Overhead Installations :→

↳ The maximum generation voltage in advanced Countries is 33 kV while that in India is 11 kV.

↳ The primary Transmission 220-765 kV depends upon the distance, the amount of power to be transmitted and System Stability.

↳ Distribution system may further be divided into feeders, distributors and Servicemains

Main components of an overhead line are enlisted →

1. Supports :→

→ The function of line support is obviously to support the Conductors so as to keep them at a suitable level above the ground.

2. Cross arms and Clamps :→

These are either wood or steel angle. Section and are used on pole structures. to support the insulators and Conductors.

3. Insulators :→

Pin, Strain or Suspension type, as the case may be for supporting the conductors and taking strain or suspending the Conductor respectively.

4. Conductors :→

- Copper, aluminium or ACSR of any other Composition depending upon the current to be carried and the span of the line

Guys and Stays :-
Brass or cables are fastened to the pole at the termination or angle poles to resist lateral forces.

6. Lightning Arrestors →
To discharge excessive voltages, built upon the line to earth due to lightning.

7. Fuses and Isolating Switches.
To isolate different parts of the Overhead System.

8. Continuous earthwire →
- Is run on the top of the towers to protect the line against lightning discharge

9. phase plate :→
- In order to distinguish the various pole.

10. Danger plate.

11. guarding of Overhead line.

12. Anticlimbing Device

13. Jumpers.

14. Corona rings.

15. Barbed wire :→ Barbed wire is wrapped on a pole at about 2.5 m from the ground for at least 1 metre.
- The prevents climbing by unauthorised persons

16. Bird Guards :→
A stick of ebonite with rounded top is fixed near the insulator on the cross arm to prevent flash-over due to birds perching on the conductors.

Rail pole:-

↳ The rail pole are used where the area is of natural Calamelic area.

↳ It is placed in gap of 75 m to 250 m.

Tubular steel pole:-

↳ The tubular steel poles are placed between 50 m to 200 m gap.

↳ Tubular steel poles are made of Corrosion free.

Lattice steel pole:-

Lattice steel pole is generally used in 33 KV overhead lines & the gap is 100 to 300 mtr.

Concrete pole:-

↳ Concrete pole are 2 types.

1. RCC pole.
2. PCC pole.

↳ RCC (Rainforced Cement Concrete)

↳ PCC (Plane Cement Concrete)

↳ In case of estimation the RCC gap is taken as 125 m & PCC as 75 m.

↳ Tubular poles are I, A, H shapes.

↳ Rail poles are H, A shapes.

↳ Lattice poles are also H & A Types but with more cross section.

↳ RCC pole are used 11 KV supply with the average distance of 200 to 500 m.

→ PCC pole are used to supply household which are placed in distance of 100 to 400 mtr.

Cross-Arms :→

↳ Cross arms may be steel & wooden.

↳ which provides support to the wiring Insulation.

→ There are 3 types.

1. Wooden Cross arm.
2. V-shape Cross-arm.
3. U-shape Cross arm.

A Overhead Line uses 33KV uses Lattice Steelpole which cost 3000 perpole and installation cost is 500 per 100 MTR. The bracket cost 70 rupee per piece clamps. Cost 20 per piece the conduction wire cost is 3 rupee per mtr. and the wire is combination of Cross 10 wire find an estimation for installation of 10km

Solution

Braker = 3

Clamp = 6

No of pole = 200 = 1

~~1~~ ~~200~~

$\Rightarrow 10000 \times \frac{1}{200}$

$\Rightarrow 50$

Pole cost = 3000

Pole Cost per pole = 50 X 3000

= 150,000

Labour Installation →

1000 x 50 = 50000

Cable Installation → 100 mtr = 500

$\Rightarrow 1 = \frac{500}{100}$

$\Rightarrow 10000 \times \frac{500}{100}$

$\Rightarrow 50000$

$\Rightarrow 50000 \times 3 = 150000$

Braket → 3 x 50 = 150

Bracket Cost 70 rupee = 150 x 70

= 10500

Clamp = 6 x 50 = 300

clamp cost 20 per piece = 20 x 300

= 6000

1m = 30

$\Rightarrow 10000 \times 30 = 300000$

Conduction wire cost is 3 rupees/metr.

⇒ 300000 x 3 = 900000

Total estimation = 150000 + 50000 + 150000 + 10500 + 6000 + 900000 = 1266500