

S.E.C. Railway
TECHNICAL SPECIFICATION & SCOPE OF WORK APPEARING IN SCHEDULE OF
MATERIALS

Name of Work: Electrical (G) works in connection with (1) Upgradation/Modernization of Hirdamali Goods shed and (2) Provision of Additional loop line with Goods Platform at Hirdamali station.

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ELECTRICAL (G) WORKS SCHEDULE 'A'

1. Supply of LT Aluminium XLPE cable

The cost covers supply of LT Aluminium XLPE power cable (armoured) of stranded aluminium conductor, unearthed system, 1.1 KV grade, XLPE insulated, PVC outer sheathed, galvanized strip/round steel wire armoured cable, confirming to IS:7098 (Part 1):1988 or latest, ISI/BIS marked. (Make: Ultracab, Polycab, Havells, Gloster, Vishal Cables, Universal cables, Rotoplast, KEI, Avercab, SPM, Hyphen and Kenter cables India Pvt. Ltd). Cables will be inspected by RITES or authorized representative of DEE/GSU/NAG at manufacturer's premises before supply. The charges of inspections shall be paid by the Railway.

- a) LT stranded aluminum conductor XLPE cable of size 2 x 10 sq. mm (armoured) of 1100 V grade.
- b) LT stranded aluminum conductor XLPE cable of size 4 x 16 sq. mm (armoured) of 1100 V grade.
- c) LT stranded aluminum conductor XLPE cable of size 4 x 35 sq. mm (armoured) of 1100 V grade.
- d) LT stranded aluminum conductor XLPE cable of size 4 x 70 sq. mm (armoured) of 1100 V grade

2. Supply 1.5 T split Air Conditioner, Inverter type, 5 Star Rated

The cost covers supply of 1.5 T split Air Conditioner (5-star rating), Inverter (variable speed) type, suitable for operation on 230V, 50Hz. 1 phase AC supply. The AC should be High wall split AC, coil material – copper, Eco-friendly refrigerant, minimum length of copper pipe and suitable connecting electrical cable for installation and commissioning – 3 M, warranty of Machine – 01-year, warranty on compressor – 05 years. The cost covers transportation of Air Conditioner also. (Voltas, Hitachi, Carrier, Lloyd, Blue Star, Godrej, LG, Videocon, Samsung or Usha International make that confirms to respective IS).

3. Supply of Heavy-Duty AC Stand/Heavy Duty Air Conditioner Outdoor Unit Mounting Bracket

The cost covers supply of heavy-duty AC Stand/ AC Outdoor unit mounting bracket made up of heavy-duty GI steel, steel finish powder coated. The stand should have load bearing capacity minimum 200 kg. This also includes supply of nuts and bolts for fixing of stand. The stand should be compatible with outdoor unit of AC supplied by Indian Railway.

4. Supply of self-contained drinking water cooler 150/150 Liters/hour capacity.

The cost covers supply of water cooler storage type - 150 liters storage capacity & 150 liters per hour cooling capacity suitable for operation on 230V, 50Hz. 1 phase AC supply with maximum energy consumption up to 1550 Watt. Water tank sheet and cooler cabinet sheet material to be stainless steel with thickness 0.8 mm or above. Water tank cover and lid bottom sheet material shall be Epoxy painted galvanized iron sheet with thickness 1.5 mm. Water cooler should be ISI marked and Energy efficient & ecofriendly. All necessary plumbing and electrical connections, conforming to relevant IS standards and Railway guidelines shall be done by contractor. Water cooler will be inspected by authorized representative of DEE/GSU/NAG at manufacturer's premises before supply. (Voltas, Blue Star, Climatrol, Godrej, Sidhwal, Usha International make that confirms to respective IS with 2 years warranty of machine and 5 years warranty of Compressor).

5. Supply of 40/45 watt LED street light fitting

The cost covers supply of 40/45 watts outdoor discrete LED street light fitting with all associated accessories, 230 V, 5500/5700 K, IP 65, powder coated finishing, LED life > 50,000 burning hours, Toughened glass, LED lumen 120 lm/w. The fitting should be supplied including driver having efficiency above 85% and Constant Current with short circuit Protection. The construction of housing to be Extruded Aluminium/CRCA/Pressure die cast aluminium. (Havells, Crompton, Orient, Philips, Bajaj, Jaquar, Surya, Wattera or Halonix make that confirms to respective IS with 5 years warranty).

6. Supply of surface mounting LED 20 W 4' tube light & accessories.

The cost covers supply of 20 W 4' LED tube light complete fitting with T8 tube & CRCA/polycarbonate box indoor type, IP >=20, 230 V AC with all associated accessories. (Havells, Crompton, Orient, Philips, Bajaj, Jaquar, Surya, Wattera or Halonix make that confirms to respective IS with 5 years warranty).

7. Supply of surface mounting 12 W LED Bulkhead Light fitting.

The cost covers supply of 12-watt LED surface mounting Bulkhead Light fitting with driver, rectangular shape, IP 65, Plastic, Safety class I (I), 1200 lumen, optic and housing material to be polycarbonate, colour temperature 5500/5700 K to work on 230 V AC supply. Suitable size dimensions shall be used to incorporate the 12-watt LED bulb. The fitting should be Weather resistance, Lower consumption and Energy saving. (Havells, Crompton, Orient, Philips, Bajaj, Jaquar, Surya, Wattera or Halonix make that confirms to respective IS with 5 years warranty).

8. Supply of 2 X 2 recess/surface mounted LED 36-watt panel light fitting.

The cost covers supply of recess/surface mounted indoor type 2'x 2' square shaped slim 36 W LED panel light fitting (cool white), Recess-mounted, white powder-coated CRCA/PVC housing with full window acrylic diffuser white powder coated finish, inner surface coated with high reflective paint for soft glare free light & high LOR for high quality energy saving & all accessories including driver to work on 230 Volts AC supply with IP 20, open circuit and short circuit protection. (Havells, Crompton, Orient, Philips, Bajaj, Jaquar, Surya, Wattera or Halonix make that confirms to respective IS with 5 years warranty).

9. Supply of 200 W LED flood light fitting, luminaire cool white with all accessories.

The cost covers supply of 200 watts outdoor discrete LED flood light fitting for High Mast with all associated accessories, 230 V, 5500/5700 K, IP 66, powder coated finishing, LED life > 50,000 burning hours Toughened glass, LED lumen 120 lm/w. The fitting should be supplied including driver having efficiency above 85% and Constant Current with short circuit Protection. The construction of housing to be Extruded Aluminium/CRCA/Pressure die cast aluminium. (Havells, Crompton, Orient, Philips, Bajaj, Jaquar, Surya, Wattera or Halonix make that confirms to respective IS with 5 years warranty).

10. Supply of Recess/Surface mounted indoor type round/square shaped slim 12 W LED panel light fitting.

The cost covers supply of recess/surface mounted indoor type, round/square shaped, 12 Watt LED panel light fitting, CRCA/PVC housing, white powder coated finish, high transmittance polycarbonate diffuser (UV stabilized), warm white, inner surface coated with high reflective paint for soft glare free light and high LOR for high quality energy saving and all accessories including driver to work on 230 Volts AC supply having open circuit and short circuit protection. (Havells, Crompton, Orient, Philips, Bajaj, Jaquar, Surya, Wattera or Halonix make that confirms to respective IS with 5 years warranty).

11. Supply of day night Light sensor switch, Automatic Light switch suitable for 230 VAC supply.

The cost covers supply of Automatic Light sensor switch with SMPS power supply and compact durable design suitable to work on 230 VAC supply. (GIS, Muller, BCH, IndoAsian, ABB, Wattcab, Havells, Standard, L&T, C&S, MDS, or Surya make that confirms to respective IS).

12. Supply of electric fan with BLDC motor, 1200 mm sweep, 26–28 watt, 5-star rating with 2 years warranty.

The cost covers supply of electric fan with BLDC motor, 1200 mm sweep, 26–28 watt, 5-star rating along with electronic fan regulator/remote with 2 years warranty suitable to work on 230V AC supply. Fans with regulator or remote will be decided by Railways. It should have 3 blades, aluminum blade material and blade thickness not less than 1.1 mm, double ball bearing, 2 Nos. canopy, down rod length should not be less than 300 mm and should be supplied with all fixing materials (nut, bolt, clamp, etc). (Crompton, Usha, Bajaj, Havells, Orient, Khaitan, Wipro, Surya, Standard, HPL, C&S, Luker, Atomberg or Anchor make that confirms to respective IS).

13. Supply of exhaust fan 300 mm sweep along with all accessories.

The cost covers supply of exhaust fan metal body having 300 mm sweep complete with all accessories to work on 230 Volts AC supply. (Crompton, Usha, Bajaj, Havells, Khaitan, Orient, Anchor, Surya, Wipro, Standard, C&S, Luker or Almonard make that confirms to respective IS having 01-year warranty period).

14. Supply of wall mounting fan 400 mm sweep, bracket with all accessories

The cost covers supply of wall mounting bracket fan of 400 mm sweep, 50–65-Watt, oscillating type, 1400 RPM, Rotary switch, Piano Switch, pull cord or string-based control, complete with accessories to work on 230V, 50Hz, 1 phase AC supply. (Crompton, Usha, Bajaj, Havells, Orient, Khaitan, Wipro, Surya, HPL, Luker, C&S, Standard, Atomberg or Anchor make that confirms to respective IS having 01-year warranty period).

15. Supply of 5 pin modular socket outlet with switch of 6 Amps capacity & 230 V grade complete with accessories

The cost covers supply of 5 pin modular socket outlet with modular switch of 6 Amps capacity & 230 V grade complete with accessories. (ABB, Anchor, Havells, Wipro, HPL, Standard, C&S, Wattcab or IndoAsian make that confirms to respective IS).

