

### Technical Explanatory Note

**Name of Work:** Electrical (G) works in connection with the Provision of 24 Hr power supply arrangement at track machine sidings and yards under the jurisdiction of Sr.DEN/East, South & DEN(C)/CKP.

**LOCATION (13 nos.):**

i. SSEE(G)/TATA: BDO, ASB

ii. SSEE(G)/DPS: BBN, BJMD, DJHR, JRLI, MLKA, JNK, CBSA, PRSL

iii. SSEE(G)/CKP: CKP

iv. SSEE(G)/BNDM: RGZ, KMPD

Location may change as per Railway's requirement as approved by Sr.DEE(G)/CKP

**Schedule I(Supply)**

Sl. No.	Specification/ Description of Work
1	The price shall cover supply of 80 mm (NB) 'B' class GI pipe which should be screwed & socketed type with clean finished end. The GI pipe should conform to IS 1239 (part-1) : 2004 with latest amendment if any. The cost of all materials including GI clamping arrangement suitable for pole/ any other structure with erection cost and make good of damage if any due to work also included in the price. Make: TATA/Jindal/Bansal/Apollo/Surya
2	The price shall cover supply of 2" dia (50mm dia) HDPE pipe with all accessories suitable for laying under the ground. The grade of HDPE pipe shall be PE 80 & PN 6 and conforming to IS 4984: 1995 with latest amendment if any and shall be durable, corrosion resistant and capable to withstand high pressure applications and temperature fluctuations. Make-TATA/Jindal/Bansal/APL Apollo/make conforming to IS as approved by Sr.DEE(G)/CKP.
3	<p>The price shall cover supply of outdoor type feeder pillar box consisting of the following items:</p> <p>Incomer switchgear:</p> <p>i. 4 pole MCCB 100 Amps, 36 kA breaking capacity - 1 no.</p> <p>ii. Terminal arrangement for connection of outgoing 100 Amp MCCB for ring main system.</p> <p>Outgoing switchgear:</p> <p>i. FP MCB 63 Amps,C series, 10 kA breaking capacity - 1 no.</p> <p>ii. DP MCB 32 Amps,C series, 10 kA breaking capacity - 3 nos.</p> <p>iii.DP MCB 16 Amps,C series, 10 kA breaking capacity - 2 nos.</p> <p>and all accessories required for design, fabrication, internal wiring etc. as per CEGE/SER's specification no. SER/ELEC/GS/DESCRIPTION/LT PANEL/1/REV-0/MAR 2024.</p> <p>MCCB type: Adjustable thermal magnetic overload release &amp; Adjustable magnetic short circuit release.</p> <p>Minimum Box dimension (WxDxH): 800 mm x 600 mm x 1400 mm. Degree of protection: IP 63.</p> <p>Shape of panel: Cubical type with a canopy at the top made of minimum 2.0 mm thick CRCA Sheet Steel to protect panel from rainwater.</p> <p>Earthing: Aluminium Earth bus of minimum cross section 50x6mm, shall run throughout the length at the bottom of the panel and shall have 02 earthing terminals.</p> <p>Bus-bar: 4 pole copper bus-bar with 160A capacity made of Electrolytic Copper with 99.9% purity (R.Y.B.N).</p> <p>Rodent protection: The enclosure &amp; connection arrangement shall be designed to prevent entry of rodents, snakes etc.</p> <p>Automatic Fire Ball: To be provided.</p> <p>The cost of feeder pillar box is inclusive of supply of indicators, channels, din rails, insulators, CTs, wirings and other items and accessories required for complete design as per CEGE/SER's specification as mentioned above.</p> <p>Make of MCCB/MCB: Havells/L&amp;T/ ABB/ Legrand/ Siemens/BCH/C&amp;S</p> <p>Before supply, drawing (as per Rlys standard if any) of LT feeder pillar box along with arrangement of MCCBs, MCBs, meters, busbars, selector/ control switches, angles, channels, frame work etc. with all details to be prepared by the contractor and got approved by Sr.DEE(G)/CKP or his authorised representative.</p> <p>Make: Havells/L&amp;T/ ABB/ Legrand/ Siemens/BCH/C&amp;S</p>
4	The price shall cover supply of DP RCCB 40A suitable for AC + pulsating DC, 30mA sensitivity along with all accessories. The RCCB shall be 2 pole and suitable for 230V, AC supply, Din rail mounting type or mounting as per site requirement as advised by consignee. Make of RCCB: Havells/ Crabtree/ L&T/ BCH/ABB/ C&S/Legrand/ Siemens.

