

Office of the Senior Divisional Electrical Engineer (General)  
DRM office/Eastern Railway, Malda -732102.  
EL/MLDT-E-Tender-437

**SPECIFICATIONS AND SCOPE OF WORK:**

**NAME OF WORK** – Electrical work in c/w “Bhagalpur- Shifting of existing 11 KV overhead power line and electrical infrastructure at Bhagalpur station.”

**Item wise detailed scope of work :**

S. No.	Description of Item
1	<p>Erection of the Rail pole 2no for 'H' pole structure of suitable length (Apprx. 9 Mtrs. long) complete with foundation of size 6 ft x 2.5 ft x 2.5 ft depth including transportation of rail pole from different location to proposed site as per IS 1239(Part-1):1990 including supply, fixing, testing and commissioning of following items as follows.</p> <p>1) 11 KV ,400 A., 50 Hz 3-phase vertically mounted Gang Operated Switch complete with down rod, isolator &amp; other accessory with proper earthing as per site requirements-01 set</p> <p>2) Supply, fixing, testing and commissioning of lighting arrester ( 9KV-5KV) ( A set of 3 pcs) with all other accessories suitable for 11 KV HT feeder-1set ( Rail pole to be supplied by Rly.)</p> <p><b>Details as:</b> - Erection of 2 nos. Rail pole of suitable length (Approx. 9 Meters. long) complete with foundation of size 6 ft x 2.5 ft x 2.5 ft depth including transportation of rail pole from different locations to proposed site &amp; muffling of base foundation of size 1.25 ft x 1.25 ft x 2 ft with cement concrete as per ratio 1:3:6 above the ground level and Supply erection &amp; commissioning of Earthing for electric Pole by provision of 40 mm dia. 2.44 Meter long GI pipe (heavy gauge) ISI marked as per IS 1239(Part-1):1990 including drawing of 6 SWG G.I. wire from earth electrode to Pole base complete with nut bolt including brazing as per site requirement, (Rail pole to be supplied by Rly.) including supply, fixing, testing and commissioning of following items as follows:</p> <p>1) 11 KV, 400 A., 50 Hz 3-phase vertically mounted Gang Operated Switch complete with down rod, isolator &amp; other accessory with proper earthing as per site requirements.</p> <p>2) Lighting arrester (9KV-5KV) (A set of 3 pcs) with all other accessories suitable for 11 KV HT feeder. (Rail pole to be supplied by Rly.)</p>
2	<p>Dismantling, shifting of existing transformer and re commissioning of same at site location as per instruction of site incharge.</p> <p><b>Details as:</b> - Dismantling, shifting of existing transformer and re-commissioning of the same at site location including testing as per instruction of site incharge.</p>
3	<p>Erection of the Rail pole suitable length (Approx. 9 Meter long) complete with foundation of size 6 ft x 2.5 ft x 2.5 ft depth including transportation of rail pole from different location to proposed site &amp; muffling of base foundation (Rail pole to be supplied by Rly.)</p> <p><b>Details as:-</b> Erection of Rail pole of suitable length (Approx. 9 Meters long) complete with foundation of size 6 ft x 2.5 ft x 2.5 ft depth including transportation of rail pole from different location to proposed site &amp; muffling of base foundation of size 1.25 ft x 1.25 ft x 2 ft with cement concrete as per ratio 1:3:6 above the ground level and Supply erection &amp; commissioning of Earthing for electric Pole by provision of 40 mm dia 2.44 Mtr long GI pipe (Medium gauge) ISI marked as per IS 1239(Part-1):1990 including drawing of 6 SWG G.I. wire from earth electrode to Pole base complete with nut bolt including brazing as per site requirement, (Rail pole to be supplied by Rly.)</p>
4	<p>Supply &amp; fixing of cross arm bracket made of M.S. angle of size 65 mm x 65 mm x 6 mm of length 6.5 ft long with 3 Nos. of 11 KV pin insulator including supply of all necessary clamps, nuts &amp; bolts etc. &amp; painting.</p> <p><b>Details as:</b> - Supply &amp; fixing of cross arm bracket at site location made of M.S. angle of size 65 mm x 65 mm x 6 mm of length 6.5 ft long with 3 Nos. of 11 KV pin insulator including supply of all necessary clamps, nuts &amp; bolts etc. &amp; painting of bracket. Make of paint- Asian/Dulux/Berger.</p>

