

General Explanatory Note

Name of Work: Electrical work for Provision of wash room cum changing room, rest room etc. for female employees at work place in Kharagpur- Bhadrak section.

S.no	Description	Explanatory notes
1	Concealed Wiring of light and fan point by 1.5 Sq. mm, Single Core, Copper wire each for phase & neutral with 1.5 Sq. mm, Single Core, Copper wire for Earthing through PVC Conduit Pipe of Nominal Size 20mm/25mm (as per site requirement) including supply and fixing of all required materials like modular switch, socket, lamp holder, ceiling rose with suitable flush metal boxes, front plate etc. as per specifications mentioned in explanatory note.	Concealed wiring of light and fan point by 1.5 Sq. mm, Single Core, Copper wire each for phase & neutral with 1.5 Sq. mm, Single Core, Copper wire for Earthing through PVC Conduit Pipe of Nominal Size 20mm/25mm (as per site requirement). The system should provide ease of access to fittings for maintenance and repair and for any possible modification to the system. Electrical wiring to be concealed in wall structure, the necessary fan hooks, conduits should be positioned during the shuttering is in place and before the concrete is poured, provision being made to protect conduits from damage. Each point circuit must include separate phase, neutral & protective earth conductor from respective junction box. Proper earthing of all apparatus and appliances in accordance with all relevant IS standards/specifications is to be maintained. The cost includes necessary masonry work including supply and fixing of all required materials like copper wire, conduit pipe, modular switch, socket, lamp holder, ceiling rose with suitable flush metal boxes, front plate etc. as per below mentioned specifications and to be provided as and where required as per direction of consignee. 1.5 Sq. mm, Single Core, Copper wire spec: It shall be Multistrand (22/0.3mm or suitable), Copper Conductor (flexible), Unsheathed, Flame Retardant Low Smoke and Halogen (FR-LSH), PVC insulated Cable of 1100V grade, Type-C PVC Compound as per IS 5831, Conforming to IS :694 - 2010 (Reaffirmed 2020), ISI marked. PVC Conduit Pipe of Nominal Size 20mm/25mm spec: It shall be Socket ended (at one end), medium mechanical stress, White Color, Resistant to Flame Propagation to grade UL-94 V0, Conforming to IS 9537 (Part 3) 1983 (Reaffirmed Year : 2017) with amendment no. 2 or latest with ISI mark. Modular Electrical Switch spec: It shall be 6A, 230 V, SP, 1 Way, 1 Module, Unenclosed type as per Clause no. 7.1.3, Method of Activation of switch shall be of Rocker type as per Clause no. 7.1.5, Switch shall be Flush type as per Clause no. 7.1.6 and shall be installed as per Design A mentioned in the Clause no. 7.1.7, Current carrying material as per Clause no. 22.5, with cover made of tough non-ignitable insulating material and bare of tough non-ignitable insulating material or of vitrified ceramic material, Conforming to IS:3854/1997 (reaffirmed 2017) with latest amendments and ISI mark. Modular 3-pin Socket spec: It shall be 6A, 230V, 2 Module, Shuttered (Operation of Shutter should be independent of Earthing Point), Cover made of tough Non-Ignitable insulating material, material of base -vitrified ceramic, Conforming to IS : 1293-2019, Amendment no. 1 or latest with ISI mark. Lamp Holder spec: It shall be Aluminium, batten type, with shade carrier ring, ISI marked, Base: B-22 suitable for use at 250V, Conforming to IS: 1258(Rev.-3)-2005) with amdt-3, with BACK plate of 53 MM Dia. & 45 MM PCD. Ceiling Rose spec: It shall be surface type ceiling rose (ISI marked), with three terminals, made of tough non ignitable insulating material ' urea formaldehyde moulding, volt-250V

		AC, Amp-6Amp, conforming to IS: 371-1999(reaffirmed 2020). Metal Box and PVC Cover Plate spec: All JB & Switch Board box shall be modular type and made of Stainless Steel. PVC cover plates shall be modular type and covers or cover parts or parts of them, which are intended to ensure protection against electric shock, shall be held in place at two or more points by effective fixings. Following points to be noted: *Two 5-ampere socket point shall be treated as one point. The plate should include 2 blank spaces for further installation of switches. *Wherever length of necessary connection wire for any point exceeds 30cm, separate flexible conduit pipe is to be provided and the same shall be duly saddled in wall structure. *All accessories shall be fixed in wall using stainless steel fastener only where required. *All wiring connections shall be made duly providing Pin Type Cu Terminal End Lugs as per specification mentioned in Annexure-A of this document. *Provision of modular fan regulator should be kept on switch board. The cost also includes fixing of fan regulator on the switch board and connection of existing light fittings/ceiling fans if any. *Note: Colour code is to be maintained (i.e. for Phase-red, for Neutral-black and for Earth- green) *Make of Cable: Havells/Polycab/KEI/Finolex, *Make of Conduit: Polycab/Presto Plast/Precision/Kalinga, *Make of Switch/Sockets/Lamp Holder/Ceiling Rose/Plate/Box:Anchor/Honeywell/Goldmedal/HPL
2	Concealed Sub Circuit wiring by 2.5 sq. mm, Single Core, Copper wire each for phase & neutral with 2.5 Sq. mm, Single Core, Copper wire for Earthing through PVC Conduit Pipe of Nominal Size 25mm including supply and fixing of all required materials like ceiling rose, suitable flush metal boxes, front plate etc. as per specifications mentioned in explanatory note.	Concealed Sub circuit wiring by 2.5 sq. mm, Single Core, Copper wire each for phase & neutral with 2.5 Sq. mm, Single Core, Copper wire for Earthing through PVC Conduit Pipe of Nominal Size 25mm. The system should provide ease of access for maintenance and repair and for any possible modification to the system. Electrical wiring to be concealed in wall structure, conduits should be positioned during the shuttering is in place and before the concrete is poured, provision being made to protect conduits from damage. Each sub circuit must include separate phase, neutral & protective earth conductor throughout the circuit length. Proper earthing of all apparatus and appliances in accordance with all relevant IS standards/specifications is to be maintained. The cost includes necessary masonry work including supply and fixing of all required materials like copper wire, conduit pipe, ceiling rose with suitable flush metal boxes, front plate etc. as per below mentioned specifications and to be provided as and where required as per direction of consignee. 2.5 Sq. mm, Single Core, Copper wire spec: It shall be Multistrand (36/0.3mm or suitable), Copper Conductor (flexible), Unsheathed, Flame Retardant Low Smoke and Halogen(FR-LSH), PVC insulated Cable of 1100V grade, Type-C PVC Compound as per IS 5831, Conforming to IS :694 - 2010 (Reaffirmed 2020), ISI marked. PVC Conduit Pipe of Nominal Size 25mm spec: It shall be Socket ended (at one end), medium mechanical stress, White Color, Resistant to Flame Propagation to grade UL-94