16. Supply of 5 pin modular socket outlet with switch of 6/16 Amps capacity & 230V grade complete with accessories

The cost covers supply of 5 pin modular socket outlet with modular switch of 16/6 Amps capacity & 230V grade complete with accessories. (ABB, Anchor, Havells, Wipro, HPL, Standard, C&S, Wattcab or IndoAsian make that confirms to respective IS).

17. Supply of modular switch board with modular switch 10 Ax 230 V capacity, mounting grid with cover and metal box for 6 Module

The cost cover supply of modular switch board with modular switch 10 Ax 230 Volt capacity, for 6 Module along with mounting grid, matching cover frame, suitable size metal/surface box. (ABB, Anchor, Havells, Wipro, HPL, Standard, C&S, Wattcab or IndoAsian make that confirms to respective IS).

- 18. Supply of modular switch board with modular switch 10 Ax 230 V capacity, mounting grid with cover and metal box, for 12 Module.**

The cost covers supply of modular switch board with modular switch 10 Ax 230 Volt capacity, for 12 Module along with mounting grid, matching cover frame, suitable size metal/surface box. (ABB, Anchor, Havells, Wipro, HPL, Standard, C&S, Wattcab or IndoAsian make that confirms to respective IS).

- 19. Supply of 4 poles MCCB 63 Amps BC 25 KA.**

The cost covers supply of 4 pole, 63 Amps MCCB, fixed type, 25 KA breaking capacity, suitable for use in 415 Volt, 3 phase, 50 Hz. AC supply (Schneider, ABB, Havells, IndoAsian, Standard, Siemens, L&T, Wattcab, C&S, MDS or HPL make that confirms to respective IS).

- 20. Supply of sheet steel enclosure for MCCB 63/100/200 Amps.**

The cost covers supply of sheet steel enclosure, powder coated, screwed cover on top with door gasket, IP-66 degree of protection, cable entry facility, mounting bracket etc. for 63/100/200 Amps four pole MCCB. (ABB, Havells, Siemens, L&T, MDS, HPL, IndoAsian, Aadi Enterprises, HPL or Sohal make that confirms to respective IS).

- 21. Supply of contractor 32 Amp, 230 Volts supply and coil.**

The cost covers supply of 3 pole power contactor, 230 V AC having pressure switch, copper contact, operation mode ON-OFF-ON, 3-way circuit. (Schneider, ABB, Havells, IndoAsian, Standard, Siemens, L&T, Wattcab, C&S, MDS or HPL make that confirms to respective IS).

- 22. Supply of PVC insulated sheathed copper flat cable of 3 x 4 sq.mm.**

The cost covers supply of 4 sq.mm, 3 core flat copper cable with PVC insulation and sheathed with multi stranded flexible copper conductor, FRLS type, 1.1 KV grade. (Anchor, Standard, KEI, Finolex, Vishal Cables, Ultracab, Havells, HPL, Polycab or Johnson make that confirms to respective IS).

- 23. Supply of 3 Phase 4 wire energy meter 10-60Amp, 3 Lines LCD display in 96 x 96 sq.mm flush mounted case, accuracy class 0.5 and 1.0 as per site requirement. Energy meter with power, active energy and reactive energy display.**

The cost covers supply energy meter of 3 phase 4 wire, base current 10 Amps and max rated current 600% of base current with active, reactive power and energy, power factor, voltage current etc display, 3 line LCD Display in 96 X 96 sq.mm flush mounted case, accuracy class 0.5 to 1.0 for 415 Volt systems confirming to IS 13779/99 (HPL, Siemens, Schneider, L&T, Surya, Genus or Secure make that confirms to respective IS).

- 24. Supply of CT coil of super enameled electrolytic grade copper wire wound CT coils ratio 30/5, burden - 5VA, accuracy class 0.5 class for measurement of currents by connecting to multi-function energy meters.**

The cost covers supply of super enamelled electrolytic grade copper wire wound CT coils ratio 30/5 burden - 5VA, accuracy class 0.5 class for energy meters for measurement of current by connecting to multi-function energy meters confirming to IS 2705-3. (EMCO, Newtek, ABB, GE, Siemens, CGL, Bhel, Wattcab, Kirloskar Electric or any make that confirms to respective IS).

- 25. Supply of Three phase energy meter box.**

The cost covers supply of meter box to accommodate three phase energy meter and CT coils. The box should be fabricated from 0.7 mm CRCA sheet steel, powder coated with IP 55 & 66 degree of protection, hinged doors & locking arrangement. (Schneider, ABB, Havells, IndoAsian, Standard, Siemens, L&T, MDS, Sohal, Aadi Enterprises or HPL).

26. Supply of GI Octagonal Pole with Single Arm of 7 metres height along with accessories.

The cost covers supply of GI Octagonal Pole with single Arm 7 meters long with bracket (short arm fixture) for single LED fitting. The poles shall have overall length - 7 meters, including arm's length 1/0.5 meter as decided by site Engineer from Railway. The pole should be hot dip Galvanized. The luminaries bracket fabricated suitably and hot dip galvanized for holding required number of luminaries. Door opening: 500 mm height from base plate, Size: 100 mm x 500 mm with Gasket (Opening permits clear access to equipment like MCB, Switches, cables, etc.), thickness of the segment should be 3.0 mm. Suitable foundation Bolts, Nuts and Washers should also be provided. Octagonal poles will be inspected by authorized representative of DEE/GSU/NAG at manufacturer's premises before supply. (TATA, Jindal, Bhushan, Fevino, Hindustan, Bansal, Utkarsh, Shubhangi casting, Phoenix luminaries Pvt. Ltd., Vakrangee, Magnetic Industries, VSTP, Crompton, Surya, Apollo or PSST).

27. Supply of GI Octagonal Pole with double Arm of 7 metres height along with accessories

The cost covers supply of GI Octagonal Pole with double Arm 7 meters long with bracket (short arm fixture) for double LED fitting. The poles shall have overall length - 7 meters, including arm's length 1/0.5 meter as decided by site Engineer from Railway. The pole should be hot dip Galvanized. The luminaries bracket fabricated suitably and hot dip galvanized for holding required number of luminaries. Door opening: 500 mm height from base plate, Size: 100 mm x 500 mm with Gasket. (Opening permits clear access to equipment like MCB, Switches, cables, etc.), thickness of the segment should be 3.0 mm. Suitable foundation Bolts, Nuts and Washers should also be provided. Octagonal poles will be inspected by authorized representative of DEE/GSU/NAG at manufacturer's premises before supply. (TATA, Jindal, Bhushan, Fevino, Hindustan, Bansal, Utkarsh, Shubhangi casting, Phoenix luminaries Pvt. Ltd., Vakrangee, Magnetic Industries, VSTP, Crompton, Surya, Apollo or PSST).

28. Supply of 1 phase Distribution Board, single door with 40 A DP isolator, busbar, earth bar and neutral link for 6 way of SPMCB 20/32 Amp.

The cost covers supply of single-phase distribution board of CRCA steel sheet, single door 6 way with 40 Amps DP isolator, bus bar, earth bar, neutral link and SP MCB 20/32 Amps outgoing, complete with base and metallic enclosure. (Schneider, ABB, Havells, IndoAsian, Standard, Siemens, L&T, Wattcab, C&S, MDS or HPL make that confirms to respective IS).

29. Supply of 3 phase, double door, MDB with 63 A capacity Four Pole Isolator, 8 way with busbar, earth bar and neutral link along with 24 Nos. SPMCB 16/20 A

The cost covers supply of three phase, Main Distribution Board with 63 A capacity Four Pole isolator, 8-way, double door distribution board with busbar, earth bar, neutral link and 24 Nos. SPMCB 16/20 Amps complete with base and enclosure. The MDB comprising with 3 phase incoming and single-phase outgoing in sheet steel enclosures. The contractor should get the Main Distribution Board approved prior to supply and execution. (Schneider, ABB, Havells, IndoAsian, Standard, Siemens, L&T, Wattcab, C&S, MDS or HPL make that confirms to respective IS).

30. Supply of ELCB of 25 Amps, 2 poles, with sensitivity 300 M Amp.

The cost covers supply of earth leakage circuit breaker of capacity 25 Amps 2 poles with sensitivity 300 mamps suitable to work on 230 Volts AC supply. (Schneider, ABB, Havells, IndoAsian, Standard, Siemens, L&T, Wattcab, C&S, MDS or HPL make that confirms to respective IS).

31. Supply of Junction Box of 200 x 150 x 80 mm with 2 Nos. 16 A kit kat fuse with suitable size Hylam sheet.

The cost cover supply of Junction Box with hylam sheet base plate & two Nos. 16 Amps kit-kat fuse units. The junction box shall be of size 200 X 150 X 80 mm size fabricated from 1.2mm CRCA sheet steel or polycarbonate, powder coated to shade RAL7032, foamed in PU gasket, screwed cover on top, IP- 55 & 66 degree of protection, bracket provided inside, cable entry facility, wall mounting bracket etc. The junction box shall have one 4-way

cable terminal block for incoming & out going. (BCH, ABB, MDS, L&T, Siemens, Wattcab, Sohal, Havells, C&S, Aadi enterprises, or Hansel make that confirms to respective IS).

32. Supply of 18 SWGMS location box of 1250 x1100 x 600 mm size to accommodate 4 Nos suitable size aluminium busbar arrangement of 300 A capacity & locking arrangement to mount on foundation.

