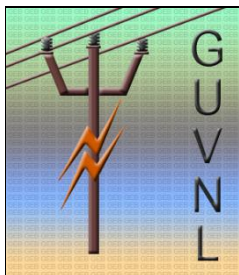


TECH. SPEC :- CONTINUOUS COMMON EARTHING FOR HT FEEDER BY PROVIDING MAINTENANCE FREE, READY CAPSULE, PIPE-IN-CAGE (PIC) TYPE EARTHING SYSTEM FOR HT FEEDERS



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**TECHNICAL SPECIFICATIONS
FOR
CONTINUOUS COMMON EARTHING
FOR HT FEEDER BY PROVIDING
“MAINTENANCE FREE, READY CAPSULE,
PIPE-IN-CAGE (PIC) TYPE EARTHING SYSTEM”**

(Sign. & Seal of the Bidder)

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1.0 SCOPE OF WORK:

This specifications cover supply, installation, testing and commissioning of specially designed maintenance free, ready capsule, pipe in cage (PIC) type earthing and continuous running GI wire SWG no 8 connected with these earthings. The earth electrode and x-arms on the pole shall be connected through GI strip having size 25 mm x 3 mm. Other fabrications and X-arm on the pole shall be connected using GI wire SWG no.8 with the help of specially developed GI clamps & SS earthing bolts. All such earthings shall be connected by laying overhead continuous running earth wire on 11/22KV poles of a selected feeder one in each discom. The successful bidder shall have to make earthings of 11/22KV poles of whole feeder, around 3 Nos in one Km length of the feeder as per the specifications and the instruction of Engineer-in-charge. GI wire will be provided by DISCOMs from their stores. All other required material like specially designed earth electrode, S/S earthing bolt, GI earthing clamp etc. as per drawing shall be in the scope of the bidder. The material offered shall conform to relevant standard with high quality and good workmanship capable to perform continuous and satisfactory operations in the actual service conditions at site.

2.0 APPLICABLE STANDARDS:

This earthing system shall be conformed to the relevant standard specification unless otherwise specified be in line with the requirement of any of the latest applicable standard and will apply in order of priority as listed below.

1.	IS: 3043/1987	Code of practice for Earthing
2.	IEC 62561-7	Requirement of Earthing Enhancement Compound
3.	IEEE-80- 2000	IEEE Guide for Safety in AC Sub Station Grounding
4.	ASTM G57-06	Test Method for Field Measurement of Soil Resistivity, Using the Wenner, Four-Electrode Method
5.	IS : 2629 & IS: 4736	for hot dip galvanizing for Iron and Steel
6.	IS:1161/1979	Steel Tubes for Structural Purposes: Specification
7.	IS:13229-1991	Zinc for Galvanizing

1.0 GENERAL REQUIREMENTS:

- a) This maintenance free earthing system shall be based on ready capsule type Pipe in Cage (PIC) technology concept in which, One Galvanized hollow pipe (Electrode) is kept inside the Galvanized Perforated cage as per drawing. The space between the electrode and cage shall be filled with a specially developed earth enhancement material(EEM) made up of Conductive Cement, Graphite carbon powder, Sodium montmorillonite/ Sodium Bentonite Powder, Hydrous aluminum silicate etc. to reduce earth resistivity.

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- b) The system shall be almost maintenance free and require no periodic or scheduled maintenance for a period of at least 15 years.
- c) There shall be no requirement to add any other chemical or water at any time after initial installation because of hygroscopic characteristic of Earth Enhancement Material (EEM).

4.0 EARTH ELECTRODE:

The earth electrode is the main component of the earthing system which is meant for collecting, releasing, and discharging earth leakage and fault currents. The earth electrode should be **ready capsule type made with Pipe in Cage (PIC) technology concept**. It includes the hollow MS pipe, as a primary electrode which should have IS marking as per IS: 1161-1979. For effective life of the earthing system, the whole shall be provided a zinc coating up to 150 microns through hot dip process. The zinc used for galvanizing should follow Zn 98.0 Grade as per IS: 13229-1991 and process and measurement of hot dip galvanizing should be as per IS: 2629.

