

ESTIMATION& COST EVALUATION-II

**Spintronic Technology & Advance Research
(STAR)**

Department of Civil Engineering



DIPLOMA

Lecture notes on

ESTIMATION& COST EVALUATION-II

BY

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ESTIMATION & COST EVALUATION-II

CHAPTER 4

4.0 PWD accounts works

4.2.3 Master roll : Its preparation & use for making payment of pay & wages

1. Terminology

Administrative Approval: This term denotes the formal acceptance by the Administrative department concerned, of the proposal for incurring expenditure in the PWD.

Technical sanction: It is an order by a competent authority sanctioning a properly detailed estimate of the cost of a work to be carried out by the PWD.

Detailed Estimate: An estimate prepared on the basis of the detailed quantities of all items worked out from the designs and drawings are known as a detailed estimate.

Major Estimate: An estimate whose sanctioned amount exceeds a certain fixed limit is known as major estimate. In PWD this limit is fixed at Rs.1 lakh.

Minor estimate: An estimate whose sanctioned amount is lower than a fixed limit is known as minor estimate. In PWD this limit is fixed at Rs.1 lakh.

Petty Work: A work, which does not cost more than Rs.7500 is known as a petty work.

Debit and Credit: In simple terms, „debit“ means expenditure and „credit“ means a receipt.

Cash: The term „cash“ as defined in the CPWD code includes legal coins, notes, cheques, deposit-at-call receipts of scheduled banks, drafts and payments on demand.

2. Methods for Carrying out the Work

Public works are carried out either departmentally or through contractors. Complicated and important works, where a high degree of reliability in the quality of work is essential, are generally executed departmentally by engaging contractual labours. This method requires intensive planning and supervision, so that the output of labours and machines is commensurate with the expenditure incurred. For most works, however, the contract method is employed. Through this method the department, taking advantage of competitive bidding by rival contractors, is able to get the work executed at the lowest possible rates. Moreover, the risks involved in construction and the day-to-day problems are the headaches of the contractor and the departmental staff can devote sufficient time to ensure that the contractor's work is in accordance with the designs, specifications, time schedule and other conditions laid down in the agreement.

These are the different methods for carrying out the works:

1. Contract methods
2. Employment of daily labor on muster roll
3. Piece work agreement
4. Work order

In certain cases due to its situation or nature or due to being not susceptible to measurements the works cannot be carried out by contract. The work in such cases is got done by departmental labour and supply of materials, usually the day to day maintenance work is attended to by the work charged establishment. The work is done by them are not measured. They are monthly paid staff employed more or less on the same footing as the regular establishment except that their pay and allowance are charged directly to the work.

2.1. Contract methods

In this system the whole work is done by a contractor who arranges all materials required and employ the workers required for completion of projects in time. The contract system may be lump sum contract, item rate contract, cost plus percentage contract, labour contract or materials contract. Details about contract system are provided in previous lectures.

2.2. Employment of daily labor on muster roll

Work may be executed departmentally through employment of daily labours such as mason, coolies, bhisties, carpenters, etc. The materials required for the construction such as bricks, cement, sand, lime, surki, timber steel etc., and tools and plants required for the operations are got issued from the store by indent or purchase directly chargeable to the work. The attendance of the labours is kept in Muster Roll by the overseer or by his authorized agents.

a) Payments to daily labours through muster roll Except for the regular and work charged establishments, all persons engaged departmentally for the execution of works are considered as casual labour. Their wages are drawn on "Muster rolls". Muster rolls are prepared in the prescribed form. The Nominal Muster Roll form consists of two parts.

Part I of N.M.R. form consists of necessary columns for entering the names of labour, designation, father's name, their attendance particulars, rates of wages and the total amount payable for each labour. N.M.R form has the provision for entering the total amount of the muster, signature or left hand thumb impression of the labour as a receipt. At the bottom of this form, the person preparing such N.M.R form should sign before submitting to A.E / D.E.E who in turn verifies the details entered and makes the payment.

Part II of the muster roll is used for recording the name of work, amount of work done in cases in which the work is susceptible to measurements. Other details like the number of measurement book, pages in which the measurements are recorded will also be entered in this part. If the work is not susceptible to measurement, a remark to that effect is recorded.

Some important instructions regarding the preparation of Muster rolls are:

- Duplicate copies of muster rolls should not be prepared.
- Separate muster rolls are prepared for each period of payment. Labour may be paid more than once a month depending upon local conditions and practices.
- The daily record of attendance and times should be recorded in such a way as to leave no possibility of tampering or making unauthorized entries.
- After the muster roll has been passed, payment should be made as early as possible.
- A record of wages that remains unpaid must be kept in a register of unpaid wages.
- Subsequent payment of unpaid wages is recorded in the hand receipt. A note of the same is recorded in the register of unpaid wages as well as in the muster roll.
- Wages that remain unpaid for three months must be reported to the divisional office.
- Progress of work done by the labour is recorded and is to be compared with departmental rates.
- Muster rolls are checked with reference to entries in the measurement book to the extent of 50% in the sub-divisional and 50% in the division office, when the divisional engineer makes payments.