The cost covers supply of 18 SWGMS location box of 1250 x1100 x 600 mm size to accommodate 4 Nos suitable size aluminium busbar arrangement of 300 A capacity, switchgears as mentioned below, location box with locking arrangement shall be suitable to mount on foundation as per the details given below:

1. The cost covers supply of 18 SWG MS location box of size 1250 x 1100 x 600 mm size to accommodate 4 Nos. suitable size aluminium bus bar arrangement of 300 Amps capacity and following switchgears with locking arrangement. The box should be powder painted, having front hinged doors, dust and vermin proof by providing gaskets. Contractor will submit technical details including layout, design and drawings of the complete panel and manufacturers test certificate, warranty conditions for approval DEE/GSU/NAG prior to fabrication, supply and installation. The material will be inspected by DEE/GSU/NAG or his representative at factory/manufacturer's premises before dispatch. (Schneider, ABB, Havells, IndoAsian, Wattcab, Standard, C&S, Siemens, L&T, MDS, Sohal, Aadi Enterprises, HPL, Harshal electricals or Balaji industries make that confirms to respective IS).
2. The cost covers supply of 4 pole, 100 Amps MCCB, fixed type, 25 KA breaking capacity, suitable for use in 415 Volt, 3 phase, 50 Hz. AC supply (Schneider, ABB, Havells, IndoAsian, Standard, Siemens, L&T, Wattcab, C&S, MDS or HPL make that confirms to respective IS).
3. The cost covers supply of 4 pole, 63 Amps MCCB, fixed type, 25 KA breaking capacity, suitable for use in 415 Volt, 3 phase, 50 Hz. AC supply (Schneider, ABB, Havells, IndoAsian, Standard, Siemens, L&T, Wattcab, C&S, MDS or HPL make that confirms to respective IS).
4. The cost covers supply of 4 pole, 32 Amps MCCB, fixed type, 25 KA breaking capacity, suitable for use in 415 Volt, 3 phase, 50 Hz. AC supply (Schneider, ABB, Havells, IndoAsian, Standard, Siemens, L&T, Wattcab, C&S, MDS or HPL make that confirms to respective IS).
5. The cost covers supply of porcelain Kit kat fuse grip 63 Amps, 415 volts grade, 50 Hz, AC supply (Gippson, Schneider, ABB, Havells, IndoAsian, Standard, Siemens, L&T, MDS or HPL make that confirms to respective IS).
6. The cost covers supply of porcelain Kit kat fuse grip 32 Amps, 415 volts grade, 50 Hz, AC supply (Gippson, Schneider, ABB, Havells, IndoAsian, Standard, Siemens, L&T, MDS or HPL make that confirms to respective IS).
7. The cost covers metering & wiring inside the location box using proper lugs for inter connection of MCCBs from bus-bar.

33. Supply of 18 SWG MS terminal box of 400x400x250 mm size with hylam sheet of suitable size, din rail, connecting terminal and 3 Nos. 32 A DP MCBs.

The cost covers supply of 18 SWG MS terminal box of 400 x 400 x 250 mm size fabricated from 1.2 mm CRCA sheet steel, powder coated with IP 55 & 66 degree of protection, hinged doors & locking arrangement. Hylam sheet of suitable size, din rail, connecting terminal, & 3 Nos. 32 A DP MCBs should be suitably fixed inside the box. (BCH, ABB, MDS, L&T, C&S, Siemens, HPL, Havells, Aadi Enterprises, HPL, Harshal electricals or Balaji industries make that confirms to respective IS).

34. Supply of GI pipe 50 mm diameter.

The cost covers supply of 50 mm diameter GI pipe. (TATA, Jindal, Bhushan, Hindustan, Bansal, Utkarsh, Shubhangi casting, Phoenix, Vakrangee, Sail, VSTP, Crompton, Surya, Apollo or PSST).

35. Supply of Solar Standalone Street Light (1 day back up) with 30Watt LED luminaries, with charge controller and minimum IP 65 protection. 12.8 V/30Ah Lithium Ferro Phosphate Battery with 6 m long MS hot dip galvanized tubular pole, metallic battery box and stainless-steel nuts and bolts, solar panel Wp 75 at 16.4 ±0.2 Volt at STC.

The cost covers supply of Solar Standalone Street Light (1 day back up) with 30 Watt LED luminaries including driver and having 120 lm/W and color temperature 5500-6500K, with charge controller and minimum IP 65 protection, 12.8 V/30Ah Lithium Ferro Phosphate Battery with 6 m long MS hot dip galvanized tubular pole, metallic battery box and stainless steel nuts and bolts, solar panel Wp 70/75 at 16.4 ±0.2 Volt at STC and motion sensor and shall have 5 years warranty. Solar panel shall be of Mono crystalline type and shall have life of 25 years. Minimum charging time of battery shall be 6-8 hours (by Sun). The glass shall be solar wafer merge with toughened glass. PV module efficiency shall be greater than or equal to 14%. PV module shall be warranted for output wattage greater than or equal to 90% at the end of 10 years and 80% at the end of 25 years. Lithium Ferro Phosphate Battery shall be operating from dusk to dawn first four-hour full brightness, rest of the time at lower level, with motion sensor. The lights shall be free from glare, flickering and UV. There shall be provision of fuses provided to protect against short circuit conditions. It shall have full protection against open circuit, accidental short circuit and for reverse polarity. There shall be a corrosion resistant metallic frame structure to hold the SPV module. The frame structure shall have provision that the module can be oriented at the suitable tilt angle. The tubular pole shall have bore size of 65 mm. The battery shall be included in the luminaire enclosure and it shall be water proof (IP65 or better) and corrosion resistant. Contractor will submit technical details including layout, design and drawings of the Solar Standalone Street Light and manufacturers test certificate, warranty conditions for approval DEE /GSU/NAG prior to fabrication, supply and installation. The material will be inspected by DEE/GSU/NAG or his representative at factory/manufacturer's premises before dispatch. This includes transportation of material at site. (Make of solar light: Havells, Crompton, Orient, Philips, Bajaj, Jaquar, Surya, Goldwyn, Wattera, Sun2earth solar or Halonix make that confirms to respective IS with 5 years warranty). (Make of pole: TATA, Jindal, Bhushan, Fevino, Hindustan, Bansal, Utkarsh, Shubhangi casting, Phoenix luminaries Pvt. Ltd., Vakrangee, Magnetic Industries, VSTP, Crompton, Surya, Apollo, PSST or same as solar light make)

36. Supply of booster pump for sprinkling purpose, 2HP, 3 phase

The cost covers supply of 2 HP Centrifugal self-priming Mono block pump, totally enclosed type, 2900 RPM, 415 Volt, 3 phase, discharge capacity 4.0 Lit/second, suction pipe size (Nominal) 50mm, delivery pipe size (Nominal) 50mm. It shall be supplied with non-return valve with housing, 3 star or above rating, complete with high quality cast iron impellers, robust in construction and tested to withstand a hydrostatic pressure of 1.5 times of maximum discharge pressure experienced, casting ring, bearing cover, bearing pedestal, deflector of stainless steel, pump shaft of carbon steel, motor body of cast iron along with its standard accessories in compliance with IS specifications latest. All nuts, bolts & washers shall be made of stainless steel. Impeller should be dynamically balanced. Pump shall be supplied with 2 years warranty period. (Crompton, Kirloskar, KSB, CRI, Shakti pumps, Lubi pumps limited or Oswal make confirming to respective IS specifications).

37. Supply of 3 HP Centrifugal self-priming Monoblock pump, 1450 RPM, 415 Volt, 3 phase, head 30 M, discharge capacity 3.6 Lit/second.

The cost covers supply of 3 HP Centrifugal self-priming Mono block pump, totally enclosed type, 1450 RPM, 415 Volt, 3 phase, head 30 M, discharge capacity 3.6 Lit/second, suction pipe size (Nominal) 50mm, delivery pipe size (Nominal) 40mm. It shall be supplied with non-return valve with housing, 3 star or above rating, complete with high quality cast iron impellers, robust in construction and tested to withstand a hydrostatic pressure of 1.5 times of maximum discharge pressure experienced, casting ring, bearing cover, bearing pedestal, deflector of stainless steel, pump shaft of carbon steel, motor body of cast iron along with its standard accessories in compliance with IS specifications latest. All nuts, bolts & washers shall be made of stainless steel. Impeller should be dynamically balanced. Pump shall be supplied with 2 years warranty period. (Crompton, Kirloskar, KSB, CRI, Shakti pumps, Lubi pumps limited or Oswal make confirming to IS specifications).

- 38. Supply of 7.5 HP bore well submersible pump set with discharge capacity 150-330 LPM at 140-55 M head suitable to run on 3PH 415 V supply, out let pipe 65 mm complete with SS impellers, non-return valve.**

The cost covers supply of 7.5 HP, 3 phase, bore well submersible pump set suitable for 150 mm diameter bore well with discharge capacity 150-330 LPM at 140-55 meters head (3 star or above rating), suitable to on 3 phase, 415 V supply, out let pipe 65 mm dia. complete with high quality SS impellers, non-return valve along with its standard accessories etc. The pump should be complete with submersible type water lubricated motor of 7.5 HP. The pump shall be suitable for vertical mounting in tube well. The Maximum efficiency with lesser number of impellers will be preferred. The pump bowl/diffuser shall be made of cast iron grade PG-200 & shall be free from bowl holes, sand holes & other detrimental defects. All nuts, bolts & washers shall be made of stainless steel. Impeller should be dynamically balanced. Pump shall be supplied with 2 years warranty period. (Crompton, Kirloskar, KSB, CRI, Shakti pumps, Lubi pumps limited or Oswal make confirming to IS specifications).

- 39. Supply of submersible 3 phase DOL starter 7.5 HP submersible pump with protections like phase failure, phase imbalance, phase reversal, short circuit etc. with metering arrangement, ON/OFF and trip indication with enclosure.**

The cost covers supply of bore well submersible 3 phase, DOL starter panel for 7.5 HP pump set with protections like single phasing, reverse phasing, over loading, dry running, short circuit, etc with metering arrangement, ON/OFF & trip indication with enclosure for pump sets. Conforming to IS marked of reputed make like (HPL, L&T, Siemens, BCH, Havells, Standard, MDS or CGL make that confirms to respective IS).