The outer cage of GI pipe shall be provided with maximum 3.5 mm dia holes and shall be hot dip galvanized with minimum 80 microns.

a) Dimensions :-

Primary Electrode: Dimensions of the electrode are as under, however, detail dimensions are shown in the attached drawing No. GPRD-16 & GPRD-17. All the tolerances and other specifications to the same should be as per IS: 1161-2014.

I. Length (L):

- a. 1900 mm (pipe) +100mm (terminal) =2000 mm (Min.)
- b. 2900 mm (pipe) +100mm (terminal) =3000 mm (Min.)

II. Outer Diameter (Ø): 48 mm (hollow) (Minimum)

III. Thickness (t): 3.2 mm (Min.)

IV. Weight of electrode: To be followed according to limit specified in IS

Perforated Cage :

- a) 1890 mm X 150 mm for 2000 mm Electrode (Minimum)
- b) 2890 mm X 150 mm for 3000 mm Electrode (Minimum)
- c) **Circular Hole Size for cage:** 3.5 mm Dia. Or lesser
- d) **Thickness of Net:** 1.5 mm (min.) with hot dip galvanized

b) **Terminal:** Each Earth pipe must be provided with a connection terminal facility as shown in drawing by pressing of 100 mm at the top side of the pipe to form a strip having dimensions as mentioned in drawing **without joint or welding. The pipe shall be pressed by hydraulic press only. No hammered pressed/ welding shall be acceptable.** Two numbers of hole of diameter as mentioned in the drawing shall be provided in the pressed portion of the top side of pipe.

c) **Electrically Insulated Enameled Paint Coating:** As shown in the drawing No. GPRD-16 & GPRD-17, the electrically insulated enameled paint coating has to be applied on the **150 mm length of electrode** immediate after the compressed portion of the electrode (terminals). **Also, optionally PVC cap of appropriate die-electric strength can be provided to prevent the flow of current in the upper portion.** The enameled paint coating should have minimum

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Dielectric strength-20 Kv/mm and min. 4 coat should be applied to the surface of electrode. This is done in order to prevent the danger to the living being from Step potential.

d) **Zinc coating:** The earth electrode consists of one mild steel pipe with provision of connections at top end as shown in the attached drawings No. GPRD-16 & GPRD-17. The entire primary electrode shall be hot dip galvanized **with at least 150 microns** over all surfaces **without leaving any point of the electrode un-galvanized and cage shall be hot dip galvanized with at least 80 microns** in accordance with IS 4736: 1986. The process of hot-dip galvanizing shall be followed as per IS: 2629. For uniform distribution of fault currents, an earth electrode must be cylindrical in shape.

e) **Short Time Current Rating:** The earth electrode shall be capable to withstand minimum 20 KA (rms) short time current for 1 sec.

f) **Other Items :**

1. **GI Strip** of 25mm wide, 3mm thick, having hot dip- galvanized-zinc coating of 80-100 microns, length – 8 meter from connection to earth electrode to the top fittings/Earth Wire is required to be provided.
2. **Rigid PVC earthing Pipe** (Outside Diameter: 40 mm (tolerance:- -0.4 mm) , Inside Diameter : 34.4 mm (Min.) (Heavy Duty), Length: 2.5 meter with tolerance + 10mm) is required to be provided with **UV protected type** to prevent the living being passing from the pole from touch potential.
3. Nut bolts (12mm) with 2 plain washer are required to be provided to make Bottom side connection of GI Strip with Earthed Electrode
4. Specially designed clamp and S/s Nut-bolts with washers required to be provided as per drawing for connection of fabrication items with common earth wire of SWG-8 to be connected as per instruction of Engineer in-charge.

