

Office of the Senior Divisional Electrical Engineer (General)  
DRM office/Eastern Railway, Malda -732102.  
EL/MLDT-E-Tender-442

**SPECIFICATIONS AND SCOPE OF WORK:**

**NAME OF WORK** – (I) Enhancement & Upgradation of existing infrastructure & maintenance facilities at Sahibganj DEMU shed.

(II) Electrical work in c/w “Construction of underground water tank of 20000 gallon Cap at DEMU shed, Sahibganj.”

(III) Electrical work in c/w “Provision of Brake van siding & Engine escape at Sakrigali station.”

**Item wise detailed scope of work :**

(I) Enhancement & Upgradation of existing infrastructure & maintenance facilities at Sahibganj DEMU shed.	
S. No.	Description of Item
1	Supply, installation, commissioning & testing of earthing as per IS:3043 or latest amendment.
	<b>Details as:</b> - Supply, erection and commissioning of earth pipe 2" dia 10 feet long heavy duty (min thickness 4.5mm) ISI marked G.I. Pipe Tata/ Jindal/Bansal ISI mark pipe. The labour charge includes construction of Earth chamber including drawing of 6 SWG G.I. wire from earth electrode to main switch/panel complete with Masonry work and covering by RCC slab with net plastering as per site requirement, writing of earth value in Ohms with black colour paint and painting of earth chamber & covering with yellow paint including supply of all materials as per IS: 3043 or latest with all necessary connection as per site requirement.
2	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 & HT body etc.
	<b>Details as:</b> - 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 & HT body etc. joint should be connected with necessary brazing/welding etc.
3	Cable trenching, laying as per IS-1255, 1983 or latest.
	<b>Details as:</b> - Cable trenching, laying, back filling & connection of LT cables through ground, under Masonry floor /wall re-plastering for matching with the wall, road crossing as per site requirement with cable route markers & meggering 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. (Cable will be supplied by Rly.) 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.
4	Cable laying through pole/wall/floor as per site requirement as per IS- 1255, 1983 or latest.
	<b>Details as:</b> - Cable laying LT with proper MS Clamp, nut bolt etc. through pole/wall/floor/ surface existing Pipe Etc. as per site requirement with meggering before laying as per IS-1255, 1983 or latest including transportation of cable from different locations to proposed site. (Cable will be supplied by Railway).
5	Supply & laying of 3" dia medium gauge ISI brand G.I. pipe. for LT cable Track crossing and road crossing and for rising of cable.
	<b>Details as:</b> - Supply, laying and fixing of 3" dia medium gauge ISI brand heavy duty G.I. pipe for LT cable Track crossing and road crossing and for rising of cable as per IS. Make- Jindal/Tata/Bansal.

6	Supply, fixing and connection of LED Street light 70W. System efficacy of min-140 Lm/w.
	<b>Details as:</b> - Supply, fixing and connection of LED street light 70W complete set having system efficacy of min-140Lumen/Watt as per detailed specification vide annexure-A2 & A3. Make of fittings-Phillips/Crompton/Bajaj/Havells/Osram/Surya/Syska/Magik/C&S/HPL/Halonix/Polycab. If any other make is offered other than mentioned above should be as per specification attached at Annexure A2 & A3 with prior approval from competent authority.
7	Supply and fixing of G.I. Pipe heavy gauge size 1/1.25 inch dia 2.5 ft. long bended as per site requirement including 2 sets of M.S clamps, nuts & bolts, wiring with flexible PVC Cu. cable through G.I. Pipe.
	<b>Details as:</b> - Supply and fixing of G.I. Pipe heavy gauge size 1/1.25 inch dia 2.5 ft. long bended as per site requirement including 2 sets of MS clamps, nuts & bolts, wiring with flexible PVC Cu. Cable through G.I. Pipe. Make-TATA/Jindal/Bansal.
8	Supply, fixing and connection of 120W LED HIGHBAY light for shed.
	<b>Details as:</b> - Supply of LED 120 W High bay light complete set having system efficacy of min-140Lumen/Watt and fixing and connection at site location with necessary fixing arrangement including connection of fittings with necessary wire of suitable size (min 2.5 sq. mm) connection from nearest point/JB with supply of all materials (wire) at site as per detailed specification vide annexure-A2 & A3. Make of fittings-Phillips/Crompton/Bajaj/Havells/Osram/Surya/Syska/Magik/C&S/HPL/Halonix/Jaquar. If any other make is offered other than mentioned above should be as per specification attached at Annexure A2 & A3 with prior approval from competent authority.
9	Wiring of sub-main line 2.5 sq. mm Phase & neutral (2 Nos copper wire) with ECC of 1no. 1.5 sq. mm, PVC insulated single core, M/strand copper wire as per General specification of IE rule.
	<b>Details as:-</b> Supply for wiring of sub-main line phase and neutral (2 Nos copper wire) through casing capping/conduit/concealed with PVC insulated, single core, multi stranded, unsheathed, Halogen Free Flame Retardant HFFR/LSZH/FRZH/ZHFR Insulated Industrial Cables 1100V grade ISI marked copper conductor of size 2.5 mm <sup>2</sup> (as per IS 694:1990) & ECC of size 1 no. 1.5 sq. mm PVC insulated single core, M/Strand copper wire including supply of all materials such as casing capping/ conduit. Wiring must be done as per IS standard 732, IS 5216 Part-1 and other relevant BIS. Make of wire: Anchor/KDK/Finolex/Polycab/RRKabel/KEI/Havells or similar. Make of Casing capping/conduit: Zeolite/Polycab/Presto Plast or similar. Diameter of Conduit pipe/width of Casing capping used should be as per IE rules and CPWD guidelines.
10	Wiring of sub-main line 4 sq. mm Phase & neutral (2 Nos copper wire) with ECC of 1no. 2.5 sq. mm, PVC insulated single core, M/strand copper wire as per General specification of IE rule.
	<b>Details as:-</b> Supply for wiring of sub-main line phase and neutral (2 Nos copper wire) through casing capping/conduit/concealed with PVC insulated, single core, multi stranded, unsheathed, Halogen Free Flame Retardant HFFR/LSZH/FRZH/ZHFR Insulated Industrial Cables 1100V grade ISI marked copper conductor of size 4 mm <sup>2</sup> (as per IS 694:1990) & ECC of size 1 no. 2.5 sq. mm PVC insulated single core copper wire including supply of all materials such as casing capping/ conduit. Wiring must be done as per IS standard 732, IS 5216 Part-1 and other relevant BIS. Make of wire: Anchor/KDK/Finolex/Polycab/RRKabel/KEI/Havells or similar. Make of Casing capping/conduit: Zeolite/Polycab/Presto Plast or similar. Diameter of Conduit pipe/width of Casing capping used should be as per IE rules and CPWD guidelines.
11	Wiring of sub-main line 6 sq. mm Phase & neutral (2 Nos copper wire) with ECC of 1no. 4 sq. mm (minimum), PVC insulated single core, M/strand copper wire as per General specification of IE rule.
	<b>Details as:-</b> Supply for wiring of sub-main line phase and neutral (2 Nos copper wire) through casing capping/conduit/concealed with PVC insulated, single core, multi stranded, unsheathed, Halogen Free Flame Retardant HFFR/LSZH/FRZH/ZHFR Insulated Industrial Cables 1100V grade ISI marked copper conductor of size 6 mm <sup>2</sup> (as per IS 694:1990) & ECC of size 1 no. 2.9 sq. mm (minimum) PVC insulated single core copper wire including supply of all materials such as casing capping/ conduit. Wiring must be done as per IS standard 732, IS 5216 Part-1 and other relevant BIS. Make of wire: Anchor/KDK/Finolex/Polycab/RRKabel/KEI/Havells or similar. Make of Casing capping/conduit: Zeolite/Polycab/Presto Plast or similar. Diameter of Conduit pipe and width of Casing capping used should be as per IE rules and CPWD guidelines.
12	Wiring of Main line 3 Phase & neutral (4 wire) copper conductor of size 10 mm sq with ECC as per General specification of IE rule.
	<b>Details as:</b> - Wiring of main line 3 Phase & neutral (4 wire) through PVC casing & capping/conduit Single core Multi strand unsheathed, Halogen Free Flame Retardant HFFR/LSZH/FRZH Insulated Industrial Cables 1100V