		V0, Conforming to IS 9537 (Part 3) 1983 (Reaffirmed Year : 2017) with amendment no. 2 or latest with ISI mark. Ceiling Rose spec: It shall be surface type ceiling rose (ISI marked), with three terminals, made of tough non ignitable insulating material 'urea formaldehyde moulding, volt-250V AC, Amp-6Amp, conforming to IS: 371-1999 (reaffirmed 2020). Metal Box and PVC Cover Plate spec: All JB box shall be modular type and made of Stainless Steel. PVC cover plates shall be modular type and covers or cover parts or parts of them, which are intended to ensure protection against electric shock, shall be held in place at two or more points by effective fixings. Following points to be noted: *Quantity per meter means- 01 (One) meter Conduit Pipe with 3 (Three) meters multi-strand Cu. cable of 2.5 Sq. mm [01 (One) meter each for phase, neutral & protective earth conductor] as per direction of Consignee. *All accessories shall be fixed in wall using stainless steel fastener only where required. *All wiring connections shall be made duly providing Pin Type Cu Terminal End Lugs as per specification mentioned in <u>Annexure-A</u> of this document. *Note: Colour code is to be maintained (i.e. for Phase-red, for Neutral-black and for Earth-green). *Make of Cable: Havells/Polycab/KEI/Finolex, *Make of Conduit: Polycab/Presto Plast/Precision/Kalinga, *Make of Ceiling Rose/Plate/Box: Anchor/Honeywell/Goldmedal/HPL
3	Concealed Sub Circuit wiring by 4 sq. mm, Single Core, Copper wire each for phase & neutral with 4 Sq. mm, Single Core, Copper wire for Earthing through PVC Conduit Pipe of Nominal Size 25mm including supply and fixing of all required materials like ceiling rose, suitable flush metal boxes, front plate etc. as per specifications mentioned in explanatory note.	Concealed Sub circuit wiring by 4 sq. mm, Single Core, Copper wire each for phase & neutral with 4 Sq. mm, Single Core, Copper wire for Earthing through PVC Conduit Pipe of Nominal Size 25mm. The system should provide ease of access for maintenance and repair and for any possible modification to the system. Electrical wiring to be concealed in wall structure, conduits should be positioned during the shuttering is in place and before the concrete is poured, provision being made to protect conduits from damage. Each sub circuit must include separate phase, neutral & protective earth conductor throughout the circuit length. Proper earthing of all apparatus and appliances in accordance with all relevant IS standards/specifications is to be maintained. The cost includes necessary masonry work including supply and fixing of all required materials like copper wire, conduit pipe, ceiling rose with suitable flush metal boxes, front plate etc. as per below mentioned specifications and to be provided as and where required as per direction of consignee. 4 Sq. mm, Single Core, Copper wire spec: It shall be Multistrand (56/0.3mm or suitable), Copper Conductor

		(flexible), Unsheathed, Flame Retardant Low Smoke and Halogen(FR-LSH), PVC insulated Cable of 1100V grade, Type-C PVC Compound as per IS 5831, Conforming to IS :694 - 2010 (Reaffirmed 2020), ISI marked. PVC Conduit Pipe of Nominal Size 25mm spec:It shall be Socket ended (at one end), medium mechanical stress, White Color, Resistant to Flame Propagation to grade UL-94 V0, Conforming to IS 9537 (Part 3) 1983 (Reaffirmed Year : 2017) with amendment no. 2 or latest with ISI mark. Ceiling Rose spec: It shall be surface type ceiling rose(ISI marked), with three terminals, made of tough non ignitable insulating material ' urea formaldehyde moulding, volt-250V AC, Amp-6Amp, conforming to IS: 371-1999(reaffirmed 2020). Metal Box and PVC Cover Plate spec: All JB box shall be modular type and made of Stainless Steel. PVC cover plates shall be modular type and covers or cover parts or parts of them, which are intended to ensure protection against electric shock, shall be held in place at two or more points by effective fixings. Following points to be noted: *Quantity per meter means- 01 (One)meter Conduit Pipe with 3 (Three) meters multi-strand Cu. cable of 4 Sq.mm [01 (One)meter each for phase, neutral &protective earth conductor]as per direction of Consignee. *All accessories shall be fixed in wall using stainless steel fastener only where required. *All wiring connections shall be made duly providing Pin Type Cu Terminal End Lugs as per specification mentioned in <u>Annexure-A</u> of this document. *Note: Colour code is to be maintained (i.e. for Phase-red, for Neutral-black and for Earth- green). *Make of Cable: Havells/Polycab/KEI/Finolex, *Make of Conduit: Polycab/Presto Plast/Precision/Kalinga, *Make of Ceiling Rose/Plate/Box:Anchor/Honeywell/Goldmedal/HPL
4	Point wiring for light, fan, plug points etc. by 1.5 sq. mm, Single Core, Copper wire each for phase & neutral with 1.5 Sq. mm, Single Core, Copper wire for Earthing through PVC Conduit Pipe of Nominal Size 25mm including supply and fixing of all required materials like ceiling rose, modular switch and socket suitable flush metal boxes, front plate etc. as per specifications mentioned in explanatory note	Point Wiring by PVC conduit /PVC Casing & Capping: Internal wiring for light, fan, plug points and lamp points by 1.5 Sq. mm, Single Core, Copper wire each for phase & neutral with 1.5 Sq. mm, Single Core, Copper wire for Earthing through PVC Conduit Pipe of Nominal Size 20mm/25mm (as per site requirement) or PVC Casing & Capping of Standard Size: 25x16mm. The system should provide ease of access to fittings for maintenance and repair and for any possible modification to the system. Electrical wiring to be rigidly fixed in wall surface / shed structure with the help of fasteners / aluminium clamp as per site requirement. Each point circuit must include separate phase, neutral & protective earth conductor from respective junction box. Proper earthing of all apparatus and appliances in accordance with all relevant IS standards/specifications is to be maintained.