5.0 EARTH CONDUCTIVITY ENHANCEMENT MATERIAL:

- a) It shall be placed between primary earth electrode and perforated cage to improve the conductivity of earth electrode & ground contact area. Earth enhancement material (Back fill compound) shall be according to **IEC 62561-7**, and superior conductive material that improves earthing effectiveness especially in areas of poor conductivity such as rocky ground, sandy soil & areas of moisture variation with different soil strata.
- b) The Earth Enhancement Material/ Backfill compound shall be Highly Conductive Compound, maintenance free. The watering shall be required at the time of its installation only. No re-charging with water, salts or any other chemical shall be required and it shall maintain almost constant earth resistance during its life cycle without manual watering.
- c) It is preferable that the resistivity of the backfill compound shall not be higher than 0.20 Ω -cm, when it is tested with 4 electrode method using a soil box having cross section

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area of 4 cm x 3.2 cm=12.8 Cm² and keeping the electrodes at a distance of 12.8 Cm. in a soil box. The supplier shall produce the facility of soil box for testing.

- d) It must set firmly and should not dissolve or decompose or otherwise pollute the soil or the local water table.
- e) It should have capacity to retain more than 10% moisture at 105°C. Test certificate for the same from NABL approved Government/government supported laboratory shall be submitted.
- f) The expected composition of the compound is as under.

*Earth enhancement Back Filling Compound Composition with maximum permissible tolerance of ± 10 % in each content.	Conductive Cement:	15 %
	Graphite carbon powder	45%
	Sodium montmorillonite/ Sodium Bentonite Powder	30 %
	Hydrous aluminum silicate	10 %
<ul style="list-style-type: none"> • Maximum permissible limit of Salt contents is below 2 • The Sulphur content in the back-fill compound shall not be more than 2 % in any case. • All the component used in the mixture shall be having mesh size at least 200 mesh. 		

- g) Material shall be **non-toxic, non-reactive, non-explosive & non-corrosive**. It shall not cause burns, irritation to eye, skin etc. It shall not pollute the soil or local water table & shall meet environmental friendly requirements for landfill.
- h) It should expand & swell considerably & remove entrapped air to create strong connection and bond between earth electrode & soil.
- i) It should diffuse in to the soil pores & create conductive roots enlarging conductive zone of the earth pit.
- j) It should be **an alkaline in nature with pH value of > 7 & < 9**. Test certificate from NABL approved Government/government supported laboratory to be provided for the compound so designed.
- k) It should have better hygroscopic properties to absorb moisture. It should absorb & release the moisture in the dry weather condition and help in maintaining the moisture around the earth electrode. Material shall be thermally stable between temperature ranges of -10°C to 60°C. **Material shall not decompose or leach out with time.**
- l) Material shall not decompose or leach out with time. **The leach test shall be tested as per IEC 62561-7 Clause 5.3** at NABL accredited Government/ government supported laboratory.
- m) **Sulphur Determination test and Corrosion Test - As per IEC 62561-7 clause 5.3 & 5.5**

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respectively.

6. GUARANTEE:

The product shall be guaranteed to sustain its initial value of system resistance without its maintenance with tolerance of $\pm 10\%$ for a period of at least 5 years from date of commissioning. However, it is desired to have trouble free operation for a period of 20 years. Any defect discovered during the guarantee period shall be rectified free of charge

7. PROCEDURE OF INSTALLING EARTH ELECTRODE & SCOPE OF WORK :

The Earthing system shall be provided to meet the criteria mentioned in the Cl. no 72(1) of the CEA Regulation-2010 on “Measures relating to Safety and Electrical Supply which is mentioned as under:-

“All metal supports and all reinforced and pre-stressed cement concrete supports of overhead lines and metallic fittings attached thereto, shall be permanently and efficiently earthed by providing a continuous earth wire and securely fastening to each pole and connecting with earth ordinarily at three points in every km. with the spacing between the points being as nearly equidistant as possible”

a) The whole ready capsule (Electrode with Earth Enhancement Material placed in Cage) with pipe in Cage with Galvanized Electrode having specification as mentioned should be inserted inside the Galvanized Perforated cage shall be supplied at site. The packing of the Earth capsule should be done in such a manner that no any material leakages should happen even in worst transport & handling condition. These packing shall be marked with the name of the manufacturer or trade name, quantity, date of manufacture, etc.