	grade ISI marked copper conductor of size 6 mm <sup>2</sup> (as per IS 694:1990) & ECC as per General specification of IE rule including supply of all materials. Wiring must be done as per IS standard 732, IS 5216 Part-1 and other relevant BIS. Make of wire- Anchor/KDK/Finolex/Polycab/RR-Kabel/KEI/Havells or similar.
13	<p>Supply, fixing &amp; connection of ceiling rose (6A) for light/fan/exhaust/wall fan point</p> <p><b>Details as:</b> - Supply, fixing &amp; connection of ceiling rose (6A) for light/fan/exhaust/wall fan point. Make :- Havells/Roma/Legrand/Crabtree/LK/ABB/C&amp;S/Polycab/Goldmedal or similar.</p>
14	<p>Supply, fixing, connection of Busbar Chamber 4 way of Cap-63A wall mounted including connection of LT cable with proper lugs and cable gland etc.</p> <p><b>Details as:</b> - Supply, fixing, connection of Bus-bar Chamber 4 way of Cap-63A wall mounted including connection of LT cable with proper lugs and cable gland etc. including labour. Make- ABB/LK/Legrand/Siemens/Schneider/Havells/C&amp;S/BCH or similar.</p>
15	<p>Surface wiring of light/lamp/Fan/Exhaust points through PVC casing &amp; capping.</p> <p><b>Details as:</b> - Wiring of light/fan/Exhaust/wall fan points (non-modular) with PVC cable Single core Multi strand unsheathed, Halogen Free Flame Retardant HFFR/LSZH/FRZH/ZHFR Insulated Industrial Cables 1100V/grade ISI marked copper conductor of size 1.5 mm<sup>2</sup> Phase &amp; neutral (2 Nos copper wire) (as per IS 694:1990) from Sub Distribution board &amp; ECC of size 1 sq. mm PVC insulated Single core, M/Strand copper wire including supply of all materials such as switch, Switch board, casing capping/ conduit and shall follow relevant IS for installation of wiring. Wiring must be done as per IS standard 732, IS 5216 Part-1 and other relevant BIS. Wire make: Anchor/KDK/Finolex/Polycab/RR Kabel/KEI/Havells or similar. Make of casing/conduit/ JBZeolite/ Presto plast/Polycab or similar. Make of Switch and socket/PVC/GI board- Havells/Roma/Legrand/Crabtree/LK/ABB/C&amp;S/Polycab/Goldmedal or similar.</p>
16	<p>Extra cost for concealed wiring for light /fan/exhaust/wall fan point.</p> <p><b>Details as:</b> - Extra cost for concealed wiring of light/lamp/Fan/Exhaust points includes cutting of wall for concealed wiring, laying of conduit pipe, wires etc. and re-plastering of cutting portion with finishing of wall as per previous wall including labour.</p>
17	<p>Supply, fixing &amp; commissioning of MCCB of Cap-100A, 4 Pole 415V, 50Hz complete with enclosure.</p> <p><b>Details as:</b> - Supply, fixing and connection of Thermal magnetic MCCB 100-160A (50kA, Ics= 100% Icu), 4P, 415V, conforming to IEC-60947-2 complete with enclosure. Make:- ABB/Legrand/LK/Siemens/Schneider/Havells/BCH/C&amp;S or similar.</p>
18	<p>Supply, fixing &amp; connection of SPN, 2way MCB sheet steel 18 SWG original enclosure, (18-20 micron) powder painted.</p> <p><b>Details as:</b> - Supply, fixing &amp; connection of SPN, 2 way MCB sheet steel 18 SWG original enclosure as per ABB cat no. SEN 2P or similar. Make – ABB/LK/Legrand/Siemens/Schneider/Havells/C&amp;S/BCH or similar.</p>
19	<p>Supply, fixing and connection of MCB DP (6-32A) with enclosure.</p> <p><b>Details as:-</b> Supply with fixing and commissioning of DP MCB (6-32A) as per ABB cat no SB202 MC6-32 or similar including fixing and connection as per site requirement. Make- ABB/Legrand/LK/Siemens/Schneider/Havells/BCH/C&amp;S/Polycab or similar.</p>
20	<p>Supply, fixing &amp; connection of industrial wall socket outlet watertight with plug of Cap-63A (3P+E+N) for welding point with GI sheet cover.</p> <p><b>Details as:</b> - Supply fixing &amp; connection of Industrial Wall Socket Outlet Watertight with Plug of Cap-63A, IP-67 (3P+E+N) as per Hensel cat no. 169 or similar for welding point with GI sheet cover of 14 SWG of suitable size. Make: Hensel/Legrand/Havells/ABB/Schneider or similar.</p>
21	<p>Supply, fixing &amp; connection of Empty box made with thermoplastic PC (LXBXH)(mm) (300X300X170) IP-66 consist with 04 nos. Al busbar of suitable size of Cap-63A for busbar chamber.</p> <p><b>Details as:</b> - Supply fixing &amp; connection of Empty box made with thermoplastic PC (L X B X H) (mm) (300 x 300 x 170) IP-66 as per Hensel cat no. K 0201 or similar consisting of 4 nos. Aluminum busbar of suitable size of Cap-63A for busbar chamber including all accessories as per site requirement. Make:</p>