5	Scraping, Cleaning & painting of Rail/tubular pole along with cross arm bracket by anti-corrosive red oxide & double coat of aluminum paint & finally black paints up to 1.5 Meter above ground level.
	<b>Details as:</b> - Scraping, Cleaning & painting of Rail/tubular pole along with cross arm bracket by anti-corrosive red oxide & double coat of aluminium paint & finally black paints up to 1.5 Meter above ground level. Pole number shall be marked on yellow background with black text with suitable size as desire by supervisor. Standard make for paint Asian/Dulux/Berger.
6	Supply & fixing of ISI branded M.S. channel of size 75 mm x 40 mm x 6 mm of length 3.5 Meters long including fabrication and binding for Double pole structure & allied accessories as per site requirement.
	<b>Details as:</b> - Supply & fixing of ISI branded M.S. channel of size 75 mm x 40 mm x 6 mm of length 3.5 Meters long including fabrication and binding for Double pole structure & allied accessories as per site requirement, painting of Channel etc. Make of paint- Asian/Dulux/Berger.
7	Supply, fixing & testing of Guy rod assembly of size 5/8 inch X 6' ft. long complete with anchor plate and guy rod of suitable length of size 7/10 SWG stranded GI wire straining insulator etc. including foundation of anchor plate as per IE standard.
	<b>Details as:</b> - Supply, fixing & testing of Guy rod assembly of size 5/8 inch X 6' ft. long complete with anchor plate and guy rod of suitable length of size 7/10 SWG stranded GI wire straining insulator etc. including foundation of anchor plate as per IE standard as required by SSE/In charge.
8	Supply, fixing, testing and commissioning of 11 KV Disc insulator completer with hardware materials.
	<b>Details as:</b> - Supply, fixing, testing and commissioning of 11 KV Disc insulator completer with hardware materials including nuts bolts and related accessories.
9	Supply & fixing of ISI branded M.S. angle of size 65 mm x 65 mm x 6 mm of length 3.5 Meters long including fabrication and binding for Double pole structure & allied accessories as per site requirement.
	<b>Details as:</b> - Supply & fixing of ISI branded M.S. angle of size 65 mm x 65 mm x 6 mm of length 3.5 Meters long including fabrication and binding for Double pole structure & allied accessories as per site requirement, painting of angle etc. Make of paint- Asian/Dulux/Berger.
10	Supply, installation & termination of Heat Shrinkable 11 KV outdoor type cable end termination kit suitable for 3 core XLPE HT cable up to 400 sq. mm 11 KV grade.
	<b>Details as:</b> - Supply, installation and termination of Heat Shrinkable 11KV outdoor type cable end termination kit suitable for 3 core XLPE HT cable up to 400 sq. mm 11 KV grade. Make- Multi Pressing/3M/Denson/Raychem/M-seal or similar.
11	Supply, installation, commissioning & testing of straight through joint kit for HT 11KV XLPE cable up to 400 sq mm
	<b>Details as:-</b> Supply, installation, commissioning & testing of straight through joint kit for HT 11KV XLPE cable up to 400 sq. mm. Make- Multi Pressing/3M/Denson/Raychem/M-seal or similar.
12	Supply and fixing of Danger Board 33 KV/ 11 KV/ LT.
	<b>Details as:-</b> Supply and fixing of 33 KV/11KV/LT Danger notice Board plate of 250mm X 200mm made of mild steel.
13	Supply, laying and fixing of Covered dog conductor with 5% sagging.
	<b>Details as:</b> - Supply, laying and fixing of covered Dog Conductor with 5% sagging as per below specification. The conductor shall consist of: <ol style="list-style-type: none"> <li>1. <b>AAAC AL59 (All Aluminium Alloy Conductor)</b></li> <li>2. <b>Extruded semi-conductive screen</b></li> <li>3. <b>TR-XLPE (Tree Retardant XLPE) inner insulation</b></li> <li>4. <b>Black UV-resistant XLPE outer insulation</b></li> <li>5. <b>Water-blocking yarn/tape/filling for longitudinal water tightness</b></li> </ol> <p>Applied standards:- EN 50397 - 1, SS 424 08 13 &amp; 14 (in general)  Conductor Material- AL 59 to SS 424 08 13 &amp; 14</p>