b) To validate the quality of capsule, necessary tests/inspection (Proto inspection, lot inspection, Resistance/ Resistivity, Material validation testing, etc.) shall be carried out on the ready capsule, If required by Engineer In charge.

c) Earthing Display board made up of FRP material having size of at least 200 mm x 150 mm x 3 mm with following details. The display board should be bound with pole as per the instruction of engineer in-charge with minimum four corner holes provided for fastening with poles.

- (1) Name of Manufacturer/ Trade Name / Supplier
- (2) PO NO:
- (3) Feeder Name
- (4) Earth Pit No
- (5) Drawing No _____
- (6) Length of Electrode in mm
- (7) Date of Installation
- (8) Resistance value in Ohm on Installation date
- (9) Soil Resistivity in Ohm-Meter

(Sign. & Seal of the Bidder)

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d) Connection to electrical part :

Connection through GI Strip: Scope of work shall cover supply, installation and Connection of 8 meter long GI Strip of 25mm wide, 3mm thick, having **hot dip- galvanized-zinc coating of 80-100 microns without any joints or welding.** The one end of the GI strip shall be connected with Earth electrode by Nut bolts as shown in the drawing. While, the other end of strip shall be connected to common earth wire with supporting clamps and SS nut bolts as shown in the drawing. GI strip shall be covered with rigid, **UV protected PVC pipe up to 2.5 meter** from the ground level supported with pole by **5 nos of standard make cable ties as per instructions of Engineer-In-Charge.**

• **Dimensions of Rigid PVC Pipe :-**

The dimension confirming to IS-9537/1983 Part: I & III.

Outside Diameter	: 40 mm (tolerance:- -0.4 mm)
Inside Diameter	: 34.4 mm (Min.) (Heavy Duty)
Length	: 2.5 meter with tolerance + 10mm

Connection through GI wire: Supply of GI wire having size **SWG No. 8** as per relevant standards shall be supplied by the relevant DISCOMs to the bidder. The bidder has to collect the material from the store. Earthing on the Transformer Center is not in the scope of this tender. However, the continuous running feeder earth wire shall be pass through transformer center structure and the earth wire connection to the fabrication of the structure shall be done as per the instruction of engineer in-charge.

- f) The earth pits should be dug with the help of an auger (not more than 10"dia.). The manual excavation of pit shall not be entertained. The ready to use electrode is inserted in the pit vertically and then the pit is filled with local soil and water. At the time of installation, sufficient watering is required to mix up the soil uniformly surrounding to the electrode.
- g) Before installation, surface of the earth electrode shall be cleaned properly, all resistive material shall be removed from the surface.
- h) Put earth electrode in the pit and ensure that the earthing electrode shall remain in the center of the pit from bottom to top.
- i) **Earth resistivity before installation of the earthing shall be measured** at the stated shackle pole with the test instrument having good accuracy and record of the same shall be maintained by the contractor as well as DISCOM representative with pole no. at which measurement done. The soil resistivity and earth resistance measuring digital instrument of standard make such as megger, Chauvin Arnoux, Fluke, etc. of professional model having good

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accuracy and reliability with all accessories including wires and cables (company provided) shall have following minimum qualification.

Professional earth test kit having

- **Earth Resistivity Kit (Company provided)** : comprising of 4T shaped rods, 4 Reels of Cable(100m Red, 100m Blue,100m Green, 30m Black),Cable Winder(10m Green), Mallet, etc.
- **2P,3P & 4P measuring method** : Range 0.001 to 99.99 k Ω
- **Resolution** : 0.001 to 10 Ω
- **Test method** : Wenner and Schlumberger with automatic calculation
- **Accuracy** : ± 2 %

The bidder has to submit technical catalogue of the earth resistivity measurement instrument to be used in tender for measurement. The bidder who are using low profile meter than stated technical spec. shall be liable to rejection.

