Department of Electrical Engineering

Subject: **Estimating and Costing**

Semester: 3rd

Purpose of Estimating and Costing

1. Estimates are also required to control expenditure during the execution of the work.
2. It gives an idea of the time needed to complete the work.
3. Estimates are required to invite tenders and quotations and to arrange the contracts.
4. It provides an rough idea of the cost of the job and therefore its feasibility can be calculated, i.e. whether or not the project would be included in the funds available.
5. It decides whether or not proposed plan matches the funds available.

The main purpose is to provide to volume of work for cost control and to see that the adequate options of materials are explored during the execution of the project.

Price List:

- A price list is a list of prices defined for a set of items.
- Each price list is applicable to a particular customer or a group of customers for a particular duration.
- A pricing organization can define different price lists for customers based on various criteria.

e.g. a pricing organization can create a price list that is applicable to regular business customers and another price list that is applicable to only a few special business customers so that the prices for the special customers are less than that for the regular customers.

Net Price List:

The net price is the value at which a product or service is sold after all taxes and other costs are added and all discounts subtracted.

Net price is what a customer pays.

Market Survey:

Market survey means a collection of first-hand data from customers, vendors, stakeholders, or the general public.

- It is usually conducted to gather data so that better marketing, growth, and product decisions can be made.
- It collects data about a target market such as pricing trends, customer requirements, competitor analysis, and other such details.

Overhead charges:

Overhead charges, often referred to as overhead or operating expenses, refer to those expenses associated with running a business that can’t be linked to creating or producing a product or service.

- They are the expenses the business incurs to stay in business, regardless of its success level.
- They are all of the costs on the company’s income statement except for those that are directly related to manufacturing or selling a product, or providing a service.

Labour Charges:

Labour charges represent the total expenditure incurred by employers for the employment of employees.

They represent a cost of salaried labour force, that is why they are sometimes referred to as salary costs.

Contingency:

It is a future event which is possible but cannot be predicted with certainty. It is defined as “ an amount to an estimate to allow for items, conditions, or events for which the state, occurrence, or effect is uncertain and that experience shows will likely results, in aggregate, in addition costs.

Electrical Wiring

Electrical wiring is the electrical power distribution through the wires in a perfect manner for economic use of wiring conductors inside a room or building with better load control.

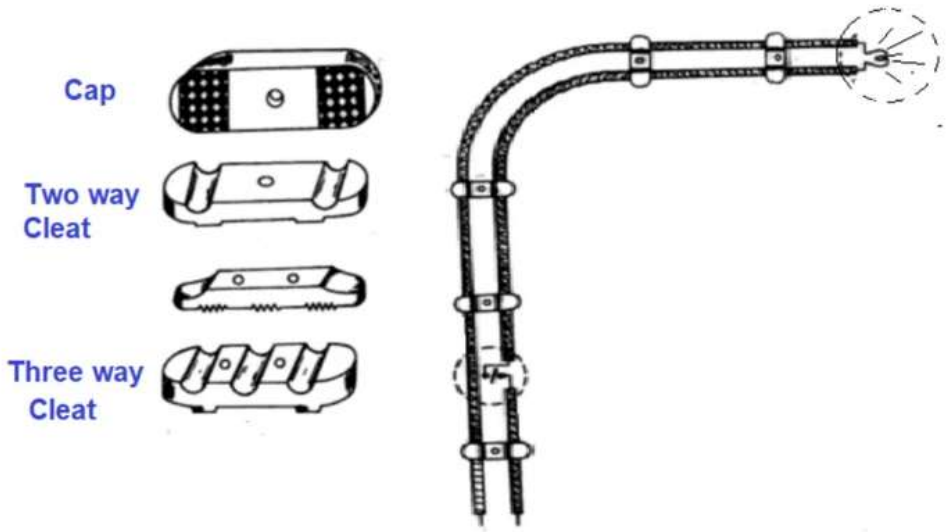
Electrical wiring system is classified into **four** categories:

1. **Cleat wiring**
2. **Casing wiring**
3. **Batten wiring**
4. **Conduit wiring**