- 40. Supply of control panel for 2 HP/3 HP, 3 phase pump with protections, ON/OFF & trip indication with enclosure.**

The cost covers supply of control panel for 2HP/3HP 3 phase pump with protections, ON/OFF & trip indication with enclosure. It shall be suitable to work on 3 phase 415 V AC supply of 50 Hz. It shall have 2 position auto-manual selection switch, fully automatic star delta oil immersed submersible control panel, contactor rating 32 Amp, digital ammeter, digital voltmeter. The control panel shall be of size 300 mm X300 mm X150 mm or of suitable size as approved by Railway, color of paint finish of power coated & suitable size thickness of MS sheet. It should have protection against overload, single phasing, reverse phasing, dry running, short circuit and sever unbalanced load. (HPL, L&T, Siemens, BCH, Havells, C&S, Standard, MDS or CGL make that confirms to respective IS).

- 41. Supply of Servo voltage stabilizer 1 KVA, output 24 V AC with 2 years warranty.**

The cost covers supply of Servo voltage stabilizer 1 KVA, output 24 V AC with 2 years warranty. Input voltage range shall be 160-260 Volt AC. It shall be air cooled type of cooling. The stabilizer enclosure shall be made of steel sheet having 1.2 mm (minimum) thickness, aesthetically finished, duly pretreated and powder coated, it shall be free from workmanship defects, sharp edges, nicks, scratches, burst, etc. All fasteners shall be fixed properly. The equipment shall be complete with all parts and all parts shall be functional. The wires supplied with voltage stabilizer shall be FRLS type and of make - Anchor, Standard, Finolex, Havells, Polycab, HPL, KEI make that confirms to respective IS. (Bhel, Schneider, Hind rectifier, Numeric Power Systems Limited, Emerson Network Power Private Limited, Autometer, Luminous, Microtech, Power Electronics, Hitachi Hi-Rel Tata libert).

- 42. Supply of LT capacitor bank of 3 KVAR.**

The cost covers supply of 3 KVAR LT capacitor bank suitable for 415 volts, 50 HZ, AC supply system. (CGL, Siemens, L&T, Havells, HPL or Frako make that confirms to respective IS).

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43. Supply of MS safety chain.

The cost covers supply of the MS safety chain of 6 mm size confirming to respective IS. The contractor shall provide test certificate with information such as name of the chain maker, Grade of material, Size of chain etc. as per IS: 5616.

44. Supply of non-return valve with bypass arrangement.

The cost covers supply of non-return valve of class 150 wrought cast iron with bypass arrangement suitable to work with 5 HP submersible pump set supplied by Indian Railway. (Kirloskar, L&T, BDK, TATA or SAIL make).

45. Supply of sluice valve for 100 mm & 80 mm pipes.

The cost covers supply of sluice valve of class 150 wrought cast iron of size 100 mm and 80 mm size suitable to work for pump set supplied by Indian Railway. (Kirloskar, L&T, BDK, TATA or SAIL make).

46. Supply of 4M sheet metal DB with metal clad Plug & Socket including insulated Neutral link, adjustable Din Rail, connecting links & 20 A SP/SPN MCB.

The cost covers supply of 4M sheet metal Distribution Board with metal clad Plug & Socket including insulated Neutral link, adjustable Din Rail, connecting links & 20 A SP/SPN MCB with enclosure. (ABB, HPL, Havells, Standard, L&T, MDS, Wipro or IndoAsian make that confirms to respective IS).

47. Supply of single-phase motor starter switch 10 to 25 Amps (Penta motor starter).

The cost covers supply of single-phase motor starter of 10-to-25-amp capacity suitable to work on 230 V AC supply. This starter is to be used for switching and controlling AC/induction motor. It should get tripped in case of short circuits. (Schneider, ABB, Havells, IndoAsian, Standard, Siemens, L&T, Wattcab, C&S, MDS or HPL make that confirms to respective IS).

48. Supply of angular batten holder.

The cost covers supply of Angular batten holder suitable to work on 230 Volts AC supply. (Anchor, Cona, Leader or any make that confirms to respective IS).

49. Supply of DP MCB, 16 Amps with sheet steel enclosure.

The cost covers supply of 16 Amps, 230 volts grade, 10 KA breaking capacity Double Pole MCB with sheet steel enclosure having din rail, complete with accessories for fixing (Schneider, ABB, Havells, IndoAsian, Standard, Siemens, L&T, Wattcab, C&S, MDS or HPL make that confirms to respective IS).

50. Supply of DP MCB, 32 Amps with sheet steel enclosure.

The cost covers supply of 32 Amps, 230 volts grade, 10 KA breaking capacity, Double Pole MCB with sheet steel enclosure having din rail, complete with accessories for fixing (Schneider, ABB, Havells, IndoAsian, Standard, Siemens, L&T, Wattcab, C&S, MDS or HPL make that confirms to respective IS).

51. Supply of Kit kat fuse grip 100 Amps, 415 volts grade

The cost covers supply of Kit kat fuse grip 100 Amps, 415 volts grade, 50 Hz. AC supply (Reputed make like Gippson, Schneider, ABB, Havells, IndoAsian, Standard, Siemens, L&T, MDS or HPL make that confirms to respective IS).

52. Supply of SDF unit of 32 A, 415 volts grade in sheet enclosure.

The cost covers supply of Switch Disconnector Fuse unit triple pole & switched neutral (FP) in steel sheet enclosure of 32 Amps, 415 volts capacity. (Schneider, ABB, Havells, IndoAsian, Standard, Siemens, L&T, MDS or HPL make that confirms to respective IS).

53. Supply of surface mounting LED decorative mirror light fitting 9 W with acrylic diffuser and accessories to work on 230 V AC supply.

The cost covers supply of surface mounting LED decorative mirror light fitting 9 W with acrylic diffuser and accessories including driver to work on 230 V AC supply. (Havells, Crompton, Orient, Philips, Bajaj, Jaquar, Surya, Wattera or Halonix make that confirms to respective IS with 5 years warranty).

54. Supply of 50 mm DWC Pipe, SN4 pressure rating/PN class

The cost covers supply of DWC pipe with collar size OD - 50 mm ID - 39 mm size of SN4. DWC pipe will be inspected by RITES or authorized representative of DEE/GSU/NAG at manufacturer's premises before supply. The charges of inspections shall be paid by the Railway. (Jain irrigation, Jindal, Astral, Delton, Ketron, Dutron, Hightech)

55. Supply of 75mm DWC Pipe, SN8 pressure rating/PN class

The cost covers supply of DWC pipe with collar size OD - 75 mm ID - 63 mm size of SN8. DWC pipe will be inspected by RITES or authorized representative of DEE/GSU/NAG at manufacturer's premises before supply. The charges of inspections shall be paid by the Railway. (Jain irrigation, Jindal, Astral, Delton, Ketron, Dutron, Hightech).

56. Supply of HDPE pipe 25 mm, PE100, PN 10

The cost covers supply of HDPE pipe 25 mm, PE100, PN 10. (Make: Jain irrigation, Jindal, Astral, Delton, Dutron, Ketron, Hightech or as approved by DEE/GSU/NAG).

57. Supply of LT joining kit for 4 core 150/120/70/35/25/16 sq.mm cable.

The cost cover installation, testing & commissioning of LT jointing kit for 4 core 150/120/70/35/25/16 sq. mm LT XLPE cable. All materials required for installation of kit shall be supplied by the contractor. The work shall be carried out in close co-ordination with DEE/GSU/Nagpur's authorized representative at site.

58. Supply of wall/pole mounting Thermoplastic polycarbonate enclosure of IP 65 and IK08 socket board -1 having incoming and outgoing socket.

The cost covers supply of Glass Fiber reinforced Polycarbonate Socket Board of wall mounting type having Dimension 450 x 300 x 209 mm with busbar type terminal block, 63 Amp Four pole MCB, 63 Amp 5 pin industrial socket. The enclosure must be double insulated, Halogen free. The Enclosure should have Degree of Ingress Protection IP 65 in accordance with IEC 60529 and Impact Strength IK08 in accordance with IEC 62262. The enclosure should be made of UV resistant material, Corrosion free. The Enclosure shall be suitable to perform under ambient temperature -35 deg C up to +80 deg C. The enclosure shall be fire retardant & self-extinguishing the combustion behaviour shall be 960 deg C accordance with EN 60695-2-11. The enclosure material is classified as V-2 in accordance with the requirements of the UL Solutions 94 flammability standard. The enclosure gasket materials shall be Polyurethane. CEE Type Insulated Industrial Socket Shall confirm IS/IEC 60309 - 1 and 2 offering an ingress protection of IP67 and the contact pins shall be made from Nickel Plated Brass Incoming: 95 Sq.mm Busbar Type Terminal Block - 4 No's., 63A FP MCB 10kA - 1 No., Outgoing: IP67 63A 5Pin Industrial Socket - 1 No., Dimension: (450(H) x 300(L) x 209(D)) mm., (Make: Cape, Walther, Mennekes, Schneider, ABB, Havells, IndoAsian, Standard, Siemens, L&T, C&S, MDS, Surya or HPL).

59. Supply of G. I. pole of 2 Mtr height, 80 mm diameter, base plate, earthing terminal and top end cap for fixing of Thermoplastic polycarbonate enclosure.

The cost covers supply of G. I. pole of 2 Meters height, 80 mm diameter, base plate, earthing terminal and top end cap for fixing of Thermoplastic polycarbonate enclosure as mentioned above. (TATA, Jindal, Bhushan, Hindustan, Bansal, Utkarsh, Shubhangi casting, Phoenix, Vakrangee, Sail, VSTP, Crompton, Surya, Apollo, PSST or as approved by DEE/GSU/NAG).