2.3. Piecework agreement These are agreements for doing the work at agreed rates, without reference to the total quantity of work or time. Small works or piecework up to Rs.5000/- are got done through the contractors by piecework agreement. In piece-work, the quantity of work is not mentioned and only the rate is mentioned. This agreement is used (i) for small works (ii) when it is necessary to start work in anticipation of the formal acceptance of the contract and (iii) for running contract. This type contract can be terminated by both parties at any instance without any penalty. Piece work agreements are:

Advantages:

- Urgent small work can be carried without any tenders.
- If a contractor leaves, another can take the work.

Disadvantages:

- Only petty contractors are interested in this contract.
- Hence careful supervision is required.

2.4. Work order Work order is used for petty works; work orders may sometimes also mention the time limit within which the work is to be completed. No formal agreement is drawn up with the contractor as in the case of piece-work when the work is awarded by a work order.

3. Measurement Book (M.B.)

The measurement of all works and supplies are recorded in the measurement book and the payments of all works and supplies are made on the basis of the measurements recorded.

Form 23 (measurement Book)

Particulars	Details of actual measurement				Contents of area
	(1) No.	(2) L.	(3) B.	(4) D.	

The measurement book is a most important record since it is the basis of all accounts and quantities whether the work is done by daily labour, piece work, Schedule contract, lumpsum contract or of materials received. As this is the original record of actual measurements or accounts and forms a reliable record; it may have to be produced as evidence in court of law in case any dispute arises. It is therefore preserved carefully and the movement between officers and persons is also watched continuously. The loss of M.B. is a serious issue and in such conditions it should be reported to the next higher authority citing the incident and for orders for sanction to its write off.

The following instructions should be observed carefully while recording detailed measurements in the M. B.:

- All entries to the measurement book should be made in a continuous chain and in chronological order.
- The pages of the measurement book are machine numbered. If any page left blank through mistake should be cancelled by diagonal lines and cancellation being initialized and dated.
- Entries to the measurement book should be recorded in ink directly at the field.
- At the end of each set of measurement, the officer recording them has to certify "measured by me" and to put his full signature with date.
- Any lines not required should be carefully scored out in order to prevent additional entries being made later on.
- No entry should be erased. If a mistake is made, it should be corrected by crossing out and inserting the corrections. The corrections made should be initialized with date.
- Separate measurement book should be used to record the works done by contractor and the works done by departmental labour.
- After completion of the detailed measurement, the abstract of quantities is drawn up in the M.B.

Check of measurements of works

Entries recorded by the section officer are always subjected to test check by subdivisional officer to the extent of 50% by their money value. Similarly, the divisional officer is required to test check at least 10% of the measurements, recorded by his subordinate and to accept responsibility for general correctness of the bill as a whole.

The object of check measurement is to detect errors in measurements and to prevent fraudulent entries. Check measurements should therefore be conducted on such items:

- Which appear obviously incorrect
- Which would be more easily susceptible of fraud
- Which would more seriously affect the total amount of the bill if inaccurate

After completion of abstract, the M.B. is sent to the sub-divisional officer for entering the rates of items of the bills by assistant engineer, and for arithmetical and other checks by the Sub-Divisional clerk. The bill thereafter is typed out in the prescribed form and made ready for payment and submitted to the divisional office for further check and payment. Any corrections to or calculations of rates needed is made in red ink by the sub-divisional or divisional officer. In case of the final bill, the corrections should be confirmed by the person making the original entries before authorizing the payment.

The bill after scrutiny is endorsed with a pay order both on M.B. and bill forms and signed by the divisional officer or executive engineer or engineer in charge. The bill having been accepted and receipted by the contractor, a crossed cheque for the net amount is drawn and handed over to the payee by the disbursing officer.

4. Standard Measurement Book:

A set of M.B. containing detailed measurement of specific buildings and structure maintained by each sub-division is kept to facilitate framing annual repairs estimate and for payment to the contractors for jobs connected therewith. Their M.Bs are known as standard measurement books (S.M.B). The S.M.Bs saves time and labour of the departmental officers from repeated work of taking detailed measurements of the same building again and again.

CHAPTER 4

4.0 PWD accounts works

4.2.5 Labour & labour report, method of labour payment, use of forms and necessity of submission

1. Land Acquisition Act

Land acquisition is defined as the process of getting back the land by the government with the certain compensation. Land is needed by the government for:

- Strategic purposes like armed forces and
- Industry and Infrastructure
- Planned development
- Residential purpose for poor, educational & health schemes
- Land for private companies for public purpose
- Needs that arise from natural calamity

1.1. Procedure for land acquisition

In India Land can be acquired by the Government according to Land Acquisition, Rehabilitation and Resettlement (LARR) Act, 2013 (Land Acquisition Act, 2013).