	The cost includes necessary clamping work including supply and fixing of all required materials like copper wire, conduit pipe / casing capping, modular switch, socket, lamp holder, ceiling rose with suitable modular boxes, front plate etc. as per below mentioned specifications and to be provided as and where required as per direction of consignee. 1.5 Sq. mm, Single Core, Copper wire spec: It shall be Multistrand (22/0.3mm or suitable), Copper Conductor (flexible), Unsheathed, Flame Retardant Low Smoke and Halogen (FR-LSH), PVC insulated Cable of 1100V grade, Type-C PVC Compound as per IS 5831, Conforming to IS :694 - 2010 (Reaffirmed 2020), ISI marked. PVC Conduit Pipe of Nominal Size 20mm/25mm spec: It shall be Socket ended (at one end), medium mechanical stress, White Color, Resistant to Flame Propagation to grade UL-94 V0, Conforming to IS 9537 (Part 3) 1983 (Reaffirmed Year : 2017) with amendment no. 2 or latest with ISI mark. Modular Electrical Switch spec: It shall be 6A, 230 V, SP, 1 Way, 1 Module, Unenclosed type as per Clause no.7.1.3, Method of Activation of switch shall be of Rocker type as per Clause no. 7.1.5, Switch shall be Flush type as per Clause no.7.1.6 and shall be installed as per Design A mentioned in the Clause no.7.1.7, Current carrying material as per Clause no. 22.5, with cover made of tough nonignitable insulating material and bare of tough nonignitable insulating material or of vitrified ceramic material, Conforming to IS:3854/1997 (reaffirmed 2017) with latest amendments and ISI mark. PVC Conduit Pipe of Nominal Size 20mm/25mm spec:It shall be Socket ended (at one end), medium mechanical stress, White Color, Resistant to Flame Propagation to grade UL-94 V0, Conforming to IS 9537 (Part 3) 1983 (Reaffirmed Year : 2017) with amendment no. 2 or latest with ISI mark. PVC Casing & Capping of Standard Size 25x16mm spec: It shall be ISI marked, white colour, double locking, Resistant to Flame Propagation to grade UL-94 V0, as per IS: 14927 Part 2: 2001 (Reaffirmed Year: 2017) or latest, Standard Length: 2 meter, Size: 25x16mm. Modular 3-pin Socket spec: It shall be 6A, 230V, 2 Module, Shuttered (Operation of Shutter should be independent of Earthing Point), Cover made of tough Non-Ignitable insulating material, material of base -vitrified ceramic, Conforming to IS : 1293-2019, Amendment no. 1 or latest with ISI mark. Lamp Holder spec: It shall be Aluminium, batten type, with shade carrier ring, ISI marked, Base: B-22 suitable for use at 250V, Conforming to IS: 1258 (Rev.-3)-2005) with amdt-3, with BACK plate of 53 MM Dia. & 45 MM PCD. Ceiling Rose spec: It shall be surface type ceiling rose (ISI marked), with three terminals, made of tough non ignitable insulating material ' urea formaldehyde moulding, volt-250V AC, Amp-6Amp, conforming to IS: 371-1999(reaffirmed2020). Metal Box and PVC Cover Plate spec: All JB & Switch Board
--	---

		box shall be modular type and made of Stainless Steel. PVC cover plates shall be modular type and covers or cover parts or parts of them, which are intended to ensure protection against electric shock, shall be held in place at two or more points by effective fixings. Following points to be noted: *Two 5-ampere socket point shall be treated as one point. The plate should include 2 blank spaces for further installation of switches. *Wherever length of necessary connection wire for any point exceeds 30cm, separate flexible conduit pipe is to be provided and the same shall be duly saddled in wall structure. *All accessories shall be fixed in wall using stainless steel fastener only where required. *All wiring connections shall be made duly providing Pin Type Cu Terminal End Lugs as per specification mentioned in Annexure-A of this document. *Provision of modular fan regulator should be kept on switch board. The cost also includes fixing of fan regulator on the switch board and connection of existing light fittings/ceiling fans if any. *Note: Colour code is to be maintained (i.e. for Phase-red, for Neutral-black and for Earth- green). *Make of Cable/Conduit/Switch/Sockets/Lamp Holder/Ceiling Rose/Plate/Box: Anchor/Honeywell/ Goldmedal/HPL or Any Indian make conforming to relevant IS as approved by Sr.DEE(G)/KGP or authorized representative.
5	Circuit/ Sub Circuit wiring by 2.5 sq. mm, Single Core, Copper wire each for phase & neutral with 2.5 Sq. mm, Single Core, Copper wire for Earthing through PVC Conduit Pipe of Nominal Size 25mm including supply and fixing of all required materials like ceiling rose, suitable flush metal boxes, front plate etc. as per specifications mentioned in explanatory note.	Circuit/Sub-circuit wiring by PVC conduit/PVC casing capping wiring by 2.5 sq. mm, Single Core, Copper wire each for phase & neutral with 2.5 Sq. mm, Single Core, Copper wire for Earthing through PVC Conduit Pipe of Nominal Size 25mm or PVC Casing & Capping of Standard Size: 25x16mm. The system should provide ease of access for maintenance and repair and for any possible modification to the system. Electrical wiring to be rigidly fixed in wall surface / shed structure with the help of fasteners / aluminium clamp as per site requirement. Each sub circuit must include separate phase, neutral & protective earth conductor throughout the circuit length. Proper earthing of all apparatus and appliances in accordance with all relevant IS standards/specifications is to be maintained. The cost includes necessary masonry work including supply and fixing of all required materials like copper wire, conduit pipe, ceiling rose with suitable modular boxes, front plate etc. as per below mentioned specifications and to be provided as and where required as per direction of consignee. 2.5 Sq. mm, Single Core, Copper wire spec: It shall be Multistrand (36/0.3mm or suitable), Copper Conductor (flexible), Unsheathed, Flame Retardant Low Smoke and Halogen(FR-LSH), PVC insulated Cable of 1100V grade, Type-C PVC Compound as per IS 5831, Conforming to IS :694 - 2010 (Reaffirmed 2020), ISI marked.

