

**TECHNICAL SPECIFICATION  
FOR  
Earthing**

**:: TECHNICAL SPECIFICATION NO::**

| Sr. No | Technical Specification No./Revision | Date of revision |
|--------|--------------------------------------|------------------|
| 1.     | <b>GUVNL/GPRD/TS/Earthing/RO</b>     | 11/1/2018        |
| 2.     |                                      |                  |
| 3.     |                                      |                  |

Signature of Tenderer

Company's Round Seal

Date:

Place

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## **1.0 INSTALLATION SPECIFICATION FOR EARTHING:**

### **GENERAL:**

All the non-current metal parts of electrical installation shall be earthed properly. All metal conduits, switches, trucking, cable sheaths, switchgear, distribution fuse boards, lighting fittings & fixtures and all other parts made of metal shall be bonded together and connected by means of specified earthing system. All earthing will be conformed to Indian Standard Specifications IS: 3043 – 1987. The bidder shall measure the resistivity of various places in the proposed sub stations and design suitable earthing system and get it approved from UGVCL.

### **EARTHING CONDUCTORS:**

All earthing conductors shall be of high conductivity G.I./ Aluminum/ copper and shall be protected against mechanical injury or corrosion.

### **CONNECTION OF EARTHING CONDUCTORS:**

- (i) Main earthing conductors shall be taken from the earth connections at the main switch earth terminal to an earth electrode with which the connection is to be made.
- (ii) Circuit earthing conductor shall run from the exposed metal of equipment and shall be connected to any point on the main earthing conductor or its distribution boards or to an earth leakage circuit breaker. Metal conduits, cable sheathing and armouring shall be earthed at the ends adjacent to switchboards at which they originate or otherwise at the commencement of the run by an earthing conductor in effective electrical contact with cable sheathing. Where equipment is connected by flexible cord, all exposed metal parts of the equipment shall be earthed by means of an earthing conductor enclosed with the current carrying conductors within the flexible cord. Switches, accessories, lighting fitting etc. which are rigidly secured in effective electrical contact with a run of metallic conduit shall not be considered as a part of earthing conductor for earthing purposes, even though the run of metallic conduit is earthed.

- (iii) All metal clad switches and other equipment carrying single phase current shall be connected to earth by a single connection. All metal clad switches, carrying medium voltages and high voltage shall be connected with earth by two separate and distinct connections. The earthing conductors inside the building, wherever exposed, shall be properly protected from mechanical injury by running the same in GI pipe of adequate size.
- (iv) Earthing conductors, outside the building, shall be laid 3000 mm below the finished ground level.
- (v) In case of copper earthing strips, the cover lapping at joints (wherever required), shall be of minimum 75 mm. Sweated lugs of adequate capacity and size shall be used for ail termination of wires above 6 sq. mm size and bare copper wire above 2.5 mm dia. Lugs shall be bolted to the equipment body to be earthed after the metal body is cleaned of paint and other oily substance and properly tinned.
- (vi) Neutral conductor, sprinkler pipes or pipes conveying gas, water or flammable liquid, structural steel work, metallic enclosures for cables and conductors, metallic conduits and lightning protection stem conductors shall not be used as a means of earthing an installation or even as a link in an earthing system. The electrical resistance of metallic enclosures for cables and conductors measured between earth connections at the main switchboard shall be low enough to permit the passage of current necessary to operate fuse or circuit breakers and shall not exceed standard ohm.

#### **PROTECTION FROM CORROSION:**

Connections between copper and galvanized equipment shall be made on vertical face and protected with paint and grease. Galvanized fixing clamps shall be used for fixing earth conductors. When there is evidence that the soil is aggressive to copper, buried earthing conductors shall be protected by suitable serving and sheathing.

### **CARBON ELECTRODE EARTHING and EARTHING PIT:**

Supply of Eco Friendly maintenance free earthing system comprising of. Outer pipe dia of 50 mm having 80-200 Micron galvanising connections, terminal dia of 12 mm with constant ohmic value surrounded by highly conductive compound with high charge dissipation. Length of Pipe 3 mtr.

For installation of Earthing Electrode making 100 mm diameter bore, 3 mtr Long, making of earth pit and fixing of earthing electrode with GI Strip.

### **EARTH RESISTANCE:**

The earth resistivity result of the soil where the earthing stations are located shall be submitted to the engineer-in-charge before the earthing work starts. If the earth resistance is too high and multiple electrode earthing does not give adequate low resistance to earth, the soil resistivity immediately surrounding the earth electrodes shall be reduced by adding an eco friendly back fill.

### **RESISTANCE TO EARTH:**

The resistance of each earth system shall not exceed standard value in high voltage system.