When the Government requires land for any of the stated purposes, a notification to that effect shall be published in the Official Gazette and in two daily newspapers circulating in that locality of which at least one shall be in the regional language. Thereupon it will be lawful for any officer and for his workmen to enter upon and survey and take levels, to dig or bore into the subsoil in such locality.

1.2. Objection

Any objection by any person to the process should be made in writing to the Collector within 30 days of publication of the notice.

1.3. Enquiry and award by the Collector

When government declares public purpose and shall control the land directly, consent of the land owner shall not be required. However, when the government acquires the land for private companies, the consent of at least 80% of the project affected families shall be obtained through a prior informed process before government uses its power under the Act to acquire the remaining land for public good, and in case of a public-private project at least 70% of the affected families should consent to the acquisition process. On the day so fixed, the Collector shall proceed to enquire into the objections (if any) and being satisfied that all the persons interested in the land who appeared before him have agreed in writing on the matters to be included in the award of the Collector in the form prescribed by rules made by the appropriate Government, make an award according to the terms of such agreement. On making an award, the Collector shall tender payment of the market value compensation awarded by him to the persons interested and entitled thereto according to the award. If there be any dispute as to the title to receive the compensation or as to the apportionment of it, the Collector shall deposit the amount of the compensation in .the Court.

1.4. Dispute and delay for acquiring land

The Owner of the land who has not accepted the award may move to the court of law hence causing delay for acquiring a land for even several years.

1.5. Matters to be considered in determining compensation:

- The market value of the land on the date of the publication of the notification;
- The damage sustained by the person interested, by reason of the taking of any standing crops or trees which may be on the land at the time of taking possession thereof;
- The damage sustained at the time of taking possession of the land, by reason of separating such land from his other land;
- The damage sustained at the time of taking possession of the land, by reason of the acquisition injuriously affecting his other property, movable or immovable, in any other manner, or his earnings;

- If, the person interested is compelled to change his residence or place of business, the reasonable expenses incidental to such change;
- and The damage bonafide resulting from reduction of the profits of the land between time of the publication of the declaration and the time of taking possession of the land.

In addition to the market value of the land an amount calculated at the rate of twelve percent per annum of such market value as interest for the period commencing on and from the date of publication of the notification in respect of such land to the date of the award or taking possession of the land, whichever is earlier

2. Types of Labour

Construction labour can broadly be divided into two classes namely casual labour and regular establishment.

2.1 Casual labour

Casual labour is employed as and when required for the execution of work, payment is made on the basis of the number of days the labour works. There is no provision of leave, except the weekly holidays. This is also known as daily labour.

2.2 Regular Establishment:

Regular establishment generally includes supervisory personal that are required for more or less continuous period during construction. They are paid monthly wages and entitled to leave and other benefits. The employees may be temporary or permanent. Permanent employees have great security of service and may be entitled to more service benefits than the temporary employees.

3. Labour Laws Related to Construction Industry

Construction is the largest industry in India and most of the employees who are working in construction industry are labours and skilled workers. As the nature of construction work is temporary the workers are recruited as and when required for the execution of work and are retrenched when no longer needed. Construction labour is migratory in nature, moving from one site to another site, and the labour attached to big contractors tends to migrate to new work sites taken up by them.

Because of such frequent migration construction labour has not been able to organize itself to the extent that labour in factories and other organized sectors of trade has. Consequently, construction labour has extremely poor bargaining power and this situation is fully exploited by employers. The construction labour beside low wages, they live in crowded unsanitary temporary huts built at the construction sites in unhygienic surroundings without basic amenities of life. For the welfare of the labour, the Governments have, from time to time, brought out labour laws.

Labour laws are classified into the following types

- Laws concerning the working conditions of labour.
- Laws concerning wages and other payments to labour.
- Laws concerning the social security of labour.

These laws are proved very much helpful to the labour for improving their living conditions.