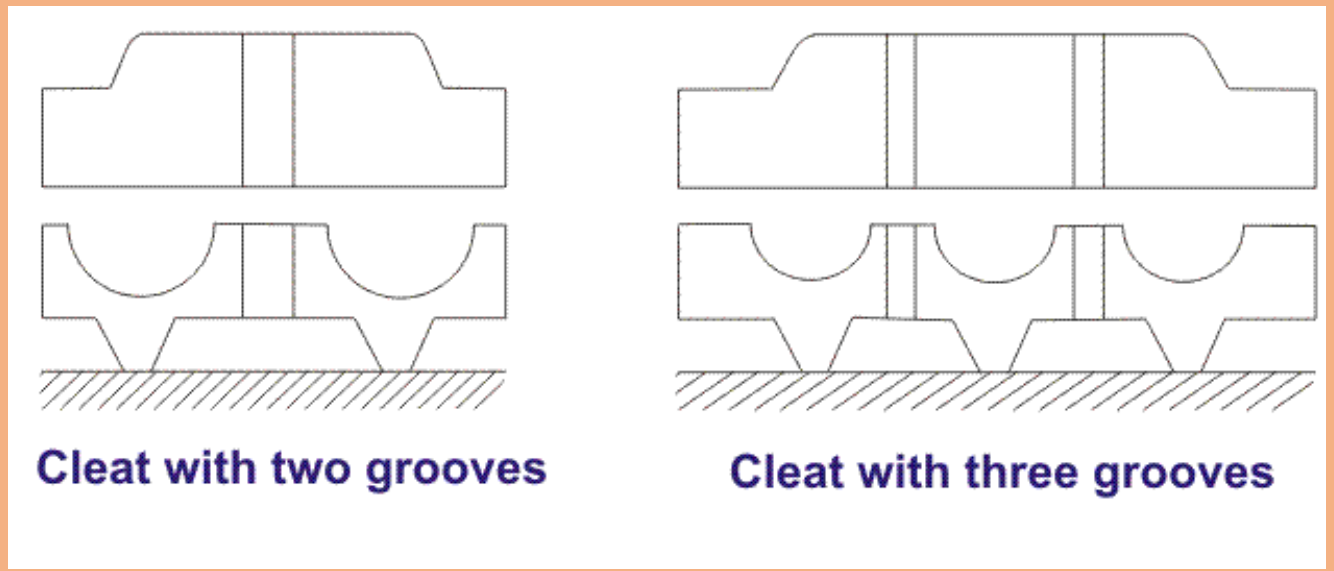
Cleat Wiring

In this wiring VIR or PVC insulated wires are braided and compounded on walls or ceiling with the help of porcelain cleats. The wires can be weather proof. Simple wire laying is done in this scheme of wiring.

In present days, this kind of wiring scheme is *not recommended* for house or building.



Cleat Wiring System



Cleat with two grooves

Cleat with three grooves

Advantages:

1. Cheap and easy wiring
2. Easy to fault detection
3. Easy to repair
4. Alteration and addition is easy.

Disadvantages:

1. Bad appearance
2. Exposed to weather to be affected by humidity, rain, smoke, sunlight etc
3. Chances for shock or fire
4. Used in only 220V in low ambient temperature.
5. Not long lasting
6. Sag happens

Casing and Capping Wiring

This kind of winding is very old fashioned. Generally PVC or VIR insulated wires are carried through the casing enclosure and capping is used to cover the casing.

Advantages:

1. Cheap and easy to install
2. Strong and durable wiring
3. Customization can be done easily
4. Safe from smoke, dust, rain and steam etc.
5. Due to casing and capping no risk of shock.

Disadvantages:

1. Very costly
2. Not suitable for weather with high humidity and acidic conditions.
3. Insect like termites or ants can damage wooden casing and capping.
4. High risk of fire.

Batten Wiring

Group of Single or double or three core cables are used to be laid on straight teak wooden batten. The cables are hold with help of tinned brass link clip or buckle clip. Brass pins are used to fix the buckle clips on the wooden batten. Buckle clips is fixed with brass pin on the wooden batten at an interval 10 cm for horizontal runs and 15 cm for vertical runs.

Advantages:

1. Easy installation
2. Cheap in material cost
3. Appearance is better.
4. Customization is easy
5. Less chance of leakage current

Disadvantages:

1. Not suitable for outdoor wiring
2. Humidity, smoke, steam etc directly affect on wires.
3. Heavy wires are not recommended for this wiring scheme.
4. Only suitable for below 250 V.
5. High risk of fire.

Conduit Wiring

The conduit wiring system is of ***two types***.

1. Surface mounting.

2. Concealed conduit wiring.

Surface mounting conduit wiring:

This kind of wiring is not easy to install. On the surface of the wall or ceiling conduit pipes (with GI wire inside) are attached with help of 2-hole strap and base clip at a regular certain distance. Next GI wire is used to lay down the wires through the conduit pipe.

Advantages:

The safest wiring

1. Appearance is better
2. No risk of fire or mechanical wear and tear.
3. No risk of damage of cable insulation
4. Safe from humidity, smoke, steam etc.
5. No risk of shock
6. Long lasting

Disadvantages:

1. Very expensive
2. Installation is not easy
3. Not easy to customize for future
4. Hard to detect the faults.

Concealed conduit wiring

Conduit wiring is a system, basically, wires or cables which are routed in metal or plastic inside the wall. Conduits isolate wires to avoid exposure, thereby reducing the risk of fires, short circuits, fire, electrocution.

Advantages

1. A conduit wiring system is best for domestic and commercial installations.
2. It provides proper protection to the installation against shock, fire hazards mechanical damage.
3. Protected from external damage due to rodents, short circuit.
4. Conduit is durable and strong, can last for a long time.
5. Great protection as it is more robust.

Disadvantages

1. If cable got damaged. replacement of cable is difficult compared to any other.
2. Requires skill in running the conduit and wires through it.
3. The cost, time, and efforts of installation are high.

MCB (Miniature Circuit Breaker)

MCB stands for *Miniature Circuit Breaker*.

It automatically switches OFF electrical circuit during any abnormal condition in the electrical network such as overload & short circuit conditions.

However, fuse may sense these conditions but it has to be replaced though MCB can be reset.

The MCB is an electromechanical device which guards the electric wires and electrical load from over-current so as to avoid any kind of fire or electrical hazards.

Handling MCB is quite safer and it quickly restores the supply. When it comes to house applications, MCB is the most preferred choice for overload and short circuit protection.

MCB can be reset very fast & don’t have any maintenance cost.

ELCB (Earth Leakage Circuit Breaker)

ELCB stands for Earth Leakage Circuit Breaker.

They have the same function as RCCB but are voltage sensor devise.

However, this is an old technology & is not in common use.

Wire gauge:

Wire gauge is a measurement of wire diameter. This determines the amount of electric current the wire can safely carry, as well as its electrical resistance and weight.