		PVC Conduit Pipe of Nominal Size 25mm spec:It shall be Socket ended (at one end), medium mechanical stress, White Color, Resistant to Flame Propagation to grade UL-94 V0, Conforming to IS 9537 (Part 3) 1983 (Reaffirmed Year : 2017) with amendment no. 2 or latest with ISI mark. PVC Casing & Capping of Standard Size: 25x16mm spec: It shall be ISI marked, white colour, double locking, Resistant to Flame Propagation to grade UL-94 V0, as per IS: 14927 Part 2: 2001 (Reaffirmed Year: 2017) or latest, Standard Length: 2 meter, Size: 25x16mm. Ceiling Rose spec: It shall be surface type ceiling rose (ISI marked), with three terminals, made of tough non ignitable insulating material ' urea formaldehyde moulding, volt-250V AC, Amp-6Amp, conforming to IS: 371-1999 (reaffirmed 2020). Modular Box and PVC Cover Plate spec: All JB box, Cover Plates shall be modular type and covers or cover parts or parts of them, which are intended to ensure protection against electric shock, shall be held in place at two or more points by effective fixings. Following points to be noted: *Quantity per meter means- 01 (One) meter Conduit Pipe with 3 (Three) meters multi-strand Cu. cable of 2.5 Sq.mm [01 (One) meter each for phase, neutral & protective earth conductor] as per direction of Consignee. *All accessories shall be fixed in wall using stainless steel fastener only where required. *All wiring connections shall be made duly providing Pin Type Cu Terminal End Lugs as per specification mentioned in Annexure-A of this document. *Note: Colour code is to be maintained (i.e. for Phase-red, for Neutral-black and for Earth- green). *Make of Cable: Havells/Mescab/KEI/Finolex, *Make of Conduit/Casing Capping: Mescab/Presto Plast/Precision/Kalinga, *Make of Ceiling Rose/Plate/Box: Anchor Roma/Honeywell/Goldmedal/HPL
6	Supply of 12W or higher wattage LED Lamp, rated voltage 220-240V, input frequency- 50Hz, Lamp efficiency ≥ 110 lm/Watt, LED chip efficiency ≥ 130 lm/Watt, Colour temperature - 6500K (cool White), IP20 protection, CRI≥ 80, Power factor≥ 0.9 Warranty=2 Years Make: Bajaj /Havells/Crompton	The cost includes supply of 12W or higher wattage LED Lamp, rated voltage 220-240V, input frequency- 50Hz, Lamp efficiency ≥ 110 lm/Watt, LED chip efficiency ≥ 130 lm/Watt, Colour temperature -6500K (cool White), IP20 protection, CRI≥ 80, Power factor≥ 0.9 Make: Bajaj /Havells/Crompton
7	Supply of modular PC Board consisting of 03 nos. 6 amp switches with inbuilt LED indication, 03 nos. 6 Amp sockets and modular SP MCB 10A, 10kA, Type B- 01 No. with 12M Box and all other accessories to complete job for concealed wiring along with 12M , modular cover plate and Stainless Steel boxes and all other accessories including stainless steel fastener, Pin Type Terminal End Lugs to complete job as per specification attached or with latest amendment	Cost includes supply, fixing and commissioning of Modular PC Board 03 nos. 6 amp switches with inbuilt LED indication, 03 nos. 6 Amp sockets and modular SP MCB 10A, 10kA, Type B- 01 No. with 12M Box and all other accessories to complete job for concealed wiring along with 12M , modular cover plate and Stainless Steel boxes and all other accessories including stainless steel fastener, Pin Type Terminal End Lugs to complete job Modular 3-pin Socket spec: It shall be 6A/16A, 230V, 2