j) The resistance of the pit & soil resistivity at each earthing location shall be measured after completion of the earthing – at least 3 times at each location as per the instruction of GPRD cell in presence of the DISCOM representative and duly signed record of the same shall be maintained. The agency shall submit the signed record along with the bill.

k) Continuous Earth Wire :-

The continuous earth wire should be provided to meet the criteria mentioned in the Cl. no 72(1) of the CEA Regulation-2010 on “Measures relating to Safety and Electrical Supply”

- The GI Wire SWG No. 8 for continuous earth wire as per the feeder length and for connection with fabrication 1 meter for each pole shall be provided by concern DISCOMs. Transportation from store and laying, stringing, etc. work shall be in the scope of the bidder.
- Supply, installation and commissioning of specially designed Clamps, bolts, nuts for connecting earth wire with the fabrication, pole and metal structures at every pole shall be in the scope of the bidder and has to be provided as per the drawing.
- The length of the GI wire SWG 8 is having length same as the length of feeder, including the sag and the length of SWG 8 (for connection with top clamp) is 1 meter for each pole.
- The earth wire shall be connected to the earth strip through 2 Nos of specially developed earthing bolts Nuts and Plain Washers. The connection of fabrication like V Cross Arm, top clamp, Horizontal cross arm should be done by specially developed

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earthing bolts and connecting GI Wire SWG 8 between fabrication and common earth wire. The earth wire should be run through V Cross Arm.

- The GI Wire shall be galvanized in accordance with and IS: 2629 /1986 and the zinc to be used for hot dip galvanizing shall confirm to grade Zn-98 as per IS: 13229-1991. The coating shall be uniform, smooth and free from visual defect.

l) All work, including transportation, installation (digging and sufficient watering at site), testing, commissioning, 3 times measurements of resistance and resistivity with stated standard instrument.

m) As the execution of the project requires shut down/line clearance of the whole/part of the feeder, the bidder has to execute the project as per the convenient timing for outage of power supply in consultation with concern SDO. All necessary safety precautions and insurance for the persons and the property during the execution of this project is a responsibility and liability of bidder/ contractor.

9. INSPECTION:

- The purchaser or his authorized inspector shall have all rights for free access to the manufacturer's works. The manufacturer or his authorized representative shall remain present at all reasonable times and conduct all tests and measurements as per the technical specifications in presence of the purchaser representative shall give facilities to inspect the manufacturing process at any stage of manufacture. The purchaser shall have the right to reject whole or part of any work or material that does not conform to the requirements of the specifications. All the reasonable/complete facilities considered necessary for the inspection by the inspector/s inspecting shall be provided by the manufacturer free of cost.
- All the base material (before mixture) as stated in the Clause no.5 shall be inspected before preparing the sound mixture & sample of the same may be collected by the inspection team while inspection for further assessment.

10. TESTS CERTIFICATES:

The bidder is required to submit the test certificates as mentioned below, with the bid. All these test certificates shall be carried out at any NABL accredited Government/ Government supported laboratory. These tests should not be older than 5(five) years as on scheduled date of opening of the Technical bid.

- a) The GI pipe used for the electrode shall be confirming to the relevant standard.
- b) Toxic Content test on Conductive materials & earth enhancement material as per standard – or Leachability Test