	Hensel/Legrand/Havells/ABB/Schneider or similar.
22	<p>Supply, fixing &amp; connection of SPN 6 way (No of module 6+2) MCB sheet steel Distribution Board with metal door Including supply of 4 nos SP MCB (6-32A) &amp; 01 no RCCB 32/40A (100mA) including all wiring.</p> <p><b>Details as:</b> - Supply, fixing &amp; connection of SPN 6 way (No of module 6+2) MCB sheet steel Distribution board with metal door as per ABB model no- E-SHC M 6 or similar Including supply of 4 nos. of SP MCB (6-32A) as per ABB cat no- SB201 M- C6-32 or similar &amp; 01 no RCCB 32/40A (100mA) as per ABB cat no- FB202 AC-40/0.1 or similar including labour charges. Make: ABB/LK/Legrand/Siemens/Schneider/Havells/C&amp;S/BCH or similar.</p>
23	<p>Supply, fixing and connection of LED 16W fittings suitable for Pit/ under Catwalk light operating voltage (40-72V) AC as per specification.</p> <p><b>Details as:</b> - Supply, fixing and connection of LED 16W fittings suitable for Pit light operating voltage (40- 72V) AC +/-10% tolerance as per HPL cat No-HPLLEDPIT16WAC72 or similar with pressure die cast aluminium enclosure with provision of aluminum heat sink arrangement for heat dissipation. IP-65 or better. LED efficacy &gt; 120Lm/watt, 6500 K, LED life- 50000 Hrs. Make of fittings: Phillips/Crompton/Bajaj/Havells/Osram/Surya/Syska/Magik/C&amp;S/HPL/Jaquar or similar.</p>
24	<p>Supply and fixing of SS cage of size min (15.5" x 6" x 4") or as per site made with SS angle frame and SS wire mesh for covering the pit light.</p> <p><b>Details as:</b> - Supply and fixing of SS cage of size min (15.5" x 6" x 4") or as per site made with SS angle frame of thickness (2mm) and SS wire (size 4mm dia) mesh fixing with screw/nut/bolt etc at site location for covering the pit light. (Drawing should be approved before supply).</p>
25	<p>Supply of power supply unit 3KVA for pit light as per specification.</p> <p><b>Details as:</b> - Supply of power supply unit (step down transformer) for pit light as per specification like Capacity 3 KVA. Input voltage: 220-230V AC, Output voltage: 48-72V AC (Cu coil) in suitable enclosure for power to pit light.</p>
26	<p>Fixing and connection of power supply unit at site location.</p> <p><b>Details as:</b> - Fixing, commissioning, connection &amp; testing of power supply unit at site location with necessary fixing arrangement.</p>
27	<p>Supply and fixing of enclosure of size min (L X W X D/2 ' x 3' X 2.5') MS original sheet enclosure of 14 SWG with inside &amp; outside anticorrosive ISI brand paint and hinged door to be kept on min 3 feet height tool made with MS angle (76 x6) mm placing of Louvolite transformer.</p> <p><b>Details as:</b> - Supply and fixing of enclosure of size min (L X W X D/2 ' x 3' X 2.5' ) MS original sheet enclosure of 14 SWG with inside &amp; outside anticorrosive ISI brand paint and hinged door to be kept on min 3 feet height tool made with MS angle (76mm x 76mm x 6 mm) placing of Power supply unit (Louvolute transformer). (Drawing should be approved before supply of material).</p>

(II) Electrical work in c/w "Construction of underground water tank of 20000 gallon Cap at DEMU shed, Sahibganj."	
S. No.	Description of Item
1	Supply and fixing of 1.1KV LT E – PVC/XLPE/HS.KITS-STRAIGHT THROUGH JOINT kit 70-120 sq mm.
	<b>Details as:</b> - Supply, fixing and commissioning of 1.1KV LT E – PVC/XLPE/HS.KITS-STRAIGHT THROUGH JOINT kit 70-120 sq mm Make-Multi Pressing/3M /Denson/Raychem/M-seal or similar.
2	Laying of LT cable through the HDPE pipe 50 mm Diameter PE-100 as per IS 4984 or Latest for underground cable laying of min 0.75 meter depth including supply of HDPE pipe (Cable will be supplied by Railway) for 25 sq mm cable.
	<b>Details as:</b> - Laying of LT cable through 50 mm dia HDPE pipe PE 100 as per IS 4984 and IS 14333 or latest for underground cable laying of minimum depth 0.75 meter to laying and inserting of LT cable of 25 sq mm dia through HDPE pipes including supply of HDPE Pipe and transportation of cable from different locations to proposed site. (Cable will be supplied by Railway) Make of HDPE pipe – Oriplast/Supreme/Astral/Sudhakar or similar.
3	Laying of LT cable through the HDPE pipe 90 mm Diameter PE-100 as per IS 4984 or Latest for underground cable laying of min 0.75 meter depth including supply of HDPE pipe (Cable will be supplied by Railway) for 70-95 sq mm cable.
	<b>Details as:</b> - Laying of LT cable through 90 mm dia HDPE pipe PE 100, PN-6 as per IS 4984 and IS 14333 or latest for underground cable laying of minimum depth 0.75 meter to laying and inserting of LT cable of 70-95 sq mm dia through HDPE pipes including supply of HDPE Pipe and transportation of cable from different locations to proposed site. (Cable will be supplied by Railway) Make of HDPE pipe – Oriplast/Supreme/Astral/Sudhakar or similar.
4	Cable trenching, laying, back filling & Connection of LT cables as per IS-1255, 1983 or latest.
	<b>Details as:</b> - Cable trenching, laying, back filling & connection of LT cables through ground, under Masonry floor /wall re-plastering for matching with the wall, road crossing as per site requirement with cable route markers & meggering 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. (Cable will be supplied by Rly.) 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.
5	Cable laying through pole/wall/floor as per site requirement as per IS- 1255, 1983 or latest.
	<b>Details as:</b> - Cable laying LT with proper MS Clamp, nut bolt etc. through pole/wall/floor/ surface existing Pipe Etc. as per site requirement with meggering before laying as per IS-1255, 1983 or latest including transportation of cable from different locations to proposed site. (Cable will be supplied by Railway).
6	Supply & laying of 3" dia medium gauge ISI brand heavy duty G.I. pipe for LT cable Track crossing and road crossing for rising of cable. (Cable will be supplied by Railway.)
	<b>Details as:</b> - Supply, laying and fixing of 3" dia medium gauge ISI brand heavy duty G.I. pipe for LT cable Track crossing and road crossing and for rising of cable as per IS. Make- Jindal/Tata/Bansal.
7	Fixing and connection of submersible pump motor set at site location.
	<b>Details as:-</b> Fixing and connection of submersible pump motor set at site location as per instruction of concerned SSE/E/G. (Submersible pump will be supplied by Railway.)
8	Supply, testing, fixing and connection of ASD submersible pump starter cap-7.5 HP, 3 Phase.
	<b>Details as:-</b> Supply, testing, fixing and connection of ASD submersible pump starter cap-7.5 HP, 3 Phase as per Havells cat No. IHSASAJ1LA or similar. Make:- Havells/CRI/LK/KSB/Crompton or similar.