	or specification issued from HQ/GRC if any time to time. Make: Goldmedal/Havells/Polycab/GM Modular	Module, Shuttered (Operation of Shutter should be independent of Earthing Point), Cover made of tough Non-Ignitable insulating material, material of base -vitrified ceramic, Conforming to IS : 1293-2019, Amendment no. 1 or latest with ISI mark.
8	Fixing and commissioning of modular PC Board consisting of 03 nos. switches with inbuilt LED indication, 03 nos. sockets and modular SP MCB 10-16A, 10kA, Type B- 01 No. with Stainless Steel 12M Box, modular cover plate duly Concealed in wall surface including all other accessories to complete job with latest amendment or specification issued from HQ/GRC if any time to time, including stainless steel fastener, Pin Type Terminal End Lugs as per specification attached. (Wiring will be covered under Schedule item No. 1as per site requirement).	12 M Box and PVC Cover Plate spec: All flush metal box shall be modular type and made of Stainless Steel. PVC cover plates shall be modular type and covers or cover parts or parts of them, which are intended to ensure protection against electric shock, shall be held in place at two or more points by effective fixings. The cost includes necessary masonry work for concealing the accessories in wall structure including supply and fixing of all required materials to complete the job. Proper earthing connection in accordance with all relevant IS standards/specifications is to be maintained. Following points to be noted: * Blank space shall be filled with filler. *All accessories shall be fixed in wall using stainless steel fastener only where required. *All wiring connections shall be made duly providing Pin Type Cu Terminal End Lugs as per specification mentioned in Annexure-A of this document. *Make of Switch/Sockets/MCB/Plate/Box: Goldmedal/Havells/Polycab/GM Modular/wipro
9	Supply of Batten with 20 W LED tube light with Colour Rendering Index (CRI) >=80, confirming IP20 (with integrated electronic driver) as per specifications mentioned in explanatory note. Make- Bajaj /Havells/Crompton/Philips.	he cost includes supply of Batten with 20W LED tube light (with constant current driver having short circuit and overload protection) with Length of LED Batten (Nominal)- 1150 mm (±5%), Operating Voltage range 140-270V, Rated Voltage 220-240 V, Input Frequency- 50Hz, Lamp efficacy ≥110 lm/Watt, LED chip efficacy ≥130 lm/Watt, Color temperature- 6500K (Cool White), Housing & Diffuser
10	Fixing and Commissioning of any kind of Batten with 18W or higher wattage LED tube light with 02 nos. of stainless steel mounting clamp and screws for surface mounting of batten.	material made of polycarbonate with Inbuilt Driver having efficiency ≥85%, Color Rendering Index (CRI) ≥80,confirming ingress protection level of IP20, SMD based LED chip, Lumen Maintenance should be ≥80% after 6000 burning Hrs. as per LM 80, Power factor≥0.9, Surge voltage withstand capacity- 2.5KV, Life of LED should be minimum 50000 Hrs. and 02 nos. of stainless steel mounting clamp and screws for surface mounting of batten with following certification on demand: 1) Availability of BIS CRS compliance as per IS 10322 (Part 5, sec-1 2012: latest. 2) Availability of Photo Biological Safety of LED as per IS: 16108 /2012/IEC: 62471:2006. 3) ISO certification: 9001:2015. 4) LM79/80 report. *Warranty for free replacement- 5 years. *Technical Data Sheet (TDS) is to be approved by Sr.DEE(G)/KGP or authorised representative. Make- Crompton,Havells,Bajaj,Surya,Orient/Any IS make as approved by Sr.DEE(G)/KGP or authorized representative. Fixing and Commissioning of the tube light provided by railway shall be done with suitable fixing accessories like 02 nos. of stainless steel mounting clamp and screws for surface mounting of batten in wall or aluminium clamp in case of structure as per direction of Rly. Engineer and supply of flexible wire with suitable PVC flexible conduit for connection of fitting to power supply from nearest point.

		Earth connection is to be ensured if fitting having such provision.
11	Supply of BEE: 5 Star rated High Speed BLDC Ceiling Fan, 1200 mm Sweep, Material of Blade Aluminium, Motor winding material: Copper, Rated Voltage: 230V, 50Hz, Single phase AC with step type electronic fan regulator and necessary accessories as per specifications mentioned in explanatory note. Make:-Havells/ Bajaj / Atomberg	Cost includes supply, fixing and commissioning of BEE: 5 Star rated High Speed Brushless DC (BLDC) Motor Ceiling Fan, ISI marked, Sweep size: 1200 mm, Minimum Air delivery- 210 Cubic Meter/Min, total harmonic distortion 8% [max], Rated Voltage: 230V, 50Hz, Single phase AC, Winding Material- Copper having purity of minimum 99.90%, Class of Insulation- Class B or higher, Blade thickness (Min): 1.1mm, Blade material: Aluminum. Bearing: Double ball bearings, Down rod size (without shackle): 300mm, Shank & Shackle thickness (Min): 2mm, Canopy : 2 nos., color standard: white, Rated power-28 watt [max], Conforming to- (i) IS:374/2019 with Amendment No. 1/2022 or latest (ii) IS:302 (Part 2/Sec 80) - For safety requirement (iii) IS:14700 (Part 3/Sec2) for THD (iv) IS 191:2007 with amendment no. 2 or latest for Copper purity. Speed control with electronic regulator (step type with minimum 5 running positions) and Regulators shall be provided with radio and television interference suppressing devices as per clause 10.7 of Amendment No. 1/2022 to IS 374/2019 or latest. Cost includes supply of step type electronic fan regulator, suitable size of Stainless Steel fastener, screw, nuts, bolts, washer etc. as per site requirement. Firm has to supply 5% of Additional Identical PCBs (as used in Ceiling Fans) along with the Ceiling Fans for post warranty repairs. Packing of PCBs should be free from moisture and damages. The following certification shall be provided on demand: (i) Type test report along with offer for the offered model & make of the BLDC fan with Electronic Regulator step type with minimum 5 running positions. Test report shall be from the NABL accredited Test lab. (ii) Routine test Certificates has to be submitted along with supply of materials. (iii) Test report along with Offer for the purity of the copper used in the winding of the Offered model & make fan. Test report shall be from the NABL accredited Test lab. Acceptance test shall be carried out by Inspection Agency as per IS 374/2019 with Amendment No. 1/2022 or latest. *The product shall carry standard free replacement warranty – 2 years (min). Fixing of the fan shall be done with suitable stainless steel clamp, hook, nut/bolts etc. with installation of step type electronic regulator including flexible multi-strand Copper wire as per site requirement with suitable PVC flexible conduit for connection of fitting to power supply from nearest point. Earth connection is to be ensured. *Make: Havells/Atomberg/Crompton
12	Fixing and commissioning of Brushless DC (BLDC) Motor Ceiling Fan, ISI marked, Sweep size: 1200 mm, with electronic regulator. Cost includes Suitable size of Stainless steel fastener, clamp, hook, screw, nuts, bolts, washer, Down rod etc as per site requirement and connection with flexible twin twisted multistrand Copper wire of 0.75 Sq.mm with flexible pipe and removing of the existing old fan (if any) and handing over of the same to Railway Store with clear acknowledgement, as per site requirement.	
13	Supply of Propeller type AC Ventilating Fan (Exhaust Fan) of size 300mm, Capacitor type, Rated Voltage-240V, Frequency 50±2 Hz, Insulation material Class B, Motor Enclosure- Totally Enclosed Type, along with Guard and other Accessories such as Frame, Legs Set, Rubber Clamps & Other Hardware etc, Conforming to IS 2312- 1967 with all amendments (Reaffirmed 2020) and ISI mark. Cost includes Suitable size of Stainless steel fastener, screw, nuts, bolts, washer etc as per site requirement. Make: Crompton/Havells/Bajaj/Orient	The cost includes Supply, Fixing & commissioning of Propeller type AC Ventilating Fan (Exhaust Fan) of size 300mm, Capacitor type, Rated Voltage-240V, Frequency 50±2 Hz, Insulation material Class B, Motor Enclosure- Totally Enclosed Type, along with Guard and other Accessories such as Frame, Legs Set, Rubber Clamps & Other Hardware etc, Conforming to IS 2312- 1967 with all amendments (Reaffirmed 2020) and ISI mark. Cost includes Suitable size of Stainless steel fastener, screw, nuts, bolts, washer etc as per site requirement. Make: Crompton/Havells/Bajaj/Orient

