Electrical Services Design
(EEE 350)

Muhammad Asad Rahman
Lecturer, Dept. of EEE
CUET

http://asad31.webs.com

Types and Installation of Wiring System
**Learning Objectives**

- To get idea about different types of electrical wiring system.
- To select the suitable wiring system for specific job.
- To compare among various wiring systems.

**Factors**

Factors to be considered during choosing type of wiring:
- Durability
- Safety
- Appearance
- Cost
- Accessibility
- Maintenance Cost
Method of Installing Wiring

Cleat Wiring (Vulcanized Indian Rubber wire known as V.I.R. wire in cleats)

In this type of wiring, insulated conductors (usually VIR, Vulcanized Indian Rubber) are supported on porcelain or wooden cleats.

→ cheapest method of wiring.
→ normally used for temporary work.

Advantages:
- Easy installation
- Materials can be retrieved for reuse
- Flexibility provided for inspection, modifications and expansion.
- Relatively economical
- Skilled manpower not required.

Disadvantages:
- Appearance is not good
- Open system of wiring requiring regular cleaning
- Higher risk of mechanical injury.
Method of Installing Wiring

Cleat Wiring

Method of Installing Wiring

Casing Capping Wiring (V.I.R. wire in wooden casings)

It consists of insulated conductors laid inside rectangular, teakwood or PVC boxes having grooves inside it.

→ The system is suitable for indoor and domestic installations.
Method of Installing Wiring

Casing Capping Wiring (V.I.R. wire in wooden casings)

Advantages:
- Cheaper than lead sheathed and conduit wiring.
- Provides good isolation as the conductors are placed apart reducing the risk of short circuit.
- Easily accessible for inspection and repairs.
- Since the wires are not exposed to atmosphere, insulation is less affected by dust, dirt and climatic variations.

Disadvantages:
- Highly inflammable.
- Usage of unseasoned wood gets damaged by termites.
- Skilled workmanship required.

Right angle joint
Method of Installing Wiring

Casing Capping Wiring

T Joint

Bridge
Method of Installing Wiring

Casing Capping Wiring

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Method of Installing Wiring

Batten Wiring

- Tough rubber-Sheathed (T.R.S.) or PVC-Sheathed cables are suitable for this type of wiring.
- Usually the cable is laid over wooden batten which is fixed on the wall.
- Link clips are used for family clipping the cables in position.
Method of Installing Wiring

Batten Wiring

Fig.: Wood Batten

Fig.: Joint Link Clips

Fig.: Straight joint

Fig.: Corner Joint

Fig.: T Joint
Method of Installing Wiring

Batten Wiring

Fig.: Cross Joint / Cross Bridge Joint

Method of Installing Wiring

Conduit Wiring (V.I.R. conductors run in metallic conduits)

In this system PVC (polyvinyl chloride) or VIR cables are run through metallic or PVC pipes providing good protection against mechanical injury and fire due to short circuit. They are either embedded inside the walls or supported over the walls, and are known as concealed wiring or surface conduit wiring (open conduit) respectively.
Method of Installing Wiring

Conduit Wiring (V.I.R. conductors run in metallic conduits)

The system is best suited for public buildings, industries and workshops.

→ best system of wiring.
→ most desirable for workshop and public buildings.
→ provides mechanical protection, safety against fire and shock if bonding and earthing are well done.
Method of Installing Wiring

Conduit Accessories

Fig.: Conduit Coupler

Method of Installing Wiring

Conduit Accessories

Fig.: Conduit Elbow
Method of Installing Wiring

Conduit Accessories

Fig.: Conduit Bushing

Fig.: Conduit Nipples

Method of Installing Wiring

Conduit Accessories

Fig.: Conduit Locknut
Method of Installing Wiring

Conduit Accessories

Fig.: Conduit Fittings

Method of Installing Wiring

Conduit Accessories

Fig.: Conduit Fittings
Method of Installing Wiring

Conduit Accessories

Fig.: Conduit Box

Method of Installing Wiring

Conduit Accessories

Fig.: Conduit Saddles / Conduit Clamps / Conduit Straps
Method of Installing Wiring

Finishing Wires Through Conduit

The conductors or wires should not be run into the conduit until and unless the whole of the mechanical works in the building are completed.

There are three methods of installing conductors in the conduit runs, namely,

1. Threading through
2. Pushing in
3. Drawing in

Method of Installing Wiring

Finishing Wires Through Conduit

1. **Threading through**

This method is suitable when the wiring is done before the conduits are erected.

→ laborious

→ takes more time

→ useful only for making extensions
Method of Installing Wiring

Finishing Wires Through Conduit

2. Pushing in

In the *pushing in method*, the wire are pushed into the conduits from one end of the outlet by exerting manual pressure on them.

3. Drawing in

In the *drawing in method*, the wires are pulled through the conduit with the help of a wire. Such a method of drawing the wires is also called “fishing”.

Presentation Summary

- Types of different wiring systems
- Different types of accessories used in wiring system.
- Factors to Consider when Selecting wiring system

The End