9	Supply & fitment of 3 inch dia 3 meters long heavy duty G.I. pipe with both end threaded and one end socket.
	<b>Details as:-</b> Supply & fitment of 3 inch dia., 3 meters long heavy duty G.I. pipe with both end threaded and one end socket conforming to <b>IS 1239 (Part 1)</b> for boring work at site location. Make of pipe and socket: Tata/Jindal/Bansal or similar.
10	Supply & fitment of 3 inch dia 1.5 meters long heavy duty G.I. pipe with both end threaded and one end socket.
	<b>Details as:-</b> Supply & fitment of 3 inch dia., 1.5 meters long heavy duty G.I. pipe with both end threaded and one end socket conforming to <b>IS 1239 (Part 1)</b> for boring work at site location. Make of pipe and socket: Tata/Jindal/Bansal or similar.
11	Supply & fitment of 3 inch dia G.I. bend pipe.
	<b>Details as:-</b> Supply & fitment of 3 inch dia G.I. bend pipe conforming to <b>IS 1239 (Part 1)</b> for boring work at site location. Make:- Tata/Jindal/Bansal or similar.
12	Supply & fitment of 3 inch dia CIDF Sluice-valve of reputed make having ISI mark for discharge pipeline.
	<b>Details as:-</b> Supply & fitment of 3 inch dia CIDF Sluice-valve of reputed make having ISI mark for discharge pipeline as per site location.
13	Supply & fitment of 3 inch dia CIDF Non-return valve of reputed make having ISI mark for discharge pipeline.
	<b>Details as:-</b> Supply & fitment of 3 inch dia CIDF Non-return valve of reputed make having ISI mark for discharge pipeline as per site location.
14	Supply & fitment of 3 inch dia heavy T with flange and short piece.
	<b>Details as:-</b> Supply & fitment of 3 inch dia heavy T with flange and short piece as per site location.
15	Supply & fitment of pressure gauge with cock of any ISI mark.
	<b>Details as:-</b> Supply & fitment of pressure gauge with cock of any ISI mark at site location.
16	Supply and laying of 3 cores copper (EC grade) submersible cable 6 sq mm.
	<b>Details as:-</b> Supply and laying of 3 cores copper (EC grade) submersible cable 6 sq mm for connection of the submersible pump motor to the motor pump starter at site location. Make of cable:- Havells/Polycab/CRI/KSB/Finolex or similar.
17	Supply, fixing & installation of 8 mm steel wire rope size 6x19 IWRC (Independent wire rope core) for holding Pump-motor set with Column pipe, etc. as per site requirements.
	<b>Details as:-</b> Supply, fixing & installation of 8 mm steel wire rope size 6x19 IWRC (Independent wire rope core) for holding Pump-motor set with Column pipe, with all accessories as per site requirements.
18	Surface wiring of light/lamp/fan/exhaust points through PVC casing & capping. (non-modular)
	<b>Details as:-</b> Surface wiring of light/lamp/fan/exhaust points line, phase and neutral (2 Nos copper wire) through casing capping/conduit/concealed with PVC insulated, single core, multi stranded, unsheathed, Halogen Free Flame Retardant HFFR/LSZH/FRZH/ZHFR Insulated Industrial Cables 1100V grade ISI marked copper conductor of size 1.5 mm <sup>2</sup> (as per IS 694:1990) & ECC of size 1 no. 1.0 sq. mm PVC insulated single core copper wire including supply of all materials such as casing capping/ conduit. Wiring must be done as per IS standard 732, IS 5216 Part-1 and other relevant BIS. Make of wire: Anchor/KDK/Finolex/Polycab/RRKabel/KEI/Havells or similar. Make of Casing capping/conduit: Zeolite/Polycab/Presto Plast or similar. Diameter of Conduit pipe/width of Casing capping used should be as per IE rules and CPWD guidelines.
19	Extra cost for concealed wiring for light /fan/exhaust/wall fan point.
	<b>Details as:-</b> Extra cost for concealed wiring for light/fan/exhaust/wall fan point includes cutting of wall for concealed wiring, laying of conduit pipe, wires etc. and re-plastering of cutting portion with finishing of wall as per previous wall including labour.