14	Fixing and commissioning of Heavy Duty Exhaust Fans with Stainless steel fastener, screw, nuts, bolts, washer etc. as per site requirement.	
15	Supply of LED 45 watt or higher wattage street light with Colour Rendering Index (CRI) ≥ 70 , confirming IP66 as per specifications mentioned in explanatory note. Make- Phillips, Crompton, Surya, Bajaj	The cost includes supply of street light LED 45 watt or higher wattage street light suitable for fixing in arm of 42.4mm dia., including system lumen efficiency ≥ 110 lm/Watt ($\pm 5\%$), Power factor ≥ 0.90 at full load, normal voltage of luminary: 230V AC $\pm 5\%$, 50HZ, Operating Voltage range: 140-270V AC, working temperature should be -10°C to 55°C , The complete unit cubicle together with its mounting arrangement shall be subjected to shock testing as per latest IEC 61373, LED life expectancy ≥ 50000 burning hrs., Colour temperature range 5500-6500K, Colour Rendering Index (CRI) ≥ 70 with driver featuring (Constant current driver with open & short circuit protection), THD $< 10\%$, efficiency $\geq 85\%$, SPD for External surge protection-of minimum 10KV to be separately installed with the each fixture (As per ANSI C 136'2- 2014), Lamp shall be Distortion free, clear, heat resistance toughened glass of thickness 4.00 mm, polycarbonate lens Fire retardant FR grade, Ingress Protection of IP-66, The housing shall be single housing, side entry high pressure aluminium die cast/extruded aluminium, grey colour corrosion-resistant polyester powder coated with separate optical and control gear compartments, high conductivity (LM/6/ADC12/LM24) with integral heat sink and heat proof silicon rubber, silicon gasket between housing & cover, Impact Resistance of IK-07. Cover to be fixed to the housing by mean of stainless steel screws and stainless steel fastener.
16	Fixing and commissioning of LED 45 watt or higher wattage street light including wiring of light from loop box with proper termination by Pin Type Terminal End Lugs including fixing to the arm by mean of stainless steel screws and stainless steel fastener as per site requirement, to complete the job.	*Warranty for free replacement- 5 years. *Technical Data Sheet (TDS) is to be approved by Sr.DEE(G)/KGP or authorized representative. *Make:Havells,Bajaj,Crompton, Philips. Cost includes for fixing and commissioning of the same in suitable fixing arm with suitable stainless steel clamp, nut/bolts, fastener & fixing accessories to fix the fitting on pole/wall or as per direction of Rly including necessary masonry work with supply of connection wire and suitable PVC flexible conduit for connection of fitting to power supply from nearest point (i.e. from cable junction box to arm bracket in case of Lighting Pole and ceiling rose to fitting in case of wall fixing). Earth connection is to be ensured. Supply cost of required materials to successful completion of work as mentioned above is also included.
17	Supply, fabrication, fixing and commissioning of Duplex Stainless Steel pipe, Dia: 42.4mm $\pm 5\%$, Thickness: 3mm $\pm 5\%$ or suitable as per consignee with SS clamp, angle, nut bolt etc for Fixing and commissioning of LED 45 watt or higher wattage street light at pole or wall as per site requirement with plastering work if required. Make: Jindal/JSW/Tata	The scope of work includes Supply, fabrication, fixing and commissioning of Duplex Stainless Steel pipe, Dia: 42.4mm $\pm 5\%$, Thickness: 3mm $\pm 5\%$ or suitable as per consignee with SS clamp, angle, nut bolt etc for Fixing and commissioning of LED 45 watt or higher wattage street light at pole or wall as per site requirement with plastering work if required. Make: Jindal/TATA/JSW
18	Laying of LT cable/cables in underground along the road through cable trench etc. as mentioned in explanatory note	The cost includes for laying of LT cable/cables along the road to be made according to drawing No. KGP/EL(G)/V. Trenching and laying of U/G cables in any kind of soil trench of size minimum 0.40 mtr wide and 1 mtr deep covered with necessary bricks for protection of the cables including

