

Sub: Standard procedure for providing earthing.

Keywords: Earthing,

1. Earthing should be provided for different kind of applications as follows:
 - a. Transformer (heavy) - Two earthing and one neutral.
 - b. Panel boards (medium) - One neutral must be provided for one electrical room.
One earthing must be provided for each panel board
With a minimum of two earthings per electrical room.
 - c. Lifts (medium) - One earthing and one neutral per lift.
 - d. Generator(heavy) - Two earthings and one neutral per generator.
 - e. Feeder boxes in villas (medium) - One earthing for each feeder box.
 - f. Generator feeder box in villas (medium) - Nil. Connect to main feeder box earthing.
 - g. Within villas (medium) - One earthing
2. Hereafter earthing and neutral shall be made with CI pipes as under. It is proposed that the older system of providing separate types of neutral and earth is dispensed with. Similar type of CI electrode to be used for earthing and neutral. In order to save cost 2 types of earthing / neutral are being proposed.
 - a. Heavy duty – for transformers and generators – use 100mm x 2750mm CI electrode.
 - b. Medium duty – for lifts and panels / feeder box/other – use 75mm x 1800mm CI electrode.
3. These have to be installed by making a bore hole of 125mm to 175mm wide, which is about 300mm deeper than the size of the electrode. The hole should be filled with good quality electrode chemical. The chemical should be filled outside the electrode. About 25 to 50 kgs of chemical is required for each electrode. In case the soil is loose, make a MS pipe – C class of 125 to 175mm dia and length of about 3000mm with heavy duty hooks. Insert the pipe with a boring machine (like borewell casing pipe) – place the electrode and pour the chemical powder before pulling out the MS pipe. Earth/neutral should be covered with a PVC/co-polymer earth pit cover.
4. The revised cost for the bore of a 6 feet depth is Rs. 1500/-, cost for the bore of a 9 feet depth is Rs. 2000/-. GST may be added incase GST bills are given.
5. All sites are directed to adhere strictly to the above mentioned rates for any auger boring works. Any deviations shall require prior approval from the concerned authority.
6. The approximate cost of electrodes and chemical is as under:
 - a. 100 – 2750mm CI electrode – Rs. 3,422 including GST.
 - b. 75 – 1800mm CI electrode – Rs. 1,623 including GST.
 - c. PVC/co-polymer earthing cover – Rs. 767 inclusive of GST.
 - d. Electrode chemical – Rs. 1,290 including GST per 25 kg bag.
7. The earth /neutral to be connected to the transformer, generator, panels, flats, villas, lifts, etc., as under:
 - a. Heavy duty – use 50 x 6mm or 25 x 6mm GI strip.
 - b. Medium duty– use 25 x 6mm GI strip.
 - c. Light duty– use 25 x 3mm GI strip (occasional use).
 - d. Lifts machinery may also be connected with 25 x 6mm GI strip.
 - e. However transformer to neutral may require 25 x 3mm or 32 x 6mm copper strip.

8. Bank of neutrals can be interconnected. A bank of earthings can also be interconnected. However, earthings and neutrals cannot be connected. The earth pits and neutral pits should be spaced at a distance of atleast 3mtrs from each other. The distance between each earth pit/neutral must be more than 2mtrs.
9. In case of villas provide earthing on the rear side of the villa and bolt the GI strip to the nearest wall at a height of 6" above the finished floor level. From there connect with a 7/20 copper wire to the DB.
10. Pit must be watered periodically. Mix 25kgs of salt in 100 ltrs of water. 25 to 50 ltrs can be poured into each pit.
11. Testing: the voltage between neutral and earth should be less than 2 volts (to be reviewed). In case the voltage is more than 2 volts then the following steps should be taken.
 - a. Water the earth/neutral pit with about 50 to 100 ltrs of water. Test after one day. If the voltage still remains high, then:
 - b. Add 25 kgs salt to 100 ltrs of water to produce brine. Pour the brine slowly into the earth pit. Wait for 2 days and check voltage. If the voltage still remains high, then:
 - c. Check all connections and if there is no error in connections then earth pit has to be remade at alternate location.
12. Relevant drawing for earth pit is uploaded on website under standard drawings as figure no. 006B (updated).
13. A excel format with comprehensive list of items that require neutral/earthing is attached herein. File is uploaded on staff login page.
14. The resistance of earth/neutral for transformer should be less than 5 ohms and for other applications less than 2 ohms (to be reviewed).