20	<p>Wiring of sub-main line 2.5 sq mm phase &amp; neutral (2 Nos copper wire) with ECC of 1 no. 1.5 sq mm, PVC insulated single core, M/strand copper wire as per General specification of IE rule.</p> <p><b>Details as:</b> - Supply for wiring of sub-main line phase and neutral (2 Nos copper wire) through casing capping/conduit/concealed with PVC insulated, single core, multi stranded, unsheathed, Halogen Free Flame Retardant HFFR/LSZH/FRZH/ZHFR Insulated Industrial Cables 1100V grade ISI marked copper conductor of size 2.5 mm<sup>2</sup> (as per IS 694:1990) &amp; ECC of size 1 no. 1.5 sq. mm PVC insulated single core, M/Strand copper wire including supply of all materials such as casing capping/ conduit. Wiring must be done as per IS standard 732, IS 5216 Part-1 and other relevant BIS. Make of wire: Anchor/KDK/Finolex/Polycab/RRKabel/KEI/Havells or similar. Make of Casing capping/conduit: Zeolite/Polycab/Presto Plast or similar. Diameter of Conduit pipe/width of Casing capping used should be as per IE rules and CPWD guidelines.</p>
21	<p>Wiring of sub-main line 4 sq mm phase &amp; neutral (2 Nos copper wire) with ECC of 1 no. 2.5 sq mm, PVC insulated single core, M/strand copper wire as per General specification of IE rule.</p> <p><b>Details as:</b> - Supply for wiring of sub-main line phase and neutral (2 Nos copper wire) through casing capping/conduit/concealed with PVC insulated, single core, multi stranded, unsheathed, Halogen Free Flame Retardant HFFR/LSZH/FRZH/ZHFR Insulated Industrial Cables 1100V grade ISI marked copper conductor of size 4 mm<sup>2</sup> (as per IS 694:1990) &amp; ECC of size 1 no. 2.5 sq. mm PVC insulated single core copper wire including supply of all materials such as casing capping/ conduit. Wiring must be done as per IS standard 732, IS 5216 Part-1 and other relevant BIS. Make of wire: Anchor/KDK/Finolex/Polycab/RRKabel/KEI/Havells or similar. Make of Casing capping/conduit: Zeolite/Polycab/Presto Plast or similar. Diameter of Conduit pipe/width of Casing capping used should be as per IE rules and CPWD guidelines.</p>
22	<p>Wiring of sub-main line 6 sq mm phase &amp; neutral (2 Nos copper wire) with ECC of 1 no. 2.9 sq mm, PVC insulated single core, M/strand copper wire as per General specification of IE rule.</p> <p><b>Details as:</b> - Supply for wiring of sub-main line phase and neutral (2 Nos copper wire) through casing capping/conduit/concealed with PVC insulated, single core, multi stranded, unsheathed, Halogen Free Flame Retardant HFFR/LSZH/FRZH/ZHFR Insulated Industrial Cables 1100V grade ISI marked copper conductor of size 6 mm<sup>2</sup> (as per IS 694:1990) &amp; ECC of size 1 no. 4 sq. mm (minimum) PVC insulated single core copper wire including supply of all materials such as casing capping/ conduit. Wiring must be done as per IS standard 732, IS 5216 Part-1 and other relevant BIS. Make of wire: Anchor/KDK/Finolex/Polycab/RRKabel/KEI/Havells or similar. Make of Casing capping/conduit: Zeolite/Polycab/Presto Plast or similar. Diameter of Conduit pipe and width of Casing capping used should be as per IE rules and CPWD guidelines.</p>
23	<p>Wiring of Main line 3 Phase &amp; neutral (4 wire) copper conductor of size 10 mm sq with ECC as per General specification of IE rule</p> <p><b>Details as:</b> - Wiring of main line 3 Phase &amp; neutral (4 wire) through PVC casing &amp; capping/conduit Single core Multi strand unsheathed, Halogen Free Flame Retardant HFFR/LSZH/FRZH Insulated Industrial Cables 1100V grade ISI marked copper conductor of size 10 mm<sup>2</sup> (as per IS 694:1990) &amp; ECC as per General specification of IE rule including supply of all materials. Wiring must be done as per IS standard 732, IS 5216 Part-1 and other relevant BIS. Make of wire- Anchor/KDK/Finolex/Polycab/RR-Kabel/KEI/Havells or similar.</p>
24	<p>Extra cost for concealed of Main/sub main line 1.5/4/ 6 sq mm.</p> <p><b>Details as:-</b> Extra cost for concealed of sub main line/main line includes cutting of wall for concealed wiring, laying of conduit pipe, wires etc. and re-plastering of cutting portion with finishing of wall as per previous wall including labour.</p>
25	<p>Supply, fixing and connection of 6A plug socket-01 nos. Switch -6A -01 nos. with board with wire connection.</p> <p><b>Details as:-</b> Supply, fixing and connection of 6A plug socket-01 nos. switch-6A-01 nos. with board. Socket with switch with wiring concealed/Surface wiring on wall with PVC copper wire ISI marked, Halogen Free Flame Retardant HFFR/LSZH/FRZH/ZHFR Insulated Industrial Cables PVC Insulated 1100V grade ISI marked copper conductor of size 2.5 mm<sup>2</sup> (as per IS 694:1990) &amp; ECC of size 1.5 sq. mm copper wire including supply of all materials like PVC/GI board with cover etc. re-plastering, matching of the wall, as per site requirements. Wiring must be done as per IS standard 732, IS 5216 Part-1 and other relevant BIS. Make of switch/socket-Havells/Roma/Legrand/Crabtree/LK/ABB/C&amp;S/Polycab/Goldmedal or similar. Make of wire: Anchor/Finolex/Polycab/RR Kabel/KEI or similar. Make of Casing capping: Zeolite/Polycab/Presto Plast or similar.</p>