ELECTRICAL (G) WORKS SCHEDULE 'B'

1. **Digging of cable trench, refilling of excavated earth along the road/track.**
The cost covers digging of cable trench 100 cm. deep in all sorts of soil & refilling of excavated earth along the road/track/platform.
2. **Laying of LT cable in the cable trench in inside DWC/HDPE pipe along the track/road.**
The cost covers laying of cable in inside DWC/HDPE pipe in trench along the road/track. After laying of the cable refilling of trench with excavated earth, ramming, compacting & levelling to original shape should be done. More than one cable can be laid in the same pipe if required. The path & type of cable to be laid on that path shall be decided by the railway supervisor at site. This also includes supply & erection of Cable Route Marker at spacing of 25 m and on every turning point of cable trench. Necessary drawing can be obtained from DEE/GSU/NAG's office.
3. **Fixing of cable along the wall/support.**
The cost covers of fixing of per cable in open air on pole/along the wall/support. The cable shall be fixed with suitable size fixture to provide sufficient grip for holding the cable. All materials & labours required shall be supplied by the contractor.
4. **Excavation of cable trench, brick throughing, sand filling and laying of two loops of cable near structure & refilling the excavated earth.**
The cost covers of excavation of cable trench, brick throughing, sand filling & laying of two loops of cable near supporting structure & refilling the excavated earth & properly dressing of land thereafter. Bricks & sand will be supplied by the contractor.
5. **Excavation of cable trench, supply & laying of (150mm dia circular RCC pipe/DWC Or HDPE pipe) across the road/track.**
The cost covers digging of cable trench of 100 cm deep in all sorts of soil which also includes supply of 150mm dia circular RCC pipe/DWC Or HDPE pipe of suitable size and refilling of excavated earth across the road/track.
6. **Laying of LT cable in DWC/HDPE pipe across the track/road.**
The cost covers laying of cable in DWC/HDPE pipe in trench across the road/track. After laying of the cable refilling of trench with excavated earth, ramming, compacting & leveling to original shape should be done. More than one cable can be laid in the same pipe if required. The path & type of cable to be laid on that path shall be decided by the railway supervisor at site. This also includes supply & erection of Cable Route Marker at spacing of 25 m and on every turning point of cable trench. Necessary drawing can be obtained from DEE/GSU/NAG's office.
7. **Excavation of cable trench & laying of cable in DWC pipe in cement concrete.**
The cost covers excavation of cable trench in cement concrete of minimum 30 cm depth, supply & laying of suitable size DWC/HDPE pipe for laying of cable in DWC/HDPE pipe. The surface of the pipe shall be of good finishing. Refilling of the excavated earth with cement concreting & properly dressing should be done by contractor.
8. **Cable trench (Horizontal drilling) & laying of cable.**
The cost covers horizontal drilling at suitable safe depth without cutting open of road, supply and pushing of 6" HDPE pipe in the drilled hole across the road/track. This includes laying of cable across the road/track through the pushed pipe. The work shall be carried out in close co-ordination with DEE/GSU/NAG's authorized representative at site. The material should conform to latest RDSO/IS/IEC specifications. Wherever these specifications do not exist the relevant BS specification shall be applicable. All materials required shall be supplied by the contractor.

9. Supply, installation, testing and commissioning of Solar LED High Mast tower lighting system of 10 M height including civil work for foundation of high mast, with 06 Nos. integrated solar LED street lights of 60-100 watt each.

The cost covers supply, installation, testing and commissioning of Solar LED High Mast tower lighting system of 10 M height, IP 65 including civil work for foundation of high mast, with 06 Nos. integrated solar LED street lights of 60-100 watt each. High mast shall be supplied with all accessories such as 60-100 watt solar LED flood lights 6 Nos./high mast, head frame, steel wire rope 6 mm dia. (7/19 construction), double drum winch, galvanized lantern carriage for 60-100 watts LED (6 Nos.) luminaries symmetrically & its control gear box & lighting finial, aviation obstruction warning lights etc. with earthing, programmable time switch digital type having range for 24 hrs and all other accessories required for installing high mast. Mast shaft shall be octagonal type hot dip galvanized from inside & outside & suitable for wind velocity 55 m/s. High mast will be inspected by RITES or authorized representative of DEE/GSU/NAG at manufacturer's premises before supply. The charges of RITES inspections shall be paid by the Railway. The contractor has to submit make and dimensions of solar high mast with foundation details before inspection to DEE/GSU/NAG & get it approved. Complete solar high mast shall have 01-year maintenance period and 02-year onsite warranty.

(Make of solar light: Havells, Crompton, Orient, Philips, Bajaj, Jaquar, Fevino, Surya, Goldwyn, Wattera, Sun2earth solar or Halonix make that confirms to respective IS with 5 years warranty)

Octagonal pole: Thickness-3mm, thickness of base plate-16mm, width of base plate-300mm, length of base plate-300mm, grade 355 of high tensile still as per IS 5968. (Make of pole: TATA, Jindal, Bhushan, Hindustan, Bansal, Utkarsh, Shubhangi casting, R Ispat, Vakrangee, Magnetic Industries, VSTP, Crompton, Surya, Apollo, PSST or same as solar light make)

Solar panel: Color temperature 5500/5700 kelvin, battery panel 12.8V/54 AH, Autonomy: 02 Nights, Solar charge controller capacitor current (ampere): 12-15 Amp, Charge Controller MPPT, Solar Pannel Wattage-150, Dusk to Dawn operation - Yes, System Wattage: 50-60, in built DC-DC type driver, PIR sensor, deep discharge protection, 1 day charging time, Charge Controller Efficiency > 90%, Luminaire Efficacy (Lumen/watt) > 100, Solar charge controller capacitor voltage (volt) -5, Beam Angle 60-90 or as per site requirement, Aluminium Extruded frame Body.

Construction of shallow foundation with M-25 grade concrete for HM- Construction of shallow foundation with M-25 grade concrete for the high mast tower light system considering the safe soil bearing capacity at site as 10 T/sq.m at 2 m depth. All materials & labours required for Construction of shallow foundation shall be supplied by the contractor.

Erection & commissioning of solar high mast, feeder pillar & earthing of high mast- Erection & commissioning of high mast & feeder pillar with earthing of high mast. Erection of high mast shall be done with the help of suitable tools & plants, wiring of luminaries with all wiring material like flexible copper cable, lugs etc. The mast feeder pillar should be installed by grouting the stand in concrete. The high mast should be earthed with earth electrode including connection to high mast earth terminal with 25 x 3 mm Gi flats (2 Nos. per mast). Solar panel angles shall be such as to generate maximum wattage. All materials & labours required for erection & commissioning of high mast, feeder pillar & earthing shall be supplied by the contractor. All the work of installation shall be carried out in closes co-ordination with authorized representative of DEE/GSU/NAG.

10. Supply, installation and commissioning of 20 M High mast with 8 Nos. LED flood light fittings of 200 watt including foundation work of high mast.

The cost covers supply of LED High mast lighting system of 20 meters with 8 Nos. LED flood light fittings d 200 watt including foundation and erection work of high mast. High mast shall be supplied with all accessories such as 200 watt LED flood lights 8 Nos high mast, head frame, steel wire rope 6 mm dia. (7/19 construction), double drum winch, galvanized lantern carriage for 200 watts LED (8

Nos.) luminaries symmetrically & its control gear box & lighting finial, aviation obstruction warning lights etc with double circuit for 50% lighting control with earthing, programmable time switch digital type having range for 24 hrs. and all other accessories required for installing high mast. Mast shaft shall be hot dip galvanized from inside & outside & suitable for wind velocity. High mast will be inspected by RITES or authorized representative of DEE/GSU/NAG manufacturer's premises before supply. The charges of RITES inspections shall be paid by the Railway. The contractor has to submit make and dimensions of high mast with foundation details before inspection to DEE/GSU/NAG's office & get it approved. Complete high mast shall have 01-year maintenance period and 02-years onsite warranty.

(Make: Havells, Crompton, Orient, Philips, Bajaj, Jaquar, Fevino, Surya, Goldwyn, Wattera or Halonix make that confirms to respective IS with 5 years warranty) (Make of pole: TATA, Jindal, Bhushan, Hindustan, Bansal, Utkarsh, Shubhangi casting, R Ispat, Vakrangee, Magnetic Industries, VSTP, Crompton, Surya, Apollo, PSST or same as LED light make as mentioned in this item, High mast, scope of work).

Construction of shallow foundation with M-25 grade concrete for HM-Construction of shallow foundation with M-25 grade concrete for the high mast lower light system considering the safe soil bearing capacity at site as 10 T/sq.m 2 m depth. All materials & labours required for Construction of shallow foundation shall be supplied by the contractor.

Erection & commissioning of high mast, feeder pillar & earthing of high mast-Erection & commissioning of high mast & feeder pillar with earthing of high mast. Erection of high mast shall be done with the help of suitable tools & plants, wiring of luminaries with all wiring material like flexible copper cable, lugs etc. The mast feeder pillar should be installed by grouting the stand in concrete. The high mast should be earthed with earth electrode including connection to high mast earth terminal with 25 x 3 mm GI flats. (2 Nos, per mast) All materials & labours required for erection & commissioning of high mast, feeder pillar & earthing shall be supplied by the contractor.

11. Fixing of Junction Box with accessories

The cost covers fixing & commissioning of Junction box with all accessories. The junction boxes shall be fixed on the poles at a height of not less than 1.5 meters with proper clamps & nut bolts. The connections & looping inside the box shall be done in close co-ordination with DEE/GSU/Nagpur's authorized representative at site. All materials required for fixing & connection of junction boxes shall be supplied by the contractor.

12. Fixing of GI pipe.

The cost covers cutting of required length of GI pipe & its fixing along the wall/pole/support with necessary clamping arrangement of size 25x2 mm. The cable shall be properly inserted in GI pipe and pipe should be fixed as cable should not be seen at downside of pole/wall. All materials & labours required for fixing shall be supplied by the contractor.

