

पेविंग कार्यों के भाग के रूप में
वैद्युत कार्यों के लिए
विनिर्देश

**SPECIFICATION
FOR
ELECTRICAL WORKS
AS PART OF PAVING WORKS**

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Abbreviations:

BIS	Bureau of Indian Standards
GI	Galvanised Iron
IS	Indian Standard
NB	Nominal Bore
PVC	Poly Vinyl Chloride
SWG	Standard Wire Gauge

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CONTENTS

1.0	SCOPE.....	4
2.0	CODES AND STANDARDS.....	4
3.0	MATERIAL SPECIFICATIONS.....	4
4.0	INSTALLATION	5

1.0 SCOPE

This specification defines the requirements for supply and installation of materials such as earth electrode, earth strip, GI conduit sleeves etc. by contractor in the areas to be paved.

2.0 CODES AND STANDARDS

The work shall be carried out in the best workman like manner in conformity with this specification, EIL Installation standards, latest edition of codes of practice of Bureau of Indian Standards and the regulations laid down by the Electrical Inspectorate and other concerned authorities as applicable.

IS : 3043	Code of practice for earthing
IS : 1239 Part-I	Mild steel tube, tubular and other wrought steel fittings.
IS : 1239 Part-II	Mild steel sockets tubular and other wrought steel pipe fittings.
IS : 4736	Hot dip zinc coating on mild steel tubes.
SP-30(BIS)	Special publication-National electrical code

3.0 MATERIAL SPECIFICATIONS

All materials and hardware to be supplied by the contractor shall be new, unused and of best quality and shall conform to the specifications given hereunder and installation standards attached with the tender. Contractor shall bring material samples to site and get it approved by Engineer-in-charge before installation.

3.1 Earth Grid

The main earth grid conductor shall be hot dip galvanised mild steel flat/as specified in design basis. Sizes for main conductors shall be as indicated on the layout drawing.

3.2 Earth Electrodes

Earth electrodes shall be of hot galvanised medium grade mild steel pipe, 65 mm diameter as per EIL installation standard unless otherwise specified as per job specification.

3.3 Earth Plate

This shall be of size 360 x 75 x 10 mm GI Earth plate (hot dip galvanised) as per installation standard unless other wise specified.

3.4 GI Pipes Sleeves

These shall be of galvanised medium grade mild steel pipe of standard diameters viz. 40, 50, 65, 80, 100, 125, 150 mm NB as required.

3.5 Galvanising

The amount of galvanizing for material shall be minimum 610 gm. per sq. meter unless otherwise specified in job specification

4.0 INSTALLATION

4.1 Earth Electrode in Test Pit

- 4.1.1 Earth Electrode shall be installed as shown on installation standard.
- 4.1.2 The location of earth pit shown on the layout drawings is indicative. The exact location of earth electrodes in the field shall be determined by the contractor in consultation with the site Engineer-in-charge.
- 4.1.3 Earth electrodes shall be located avoiding interference with road, building foundation, column, pipelines etc. to the extent possible. The civil area drawings shall be referred for this.
- 4.1.4 The distance between two electrodes shall preferably not be less than twice the depth of electrode.
- 4.1.5 Electrodes shall preferably be located in a moist soil which has a fine texture, grain size and distribution. Wherever practicable the soil shall be dug up, all lumps broken and stones removed from the immediate vicinity of the electrodes and soil packed by watering and ramming as tight as possible.
- 4.1.6 The electrodes shall have a clean surface, not covered by paint, enamel, grease or other materials of poor conductivity.
- 4.1.7 The disconnect facility shall be provided for the individual earth electrode to check its earth resistance periodically.
- 4.1.8 Location of earth electrode shall be marked by permanent markers for easy identification. Top cover of electrode shall be serial numbered and also marked on "As built drawing" for reference.
- 4.1.9 Each earth plate shall be connected to main earth grid by two vertical risers (earth strip) from earth grid. Where earth plates are not indicated on the drawing, vertical riser (earth strip) from earth grid upto 300 mm above finish level of pavement/floor shall be provided as per layout.

4.2 Earthing Network

- 4.2.1 This consists of main earth conductor (grid conductor) forming a closed ring network with required number of earth electrodes to provide a common earth path for electrical devices and metallic structures. From each earth electrode two distinct connections shall be made to the main earth conductor.
- 4.2.2 The earth conductor shall be laid as indicated on the earthing layout drawing and exact route may be modified at site to suit site conditions.
- 4.2.3 Earthing conductors shall be buried in both longitudinal and transverse directions to facilitate the earthing of various equipment.
- 4.2.4 The reinforcement of pavement shall also be connected to the plant earthing grid by means of welding /clamping at an interval of 25m (max.).
- 4.2.5 Earth conductor running along lined trenches shall be firmly cleated on the structure surface using GI spacers and clamps at intervals of approximate 1000mm unless specified otherwise and also clamps shall be installed near to termination ends.
- 4.2.6 Earth conductor, in case laid underground, shall be at a depth of 300mm below finished pavement level.

- 4.2.7 Joints and tappings in the main earth loop shall be made in such a way that reliable and good electrical connections are permanently ensured.
- 4.2.8 All joints below grade shall be welded and shall be suitably protected by giving two coats of bitumen and covering with hessian tape.
- 4.2.9 Earth strip laid above ground shall be welded across straight through joints and joints shall be suitably protected by giving two coats of bitumen. Welding shall be done with an overlapping of strip equivalent to double the width of the strip and all three sides shall be continuously welded.
- 4.2.10 Earth plates shall be provided for taking earth connections to different equipment. For this, earth strips (two nos.), welded to earth network, below ground shall be extended above grade level and connected to earth plate.
- 4.2.11 Earth Electrodes for lightning protection shall be dedicated. These shall be bonded atleast at two points below ground, with the main earthing network.

4.3 GI Pipe Sleeves

All GI Pipes shall be laid as per layout drawings for the purpose of taking electrical cables to electric Motor/Other equipment. Fabrication of various profiles, shall be made by hydraulically operated bending machine (which is to be arranged by the contractor) and all the burrs in the pipes shall be removed. The number of bends made in each pipe length shall be restricted to one. GI Pipes, buried in soil shall have bitumen coating on the buried portion. Installation of GI Pipes shall be undertaken well before paving is done. GI lids or PVC bushes (size to suit pipe) shall be provided at both the ends of pipe. Pull wire (16 SWG steel wire) shall be provided inside pipe having length more than 3 meters for ease of cable pulling by other agency at later stage.