4. Trade Unions Connected With Construction Industry

Trade unions are voluntary group of workers which are formed with the objective of protecting and promoting the interest of workers. Trade unions have both legal status and social approval. The main functions of Trade unions are:

- i. Improving working conditions at site
- ii. Improving wages of workers
- iii. Promoting welfare activities such as health plans, life insurance, bonus, provident fund etc. for workers
- iv. Providing legal assistant to workers where ever required.
- v. Establishing cordial relation between employers and workers

Important trade unions connected with construction industry in India are:

- All India Trade Union Congress (AITUC): founded by congress party in 1919. Presently under influence of Communist party of India
- Indian National Trade Union Congress (INTUC): formed in 1947 by congress party.
- Bharatiya Mazdoor Sangha (BMS): set up by Jan Sangh (Bharatiya Janata Party) in 1955
- United trade Union Congress (UTUC): founded by left parties in 1949
- Hind Mazdoor Sabha (HMS) set up in 1948 by socialist party.
- Center of Indian Trade Unions (CITU) funded in 1970 having 2,231 affiliated unions. Functioning under influence of communist party of India (Marxist)

5. Labour Insurance

Insurance laws are applicable only to regular employees. In construction industry most of the labour is of casual nature and insurance laws are not applicable to them. For the welfare of casual labour, different Acts such as Minimum wages Act, Compensation Act etc. are passed by the Government.

6. Payment of Wages

The remuneration given to workers for work performed by them is known as wages. Wages are of two types.

Nominal wage: This is the remuneration paid to the worker in the form of money, but it does not include the value of any other benefit that may be provided.

Real Wage: Labour is often entitled to different benefits, such as leave, medical care, house rent allowance, bonus etc. If the value of such benefits is added to the nominal wage, it is known as real wage.

Wages are paid to the labour based on two methods:

- Depending upon time devoted to the work (Time rate system)
- Depending upon the quantity of work performed (Piece rate system)

Time Rate system:

In Time rate system of payment of wages, a suitable rate of payment is fixed per unit of time devoted to work by the labour. The unit of time can be hours, days, weeks or months. The rate of payment for casual labour is fixed per day and that of regular employees per month in the construction industry.

Advantages

- It is simple and easily understood by labour.
- The quality of work will be good.
- The workers do not get overstrained.

Disadvantages

- Constant supervision is required.
- Effective cost control can not be ensured.

Piece Rate System

In this system payment is made on the basis of the output of the workers. The work done by each labour is measured and payment is made at the agreed rate. Thus a worker can make more money by increasing his output. The rate of each item of work is fixed on the basis of the past record of output.

Advantages:

- The overall productivity is increased.
- The need of supervision is reduced.
- Effective cost control can be ensured.
- The system is fair to the workers and employers.
- The better workers with higher outputs get higher payment.

Disadvantages:

- The system is unsuitable for works which cannot be measured.
- The quality of work is lowered.
- There are no guaranteed wages for workers.

Whatever the system may be, there must be an adequate compensation for the labour put in and this is known as “fair wages”

7. Minimum Wages Act, 1948

The Minimum wages Act of 1948 was passed for the welfare of labour and provided for fixing the minimum rate of wages of labour. The Act aims at making provisions for the statutory fixation for the minimum rate of wages in number of industries where there are extensive chances for the exploitation of labour.

The main provisions of Minimum wages Act are:

- The setting of advisory committees to collect information on which the minimum wages are based.
- The wages of a worker in any scheduled employment shall be paid on a working day by:
 - The 7th day after the last day of the wage period if the establishment has less than 1,000 employees.
 - The 10th day after the last day of the wage period if establishment has more than 1,000 employees.
- The wages of an employee should be paid without any deductions except those items given below
 - Fines in respect of acts of omission
 - Absence from duty
 - Loss of goods directly attributed to the neglect of the employee
 - House accommodation provided by the employer
 - Amenities and services provided by the employer
 - Income tax
 - Subscription to the provident fund
 - Recovery of advances
 - Deductions ordered by the court
 - Payments to co-operative societies / Life Insurance
 - Corporation

8. Workmen Compensation Act, 1923

The Workmen Compensation Act passed to protect the victims of accidents and their families from hardships out of and in the course of employment. The Act covers workers employed in hazardous occupations as specified in the schedule but excludes those employed in clerical or administrative work. The Act provides for payment of compensation in case of accidents on work sites. The compensation, however, is not payable for injuries due to

1. Disobedience or negligence,
2. Non observance of safety measures
3. Consumption of liquor
4. Diseases which are not contracted as a result of the occupation.

In the case of the death of a worker, compensation is paid under all circumstances.

Accidents are due to

1. Human causes such as poor eye sight, negligence, effect of intoxicants,
2. Mechanical causes such as inadequate safety devices, live electrical equipment, unreliable scaffolding etc. and
3. Environmental causes. Such as poor lighting, heat, noise etc.

The result of an accident may be:

1. Temporary disablement, which may be total or partial.

2. Permanent total disablement.
3. Permanent partial disablement.
4. Death.

The Compensation to be paid is depends on the result of the accident. The Act provides for the appointment of Commissioner for the quick disposal of claims for compensation. The employers are required to notify fatal or serious accidents to the commissioner within seven days. Civil courts are debarred from considering cases arising out of the Act and these are under the jurisdiction of the commissioner.