13. Installation, commissioning of water Cooler.

The cost covers installation & commissioning of water Cooler 150 Liters/400 Liters capacity. The water cooler shall be installed on the foundation. Water cooler cable shall be connected to MCB board with flexible pipe. Water cooler body should be earthed properly by an earth continuity conductor of copper wire of 4 Sq mm FRLS (Green color). Any modification required shall be carried out by the tenderer. The incoming & outgoing pipe line & drain connections shall be done by the tenderer as per the directive of DEE/GSU/NAG's authorized representative at site. All materials required for installation of water cooler shall be supplied by the tenderer.

14. Fixing of MCB DP, 10-32 Amps 240 Volts.

The cost covers fixing, testing and commissioning of DP MCB 10 to 32 amp complete with enclosure & accessories required for fixing of MCB. All materials necessary for installation and commissioning of MCB shall be supplied by the contractor.

15. Concealed wiring point for AC with 4 Sq. mm FRLS copper wire, fixing and connection DB with 4M flush type with starter, DP MCB and Plug top

The cost covers concealed wiring point for AC with 4 Sq. mm FRLS copper wire, fixing & connection DB with 4M flush type with starter, DP MCB & Plug top with indicator. The wiring shall be done with PVC pipe and FRLS PVC insulated stranded copper conductor 4 sq. mm 1100 volt grade. An earth continuity copper wire of 4 sq. mm FRLS (Green colour) shall run all along the piping, after proper fixing of PVC pipe, finishing of cement plastering & touching up of distempering in proper manner should be done so as to keep the aesthetic look of the building intact. ((FRLS copper wire - Anchor, Standard, Finolex, Havells, Polycab, HPL, KEI make that confirms to respective IS). This also covers fixing, testing and commissioning of 4M flush type with starter, DP MCB & Plug top with indicator complete with accessories.

16. Fixing of Penta motor starter switch of 16 to 25 Amps capacity

The cost covers fixing of single-phase Penta motor starter of 16-to-25-amp capacity suitable to work on 230 V AC supply. It shall be fixed properly for switching and controlling AC/induction motor. All the work shall be carried out in close co-ordination of authorized Railway representative.

17. Fixing of Day Night sensor

The cost covers fixing, testing & commissioning of light sensor switch. The Day Night sensor timer shall be fixed with proper fixture & the wiring shall be done as per the directive of DEE/GSU/NAG's authorized representative at site. All materials & labour required for fixing of timer shall be supplied by the contractor.

18. Fixing of contractor 32 Amp, 230 Volts supply and coil

The cost covers fixing, testing & commissioning of 3 pole power contactor 32 Amp, 230 volts. The 3-pole power contactor shall be fixed with proper fixture & the wiring shall be done as per the directive of DEE/GSU/NAG's authorized representative at site. All materials & labours required for fixing of timer shall be supplied by the contractor.

19. Concealed wiring with PVC conduit pipe with modular switch & 1.5 sq. mm FRLS copper wire.

The cost covers concealed wiring for light, fan with Modular type switches & PVC conduit pipe. The wiring shall be done with PVC insulated stranded copper wire 1.5 sq. mm 1100-volt grade FRLS. The wiring shall be terminated into ceiling rose for light & fan points inclusive of supply of all materials. The Modular switches shall be fixed on to a concealed board made of powder painted sheet steel frame with hylam sheet cover 3 mm thick & white finish of suitable size. The metallic part of the board shall be earthed at two places using 4 sq mm FRLS (Green color) copper wire. The fan regulators shall be fitted into the switch board & connected. An earth continuity conductor of 4 sq mm FRLS (Green color) copper wire shall be run all along the piping & shall be connected to the fan regulator & the down rod of the fan. After proper fixing of PVC pipe, finishing of cement plastering & touching up of distempering in proper manner should be done so as to keep the aesthetic look of the building intact. (FRLS copper wire-Anchor, Standard, Finolex, Vishal cables, Havells, KEI, Polycab, HPL or Johnson make that confirms to respective IS) (PVC conduit- Sarswati, Vasan, Polycab, Anchor, Cello or Preshtech make that confirms to respective IS).

Note - The tube lights & fans shall be connected to the ceiling rose with 1.5 sq. mm flexible copper wire (FRLS) approximately 1 (one) meter for each fitting.

A) Switch Board - The control switch board shall be of suitable size MS box fitted in the groove of the wall with white hylem sheet of 3 mm thick on TOP portion of MS box. The controlling switches shall be fixed on the hylem sheet by making necessary slots. The size of the board shall be so as it should accommodate controlling switches & regulator of the same room in close vicinity. The box shall be concealed & Hylem sheet portion will be on the face of wall.

B) Switches and ceiling rose - A PVC white flush type modular switch for controlling the supply & PVC white ceiling rose for wiring terminals both of 5 Amp, 250V grade. The fitting should be connected to the ceiling rose through 1.5 sq.mm twin core copper wire (FRLS).

C) Marking on switches - The switches should be marked properly as F, L, S & E on it for fan, lights, socket & Exhaust respectively.

20. Sub circuit wiring with 2.5 sq.mm FRLS copper wire

The cost covers of wiring from main switch boards to switch boards & from one room to another room is referred as sub-circuit. The sub-circuits shall run through PVC conduits and having PVC insulated FRLS copper wire 2.5 sq. mm size, 1100 V grade. A number of sub-circuits may run through one PVC conduit for convenience of wiring. One sub-circuit shall consist of two wires one phase & one neutral. An earth continuity conductor of 4.0 sq mm FRLS (Green colour) copper wire shall be run all along the piping in the sub circuit. (FRLS copper wire-Anchor, Standard, Finolex, Vishal cables, Havells, HPL, Polycab or Johnson make that confirms to respective IS).

21. Sub circuit wiring with 4 sq.mm copper wire FRLS

The cost covers of wiring from main switch boards to switch boards & from one room to another room is referred as sub-circuit. The sub-circuits shall run through PVC conduits and having PVC insulated FRLS copper wire 4.0 sq. mm size, 1100 V grade. A number of sub-circuits may run through one PVC conduit for convenience of wiring. One sub-circuit shall consist of two wires one phase & one neutral. An earth continuity conductor of 4.0 sq mm FRLS (Green colour) copper wire shall be run all along the piping in the sub circuit. (FRLS copper wire-Anchor, Standard, Finolex, Vishal cables, Havells, HPL, Polycab or Johnson make that confirms to respective IS).

22. Fixing & wiring of outdoor fittings with short arm fixture

The cost covers fixing of LED outdoor street light fittings/Flood light fittings on Rail/SST/Octagonal pole or on building/shelter with supply and fixing of short arm fixture. The cost also covers supply and fixing of flexible FRLS 1.5 Sq. mm copper wire and PVC conduit pipe of suitable size for fixing of LED outdoor fittings from junction box. The short arm fixture consists of bend pipes of suitable dia. made out of class-A GI pipe as per design of the fitting. Pipes shall be bent at 20 degrees above the horizontal, clamped to the pole with two sets of suitable clamps made out of 25 mm x 5mm MS flat painted properly with red oxide with suitable nuts and bolts etc. The connection to light fitting shall be done with PVC insulated flexible FRLS 1.5 Sq. mm copper wire through PVC conduit pipe of suitable size to be fixed with fixtures & kit-kat fuses in the junction box provided on pole. The work of fixing of light fitting shall be done in close co-ordination with DEE/GSU/NAG's authorized representative. All materials necessary for fixing and wiring shall be supplied by the contractor.

23. Fixing of modular switch board, modular switch, mounting grid, cover & metal box.

The cost covers fixing of Modular switch boards with modular switches, covers, modular plates with support should be fitted on wall/column/structure in close vicinity. The box shall be fitted in the manner that it will not obstruct any person working. The work shall be done as per the directives of the representative of DEE/GSU/NAG at site. All materials & labours required for making groove in the wall & fixing of the boards shall be supplied by the contractor.

24. Installation & commissioning of 4 pole MCCB, 63/100 Amps with sheet steel enclosure.

The cost covers installation & commissioning of 4 poles, MCCBs 63/100 amp with sheet steel enclosure with all accessories. The work of installation & commissioning of MCCBs shall be done by the contractor with supply of labour & tools and shall be carried out in close co-ordination with DEE/GSU/NGP's authorized representative at site. All materials necessary for installation shall be supplied by the contractor.

25. Installation & commissioning of 1 and 3 phase DB with all accessories.

The cost covers fixing, testing & commissioning of 1 phase & 3 phase distribution board with MCBs, complete with base and enclosure. The Distribution Boards shall be fixed at a suitable height with proper fixture. An earth continuity copper wire of 4 sq. mm FRLS (Green color) shall run from the main board to the Distribution Board and connected to the earth terminal for Earthing of Distribution Boards. The lug should be fixed at the cable end & it should be crimped tightly with necessary ferrules duly marked. All materials and labours required for fixing of Distribution Boards shall be supplied by the contractor.

26. Installation and commissioning of 1.5 T and 2 T split AC.

The cost covers installation, testing & commissioning of 1.5 T/2 T split AC indoor unit and outdoor units, their electrical and air pipe inter connection. The cost also covers dismantling of AC indoor unit and outdoor unit along with outdoor unit mounting bracket as per instructions of DEE/GSU/NAG or his authorized representative at site. All materials required for installation, testing and commissioning of split AC shall be supplied by the contractor. Similarly, all materials required for dismantling of complete Air conditioner shall be supplied by the contractor. Dismantled air conditioners shall be submitted to store of SSEE/electrical G store. An earth continuity copper wire of 4 sq mm FRLS (green color) shall run from the main board to the split AC and connected to the earth terminal.