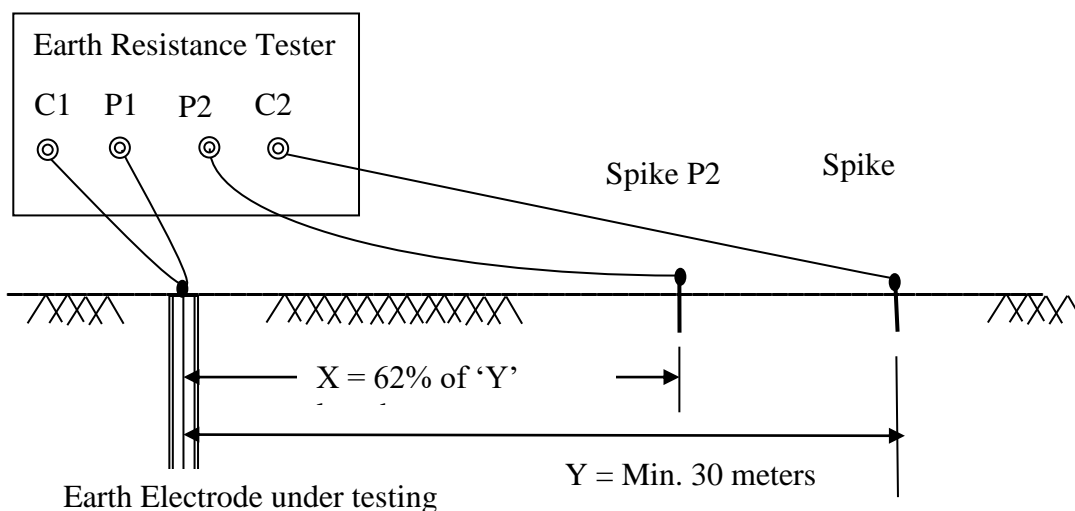
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- c) Short Circuit Withstand Test on Earth electrodes: It should be capable of withstanding short time current of 20 KA (rms) for 1 second.
- d) All Physical dimensions check of the electrode.
- e) PH Value Test
- f) Measurement of zinc Coating of the Earth Electrode
- g) Sulphur determination Test
- h) Granular Size of Material

11. PROCEDURE OF MEASUREMENT

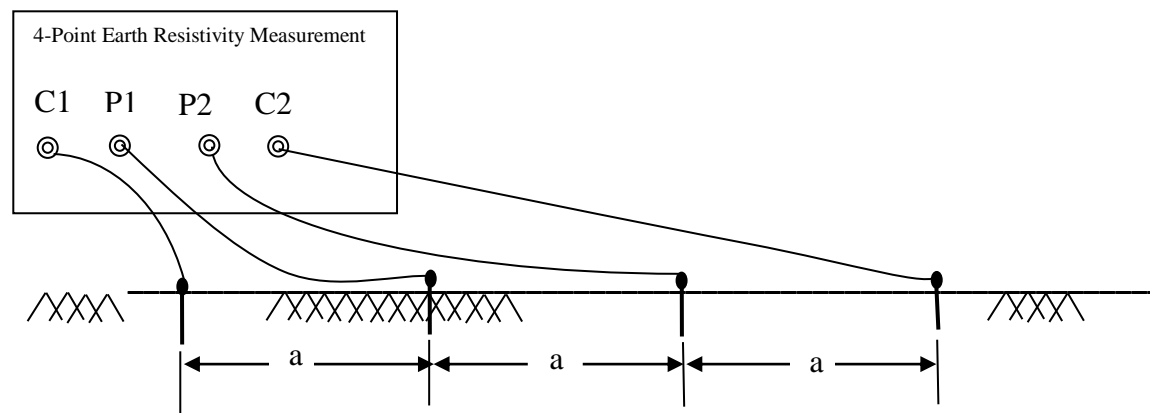
1. MEASUREMENT OF EARTHING RESISTANCE:

The value of earthing resistance should be measure by following method of measurement.



The connecting wire length of the terminal connecting earth electrode with C1-P1 of megger should not be more than 1 meter. All three electrodes should be in linear alignment to avoid unnecessary addition of extra earth resistance during measurement process.