26	Supply, fixing and connection of 20A & 10A plug socket-01 nos. Switch 20A-01 nos. with board with wire connection.
	<b>Details as:-</b> Supply connection & fixing of 20A & 10 A multiple socket and modular 20 A switch for plug point with PVC insulated, single core, multi stranded, unsheathed, HFFR/LSZH/FRZH/ZHFR Insulated Industrial Cables PVC Insulated 1100V grade ISI marked copper conductor of size 4 mm <sup>2</sup> (as per IS 694:1990) & ECC of size 1 no. 2.5 sq. mm PVC insulated single core copper wire including supply of all materials like PVC/GI board with cover etc. Including supply of all materials. Wiring must be done as per IS standard 732, IS 5216 Part-1 and other relevant BIS. Make of Switch and socket/PVC/GI board (modular)- Havells/Roma/Legrand/Crabtree/LK/ABB/C&S/Polycab/Goldmedal or similar. Make of wire: Anchor/Finolex/Polycab/RRKabel/KEI or similar. Make of Casing capping: Zeolite/Polycab/Presto Plast or similar. Separate wiring circuit need to be done. 20A & 10A plug socket outlets shall be wired in the 'power' circuit.
27	Extra cost for concealed of 6A/6-16A plug point.
	<b>Details as:-</b> Extra cost for concealed for 6A/6-16A plug point includes cutting of wall for concealed wiring, laying of conduit pipe, wires etc and re-plastering of cutting portion with finishing of wall as per previous wall including labour.
28	Supply, fixing & connection of LED 9W lamp with suitable angular batten holder with metal ring.
	<b>Details as:-</b> Supply, fixing & connection of LED 9W lamp, with suitable angular batten holder. Make of LED lamp: - Phillips/Crompton/Bajaj/Havells/Osram/Surya/Syska/C&S/HPL/Magik/Jaquar or similar. Make of holder- Anchor/Havells/Standard/Roma or similar.
29	Supply & fixing of LED tube light fitting complete set 20W (Aluminum housing) System efficacy min-120Lm/w.
	<b>Details as:-</b> Supply of LED tube light fitting complete set 20W (Aluminum Housing) System efficacy min-120Lm/w. and fixing & connection of fittings with necessary wire connection from nearest point/JB with supply of all materials (wire) as per site including transportation of fittings at site as per details specification vide Annexure- A1 & A3 for reputed make of fittings-Phillips/Crompton/Bajaj/Havells/Osram/Surya/Syska/Magik /C&S/HPL/Halonix/Polycab. If any other make offered other than mentioned above should be as per specification attached at Annexure A1 & A3 with prior approval from Railway engineer/administration.
30	Supply, replacement/new provision and fixing of BLDC energy efficient (5 star rated) ceiling fan 1200 mm sweep wattage-max 35W with air delivery: min 230 cu/meter/minute (with remote)
	<b>Detail as:-</b> Supply of BLDC energy efficient (5 star rated) ceiling fan (with remote) 1200 mm sweep, copper wound having operating voltage of range 165V-285V AC, wattage rating- less than or equal to 35 Watt with air delivery of minimum 230 m <sup>3</sup> /min and maximum speed of 385 RPM, Service value of more than or equal to 6.5, Class of Copper Insulation for winding- Class F, with provision of SS safety wire rope, Power factor> 0.9 and a minimum warranty/guarantee of 1 year or more (from OEM/dealer of OEM) and fixing & connection at site location with necessary fixing arrangement, downward rod and wire connection. Make- Atomberg/Superfan/Polycab/Usha/Havells/Crompton/orient/Bajaj or similar.
31	Supply, fixing and connection of Exhaust Fan of 300 min.
	<b>Details as:-</b> Supply of Exhaust Fan of 300 mm sweep min 1320 RPM double ball bearing heavy duty (LOW Noise type) anti-corrosive treatment and metallic finish with louver shutter. Labour charge includes fixing and connection of exhaust fan including cutting of holes, Masonry work, re-plastering, recoloring with matching of the wall. Make-Marshall/Usha/Crompton/standard/Havells/Polycab/Orient/Bajaj or similar.
32	Supply and fixing of G.I. Pipe heavy gauge size 1/1.25 inch dia 2.5 ft. long bended as per site requirement including 2 sets of M.S clamps, nuts & bolts, wiring with flexible PVC Cu. Cable through G.I. Pipe.
	<b>Details as:-</b> Supply and fixing of G.I. Pipe heavy gauge size 1/1.25 inch dia 2.5 ft. long bended as per site requirement including 2 sets of M.S clamps, nuts & bolts, wiring with flexible PVC Cu. Cable through G.I. Pipe. Make-TATA/Jindal/Bansal.
33	Supply, fixing and replacement/new provision of floor mounted LT distribution Feeder pillar consists of followings items. 1. 3 phase with neutral Aluminum bus bar of 300 amps & nut bolt etc.
	<b>Details as:-</b> Supply, fixing and connection of floor mounted LT distribution Feeder pillar 4-way size 36"x30"x20" made by 50mmx50mmx6mm angle covered with inside & outside anticorrosive painted with MS