Sl. No.	Specification/ Description of Work
5	<p>The price shall cover supply of cable junction box (CRCA) of size 300mm x 450mm x 170mm (or higher size as per OEM standard) with IP 65 protection (or grade higher than 65) and metric knockouts for suitable size of cable (as advised by consignee ) entry &amp; exit, and completely protected against shock, rust, rot, weather, tamper, pilferage &amp; termite. The box should be maintenance free, fire retardant as per relevant IS with latest amendment if any, single cover door with locking arrangement having four pole terminal, suitable for pole / wall / FOB mounting (as per site requirement and advice of consignee ). The price is inclusive of all accessories including glands for cable entry.</p> <p>Make: National/EPP/ARC/Hager/Havells/ ABB/Schneider/BCH/C&amp;S</p>
6	<p>The price shall cover supply of outdoor type apparatus case/ location box of size 960 mm x 610 mm x 1410 mm (W x D x H) complete with hinged type front &amp; back door with lock &amp; key arrangement, 315A capacity 4 pole copper bus-bar, MS flat fixed on suitable capacity insulator for fixing of switch gears. The location box shall have 3 nos. 200A HRC fuse units for incoming supply and 9 nos. of 100A / 63A fuse units (as advised by consignee) for out going supply. The bus-bar shall be properly insulated with colour coded heat shrinkable sleeves and separated with minimum 26 mm gap between the bus-bars and shall have suitable size of holes for incoming &amp; outgoing cable connections through fusing arrangement. The location box shall be made of 14 SWG MS sheet steel phosphated and powder coating painted with weather proof properties and provided with suitable size gland for cable entry at the bottom. The location box shall be provided with suitable supporting structure for holding the incoming and outgoing cables and provided with suitable size of metal plate with 'Danger' mark for 440V. All the items used shall conform to latest IS specification.</p>
7	<p>The price shall cover supply of cable route marker size : Width -12", Thickness -6", Height -2'6". The word 'DANGER HT CABLE'(or marking letters as per Railways requirement) should be embossed on the top of the marker. 33 KV/ 11 KV/LT shall be marked as advised by consignee. Letter shall be permanent and well finished for long lasting prominence. The cost is inclusive of installation of marker along with supply of all requisite materials.</p>
8	<p>The price shall cover supply of cast iron cable route marker with steel rod stand and fixing in cable trench. The cable route marker shall have permanent and prominent marking of suitable voltage rating and depth and design shall be as advised by consignee.</p>
9	<p>The price shall cover supply of all requisite materials for earthing including electrode &amp; pit as per Railway's drawing No. CEE/G/A3/P-150 (Alt.1) &amp; CEE/G/A3/P-134 (Mod.1) with CEGE/SER's amendment dated 26.11.2024 and connection from earth electrode to required terminals as advised by concerned SSEE(G). Cost also includes supply of 35mm X 3 mm GI strip between earth pipe and main switch/DB/Rail pole etc. as advised by consignee.</p> <p>The specifications shall include:</p> <ol style="list-style-type: none"> <li>1. Earth electrode pipe with nominal bore 50 mm shall be as per IS: 1239-Pt.1(LATEST), TABLE - 5.</li> <li>2. The earth pipe should be made of single piece without any joint and should be kept free from paint, enamel &amp; grease.</li> <li>3. The resistance of the electrode should not be more than 5 ohms.</li> <li>4. The permissible tolerance in the length of the finished product should be limited to <math>\pm 1\%</math>.</li> <li>5. Galvanized steel clamp (Width - 25 mm , Thick - 6mm) &amp; galvanized reducing socket (80 mm x 65 mm ) to be welded with galvanized Pipe (Light &amp; seamless).</li> <li>6. Items: Nut, bolt &amp; washer shall be made of stainless steel</li> </ol> <p>Complete earth cone assembly shall be hot dip galvanized after welding/ fabrication as per IS: 4736 (latest).</p> <p>Make: Make of items accepted shall conform to all IS and standards, amendments mentioned in Railway's drawing mentioned above and as approved by Sr.DEE(G)/CKP.</p>