9. Contract Labour Act, 1970

The contract labour Act, 1970 was passed to regulate the employment of contract labour in certain establishments. It also provides for improving the service conditions of contract labour. The Act is of importance to the construction industry where works are executed through contractors or by contract labour.

The Act applies to every establishment and contractor employing twenty or more workmen. The Act does not apply to establishments in which only work of an intermittent or casual nature is performed.

The Act provides for the constitution of a Central Advisory Contract Labour Board under the Central Government and of state Advisory contract labour Board under each State Government to advise the Central and State Governments on matters arising out of the administration of the Act and to carry out the functions assigned to it under the Act. The main provisions of the Act are:

9.1 Registration of establishments

Every principal employer of an establishment to which the Act applies is required to make an application to the registering officer on the prescribed form for the registration of the establishment.

9.2 Licensing of Contractors

Every contractor executing any work through contract labour is required to obtain a license

9.3 Welfare and Health of Contract Labour

Under the Act, the following facilities are required to be provided for the welfare and health of the contract labour:

- For works likely to continue for more than three months, where labour is required to halt at night in connection with the working of the establishment, the contractor should provide rest rooms. Separate rooms should be provided for women.
- For works likely to continue for more than six months and employing more than 100 or more labour, an adequate canteen should be provided.
- Latrines and urinals must be maintained in clean and sanitary conditions.

9.4 Payment of wages

Responsibility for the payment of wages rests upon the contractor

CHAPTER 4

4.0 PWD accounts works

4.2.6 Classification of stores, receipt / issue statement on standard form, method of preparation of stock account, preparation and submission of returns, verification of stocks, shortage and excess

DISPUTE AND ITS RESOLUTION

1. Dispute

Given the uncertainties involved in a construction project and the magnitude of funds involved it is only natural to have disagreement between the parties, but these needs to be resolved. While most such day-to-day differences are resolved in an amicable manner, without having to resort to a more formal mechanism, the parties at times agree to disagree and seek redressal through independent intervention.

2. Causes of Disputes

Following are the main causes of disputes between the owner and the contractor:

- Incorrect or different site conditions
- Use of faulty and ambiguous provision in contracts
- Change orders/extra or out-of-scope work
- Suspension of works
- Poor quality of work and construction defects
- Default by the contractor
- No publicity involved
- Unfair distribution of risk
- Delay in payments and over payment
- Levy of compensation for delay
- Termination of work-order

3. Various Dispute Resolution Mechanisms

3.1. Negotiation

Parties themselves or their representatives try to resolve the dispute without involving any neutral third party.

3.2. Mediation

Mediation is a private, quick, cheap process (compare to either arbitration or litigation) where a third party makes possible dialogue between the parties in order that the parties can reach their own decision that is initially non-binding. The parties can however, agree to be bound by their final decision.

3.3. Conciliation

It is a process similar to mediation except that the conciliator can express an opinion on the merits of the case and is required to recommend a solution if the parties fail to agree.

3.4. Mini-trial

In Mini-trial, the case is heard not by judges, but by the senior professional or other high level business people having full settlement authority from both sides. A third party neutral usually joins the party representatives listening to the proofs and arguments, and can make any necessary decision to regulate the process.

3.5. Adjudication

The dispute is referred to an adjudicator, an eminent person with sound legal knowledge, who is appointed to provide speedy legal decision without going through time consuming court proceedings.

3.6. Arbitration

Arbitration is a process where a third party who is independent of parties, but may be appointed by them, makes a decision on the dispute. The decision is binding and can be enforced by the courts. Thus arbitration is a out-of-court proceeding where the arbitrator acts as judge. The outcome is one of a win/lose situation.

3.7. Litigation

Litigation (used when all other venues fails) is a dispute resolution method that is inquisitorial and adversarial, where by the disputants initiate legal action against the other party by going to the court. It is costly and results into much delay for the disputants and may not do justice to the parties. However, the benefit the litigation is that the court has the authority to find out the “truth” from the parties and the enforcement of the order or the judgment is supported by other law enforcement agencies.

3. Advantages of Arbitration over Litigation

- Cost: Arbitration is less expensive than court proceeding.
- Speed: Disputes are settled much faster through arbitration as compared to law suit in the court.
- Convenience: Arbitration hearings are fixed considering the convenience of both the parties.
- Technical knowledge: Both parties have the distinct advantages of appointing arbitrators having technical knowledge and expertise which facilitates satisfactory judgment.
- Informality: Arbitration is conducted in a relatively informal atmosphere observing certain minimum prescribed legal formalities.
- Proceedings in the private premises: Arbitration proceedings are held in the private premises; consequently business activities of the parties do not suffer.
- Confidentiality of awards: The arbitral proceedings and an arbitral awards are generally non-public and can be made confidential.
- Finality of award: The award given by the arbitration is final except in exceptional cases.