	<p>sheet of 14 SWG(2mm thick) on RCC basement consisting of the following components:  i) 3 phase with neutral Aluminum bus bar of 300 amps &amp; copper nut bolt etc. as per IS specification. ii) 2 Nos. 440 Volts Danger plate for both side.  iii) 04 No Porcelain Cut Out assembly of capacity 200 amps fixing into the heavy-duty PVC board. iv) Hinged double doors of the same material shall be provided on the front, with necessary handles and inbuilt locks with double keys. Neoprene gaskets shall be provided for the doors.</p>
	<p>Supply, fixing &amp; connection of SPN 6 way (No of module 6+2) MCB sheet steel Distribution Board with metal door  i) Including supply of 4 nos SP MCB (6-32A)  ii) 01 no RCCB 32/40A (100mA)</p>
34	<p><b>Details as:-</b> Supply, fixing &amp; connection of SPN 6 way (No of module 6+2) MCB sheet steel Distribution board with metal door as per ABB model no- E-SHC M 6 or similar Including supply of 4 nos. of SP MCB (6 32A) as per ABB cat no- SB201 M- C6-32 or similar &amp; 01 no RCCB 32/40A (100mA) as per ABB cat no- FB202 AC- 40/0.1 or similar including labour charges. Make: ABB/LK/Legrand/Siemens/Schneider/Havells/C&amp;S/BCH or similar.</p>
	<p>Supply, installation, commissioning &amp; testing of earthing as per IS:3043 or latest amendment.</p>
35	<p><b>Details as:-</b> Supply, erection and commissioning of earth pipe 2"dia 10 feet long heavy duty (min thickness 4.5mm) ISI marked G.I. Pipe Tata/ Jindal/Bansal ISI mark pipe. The labour charge includes construction of Earth chamber including drawing of 6 SWG G.I. wire from earth electrode to main switch/panel complete with Masonry work and covering by RCC slab with net plastering as per site requirement, writing of earth value in Ohms with black colour paint and painting of earth chamber &amp; covering with yellow paint including supply of all materials as per IS: 3043 or latest with all necessary connection as per site requirement.</p>
	<p>Supply, fixing &amp; commissioning of 5 Meters length GI octagonal pole with all accessories and necessary RCC foundation.</p>
36	<p><b>Details as:-</b> Supply of 5 Meters length GI octagonal pole, minimum internal &amp; external surface of the pole shall be Hot Dip galvanized to 65 micron DFT and minimum sheet thickness-3mm with inbuilt junction box i.e. Flush Door &amp; Base plate size minimum 200x200x12 mm with Single/Double arm of minimum 1000 mm long (each) or as per site requirement suitable for street light &amp; standard ARM cap and cable terminal board for internal connection of cable as per site requirements Cat ref:- Bajaj BOP- 5030 or identical. Make: Bajaj/Skipper Ltd./Utkrash/Surya/Valmont or similar. Erection and commissioning and along with transportation at site location of above GI pole. (Cement:Stone:Sand= 1 : 2 : 4) including RCC foundation accessories including foundation bolt of minimum size- 4 nos x 16mm(D)x 600mm(L).</p>
	<p>Supply, fixing &amp; connection of LED street light 45W. System efficacy min-140Lm/W.</p>
37	<p><b>Details as:-</b> Supply and fixing and connection of LED Street light 45W. System efficacy min-140Lm/w as per detailed specification vide Annexure-A2 &amp; A3. Make of fittings- Phillips/Crompton/Bajaj/Havells/Osram /Surya/Syska/Magik/C&amp;S/HPL/Halonix/Polycab. If any other make is offered other than mentioned above should be as per specification attached at Annexure A2 &amp; A3 with prior approval from competent authority.</p>
	<p>Supply, fixing &amp; commissioning of MCCB of Cap-100A, 4 Pole 415V, 50Hz complete with enclosure.</p>
38	<p><b>Details as:-</b> Supply, fixing and connection of Thermal magnetic MCCB 100-160A (50kA, Ics= 100% Icu), 4P, 415V, conforming to IEC-60947-2 complete with enclosure. Make:- ABB/Legrand/LK/Siemens/Schneider/Havells/BCH/C&amp;S or similar.</p>
	<p>Provision of Heavy flooring of size 16 feet x 16 feet x 2 feet with boundary wall for transformer placement (Size as per site, total volume of work remain same)</p>
39	<p><b>Details as:-</b> Provision of heavy duty flooring for transformer base of size 16 feet x 16 feet x 2 feet (Height) with provision of ramp. Flooring consists of 2" thick heavy-duty flooring over 100 mm for cement concrete (1:1.5:3) laid over single layer brick flat soling. The boundary wall consists of 10" thick wall height up-to 5 feet. The wall should be plastered on both side &amp; snowcem (12mm) to be done on plastered surface. A grill gate having width 6 feet should be fixed in suitable position. The foundation of boundary wall should be of standard depth &amp; work to be completed in all respect as per instruction of site engineer including cost of material, labour and any other charges.</p>

(III) Electrical work in c/w "Provision of Brake van siding & Engine escape at Sakrigali station."

S. No.	Description of Item
1	<p>Laying of LT cable through the HDPE pipe 50 mm Diameter PE-100 as per IS 4984 or Latest for underground cable laying of min 0.75 meter depth including supply of HDPE pipe (Cable will be supplied by Railway) for 25 sq mm cable.</p> <p><b>Details as:-</b> Laying of LT cable through 50 mm dia HDPE pipe PE 100 as per IS 4984 and IS 14333 or latest for underground cable laying of minimum depth 0.75 meter to laying and inserting of LT cable of 25 sq mm dia through HDPE pipes including supply of HDPE Pipe and transportation of cable from different locations to proposed site. (Cable will be supplied by Railway) Make of HDPE pipe – Oriplast/Supreme/Astral/Sudhakar or similar.</p>
2	<p>Cable trenching, laying, back filling &amp; Connection of LT cables as per IS-1255, 1983 or latest.</p> <p><b>Details as:-</b> Cable trenching, laying, back filling &amp; connection of LT cables through ground, under Masonry floor /wall re-plastering for matching with the wall, road crossing as per site requirement with cable route markers &amp; meggering before laying with certificate. In case of underground proper grade of bricks &amp; sand to be used for back filling as per IS-1255, 1983 or latest. (Cable will be supplied by Rly.) 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.</p>
3	<p>Cable laying through pole/wall/floor as per site requirement as per IS- 1255, 1983 or latest.</p> <p><b>Details as:-</b> Cable laying LT with proper MS Clamp, nut bolt etc. through pole/wall/floor/ surface existing Pipe Etc. as per site requirement with meggering before laying as per IS-1255, 1983 or latest including transportation of cable from different locations to proposed site. (Cable will be supplied by Railway).</p>
4	<p>Supply, laying &amp; fixing of 3" dia medium gauge ISI brand G.I. pipe for LT cable Track crossing and road crossing and for rising of cable (Cable will be supplied by Railway).</p> <p><b>Details as:-</b> Supply, laying and fixing of 3" dia medium gauge ISI brand heavy duty G.I. pipe for LT cable Track crossing and road crossing and for rising of cable as per IS. Make- Jindal/Tata/Bansal.</p>
5	<p>Supply, fixing &amp; commissioning of 5 Meters length GI octagonal pole with all accessories and necessary RCC foundation. (Straight arm bracket).</p> <p><b>Details as:-</b> Supply of 5 Meters length GI octagonal pole, minimum internal &amp; external surface of the pole shall be Hot Dip galvanized to 65 micron DFT and minimum sheet thickness-3mm with inbuilt junction box i.e. Flush Door &amp; Base plate size minimum 200x200x12 mm with Single/Double arm of minimum 1000 mm long (each) or as per site requirement suitable for street light &amp; standard ARM cap and cable terminal board for internal connection of cable as per site requirements Cat ref:- Bajaj BOP- 5030 or identical. Make: Bajaj/Skipper Ltd./Utkrash/Surya/Valmont or similar. Erection and commissioning and along with transportation at site location of above GI pole. (Cement:Stone:Sand= 1 : 2 : 4) including RCC foundation accessories including foundation bolt of minimum size- 4 nos x 16mm(D)x 600mm(L).</p>
6	<p>Supply, fixing and connection of LED Flood light 100W.</p> <p><b>Details as:-</b> Supply of LED 100 W flood light complete set, System efficacy min-140Lm/w and fixing and connection at site location with necessary fixing arrangement including connection of fittings with necessary wire of suitable size (min 2.5 sq. mm) connection from nearest point/JB with supply of all materials (wire) at site as per detailed specification vide annexure-A2 &amp; A3. Make of fittings- Phillips/Crompton/Bajaj/Havells/Osram/Surya/Syska//Magik/C&amp;S/HPL/Jaquar. If any other make offered other than mentioned above should be as per specification attached at Annexure A2 &amp; A3 with prior approval from competent authority.</p>