	<p>Nominal Cross-sectional Area- Min 120 mm<sup>2</sup>  DC Resistance at 20°C (Max.)- Max 0.25 Ω/km  Continuous Current Rating (40°C ambient)- 375 A  Maximum Operating Temperature- 95°C  Coefficient of Expansion- <math>23 \times 10^{-6}</math> /°C</p> <p><b>Inner Insulation</b></p> <ul style="list-style-type: none"> <li>Material: <b>TR-XLPE</b></li> <li>Nominal thickness: <b>1.2 mm.</b></li> </ul> <p><b>Outer Insulation</b></p> <ul style="list-style-type: none"> <li>Black XLPE.</li> <li>UV resistant.</li> <li>Erosion resistant.</li> <li>Nominal thickness: <b>1.1 mm.</b></li> </ul> <p><b>Water-Tightness Requirements</b>  The conductor must be longitudinally water-tight through suitable filling material compatible with:</p> <ul style="list-style-type: none"> <li>Aluminium alloy conductor.</li> <li>Insulation materials.</li> </ul> <p>The specification specifically requires water-tight construction using yarn/tape/filling compounds.</p> <p><b>Stranding</b></p> <ul style="list-style-type: none"> <li>Alternate lay directions.</li> <li>Outer layer right-hand lay.</li> <li>Uniform compact stranding.</li> </ul> <p><b>Major Acceptance Tests as per standard norms:</b></p> <ul style="list-style-type: none"> <li>Conductor resistance</li> <li>High-voltage test</li> <li>Leakage current test</li> <li>Tracking resistance test</li> <li>Water penetration test</li> <li>Water absorption test</li> <li>Tensile and elongation tests</li> <li>UV resistance test</li> <li>Carbon black content test</li> <li>Chemical analysis of aluminium alloy</li> <li>Stress-strain test</li> <li>Ageing test of insulation.</li> </ul> <p>Make:- KEI/Polycab/Havells or similar.</p>
<b>14</b>	<p>Supply and fixing of PG Clamp 200mm.</p> <p><b>Details as:</b> - Supply and fixing of PG Clamp 200mm or as per site of ISI make.</p>
<b>15</b>	<p>Supply &amp; erection of HT 11KV cable route indicator</p> <p><b>Details as:-</b> Supply &amp; erection of HT 11KV cable route indicator to specify the physical location of underground power cables to help prevent accidental damage during excavations, guide future maintenance, and mark critical locations such as bends, joints, and crossings.</p>
<b>16</b>	<p>Clamp for supporting XLPE Cable for 11 KV Rail pole (Round type with back clamp) 2.5 Kg.</p> <p><b>Details as:</b> - Supply and fixing of Clamp for supporting XLPE Cable for 11 KV Rail pole (Round type with back clamp) 2.5 Kg at site location.</p>
<b>17</b>	<p>Supply &amp; fixing of 11 KV Disc insulators with hardware materials.</p> <p><b>Details as:-</b> Supply, fixing, testing and commissioning of 11 KV Disc insulator complete with hardware materials including nuts bolts and related accessories.</p>