		filling of space between brick and cable/cables with sand and refilling the trench with excavated soil, leveling up, and restoring the surface duly rammed. Coil of cable/cables to be made and grounded at both end of trench /at bend of trench/way of trench (if required) as per instruction of consignee. The cost also includes termination, connection, testing and commissioning of cable with proper socketing of cables. Cost also includes collection of cable/cables from Railway store if required.
19	Laying of LT cable/cables across the road, track, drain through RCC/GI pipe as mentioned in explanatory note.	The cost includes Laying of LT cable/cables across the road, track, drain etc. through RCC/GI pipe according to drawing No. KGP/EL(G)/V. The cable/cables to be mechanically protected by RCC/GI pipe of size 100 mm/150 mm conforming to IS standard. The cost also includes Termination, connection, testing and commissioning of suitable size Cable/cables including supply and fixing of cable glands as per site requirement. Cost also includes collection of cable/cables from Railway store if required. *Required RCC/GI pipes to be supplied by contractor.
20	Laying of LT cable/cables on wall/structure through PVC casing pipe of size 4inches or 3inches with accessories as mentioned in explanatory note.	The cost includes Laying of LT cable/ cables on wall / structure through PVC casing pipe of size 4 inches or 3 inches or as per site requirement with all accessories as per site requirement with suitable clamp / saddle/ fixtures etc. with necessary termination, connection and testing as per standard drawing including supply and fixing of lugs of suitable size. Cost also includes collection of cable/cables from Railway store if required. *Make of PVC casing pipe: Any IS make as approved by Sr.DEE(G)/KGP or authorized representative
21	Transportation of cables in rolls with or without wooden drums from the store of concerned SSEE or any store of kharagpur to the site of works.	The cost includes Transportation of cables in rolls with or without wooden drums from the store of concerned SSEE or any store of kharagpur to the site of works.
22	Supply, erection, testing and commissioning of LT XLPE cable gland made of stainless steel with aluminium lugs/sockets (4 Nos.) suitable for termination work of LT 4 Core X 16-25 sq. mm XLPE aluminum conductor armoured cable. Make-3M/Denso/Raychem	Supply, erection, testing and commissioning of LT XLPE cable gland made of stainless steel with aluminium lugs/sockets (4 Nos.) suitable for termination work of LT 4 Core X 16-25 sq. mm XLPE aluminum conductor armoured cable. Make-3M/Denso/Raychem
23	Supply of 50mm dia HDPE pipe of Grade PE-100 & PN 10 conforming IS 4984: Latest. Make: Astral/Supreme/Finolex	The cost includes Supply, erection & commissioning of 50mm dia HDPE pipe of Grade PE-100 & PN 10 conforming IS 4984: Latest with all accessories to complete job. Make: Astral/Supreme/Finolex
24	Erection and commissioning of HDPE pipe of Any size with all accessories to complete job.	

25	Supply of Miniature Circuit Breaker, 63Amps, ISI marked, Instantaneous tripping range:B, four pole with 4PP(PP=Protected pole), 415V AC, conforming to IS/ IEC: 60898-1:2015, with rated circuit current capacity 10KA, fixed unadjustable time current characteristics and suitable for use in protection of industrial, commercial and domestic installations. MCBs shall be suitable for 50 HZ AC main supplies and have facility for termination of alluminium cable. MCBs shall have fixing arrangement for mounting on steel rails of top Hat section Rail TH:35-7.5, conforming to IS/IEC 60715:2017.with Sheet Steel Enclosure suitable for Four Pole MCB as per IS/IEC 60898-1, 2002 & IS/ERC 60947- 1- 2002 having characteristics of C/B, with front Sheet Steel cover, having cutout for installation of Circuit Breaker. The enclosure shall be powder coated with Minimum 2 earth earthing points and adequate din Rail for mounting the Circuit Breaker as per IS:11039-1983 Top Hat Section Rail TH: 35/7.5. The enclosure must have provision of knockout punches on top and bottom for conductor entry and exit and shall be as per IEC 61439-3 with IP-65 protection Make of MCB: L&T/Havells/HPL/ABB	The cost includes Supply, erection & commissioning of 63 A MCB SI marked, Instantaneous tripping range:B, four pole with 4PP(PP=Protected pole), 415V AC, conforming to IS/ IEC: 60898-1:2015, with rated circuit current capacity 10KA, fixed unadjustable time current characteristics and suitable for use in protection of industrial, commercial and domestic installations. MCBs shall be suitable for 50 HZ AC main supplies and have facility for termination of alluminium cable. MCBs shall have fixing arrangement for mounting on steel rails of top Hat section Rail TH:35-7.5, conforming to IS/IEC 60715:2017.with Sheet Steel Enclosure suitable for Four Pole MCB as per IS/IEC 60898-1, 2002 & IS/ERC 60947- 1- 2002 having characteristics of C/B, with front Sheet Steel cover, having cutout for installation of Circuit Breaker. The enclosure shall be powder coated with Minimum 2 earth earthing points and adequate din Rail for mounting the Circuit Breaker as per IS:11039-1983 Top Hat Section Rail TH: 35/7.5. The enclosure must have provision of knockout punches on top and bottom for conductor entry and exit and shall be as per IEC 61439-3 with IP-65 protection. Make of MCB: L&T/Havells/HPL/ABB
26	Fixing and commissioning of 63Amps, ISI marked, Instantaneous tripping range:B, four pole with 4PP(PP=Protected pole), MCB with all accessories required as per site requirement.	
27	Supply of SPN 8-way DB (Double Door) consisting with DP 40A, 10kA MCB with 2PP, Type B- 01 no. & DP 40A, 30mA RCCB, Type AC- 01 no. as incoming and SP 20A, 10kA MCB, Type B- 01 no, SP 10A, 10kA MCB, Type B- 03 nos as outgoing with Cu.bus-bar, Neutral links, Spreader Link and Earth bar etc. Thickness of DB material (in mm): 1.6 mm (CRCA Sheet Steel). Cost includes all other accessories including stainless steel fastener, Pin Type Terminal End Lugs to complete job as per specification attached. Make of MCB/MCCB/DB: L&T/Legrand/Hager/ABB	The cost includes supply, fixing and commissioning of SPN DB (Double Door) of size-8 Way, sheet thickness (minimum): 1.6mm (Powder Painted CRCA Sheet Steel), Ingress Protection: IP43 or better, Impact Protection: IK09 or better consisting with with DP 40A, 10kA MCB with 2PP, Type B- 01 no. & DP 40A, 30mA RCCB, Type AC- 01 no. as incoming and SP 20A, 10kA MCB, Type B- 01 no, SP 10A, 10kA MCB, Type B- 03 nos as outgoing with Cu. bus-bar, Neutral links, Earth bar, cable gland etc. with wiring and accessories to complete the job.
28	Fixing and Commissioning of SPN 8-way DB (Double Door) consisting with DP 40A, 10kA MCB with 2PP, Type B- 01 no. & DP 40A, 30mA RCCB, Type AC- 01 no. as incoming and SP 20A, 10kA MCB, Type B- 01 no, SP 10A, 10kA MCB, Type B- 03 nos as outgoing with Cu.bus-bar, Neutral links, Spreader Link and Earth bar etc. and all other accessories including stainless steel fastener, Pin Type Terminal End Lugs as per specification attached with complete wiring to complete job.	Only Stainless Steel (SS) fasteners, nut-bolts to be used for fixing purpose and all wiring connections are to be done with provision of Pin Type Cu Terminal End Lugs as per specification mentioned in Annexure-A of this document. During commissioning any blank space of DB is to be covered by MCB dummy plate. DB should be confirming to IS: 13032:1991 latest or IEC: 61439 Part-3 latest and MCBs should be confirming to IS/IEC 60898: PART 1:2015 latest. **Make of MCB&DB: Legrand, ABB, Seimens, L&T /Hager
29	Supply, laying, fixing and commissioning of 25x5mm GI strip as and where required extra for earth connection, at 0.5 Mtr below ground between earth electrode and main switch/ DB/ Electric pole etc. as per site supervisor's instruction, including connection & terminating	Supply, laying, fixing and commissioning of 25x5mm GI strip as and where required extra for earth connection, at 0.5 Mtr below ground between earth electrode and main switch/ DB/ Electric pole etc. as per site supervisor's instruction, including connection & terminating with stainless steel nut, bolt, spring, washer etc, as required. (joining shall be done

