

Why Earthing is Important?

The primary purpose of earthing is to avoid or minimize the danger of electrocution, fire due to earth leakage of current through undesired path and to ensure that the potential of a current carrying conductor does not rise with respect to the earth than its designed insulation.

When the metallic part of electrical appliances (parts that can conduct or allow passage of electric current) comes in contact with a live wire, maybe due to failure of installations or failure in [cable insulation](#), the metal become charged and static charge accumulates on it. **If a person touches such a charged metal**, the result is a severe shock.



Good to know

Difference between Earthing, Grounding and Bonding

Let me clear the confusion among earthing, grounding and bonding.

Earthing and **Grounding** are the same terms used for earthing. **Grounding is the commonly word** used for earthing in the **North American** standards like **IEEE, NEC, ANSI** and **UL** etc while, **Earthing is used in European**, Common wealth countries and *Britain standards like IS and IEC* etc.

The word **Bonding** used for jointing two wires (as well as conductors, pipes or appliances together. Bonding is known as connecting the metallic parts of different machines which is not considered to be carrying electric current during normal operation of the machines to bring them at the same level of electric potential.

2. From the point of view of safety, the resistance of the earthing electrode should be

- a. Low
- b. High
- c. Medium
- d. The value of resistance of earth does not affect the safety

Answer

Answer. a

What is strip earthing?

Strip or wire earthing. Plate Earthing. In this type of earthing, a **plate made up of galvanized iron or copper** is buried vertically at a depth not less than 3m from the ground level. 01-Mar-2016

8. The earth's potential is taken as

- a. Infinite
- b. Supply voltage
- c. 1 volt
- d. Zero

Answer

Answer. d

9. For reducing tower footing resistance, it is better to use

- a. Chemical and ground rod only
- b. Chemical and counterpoise only
- c. Ground rod and counterpoise only
- d. None of these

Answer

Answer. c

3. Materials used in plate earthing are

- a. Wood coal
- b. Salt, earthing plate
- c. (a) and (b) both
- d. None of the above

Answer

Answer. c

4. Minimum distance of underground cable from the foundation of a building should be

- a. 100 cm
- b. 50 cm
- c. 10 cm
- d. 5 cm

Answer

Answer. c

15. The addition of ground rods in the earthing grid

- a. Decrease the earth resistance
- b. Has no effect on earth resistance
- c. Slightly decrease the earth resistance
- d. Slightly increase the earth resistance

Answer

Answer. c

16. The purpose of earthing electric appliances is

- a. To provide safety against shock
- b. To ensure that the appliances work properly
- c. To ensure that the appliances get full voltage
- d. None of the above

Answer

Answer. a

Size of Earthing Electrode

Both copper and iron can be used as earthing electrode.

The size of earth electrode (In case of copper)

2×2 (two foot wide as well as in length) and 1/8 inch thickness.. I.e. **2' x 2' x 1/8"**. (600x600x300 mm)

In case of Iron

2' x 2' x 1/4" = 600x600x6 mm

It is recommended to bury the earth electrode in the moisture earth. If it is not possible, then put water in the GI (Galvanized Iron) pipe to make possible the moisture condition.

In the earthing system, put the earth electrode in vertical position (underground) as shown in the above fig. Also, put a 1 foot (about 30cm) **layer of powdered charcoal and lime mixture** around the earth plate (don't confuse with earth electrode and earth plate as both are the same thing).

6. Earth resistance comprises of

1. Resistance of soil away from electrode.
2. Contact resistance between electrode and soil.
3. Resistance of metal electrode

- a. 1 only
- b. 1 and 2 only
- c. 1 and 3 only
- d. 1,2 and 3 together

Answer

Answer. d

18. Mixture preferred for filling around the earth electrode for effective earthing is

- a. Paper-salt mixture
- b. Saw dust mixture
- c. Coal-salt mixture
- d. Lime-sand mixture

Answer

Answer. c

14. For the measurement of the earth resistance of a given earth electrode

- a. collecting electrode should be very near to the electrode under test
- b. collecting electrode should touch the electrode under test
- c. collecting electrode should be far way the electrode under test
- d. none of these

Answer

Answer. c

12. Inside the earth pit, the earthing electrode should be placed

- a. Vertical
- b. Horizontal
- c. Inclined at 45°
- d. Inclined at any angle other than 45°

Answer

Answer. a

Different Terms used in Electrical Earthing

- **Earth:** The proper connection between electrical installation systems via conductor to the buried plate in the earth is known as Earth.
- **Earthed:** When an electrical device, appliance or [wiring systems](#) connected to the earth through earth electrode, it is known as earthed device or simple "Earthed".
- **Solidly Earthed:** When an electric device, appliance or electrical installation is connected to the earth electrode without a [fuse](#), circuit breaker or resistance/Impedance, It is called "solidly earthed".
- **Earth Electrode:** When a conductor (or conductive plate) buried in the earth for electrical earthing system. It is known to be Earth Electrode. Earth electrodes are in different shapes like, conductive plate, conductive rod, metal water pipe or any other conductor with low resistance.
- **Earthing Lead:** The conductor wire or conductive strip connected between Earth electrode and Electrical installation system and devices in called Earthing lead.
- **Earth Continuity Conductor:** The conductor wire, which is connected among different electrical devices and appliances like, [distribution board](#), different plugs and appliances etc. in other words, the wire between earthing lead and electrical device or appliance is called earth continuity conductor. It may be in the shape of metal pipe (fully or partial), or cable metallic sheath or flexible wire.
- **Sub Main Earthing Conductor:** A wire connected between switch board and distribution board i.e. that conductor is related to sub main circuits.
- **Earth Resistance:** This is the total resistance between earth electrode and earth in Ω (Ohms). Earth resistance is the algebraic sum of the resistances of earth continuity conductor, earthing lead, earth electrode and earth.