7	Supply, fixing & commissioning of MCCB of Cap 32-100A, 4 Pole 415V, 50Hz complete with enclosure.
	<b>Details as:-</b> Supply, fixing and connection of Thermal magnetic MCCB 100-160A (50kA, Ics= 100% Icu), 4P, 415V, conforming to IEC-60947-2 complete with enclosure. Make:- ABB/Legrand/LK/Siemens/Schneider/Havells/BCH/C&S or similar.
8	Supply, installation, commissioning & testing of earthing as per IS:3043 or latest amendment.
	<b>Details as:-</b> Supply, erection and commissioning of earth pipe 2" dia 10 feet long heavy duty (min thickness 4.5mm) ISI marked G.I. Pipe Tata/ Jindal/Bansal ISI mark pipe. The labour charge includes construction of Earth chamber including drawing of 6 SWG G.I. wire from earth electrode to main switch/panel complete with Masonry work and covering by RCC slab with net plastering as per site requirement, writing of earth value in Ohms with black colour paint and painting of earth chamber & covering with yellow paint including supply of all materials as per IS: 3043 or latest with all necessary connection as per site requirement.
9	Supply and laying of GI strip 12.5 mm X 6 mm or 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 & HT body etc.
	<b>Details as:-</b> Supply and laying of GI strip 12.5 mm X 6 mm or 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 & HT body etc. joint should be connected with necessary brazing/welding etc.
10	Supply, fixing and connection of Timer Consisting of Below materials with Complete wiring-1) MCB 32A 4P - 01 set, 2) Contactor 32A 3P-01 set, 3) Digital Time Switch-01 set, 4) 2Way Center Off Change over Switch 25 A-01set with all wiring connection and 14SWG MS original sheet enclosure of suitable size with hinged door opening.
	<b>Details as:-</b> Supply, Installation & fixing Timer consisting of all accessories including fixing materials and wiring as under. a) Supply of MCB 3 Phase 32 Amp, 4 pole- 01 nos as per LK cat No- BB40320C or similar. b) Supply of 32A, 3 pole 440 Volt Contactors -01 nos as per LK cat No- CS94111 or similar. c) Supply of Digital Timer switch -01 nos as per LK cat no- AUTS02DIG00 or similar. d) Supply of 2 Way Center Off Change over Switch 25 A-01 set as per LK cat no. AUC00404000 or similar. e) SS Enclosure of Size min (400 x 300x 190) mm-1 set including MCB Chancel, wiring including labour cost. Make-MCB/Contactors/Timer etc.- LK/ABB/Legrand/Havells/Siemens/C&S/Schneider.

**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.**

**SPECIFICATIONFOR18/20WATTL EDTUBELIGHT**

Light Source/Type of LED	Mid power SMD (Surface Mounting Device) LED
LED Make	Nichia, Osram, seoul, Philips, lumileds, Everlite, Avago, Cree & Lednium.
Lumen Output/System Efficacy(lm/w)	MinimumLumenoutput-120lumens/watt
LED life	>50,000burningHours.
Driver type	Constant current driver with short circuit protection
Driver components	Industrial grade only
Efficiency of Driver electronic	>85%
Power Factor	Minimum0.95atfullload/230volt
Depreciation	Maximum30%after50,000 burning hours
THD (Total Harmonic Distortion)	<20 %
Rated voltage	220–240voltAC
Input Operating Voltage	140to277VoltAC
Beam Angle typical	LEDBEAMANGLE>120°
Input frequency	47to53Hz
Color Rendering Index	=80
Color Rendering Temperature	6500 K
Working Temperature	(-)20°C to (+)45°C
Outer body temperature	Maxupto70°C (±)
Ingress protection.	IP20orabove
Voltage drops and interrupts	AsperIEC61000-4-11
Certifications	NABL approved laboratories
Report to be submitted	LM79 from NABLaccreditedLab&LM80 &Photo biological/eye diffuser
For retrofit	Integrated Driver with aluminum housing and milky polycarbonate diffuser
For standalone (Batten type)	Integrated Driver with aluminum housing & milky polycarbonate diffuser
Uniformity	Individual LEDs should not be visible through diffuser
Electric strength test	1.5KV

**Annexure-A2****SPECIFICATION FOR OUT DOOR LED Street/Flood Light/Highbay**

Light Source/Type of LED	SMD type(Surface Mounting Device) LED
LED Make	Nichia, Osram seoul, Philips, lumileds, Ever lite, Avago, Cree & Lednium
Lumen Output/System Efficacy(lm/w)	Minimum 140lm/Watt.
LED life	>50,000 burning Hours.
Driver type	Constant current driver with short circuit protection
Driver components	Industrial grade only
Efficiency of Driver electronic	>85%
Power Factor	The power factor of the total fittings greater than 0.95
Depreciation	Maximum 30% after 50,000 burning hours
THD (Total Harmonic Distortion)	< 20% at full load
Rated voltage	220 – 240 volt AC
Input Operating Voltage	140 to 277 Volt AC
Beam Angle typical	LED BEAM ANGLE > 120°
Input frequency	47 to 53 Hz
Color Rendering Index	≥ 65
Color Rendering Temperature	Min 5700 K
Working Temperature	(-) 20°C to (+) 45° C
Outer body temperature	Max upto 70°C (±)
Ingress protection.	IP66 or Higher
Voltage drops and interrupts	As per IEC 61000-4-11
Certifications	NABL approved laboratories
Report to be submitted	LM 79 from NABL accredited Lab & LM 80 & Photo biological/eye diffuser
Electric strength test	1.5 KV

**Annexure A3**

Following under mentioned criteria must be followed for supply of LED fittings/fixture

- LM-79 & LM-80 report or latest report to be provided conforming to govt. approved NABL accredited lab.
- System efficacy: Greater than or equal to 120 lumen/Watt (For tubelight). Greater than or equal to 140 lumen/Watt (For LED Street/Flood light/Highbay)

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

Guarantee: Guarantee period other than LED 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.**