	with stainless steel nut, bolt, spring, washer etc, as required. (joining shall be done by overlapping and with 2 sets of stainless steel nut bolt & spring kit complete as per IS, IE rules and site requirement. Make: JSW/Jindal/TATA	by overlapping and with 2 sets of stainless steel nut bolt & spring kit complete as per IS, IE rules and site requirement. Make: JSW/Jindal/TATA
30	Supply of Earthing arrangement with supply of Hot Dip Galvanized (HDG) earth cone and all other requisite materials as per CEE/GRC's Drg. No.CEE/G/A3/P-150, Alt.1 including sump box with salt and charcoal, metallic cover etc. as per site supervisor's instruction. Cost includes supply of all materials mentioned in the Drawing including 04 mtrs 25x5mm GI strip for connection from earth electrode pipe to light pole /Rail pole etc. Make: JSW/Jindal/TATA	The cost includes supply and erection of Earthing arrangement with supply of Hot Dip Galvanized (HDG) earth cone and all other requisite materials as per CEE/GRC's Drg. No.CEE/G/A3/P-150, Alt.1 including sump box with salt and charcoal, metallic cover etc. as per site supervisor's instruction. Cost includes supply and erection of all materials mentioned in the Drawing including 02 meters 25 x 5mm GI strip for connection from earth electrode pipe to light pole /Rail pole etc.
31	Erection of Earthing arrangement with erection of Hot Dip Galvanized (HDG) earth cone and all other requisite materials as per CEE/GRC's Drg. No.CEE/G/A3/P-150, Alt.1 including sump box with salt and charcoal, metallic cover etc. as per site supervisor's instruction. Cost includes erection of all materials mentioned in the Drawing including 04 mtrs 25x5mm GI strip for connection from earth electrode pipe to light pole /Rail pole etc.	*Make: Jindal/JSW/TATA/Any IS make as approved by Sr.DEE(G)/KGP or authorized representative.

NOTE:

(i) All the necessary drawings are to be got approved before supply by Sr.DEE(G)/KGP.

(ii) Make of Materials are to be got approved by Sr.DEE(G)/KGP or his authorized representative before supply of the materials. Sr.DEE(G)/KGP has the sole authority to accept or reject any proposed make other than specified makes.

(iii) In case of any dispute over technical specification of any material mentioned in above schedules, final decision will be of Sr.DEE/G/KGP and the same shall be binding on the contractor.

(iv) If there is any varying of conflicting provisions in the documents forming part of the contract, Sr.DEE/G/KGP shall be the deciding authority with regards to the intention of the provisions and decision shall be final and binding on the contractor.

❖ TECHNICAL SPECIFICATION FOR PIN TYPE CU TERMINAL END LUGS:

Pin Type Terminal End Lug with dimensions as per attached drawing SN 1, Non-insulated type, manufactured from "tough pitched electrolytic copper of 99.9% purity as per IS 191:2007 with amendment no. 2 or latest", electro tinned finish, for solderless crimping to 1.5 Sq. mm Cable, suitable for cable termination in Switches, Sockets, MCBs, MCCBs, RCCBs and Terminal Blocks.

Pin Type Terminal End Lug with dimensions as per attached drawing SN 2, Non-insulated type, manufactured from "tough pitched electrolytic copper of 99.9% purity as per IS 191:2007 with amendment no. 2 or latest", electro tinned finish, for solderless crimping to 2.5 Sq. mm Cable, suitable for cable termination in Switches, Sockets, MCBs, MCCBs, RCCBs and Terminal Blocks.

Pin Type Terminal End Lug with dimensions as per attached drawing SN 3, Non-insulated type, manufactured from "tough pitched electrolytic copper of 99.9% purity as per IS 191:2007 with amendment no. 2 or latest", electro tinned finish, for solderless crimping to 4 Sq. mm Cable, suitable for cable termination in Switches, Sockets, MCBs, MCCBs, RCCBs and Terminal Blocks.

Pin Type Terminal End Lug with dimensions as per attached drawing SN 4, Non-insulated type, manufactured from "tough pitched electrolytic copper of 99.9% purity as per IS 191:2007 with amendment no. 2 or latest", electro tinned finish, for solderless crimping to 6 Sq. mm Cable, suitable for cable termination in Switches, Sockets, MCBs, MCCBs, RCCBs and Terminal Blocks.

Drawing: Copper Pin Type Terminal End Lug**Dimension (Tolerance $\pm 5\%$)**

SN	Cable size (Sq. mm)	$\varnothing A$ (sq. mm)	$\varnothing C$ (sq. mm)	D (mm)	B (mm)	J (mm)
1	1.5	1.6	3.2	1.9	5	17
2	2.5	2.3	3.9	1.9	5	17
3	4	2.9	4.9	2.7	6	20
4	6	3.6	5.6	2.7	6	20