4. Disadvantages of Arbitration

- Arbitration may be subjected to pressure from powerful law firms representing the stronger and wealthier parties.
- Arbitration agreements are sometimes contained in ancillary agreement or small print in other agreements and consumer or the employees often do not know in advance that they have agreed to mandatory binding pre-dispute arbitration b purchasing a product or taking a job.
- The awards of arbitration by large is final and binding. There is very Limited Avenue for appealing against erroneous decision of arbitrators.
- In some arbitration agreement, the parties are required to pay for the arbitrator, which adds an additional layer of legal cost that can be prohibitive, especially for small consumer disputes.
- Arbitration in most countries has fewer enforcement options than the litigation. A party seeking to enforce an arbitration award has to resort to judicial remedies, called an action to confirm an award.
- Matters like; matters related to crime, status, family law, etc., cannot be resolved by arbitration as power of parties to enter into an agreement upon these matters is least restricted.

6. Types of Arbitration

6.1 Arbitration without intervention of a court

It arises from the execution of an arbitration agreement. The court may set aside the award of arbitrators only in exceptional cases. After the award by the arbitrator is declared, the parties concerned can apply for a decree on the award, same as any other decree of a court of law.

6.2 Arbitration with intervention of a court

The selection of the act gives an alternative right to the parties to an arbitration agreement. The appointment of arbitrator can be done jointly by the parties or one arbitrator by each party or the court.

6.3 Arbitration in suits (Cases)

When the suit is pending before the court and when the parties desire to settle the same through arbitration before the judgment is pronounced, they can apply for the same and in such cases the court may refer the matter to the arbitrator, appointed in such a manner as may be agreed upon between the parties.

7. Arbitrator

Arbitrator is a person chosen by the parties themselves to whom the disputes and differences are referred to the arbitrator acts as judge and gives his judgment which is binding to both parties. When both the parties mutually agree upon a single person to act as a judge, he is known as sole arbitrator. But when each party forwards own arbitrator, it is called Joint arbitrator. For joint arbitrator an umpire is selected with the consent of both parties.

7.1 Qualification of an Arbitrator

- a) An arbitrator must be an expert in the particular branch of profession and the matter in the dispute.
- b) He should not be related to any of the parties.
- c) He must be impartial, unbiased and free from ill feelings against any of the parties.
- d) He must have unquestionable character, high integrity and unshakable faith in justice.
- e) For engineering project, an arbitrator should be a person not below the rank of superintending engineer. Preferably, he must be from the panel of arbitrators provided by the high court.

7.2 Powers of arbitrator

- a) To administer oath to the parties and witness appearing,
- b) To state a special case for the opinion of the court or any question of law involved or state the award wholly or in part in the form of a special case of such question for the opinion of the court
- c) To make the award conditional or in the alternative
- d) To correct in an award any clerical mistake or error arising from the accidental slip or omission.
- e) To administer to any party to the arbitration interrogatories as may in the opinion of the arbitrator or umpire, be necessary.

8. Procedure to Settle of Dispute by Arbitration

The beginning of the arbitration process involves one party giving notice to another of their intent to arbitrate a dispute, informing them of the nature and basis for the proceeding. The other party then gets a period of time to respond in writing, indicating whether they agree to resolve this dispute via arbitration. Once it is established that the disagreement will be resolved in an arbitration, the arbitration process itself begins, based on the rules and procedures selected by the parties or specified by contract.

After this, the process is somewhat similar to a courtroom trial. Parties make arguments before the arbitrator(s), call witnesses, and present evidence to establish and defend their respective cases. The rules for an arbitration hearing may differ from those of a courtroom, however, and opportunities to question or cross-examine witnesses may be more limited. Once the hearing is concluded, an arbitrator or panel is given a certain amount of time in which to consider the decision and make a ruling.

One of the reasons that arbitration is often thought of as quicker and cheaper than litigation is that the paperwork involved in a dispute is cut down sharply when compared to litigation. The procedures for many arbitrations cut down sharply on some of the burdensome and expensive litigation tools collectively known as "discovery". The discovery process is intended to allow for exchanges of documents and evidence between parties in a dispute. However, this can often lead to costly and time-consuming disputes, with mountains of paperwork. The arbitration process usually cuts down significantly on discovery, allowing an arbitrator to take a more active role and possibly curtail excesses.

a) Steps in Arbitration

1. Dispute arises between two parties
2. One party submits a formal request for resolution of dispute through arbitration (This may be to a specific arbitrator or to an arbitral institution. Choices may be predicated by a pre-contractual term in an agreement which has given rise to the dispute.