18	Supply and fixing of 11 KV HT pin insulator with hard ware materials.
	<b>Details as:-</b> Supply and fixing of 11KV pin insulator with hardware materials to mechanically support and electrically insulate overhead distribution conductors conforming to IEC 61952.
19	Supply and fixing of Anti climbing device (Barbed wire).
	<b>Details as:-</b> Supply and fixing of Anti climbing device (Barbed wire) at least 2.75 m above the datum level.
20	Construction of laying of min 160 mm dia HDPE pipe (PE-80, PN-6) by Micro-tunneling method under the road, footpath, rail track etc. as per required depth to laying and inserting HT XLPE 3 core 400sq mm cable through HDPE pipes (Including supply of HDPE pipe and 3C x 400 sq mm XLPE armoured, screened 11 KV HT aluminium (E) cable.)
	<b>Details as:-</b> Laying of minimum 160 mm dia HDPE pipe (PE-80, PN-6) as per IS 4984 and IS 14333 or latest by Micro tunnelling method under the road, footpath, rail track etc. as per required depth to laying and inserting of HT XLPE 3 core 400 sq mm cable through HDPE pipes including supply of HDPE pipe and HT XLPE armoured, screened 11 KV HT aluminium (E) cable 3C x 400 sq. mm cable as per Indian Standards (IS:7098- part 2): 2011 or latest. Including transportation of cable and HDPE from concerned SSE/Store to proposed site. Make of HDPE pipe – Oriplast/Supreme/Astral/Sudhakar or similar. Make of cable- Polycab/Havells/KEI/Finolex/RR Kabel or similar.
21	Butt welded joint for micro tunneling work with laying of 160 mm dia HDPE pipes (one joint for every 6 meters length)
	<b>Details as:-</b> Butt welded joint to be made for micro tunneling work with laying of 160 mm dia HDPE pipes or as per site, one joint must be done for every 6 meters length.
22	Supply and fixing of min 160 mm GI pipe for rising 400 Sq mm 11 KV HT cable including all necessary bracket/clamp as per site requirement. (Including supply of 3C x 400 sq mm XLPE armoured, screened 11 KV HT aluminium (E) cable.
	<b>Details as:-</b> Supply and fixing of min 160 mm dia GI pipe conforming to IS: 1239 or IS: 3589 standards, for rising of 400 Sq. mm 11KV HT cable including all necessary bracket/clamp as per site requirement including supply of HT XLPE armoured, screened 11 KV HT aluminium (E) cable 3C x 400 sq. mm cable as per Indian Standards (IS:7098- part 2): 2011 or latest. Including transportation of cable and HDPE from concerned SSE/Store to proposed site. Make of cable- Polycab/Havells/KEI/Finolex/RR Kabel or similar. Make of GI Pipe: Tata/Jindal/Bansal or similar.
23	HT Cable trenching, laying as per IS-1255, 1983 or latest. (Including supply of 3C X 400 sq mm XLPE Armoured, Screened 11 KV HT aluminum (E) cable.
	<b>Details as:-</b> Cable trenching, laying, back filling & connection of HT cables through ground, under Masonry floor /wall re-plastering for matching with the wall, road crossing as per site requirement with cable route markers & meggaring before laying with certificate. In case of underground proper grade of bricks & sand to be used for back filling as per IS-1255, 1983 or latest including supply of HT XLPE 3C x 400 sq. mm XLPE Armoured, Screened 11KV HT aluminum (E) cable conforming to Indian Standards (IS:7098- part 2): 2011 or latest. Make of cable-Polycab/Havells/KEI /Finolex/RR Kabel or similar. Labour charge includes trenching, laying of cable through ground, under Masonry floor /wall replastering for matching with the wall, road crossing as per site requirement including transportation of cable from different locations to proposed site.
24	Dismantling of Rail/Tubular pole/Octagonal pole complete with foundation, MS bracket, nut bolts, ACSR etc. and all released materials shall be carried out and handed over to Sr. S.E.E(G) store with proper acknowledgement.
	<b>Details as:-</b> Dismantling of Rail/Tubular pole/Octagonal pole complete with foundation, MS bracket, nut bolts, ACSR etc. and all released materials shall be carried out and handed over to Sr. S.E.E(G) store with proper acknowledgement.