2. MEASUREMENT OF EARTHING RESISTIVITY :



GUARANTEED TECHNICAL PARTICULARS

Sr. No.	Technical Particulars	Confirmation (Yes)
1	<p>Electrode: Confirming to IS: 1161-2014.</p> <p>(A) For 2000 mm Electrode Length (L): 1900 mm(pipe)+100mm(terminal)=2000 (Min) Outer Diameter (Ø): 48 mm (hollow) Thickness (t): 3.2 mm(Min) Weight of electrode : 7.1 (Kg.) At least Cross section Area : 4.53 cm²</p> <p>(B) For 3000 mm Electrode Length (L): 2900 mm(pipe)+100mm(terminal)=3000 (Min) Outer Diameter (Ø): 48 mm (hollow) Thickness (t): 3.2 mm(Min) Weight of electrode : 10.6 (Kg.) At least Cross section Area : 4.53 cm² (all tolerance will be applicable as per IS:1161-2014)</p>	
2	<p>Galvanized Perforated cage for Earthing :-</p> <p>I. Dimensions :-</p> <ol style="list-style-type: none"> a) 1890 mm X 150 mm for 2000 mm Electrode b) 2890 mm X 150 mm for 3000 mm Electrode c) Circular Hole Size of Net: 3.5 mm Dia. Or lesser d) Thickness of Net : 1.5 mm (min.) with hot dip galvanized <p>II. Design Versatility :- The cage should be designed with high durability such that in worst transport condition also, the particles of Earth Enhancement Material should not leach out.</p> <p>III. Handling :- The cage with all content should be design kept in view handling condition at site. The handling at site should be easy, The necessary arrangement such as handle should be provided, if required.</p>	

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3	<p>Electrically insulated Enameled Paint Coating : Uniform Paint coating on 150 mm long electrode after terminals The enameled paint coating should have minimum Dielectric strength-20 Kv/mm and min. 4 coat should be applied to the surface of electrode. Optionally, PVC cap of appropriate dielectric strength can be provided to prevent the flow of current in the upper portion.</p>									
4	<p>Zinc coating on electrode :- The entire primary pipe electrode shall be hot dip galvanized with at least 150 microns over all surfaces without leaving any point of the electrode un-galvanized in accordance with IS 4736: 1986. The process of hot-dip galvanizing shall be followed as per IS: 2629. For uniform distribution of fault currents, an earth electrode must be cylindrical in shape. The cage shall be hot dip galvanized with at least 80 microns in accordance with IS 4736: 1986.</p>									
5	<p>Mixture proportion for Earth enhancement Back Filling Compound Confirming to IEC: 62561-7</p> <table border="1" data-bbox="304 913 986 1115"> <tr> <td>Conductive Cement:</td> <td>15 %</td> </tr> <tr> <td>Graphite carbon powder</td> <td>45%</td> </tr> <tr> <td>Sodium montmorillonite/ Sodium Bentonite Powder</td> <td>30 %</td> </tr> <tr> <td>Hydrous aluminum silicate</td> <td>10 %</td> </tr> </table> <p>Sulphur content < 2 % Content tolerance of ± 10 % Resistivity < 0.2 Ω-m Salts contents < 2 % All the component used in the mixture shall be having mesh size between 150-200 mesh.</p>	Conductive Cement:	15 %	Graphite carbon powder	45%	Sodium montmorillonite/ Sodium Bentonite Powder	30 %	Hydrous aluminum silicate	10 %	
Conductive Cement:	15 %									
Graphite carbon powder	45%									
Sodium montmorillonite/ Sodium Bentonite Powder	30 %									
Hydrous aluminum silicate	10 %									
6	<p>Earth pit:- Method of digging Earth Pit:-through Bore/auger machine Diameter = 200 mm</p>									
7	<p>Confirmation of Scope of work, Supply, Installation, commissioning and testing procedure as mentioned in specification</p>									

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SPECIFICATION OF H.D.RIGID PVC PIPE

1. SCOPE :

This specification covers the manufacture, testing at works and supply of HD Rigid PVC Pipe with UV protection.

2. APPLICABLE STANDARD :

IS-9537 (Part-I & II)1983

3. GENERAL CONSTRUCTION REQUIREMENT OF HD RIGID PVC PIPE

3.1 Material :

Material should be strictly supplied confirming IS-9537/1983 Part: I & III.