#### Schedule II (Erection)

Sl. No.	Specification/ Description of Work
1	<p>The price shall cover provision of all requisite materials for laying of cables <b>along the road/ track</b> as per CEE /GRC's drawing No. CEE/G/A3/P-134, digging of cable trench in any kind of soil, removal of soil/ballast, supply &amp; provision of bricks, supply &amp; spreading of sand, laying of cables, filling the trench with soil/concrete as per site after completion of work, Connection of cables for power supply by use of proper size end termination socket. The cost of transportation of cable, sand, bricks and all the required materials for cable laying also included in the price.</p>

Sl. No.	Specification/ Description of Work
2	The price shall cover provision of all requisite materials for fixing/ laying of cable <b>through GI pipe on pole/ PF shed structure or wall</b> by cleating with necessary clamping not more than 50 cm apart, PVC sleeve / Pipe should be used as per site requirement and as per advised by consignee. The cost of clamps of suitable size and PVC sleeve / pipe also included in the price.
3	The price shall cover provision of all requisite materials for laying of cables <b>across the road/ track</b> as per CEE /GRC's drawing. No. CEE/G/A3/P-134. The price is inclusive of cost for digging of cable trench in any kind of soil/concrete/road/drain etc. and laying of pipes. Price shall also cover filling up the trench with removed soil/ concrete as per site requirement after completion of work.
4	The price shall cover erection of 2" dia (50mm dia) HDPE pipe with all accessories including cutting of cement concrete as and when required and finishing with cement concrete to keep the site to its original condition.
5	The price shall cover erection, testing & commissioning of feeder pillar box consisting of 100A MCCBs as incoming and outgoing 63A MCBs, 32A MCBs, 16A MCBs with all accessories including supply & erection of suitable size of glands and sockets as per size of Railway supplied cable. The pillar box to be erected with suitable masonry work and finishing the base as advised by consignee. The price also covers internal wiring, painting of unprotected parts as per requirement and connection of incoming and outgoing cables and earthing connection as per IE rules. The cost is also inclusive of transport, labour and make good of damage if any during execution of the work including masonry work, painting work as per site requirement.
6	The price shall cover erection, testing & commissioning of Railway supplied 160A MCCB in enclosure and connection with suitable size LT cables, bus bar, links for incoming and outgoing power supply arrangement with provision of end termination sockets. The cost of gland & end termination kit (sockets) and all accessories also included in the price.
7	The price shall cover erection, testing & commissioning of railway supplied 63A MCCB in enclosure and connection with suitable size LT cables, bus bar, links for incoming and outgoing power supply arrangement with provision of end termination sockets. The cost of gland & end termination kit (sockets) and all accessories also included in the price.
8	The price shall cover erection, testing & commissioning of DP RCCB 40A suitable for AC + pulsating DC, 30mA sensitivity along with all accessories and wiring connection as advised by consignee.
9	The price shall cover fixing of cable junction box of size 300mm x 450mm x 170mm for power supply arrangement with PF shed structure/ street light pole/ FOB structure (as advised by consignee) by suitable clamping arrangement. The price is inclusive of all required materials for fixing the junction box i.e. clamps & nut- bolts etc. by suitable arrangement. Price for cable fixing is also included in the cost by use of proper size end termination socket (Cost of socket also included in the price).
10	The price shall cover erection, testing & commissioning of apparatus case/ location box complete set mounted on suitable height plinth made by casting with 1:3:6 (cement : sand : ballast) cement concrete. The erection cost also includes supply of all the required materials necessary for erecting the location box and finishing the base including suitable size of glands and bimetallic (Cu/Al) sockets as per size of Railway supplied cable.. The price covers internal wiring, painting of unprotected parts as per requirement and connection of incoming and outgoing cables with gland and socket as advised by consignee and earthing connection as per IE rules.
11	The price shall cover dismantling of concrete kerb stones / rail level platform stones/ concrete beams/slab or similar light structure parts/stones without appreciable damage including stacking of serviceable material and disposal of unserviceable material within 50 mtr lead as advised by consignee.
12	The price shall cover cement concrete work 1:2:4 (1 cement: 2 sand:4 ballast) for make good of damage due to work with supply of cement, sand & ballast including labour as advised by consignee.
13	The price shall cover erection, testing & commissioning of 5 mtr. long GI octagonal pole including transport to site, making of RCC foundation (Cement : Stone : Sand = 1 : 1.5 : 3), foundation depth shall be 1300 mm below ground level ( or as advised by consignee) including all accessories with supply & erection of foundation bolt of size - 4 nos x 20 mm (Dia) x 600 mm (Length).The price is also inclusive of drawing of suitable size GI flat from earth electrode to Pole base complete with nut bolt including brazing as per site requirement as per I.E Rules etc.

