.**

Sl.no	Particulars	Calculation	Cost (₹)
i	Plinth area rate	₹4000/ *sqm* ×1500*sqm* =₹6000000	6000000
ii	Extra for Architectural treatments	1.5% of the building cost= $\frac{1.5}{100}\times 6000000 = ₹90000$	90000
iii	Extra for water supply & sanitary installations	5% of the building cost = $\frac{5}{100}\times 6000000 = ₹300000$	300000
iv	Extra for electrical installations	10% of the building cost = $\frac{10}{100}\times 6000000 = ₹600000$	600000
		Total cost=	**6990000**
v	Consulting & supervision & contingencies	8% of total cost = $\frac{8}{100}\times 6990000 = ₹559200$	559200
		Total =	**7549200**
		Work charged 2 ½ % of the total=	188730
		Total estimated cost of building project=	**7737930**

13. A person has purchased an old building at a cost ₹4,00,000/- on the basis that the cost of land is ₹2,00,000/- and the cost of building structure is ₹2,00,000/-. Considering the future life of the building structure be 20 years. Workout the amount of annual sinking fund at 4% interest when scrap value is 10% of the cost of the building.

Scrap value =10% of the cost of the building.

$$\text{Scrap Value} = \frac{10}{100}\times 200000 = ₹20000$$

The total amount of sinking fund to be accumulated at the end of 20years

S = Cost of building – Scrap value = 200000 – 20000 = ₹1,80,000
$i = 4/100 = 0.04$, $n = 20$, S = 180000

Annual installment of Sinking fund $= \frac{Si}{(1+i)^n - 1} = \frac{180000 \times 0.04}{(1+0.04)^{20} - 1} = ₹6050.42$

14. A pumping set with a motor has been installed in a building at a cost of ₹ 2,500.00. Assuming the life of the pump as 15 years, work out the amount of annual instalment of sinking fund required to be deposited to accumulate the whole amount of 4% compound interest.

The annual sinking fund, $= \frac{Si}{(1+i)^n - 1} = \frac{2500 \times 0.04}{(1+0.04)^{15} - 1} = 2500 \times 0.05 = ₹ 125$

If the owner will deposit ₹ 125 annually in 4% compound interest carrying investment for 15 years then he will get ₹ 2,500 accumulated.

15. An old building has been purchased by a person at a cost of ₹30,00,000 excluding the cost of the land. Calculate the amount of the annual sinking fund at 4% interest assuming the future life of the building as 20 years and the scrap value of the building as 10% of the cost of purchase.

The total amount of sinking fund to be accumulated at the end of 20 years.

$$S = 3000000 \times \frac{90}{100} = ₹ 27,00,000$$

Annual instalment of sinking fund, $= \frac{Si}{(1+i)^n - 1} = \frac{2700000 \times 0.04}{(1+0.04)^{20} - 1}$

$= 27,00000 \times 0.0336 = ₹ 90670.72$

Annual instalment for sinking fund required for 20 years = ₹ 90,670.72.