3. The other party then gets a period of time to respond in writing, indicating whether they agree to resolve this dispute via arbitration. Arbitration process begins once the other party agrees.
4. Parties agree on an arbitrator or an arbitrator is appointed by an arbitral institution or a court.
5. Arbitrator accepts appointment.
6. Preliminary meeting at arbitrator's request. This may be a joint session with everyone present or may be conducted by telephone conference.
7. Arrangements for the arbitration including hire of venue and travel arrangements, usually done by the parties with or without the assistance of an arbitral institution.
8. Preliminary hearings and interim awards possible in respect of security of costs, scope of arbitration agreement etc.
9. Arbitrator directs to the claimants to submit his statement of facts containing detail grievances and claims against respondents within a specified time period. The claimant submits his statements of facts along with copies of all documents justifying his claims. The arbitrator next directs the respondent to submit his counter statement of facts within a specified date. Respondents prepare the defense, duly supported by adequate documentary evidence and witnesses, and submit before arbitrator.
10. Then the hearing of the case starts. The claimant's representative (often a lawyer) reads the statement of fact. Then the arbitrator directs the respondent or his representative of to counter the statement by claimants with evidentiary proof. During hearing if representative of respondent or claimants wants arbitrator may provide permission to cross examine the witness.
11. After the completion of pleading of both the parties, each party is given the permission to argue his case on the basis of findings in course of the sitting held in the case. Arbitrator hears the pleadings and arguments of both the parties scrutinize and examine all documents and papers produced in the course of the sittings and then close the case and publish the awards. As per the prevailing law arbitration must complete within four months from the date the arbitrator first enters in to reference.
12. The arbitrator has to made his award on a non-judicial stamp paper, sign it and shall give notice to the parties for signing it thereof and the amount of fees and charges payable in respect of the arbitration award.
13. After the award is written on the stamp paper, it should be examined if it is acceptable to both the parties. 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 although it is not necessary for arbitrations out of court. This is made to ensure the award of arbitration is enforceable.

VALUATION

1. Definition

Valuation is the technique of determination of fair price of a property such as land, building, factory or other structures. Valuation determines present value of the property for sale or renting purpose.

1.1 Difference between Cost, Price and Value

- Cost means the original cost of construction minus the loss due to its age and change in taste or fashion.
- Price is the amount calculated adding the cost of the production, interest on investment and profit to the producer or the owner.
- Value is the worth or utility of a property. Value of a property depends largely on the demand and supply.

For example the cost to draw a painting may be 1,000/- rupees, but by adding profit for the painter the price may be fixed at 1,500/- rupees. Let us consider the painting is a very famous painting whose demand is more (like Monalisa by Leonardo da Vinci) then the value of the painting may be significantly high.

2. Purpose of the Valuation

The main purposes of valuation are as follows:

- Sale or Purchase of a property
- To fix up the municipal taxes, wealth tax and estate duty on a property
- To fix up the gift tax payable to the govt when the property is gifted to somebody else.
- To probate, i.e. to prove before a court that the written paper purporting to be the will of a person who has died is indeed his lawful act the official copy of a will is to be presented along with court stamp fees. The stamp fee depends on the value of a property and for this valuation is necessary.
- To divide the property among the shareholders in case of the partition.
- Assessment of income or stamp duty.
- To pay the capital gains tax when a capital asset is disposed of and the proceeds exceed the costs incurred in acquiring the asset.
- Rent Fixation
- To work out the insurance value of a property
- To determine the quantum of loan that can be sanctioned against a property as mortgage or security
- For compulsory acquisition of the property by govt. for public purpose.
- To determine the speculative value of a property, i.e. the purchase of a property with intention to sale at a later date and to make some profit.
- To fix up the betterment charges, i.e. construction of new road, providing market complex, community hall etc. so that the value of the property will increase.

3. Terminology

3.1. Incomes:

a) Gross income: Total income from all sources.

b) Outgoings: these are the expenses which are required to be incurred to maintain the property. These includes: Taxes, periodic repairs, management and collection charges, sinking fund, and loss of rent (for the period when the property is not occupied).

c) Net income: The amount left after deducting all outgoings from the gross income.

d) Net income = gross income- outgoings.

e) Perpetual income: It is the income receivable for indefinite period of time.

f) Deferred Income: it is the income receivable after a lapse of certain period.

3.2. Scrap value

If a building is to be dismantled after the period its utility is over, some amount can be fetched from the sale of old materials. The amount is known as scrap value of a building. Scrap value varies from 7% to 10% of the cost of construction according to the availability of the material.

3.3. Salvage value

If a property after being discarded at the end of the utility period is sold without being into pieces, the amount thus realized by sale is known as its salvage Scrap value

3.4. Year's purchase

It may be as the figure which when multiplied by the net income from a property gives capitalized value of the property. It can also be defined as "a certain amount of capital whose annuity of Rs.1/- at a certain rate of interest can be received"

Year's purchase = $100/\text{rate of interest} = 1/i$

3.5. Capitalized value

It is defined as that amount of money whose annual interest at the highest prevailing rate will be equal to the net income received from the property. To calculate the capitalized value, it is necessary to know highest prevailing on such properties and income from the property.