	<p>Supply, fixing and connection of UL listed &amp; CPRI Tested maintenance free, Low carbon copper coated earth rod of 3-meter electrode having diameter of 25 mm with copper coating thickness of 250 micron tested as per IEC 62561-2, short circuit current with detailed specification.</p> <p><b>Details as:-</b> 1. Supply, fixing and connection of UL Listed, CPRI Tested 25 mm Dia and 3000mm Long Copper Bonded Rod with 250 Micron Coating as per IEC 62561-2 &amp; UL 467. (For Sub-station).  2. Supply of 25 Kg earth enhancing mineral compound tested for leaching and TCLP with NABL has resistivity less than 0.15 ohms-m.  3. SS-304 Connection Clamp.  4. Eco friendly and Rust proof HDPE earth pit chambers with the Load capacity Bearing of 5000Kgs (Test Report need to be submitted).  1. Copper Bonded Earth Electrode:  a) Earth Electrode should be 25 mm Dia and 3000mm Long copper bonded rod with minimum 250micron copper coating. Test Certificate by NABL accredited lab to be submitted for copper coating.  b) Earth Electrode should be UL Listed and Tested from CPRI/ERDA.  c) Offer Electrode should have short circuit current rating of minimum 32KA RMS and 70kA Peak value for 1 sec. Related Test certificate from CRPI/ERDA should be submitted.  d) Environmental Test Report for Corrosion, Bend and Adhesion Test Report, Mechanical Strength Test Report.  2. Earth Enhancement Materials (Chemical):  a) Material should be of high conductivity, non-corrosive leaching free and should not be normal bentonite. The material shall be chemically inert to sub soil and shall not pollute the environment. It shall provide a stable environment in terms of physical and chemical properties and exhibit low resistivity. It shall not be corrosive to the earth electrode itself.  b) Resistivity should be less than 0.15 Ohm-M.  c) Tested for Corrosion test, Resistivity test, Leaching test, Sulphur Content test, RoSH test report.  d) Minimum 25Kg of chemical required for an Earth Pit.  i) Earth enhancing compound shall be so designed and constructed that in normal use their performance is reliable and without danger to persons and the surroundings.  j) Should be tested as per ISO/IEC 62561-7 &amp; Test Report should be submitted.  3. Universal Connecting clamps:  g) Universal Connecting Clamp with Accurate Number of Fasteners should be made of Stainless Steel, which is resistant to corrosion.  h) Size of the Stainless Steel Universal Connecting Clamp should be selected according to the electrode and earthing conductor dimensions.  i) The Stainless Steel Universal Connecting Clamp should be tested as per IEC 62561-1 &amp; Test Report should be submitted.  4. Earth Inspection Chamber / Earth Pit Cover:  G. Earth Inspection Chamber / Earth Pit Cover Should have an inner dimension of 250 mm X 250 mm X 250 mm made of Polypropylene material.  H. Should be Flush Mounted, removable and lockable cover of the earth pit should be able to withstand 5000 KG.  I. Should be tested as per IEC 62561- 5 &amp; Test Report should be submitted.  5. General Specifications:  a) Earthing components are designed, manufactured and tested as per IS 3043, IEC 62651-1 &amp; 7, IS IEC 62305.  b) Warranty 10 years from the date of supply.  Make:- ABB/OBO/Axis Electrical or similar.</p>
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	<p>Supply and laying of GI strip 25 mm x 6 mm or 50 mm x 6 mm for laying from earth pipe to transformer/body /panel board/ switch board earth neutral connection with LT &amp; HT body etc.</p> <p><b>Details as:-</b> Supply and laying of GI strip 25 mm x 6 mm or 50 mm x 6 mm/12.5 mm X 6 mm for laying from earth pipe to transformer/body/panel board/ switch board earth neutral connection with LT &amp; HT body etc. joint should be connected with necessary brazing/welding etc.</p>
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**Cutting of wall for all kind of concealed work, shall be done neatly using proper cutting tools having provision of dust collector. All relevant IS standards to be strictly followed.**

**Cable crossing through road/Rail track shall be done using proper manual/mechanized digging tools.**

**NOTE:- Approval of make and model of all materials (Along with supporting documents) needs to be taken from competent Authority before supply.**

In case of any ambiguity in the Technical details, clarification may be collected from Sr.DEE/G/MLDT's office if required.

**Guarantee:** Guarantee period of the work is one year from the date of completion of the work. Any defects & deficiencies will be rectified/replaced free of cost within guarantee period.

**Sr. Divisional Electrical Engineer(G)**  
**Eastern Railway/Malda.**