3.2 Color :

Grey or Black

3.3 Dimensions :-

Outside Diameter : 40 mm (tolerance: -0.4 mm)

Inside Diameter : 34.4 mm (Min.) (Heavy Duty)

Length : 2.5 meter with tolerance + 10mm

All the other relevant dimensions and applicable tolerances shall be observed as per IS.

4. MARKING :

“GPRD-GUVNL”, trade mark of supplier and Nominal size of conduits should be screen print & embossed on the pipe at every half meter length preferably at 50 MM from one end.

5. TYPE TEST CERTIFICATE :

The firm has to submit type test certificate not more than five years older HD Rigid PVC Pipe for all the test as per Clause No. 14.1 of IS-9537 (Part-III)/1983 except bending test (Clause No. 9.2) and collapse test (Clause No.9.5) as these both test not required for 40mm HD PVC Pipe application thereof.

6. ACCEPTANCE OF LOT :

6.1 Sampling and Acceptance criteria :-

The Nos. of sample randomly selected from the lot shall be in accordance with and acceptance criteria shall be in assurance with Appendix-A of IS-9537 (Part-III)/1983.

6.2 Acceptance Test :-

The selected samples shall be subjected to the acceptance test in following order as per IS-9537 (Part-III) 1983.

a) Visual inspection.

b) Verification of dimensions as per Company's requirement.

c) Compression test (Clause No. 9.3)

d) Resistance to burning (Clause No. 11.0)

e) Electrical characteristics (Clause No.12.0)

7. TENDER SAMPLE :

Tenderer should submit two nos. of sample along with offer. Offer without sample

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will be straight way rejected. The Samples are to be delivered to Dy. Engr. , Regional Store Office , PGVCL, Dudh sagar Road : Rajkot : 360003.

8. GUARANTEED TECHNICAL PARTICULARS (GTP) :

Tenderer should submit the required details in attached Guaranteed Technical Particulars (GTP) offer without GTP will be straight way rejected.

GUARANTEED TECHNICAL PARTICULARS (GTP)

Technical information and guaranteed technical information for supply of HD Rigid PVC Pipe.

PART : A : BIDDER HAS TO CONFIRM FOLLOWING IMPORTANT REQUIREMENT

Sr.No.	Particulars	Confirmation
1.	HD Rigid PVC Pipe with UV protection shall be supply as per Confirming IS No.9537/1993 (P.I & III)	YES/No
2.	Outside Diameter : 40 mm (tolerance:- -0.4 mm) Inside Diameter : 34.4 mm (Min.) (Heavy Duty) Length : 2.5 meter with tolerance + 10mm	Yes/No Yes/No Yes/No
3.	Marking shall be as under : “GPRD-GUVNL”, trade mark of supplier and Nominal size of conduits should be screen print & embossed on the pipe at every half meter length preferably at 50 MM from one end.	Yes/No

TECH. SPEC :- CONTINUOUS COMMON EARTHING FOR HT FEEDER BY PROVIDING MAINTENANCE FREE, READY CAPSULE, PIPE-IN-CAGE (PIC) TYPE EARTHING SYSTEM FOR HT FEEDERS

PART: B

Bidder has to furnish below details above materials.

Sr.No.	Particulars	
1.	Color of pipe	----
2.	Manufacturer Trade Name	----

PART: C

Bidder has to enclose following document and has to confirm for the same.

Sr.No.	Particulars	Confirmation
1.	The type test certificate as per specification Clause No.5 at any Govt. approve laboratory are submitted as under. The name of laboratory Laboratory Test Report Nos. Date of Report.	---- ---- ----
2.	Two (2) Nos. sample to be sent with Tender	Yes/No
3.	List of Plant & Machinery	Yes/No
4.	List of Testing Equipment	Yes/No
5.	List of order pending/executed at least for past two years for the item offered. (a) with PGVCL/DISCOMs under GUVNL (b) With the Purchase other than PGVCL/DISCOMs under GUVNL	Yes/No Yes/No

PART: D

Bidder has to mention deviation here under if any, quoting relevant Clause of specification.

(Sign. & Seal of the Bidder)

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