3.6. Obsolescence

The value of property decreases if its style and design are outdated i.e rooms not properly set, thick walls, poor ventilation etc. The reason of this is fast changing techniques of construction, design, ideas leading to more comfort etc.

3.7. 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.

3.8. Book value

Book value is the amount shown in the account book after allowing necessary depreciations. The book value of a property at a particularly year is the original cost minus the amount of depreciation up to the previous year.

3.9. Annuity

It is defined as the return of capital investment in the shape of annual instalments monthly, quarterly, half-yearly and yearly. It is the annual payments for the repayment of the capital amount invested by a party. These annual payments are made at the beginning or end of a year, usually, for a specific number of years.

- Annuity Certain: If the amount of the annuity is paid for a definite number of years. The lesser the number of year higher the annuity and vice versa
- Annuity Due: If the amount of annuity is paid at the beginning of each period or year and payments are continued for definite number of periods
- Deferred Annuity: If the payment of the amount of annuity begins at a future date after a number of years.
- Perpetual Annuity: If the payment of the annuity continues for an indefinite period.

Though annuity means annual payment, the amount of annuity may be paid by 12 monthly instalments, quarterly or half-yearly instalments.

3.10. Sinking fund

It is an amount which has to set aside at fixed intervals of time (say annually) out of the gross income so that at the end of the useful life of the building or the property, the fund accumulated should be equal to the initial cost of the property. The sinking fund may also be required for payment of the loans. () , Where, S = Total amount of sinking fund to be accumulated, n = useful life of the property or nos. of years required to accumulate the sinking fund, i = rate of interest in decimals and I = is the annual instalments paid.

4. Factors Affecting Value of a Building

- Type of the building
- Location
- Building structure and durability
- The quality of materials used in the construction
- Size of the building

5. Depreciation

It is the loss in value of a building or property due to structural deterioration, wear and tear, decay and obsolescence. It depends on use, age, nature of maintenance etc. A certain percentage (per annum) of the total cost may be allowed as depreciation to determine its present value. The percentage rate of depreciation is less at the beginning and increases with age. Annual depreciation is the annual decrease in the value of the property.

6. Calculation of Depreciation

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

- Straight line method
- Constant percentage method
- Sinking fund method
- Quantity survey method

7. Straight line method

It is assumed that the property loses its value by the same amount every year. A fixed amount is deducted every year, so that at the end of the utility period, only the scrap value remains. Therefore, the annual depreciation “D” is estimated .

8. Methods of Valuation of Building.

The valuation of a building is determined by working out its cost of construction at the present day rate and allowing a suitable depreciation. Following data are required for valuation of a building

- Cost of incurred if the building to be constructed in present day
- Age of the building should be determined
- Visual inspection of its present condition
- Future life span should be determined

8.1. Estimation of present day cost

Present day cost may be estimated from the records, Estimates and Bill of Quantities. If the actual cost of construction is known, this may increase or decrease according to the percentage rise or fall in the rate obtained from the PWD Schedule of Rates. Following are the methods to ascertain the present day cost of a building:

a) Cost by detailed measurement

Cost of construction may be calculated by preparing the BOQs of various items of works by detailed measurement at site and taking the rate of each item of work as per the current PWD SOR. All the items of work shall be thoroughly scrutinized and their detailed specification ascertained as per original.

b) Cost by plinth area

The plinth area of the building is measured and the present day plinth area rate of similar buildings in the locality is studied, and the cost calculated. It is necessary to examine thoroughly the different parts of the building including the foundation, structure, doors & windows, finishes etc.

8.2. Estimation of present day value of the building

Following methods are available to determine value of a building:

a) Direct comparison method/ Plinth area method: It is the simplest form of valuation. The cost of the property is derived from the cost of property sold recently at its neighbourhood. Plinth area cost prevailing in the locality is then worked out. Finally value of the property can be derived from Plinth area cost multiplied by the plinth area of the property. Similarly Cost may be estimated by Cubical content method.

b) Depreciation rate method: After deciding the cost of the building or structure by any one method, it is necessary to allow a suitable depreciation on the cost.

c) Rental method In this method, the net income by way of rent is found out by deducting all outgoings from the gross rent. A suitable rate of interest as prevailing in the market is assumed and the years purchase is calculated. The net income multiplied by Y.P. gives the capitalized value or valuation of the property.

d) Land and building method In this method, the market value of land and the depreciated value of building are determined individually. Then these two values are added to determine the final value of the property.

e) Development method This method of valuation is used for the properties which are undeveloped or under developed. Those properties were brought, developed and then offered for the sale. The valuation in that case would depend on initial investment, development cost and expected profit.