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Topic:		BOQ for earthing/neutral					Prepared by:	Soham			
Company:		AMS 801					Date:	3-Jan-25			
Project:		AMS 801									
	Price per unit		3,422.00	1,623.00	3,422	1,623	3,422	1,623	3,422		
S No	Details of earthing & neutral with usage/equipment	Location	Independent body earthing - 100/2750m m CI electrode - Qty in Nos	Independent body earthing - 75/1800mm CI electrode - Qty in Nos	Earthing bank body earthing - 100/2750m m CI electrode - Qty in Nos	Earthing bank body earthing - 75/1800mm CI electrode - Qty in Nos	Independent neutral - 100/2750m m CI electrode - Qty in Nos	Independent neutral - 75/1800mm CI electrode - Qty in Nos	Neutral bank - 100/2750m m CI electrode - Qty in Nos	Sub-total	Remarks
1	Transformer - 1000KVA		2.00	-	-	-	2.00	-	-	4.00	Scope of Contractor / Venu babu
2	Vacuum Curci Breaker (VCB)		2.00	-	-	-	-	-	-	2.00	Scope of Contractor / Venu babu
3	Metering cubical		2.00	-	-	-	-	-	-	2.00	Scope of Contractor / Venu babu
4	Single pole structure		2.00	-	-	-	-	-	-	2.00	Scope of Contractor / Venu babu
5	LT kiosk		2.00	-	-	-	-	-	-	2.00	Scope of Contractor / Venu babu
6	Panel main PCC		-	-	2.00	-	-	-	-	2.00	
7	Panel APFC		-	-	2.00	-	-	-	-	2.00	
8	Panel -Sub PCC		-	-	1.00	-	-	-	-	1.00	
11	DG1-250KVA		-	-	1.00	-	-	-	2.00	3.00	
12	DG2-250KVA		-	-	1.00	-	-	-	2.00	3.00	
13	Lift 1		-	2.00	-	-	-	-	-	2.00	
14	Lift 2		-	2.00	-	-	-	-	-	2.00	
16	Lightening arrestor		-	6.00	-	-	-	-	-	6.00	
17	UPS		-	1.00	-	-	-	1.00	-	2.00	
18	VTPN-4 nos		-	-	-	4.00	-	-	-	4.00	
19	Isolator panel-5		-	-	-	-	-	-	-	-	
20	Extra earthing/neutral		-	-	3.00	-	-	-	1.00	4.00	
22	Street lights		-	-	-	-	-	-	-	-	
23	ETP		-	-	-	-	-	-	-	-	
24	STP		-	-	-	-	-	-	-	-	
25	HSD		-	-	-	-	-	-	-	-	

S No	Details of earthing & neutral with usage/equipment	Location	Independent body earthing - 100/2750m m CI electrode - Qty in Nos	Independent body earthing - 75/1800mm CI electrode - Qty in Nos	Earthing bank body earthing - 100/2750m m CI electrode - Qty in Nos	Earthing bank body earthing - 75/1800mm CI electrode - Qty in Nos	Independent neutral - 100/2750m m CI electrode - Qty in Nos	Independent neutral - 75/1800mm CI electrode - Qty in Nos	Neutral bank - 100/2750m m CI electrode - Qty in Nos	Sub-total	Remarks
26	Cable trays		-	-	-	-	-	-	-	-	
27	Fire alarm		-	-	1.00	-	-	-	-	1.00	
28	Fire pump room		-	-	-	-	-	-	-	-	
29	Chillers		-	-	-	-	-	-	-	-	
30	Chiller pumps		-	-	-	-	-	-	-	-	
31	UMCC panel		-	-	-	-	-	-	-	-	
32	Total:		10.00	11.00	11.00	4.00	2.00	1.00	5.00	44.00	
33	Total cost:		34,220.00	17,853.00	37,642.00	6,492.00	6,844.00	1,623.00	17,110.00		