27. Fixing of Heavy-Duty AC stand/Heavy Duty AC Outdoor Unit Mounting Bracket.

The cost covers of fixing of heavy-duty AC stand/Heavy duty Air conditioner outdoor unit mounting bracket. The bracket will be rigidly fixed on the wall with the help of nuts and bolts at the location and height as desired by the site engineer. The aesthetic beauty of the wall will be maintained by the contractor after fixing of the bracket. All materials required for fixing shall be supplied by the contractor.

28. Fixing of ELCB

The cost covers fixing, testing & commissioning of Earth Leakage Circuit Breaker 2 pole and 4 pole on main distribution board under Railway Supervisor's direction. All materials & labours required for fixing of ELCB shall be supplied by the contractor.

29. Wiring, installation & commissioning of energy meter with box, CT coils for measurement of energy, voltage, current, power factor etc. of the feeder to which it is connected with supply of wooden board.

The cost covers fixing & commissioning electronic Energy Meter box with wooden board of suitable size to accommodate Energy meter, CT coils. The box shall be fixed firmly on wall at suitable height. It also includes earth connection with 4 Sq. mm FRLS (green colour) copper wire from the nearest earthing point for earthing of SFU/DPMCB/Energy meter. The work of fixing of energy meter shall be done in close co-ordination with DEE/GSU/Nagpur's authorized representative at site. All material & labour required for fixing of energy meter shall be supplied by the contractor.

30. Transportation, installation and commissioning of 18 SWG MS location box with switchgear.

The cost covers transportation, installation & commissioning of 18 SWG MS location box on suitable size foundation. This includes transportation of material at site also. The location box shall be installed with proper nut bolts on the foundation constructed with bricks, cement and concrete up to a suitable height so that it is safe from accumulation of rain water. Foundation for location box shall be constructed by contractor. The lug should be fixed at the cable end & it should be crimped tightly with necessary ferrules duly marked. All materials required for transportation, installation & commissioning of location box, with switchgear shall be supplied by the contractor. The connections & looping inside the box with switchgears shall be done in close co-ordination with DEE/GSU/NAG's authorized representative at site.

31. Transportation, installation, testing & commissioning of LT cubical panel

The cost covers transportation, installation & commissioning of LT cubical panel. The proper installation of LT cubical panel, connections and looping inside the panel should be done as per directives of DEE/GSU/NAG's authorized representative at site. All materials and labours required for transportation, installation & commissioning of LT cubical panel shall be supplied by the contractor.

32. Transportation, installation, testing and commissioning of 7.5 HP pump set.

The cost covers transportation, installation, testing & commissioning of 7.5 HP submersible pumps set. The pump set shall be installed properly in the bore well, as per directive of DEE/G/GSU/NAG's or his authorized representative at site. The pump set with control gear, cable etc. shall be tested for a period of 72 hours continuously and the results shall be jointly signed by the contractor and DEE/G/GSU/NAG's authorized representative at site. All materials required for transportation, installation, testing & commissioning shall be supplied by the contractor.

INSPECTION - Pump and motor shall be inspected by DEE/GSU/NGP or his authorized representative as per relevant IS and the specification. All other items shall also be inspected by DEE/GSU/NGP or his representative on the basis of respective manufacturers test certificates & suppliers guarantee certificate. The tenderer shall furnish the 'Head/Output' and 'Output efficiency' characteristics curve as well as BHP/ KW required and efficiency of the pump at duty point. The tenderer should supply all necessary catalogues/list of spares /pamphlets of the manufacturers to show the efficiency of the equipment proposed to be supplied, failing which the offer is liable to be ignored. Contractor shall furnish instruction manual for installation and maintenance along with supply. One set of suitable tool shall be supplied along with the pump set for installation of the pump set - Spanner set -1 No., Screw driver (10") - 1 No., Screw Driver (18") -1 No, Clamp for column pipe - 3 Sets.

33. Installation, testing and commissioning of submersible 3 phase DOL starter.

The cost covers installation, testing & commissioning of 3 phase DOL starter panel for 7.5 HP pump with pump protection & all its standard accessories. The commissioning shall be as per the directive of DEE/GSU/NAG's authorized representative at site. All materials for installation & commissioning of starter shall be supplied by the contractor.

34. Fixing, testing & commissioning of LT capacitor bank of 3 KVAR.

The cost covers installation, testing & commissioning of 3 KVAR capacitor bank suitable for 50 HZ, AC supply system. The commissioning of capacitor bank shall be done as per the directive of DEE/GSU/NAG's authorized representative at site. All materials shall be supplied by the contractor.

35. Fixing of 18 SWG MS terminal box of 400 x 400 x 250 mm

The cost covers supply of terminal box of 400 x 400 x 250 mm size fabricated from 1.2 mm CRCA sheet steel, powder coated with IP 55 & 66 degree of protection, hinged doors & locking arrangement. Hylam sheet of suitable size, din rail, connecting terminal, & 3 Nos. 32 A DP MCBs should be suitably fixed inside the box. (BCH, ABB, MDS, L&T, Siemens, Havells or Sohal make that confirms to respective IS).

36. Fixing of Kit Kat fuse grip.

The cost covers fixing of fuse grip inside the box. The work of fixing of fuse grip shall be done by the contractor with supply of labour, tools, material (if required) & shall be carried out in close co-ordination with DEE/GSU/NAG's representative at site. The work of commissioning include connection of incoming & out going cables/wires to the box with socketing of each cable/wire, earthing of the box with 8 SWG GI wire & charging.

37. Fixing, testing and commissioning of SDF unit of 32A/63A/100A 415 V.

The cost covers fixing, testing and commissioning of Switch Disconnector Fuse unit in steel sheet enclosure of 32/63/100 Amps, 415 volts capacity. The SDF shall be fixed with proper fixture on board/the brick wall & the cables shall be connected with lugs to the cable links as per the directive of DEE/GSU/NAG's authorized representative at site. The SDF shall be earthed to the nearest existing earth pit with 8 SWG size GI wire to be supplied by the contractor. All materials required for fixing and wiring of SDF unit shall be supplied by the contractor.

38. Installation & commissioning of submersible pump control panel for 3 phase pumps

The cost covers installation, testing & commissioning of submersible pump control panel for 3 phase pumps with pump protection & all its standard accessories. The commissioning shall be done as per the directive of DEE/GSU/NAG's authorized representative at site. All materials for installation & commissioning of starter shall be supplied by the contractor.

39. Fixing of Safety chain set.

The cost covers fixing of the MS chain with the pump set. It shall be clamped firmly to proper hook/structure of the pump house to prevent the pump set from falling accidentally into the well. Fixing of chain shall be as per the directive of DEE/GSU/NAG's authorized representative at site. All materials shall be supplied by the contractor.

40. Fixing, testing & commissioning of non-return valve with bypass arrangement.

The cost covers fixing, installation, testing & commissioning of Non return valve for 7.5 HP pump with bypass arrangement. The commissioning of valve shall be as per the directive of DEE/GSU/NAG's authorized representative at site. All materials for fixing, installation, testing & commissioning shall be supplied by the contractor.

41. Fixing, testing and commissioning of sluice valve for the pump set.

The cost covers fixing, installation, testing & commissioning of sluice valve arrangement for pump sets. The commissioning of valve shall be as per the directive of DEE/G/GSU/NAG's authorized representative at site. All materials for fixing, installation, testing & commissioning shall be supplied by the contractor.

42. Fixing & connecting of 6 Amps & 16/6 sockets & switches with 2.5 sq. mm single core flexible FRLS copper wire & earth connection

The cost covers fixing & connecting of 6, 16/6 Amps sockets & switches with 2.5 Sq. mm single core flexible copper wire and earth connection from sub-circuit wiring, which is to be terminated at suitable good quality connector fixed inside the switch board. Outgoing to be taken separately one for 6, 16/6 Amps socket with 2.5 sq.mm & one for light & fan wiring with 1.5 sq. mm single core flexible FRLS copper wire. An earth continuity conductor of copper wire of 4 sq. mm FRLS (Green colour) shall be run from the main board to the plug socket. (FRLS copper wire-Anchor, Standard, Finolex, Havells, Polycab, HPL or Johnson make that confirms to respective IS).

43. Fixing of Ceiling fan.

The cost covers fixing of ceiling fan on fan hook & connecting of ceiling fan with 1.5 sq. mm FRLS copper wire from ceiling rose. A copper wire of 4 sq.mm FRLS (Green colour) shall run from ceiling fan to board and main board for Earthing. All materials required for fixing of ceiling fan shall be supplied by the contractor.

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44. Fixing of wall mounting fan.

The cost covers fixing & connecting of wall mounting fan of 400 mm size complete with all accessories. The fan should be fixed as per the instructions of DEE/GSU/NAG's authorized representative at site. Necessary materials for fixing should also be supplied by contractor. An earth continuity copper wire of 4 sq.mm FRLS (Green colour) shall run from the main board to the fan and connected to the earth terminal.

45. Fixing of exhaust fan and plastic air fresh fans.

The cost covers fixing & connecting of exhaust fan of 300 mm sweep and plastic fresh air fan complete with all accessories. The fan should be fixed as per the instructions of DEE/GSU/NAG's authorized representative at site. Necessary materials for fixing should also be supplied by contractor. An earth continuity copper wire of 4 sq.mm FRLS (Green color) shall run from the main board to the fan and connected to the earth terminal.

46. Fixing and wiring of LED light fitting.

The cost covers fixing & connecting of LED tube light, down light, square light fitting with all accessories. Fitting should be properly fixed on the wall/ceiling/surface/recess with the help of wooden/PVC blocks/clamps etc, with sufficient strength to hold the fitting. Connection to the fitting should be done with 1.5 sq.mm flexible FRLS stranded copper wire from the ceiling rose. All materials and labours required for fixing of LED shall be supplied by the contractor

47. Fixing of angular batten holder.

The cost covers fixing, testing and commissioning of Angular batten holder. Holder should be properly fixed on the wall with the help of PVC blocks with sufficient strength to hold the holder. This also includes supply of PVC block. All materials for fixing shall be supplied by the contractor.

48. Provision of earthing arrangement

The cost covers supply & erection of earth cone with cover. Earth cone to be laid down shall be fabricated from Class 'B' G. I. Pipe conforming to relevant IS and as per drawing No: CEE/G/A 4/P-105. Erection of earth cones so fabricated shall be done as per drawing No: CEE/G/A1/P-124 including supply of all materials. The location of the earth cones will be decided by the Representative of DEE/GSU/NAG. The Earth pipe shall be fitted with clamp for proper connection of 8 SWG GI wire through nuts & bolts along with supply of suitable length of 8 SWG, GI wire to connect nearby electrical asset. Earth pit will be painted with yellow oil paint and earth value to be written with black oil paint. All materials shall be supplied by the contractor.

49. Excavation of pit, erection, transportation of octagonal pole

The cost covers excavation of pit of size 750x750x1828mm & erection of Rail/SST pole & concreting the foundation plinth with 1:3:6 of cement, sand & ballast of 40 mm size including supply of materials, labours, tools. Poles shall be erected in proper alignment and vertically with supply and erection of foundation bolts of suitable size. For octagonal poles making M-20 grade reinforced cement concrete foundation by considering the safe soil bearing capacity at site as 10 T/sqm at 1.5 m depth including supply of steel concrete, excavation and fixing provided nut bolts with the help of template, duly plastered as per design complete. The Cost also includes transportation of octagonal poles from nearby depot to site.

50. Wiring & fixing of LED light outdoor fittings on existing short arm fixture of street light poles.

The cost covers fixing of LED outdoor street light fittings/Flood light fittings on Rail/SST pole on existing short arm fixture i.e. bend pipes of suitable dia. made out of class-A GI pipe as per design of the fitting. Pipes shall be bent at 20 degrees above the horizontal, clamped to the pole with two sets of suitable clamps made out of 25mm x 5mm MS flat painted properly with red oxide with suitable nuts and bolts etc. The connection to light fitting shall be done with PVC insulated flexible FRLS 1.5 Sq. mm copper wire through PVC conduit pipe of suitable size to be fixed with fixtures & kit-kat fuses in the

junction box provided on pole. PVC insulated flexible FRLS 1.5 Sq. mm copper wire and PVC conduit pipe of suitable size should be supplied by contractor. The work of fixing of light fitting shall be done in close co-ordination with DEE/GSU/NAG's authorized representative. All materials necessary for fixing and wiring shall be supplied by the contractor.

51. Installation, testing and commissioning of Solar Standalone Street Light with 30Watt LED luminaries, with charge controller, 12.8 V/30Ah Lithium Ferro Phosphate Battery with 6 m long MS hot dip galvanized tubular pole foundation.

The cost covers installation, testing and commissioning of solar standalone street light. Foundation for the solar street light system should be in accordance with the standard design of solar street light system given by manufacturer. Detailed foundation design should be submitted to the Railway and get it approved from DEE/GSU/NAG. There shall be provision of 4 or more foundation bolts. The diameter of bolts shall be more than 16 mm. The locations for installation and commissioning of solar street light shall be decided with authorized representative of DEE/GSU/NAG. All materials and labours required for installation and commissioning of solar street light shall be supplied by contractor.

52. Transportation, installation and commissioning of centrifugal self-priming Monoblock pump for sprinkling purpose

The cost covers transportation, installation, testing & commissioning of 3 HP Centrifugal self-priming Mono block pump set. The pump set shall be installed properly, as per directive of DEE/GSU/NAG's or his authorized representative at site. The pump set with control gear, cable etc. shall be tested for a period of 72 hours continuously and the results shall be jointly signed by the contractor and DEE/GSU/NAG's authorized representative at site. All materials required for transportation, installation, testing & commissioning shall be supplied by the contractor.

INSPECTION - Pump and motor shall be inspected by DEE/GSU/NAG or his authorized representative as per relevant IS and the specification. All other items shall also be inspected by DEE/GSU/NAG or his representative on the basis of respective manufacturers test certificates & suppliers guarantee certificate. The tenderer shall furnish the 'Head/Output' and 'Output efficiency' characteristics curve as well as BHP/ KW required and efficiency of the pump at duty point. The tenderer should supply all necessary catalogues/list of spares /pamphlets of the manufacturers to show the efficiency of the equipment proposed to be supplied, failing which the offer is liable to be ignored. Contractor shall furnish instruction manual for installation and maintenance along with supply. One set of suitable tool shall be supplied along with the pump set for installation of the pump set - Spanner set -1 No., Screw driver (10") - 1 No., Screw Driver (18") -1 No, Clamp for column pipe - 3 Sets.

53. Transportation, installation and commissioning of booster pump for sprinkling purpose

The cost covers transportation, installation, testing & commissioning of 2 HP booster pumps set for sprinkling purpose. The pump set shall be installed properly, as per directive of DEE/GSU/NAG's or his authorized representative at site. The pump set with control gear, cable etc. shall be tested for a period of 72 hours continuously and the results shall be jointly signed by the contractor and DEE/GSU/NAG's authorized representative at site. All materials required for transportation, installation, testing & commissioning shall be supplied by the contractor.

INSPECTION-Pump and motor shall be inspected by DEE/GSU/NAG or his authorized representative as per relevant IS and the specification. All other items shall also be inspected by DEE/GSU/NAG or his representative on the basis of respective manufacturers test certificates & suppliers guarantee certificate. The tenderer shall furnish the 'Head/Output' and 'Output efficiency' characteristics curve as well as BHP KW required and efficiency of the pump at duty point. The tenderer should supply all necessary catalogues/list of spares /pamphlets of the manufacturers to show the efficiency of the equipment proposed to be supplied, failing which the offer is liable to be ignored. Contractor shall furnish instruction manual for installation and maintenance along with supply. One set of suitable tool shall be

supplied along with the pump set for installation of the pump set Spanner set-1 No., Screw driver (10") 1 No., Screw Driver (18")-1 No. Clamp for column pipe - 3 Sets.

54. Fixing of thermoplastic polycarbonate enclosure

The cost covers fixing of thermoplastic polycarbonate enclosure along with all switchgears on the 2 M GI pole with proper fixture & the wiring inside the enclosure shall be done as per the directive of DEE/GSU/NAG's authorized representative at site. All materials & labours required for fixing of timer shall be supplied by the contractor.

55. Fixing of HDPE pipe 25 mm, PE100, PN 10

The cost covers fixing of HDPE pipe 25 mm size, PPE 100, PN 10. The pipe along with cables shall be fixed along the road/platform in the trench. All the work of fixing of HDPE pipe shall be done in co-ordination with authorized representative of DEE/GSU/NAG.

56. Excavation of pit and concreting of 2M GI pole for fixing of Thermoplastic polycarbonate enclosure.

The cost covers excavation of pit of suitable size and erection of 2 M GI pole for fixing of thermoplastic polycarbonate enclosure along with concreting the foundation plinth with 1:3:6 of cement, sand & ballast of 40 mm size including supply of materials, labours, tools. Poles shall be erected in proper alignment and vertically with supply and erection of foundation bolts of suitable size. For octagonal poles making M-20 grade reinforced cement concrete foundation by considering the safe soil bearing capacity at site as 10 T/sqm at 1.5 m depth including supply of steel concrete, excavation and fixing provided nut bolts with the help of template, duly plastered as per design complete. The Cost also includes transportation of octagonal poles from nearby depot to site.

57. Dismantling and transportation of existing Rail/SST/Octagonal poles from site to nearby depot.

The cost covers dismantling, safe loading, unloading and transportation of Rail/SST/Octagonal poles to from site to nearby PL depot. After cutting of poles, it should be placed properly so that it will not obstruct for any movement. The equipment, material and manpower required for cutting of Rail/SST poles, transportation of Rail/SST poles should be supplied by the contractor.

58. Fixing of LT joining kit for 4 core 150/120/70/50/25/16 sq.mm cable

The cost cover installation, testing and commissioning of LT jointing kit for 4 core 150/120/70/50/25/16 sq.mm LT XLPE cable. All materials required for installation of kit shall be supplied by the contractor. The work shall be carried out in close co-ordination with DEE/GSU/Nagpur's authorized representative at site.

59. Supply & fixing of aluminium lugs.

The cost covers supply & fixing of aluminium lugs for cables. The lug should be fixed at the cable end & it should be crimped tightly with necessary ferrules duly marked. All materials necessary for fixing of lugs shall be supplied by the contractor. (Dowels, Gripwel, Jainson or any make that confirms to respective IS).

- a. Supply and fixing of aluminium lugs 70 sq.mm
- b. Supply and fixing of aluminium lugs 35 sq.mm
- c. Supply and fixing of aluminium lugs. 16 sq.mm
- d. Supply and fixing of aluminium lugs 10 sq.mm



Note:

- 1 All materials to be supplied should confirm to latest RDSO/IS/IEC specifications. Wherever these specifications do not exist the relevant BS specification shall be applicable.
- 2 If any minor item left in the scope of work & schedule, the contractor shall provide himself for completing the job.
- 3 All electrical items should be ISI marked wherever applicable.
- 4 Prior to the execution, sample approval of items should be taken.
- 5 Compliance with regulations: - The installation of electrical wiring on railway buildings shall be carried out in accordance with the specification and in addition, shall comply with the following regulations in all respects excepts where amended herein.
 - a. Indian standard code of practice for electrical wiring, installation (System voltage not exceeding 650 volts IS-732-89, 3rd Revision).
 - b. The Indian electricity act and all rules framed therein.
- 6 All LED light fittings will have sixty months warranty from date of commissioning or seventy-two months from date of supply whichever is earlier.
- 7 The contractor or his sub -contractor should have valid electrical contractors license for execution of electrical general portion of work.


DEE/GSU/NAG


08/06/2026
Sr.SE/EL(G)/GSU/NAG