Sl. No.	Specification/ Description of Work
14	<p>The price shall cover erection, testing &amp; commissioning of Railway supplied 45W LED street light luminaire with GI clamping and GI bracket arrangement with masonry work and painting work required at site as advised by consignee.</p> <p>The cost is also inclusive of street light point wiring with supply of suitable length of 2 nos. 1.5 sq. mm (phase &amp; neutral) &amp; 1.5 sq.mm earthing wire all PVC insulated FRLSH multistrand copper conductor cable of 1100 V grade conforming to IS 694 : 2010 with latest amendment if any, suitable size of ISI marked conduit pipe/ concealed for laying wires and all accessories for wiring from junction box/ DB to luminaire and earthing connection in concealed/ conduit pipe and complete wiring as advised by consignee.</p>
15	<p>The price shall cover the erection, testing and commissioning of earthing electrode and pit as per Railway's drawing No. CEE/G/A3/P-150 (Alt.1) &amp; CEE/G/A3/P-134 (Mod.1) as per CECE/SER's amendment dated 26.11.2024 and connection from earth electrode to required DB/Panel/Junction box with 35mm X 3 mm GI flat as per advice of consignee. Th cost is inclusive of all the accessories including nuts-bolts, GI flats, wires etc. all conforming to mentioned drawings to complete the work in all respect.</p> <p>The earth pit shall be complete with RCC sump and MS cover plate with dimensions mentioned in above drawing.</p>
Notes	<p>Following conditions shall be applicable to above specification/ description of work to ensure proper execution of work:</p> <ol style="list-style-type: none"> <li>1) Technical Specifications issued by Railway Board, RDSO, PCEE/SER, CECE/SER, Dy.CESE/GRC, DEE(G)/CKP as mentioned in Tender Schedule, shall be followed strictly and no deviations shall be allowed. If required, copies of standard specifications issued by Railways may be collected from Sr.DEE(G)/CKP's office.</li> <li>2) Queries by Contractors regarding Technical Specification/ Description of materials and works mentioned under Tender Schedule along with Explanatory notes, General Explanatory notes or anomalies if any may be got clarified prior to offering bid for the Tender. In case of no queries, Contractor being awarded the tender shall be liable to execute the work as per mentioned specifications in Tender Schedule and decision of Railway shall be final in this regard.</li> <li>3) Wiring work in buildings including selection of conduit/ casing/ switch board/JB, size of materials/ accessories and clearances shall be selected/executed as per IS 732 : 2019 (with latest amendment if any), other mentioned IS, IE rules, CEA (CENTRAL ELECTRICITY AUTHORITY) 2023 (with latest amendment).</li> <li>4) While executing wiring work, aesthetic look of buildings/ structures and convenience of day to day operation, symmetry etc. must be taken care of and no short-cut, temporary works shall be allowed.</li> <li>5) Electrical wiring shall be done with supply &amp; erection of all the mandatory wiring accessories, such as 1 way/2 way/ 3 way/ 4 way box, through box, adapters, bends, Tees, saddle, cover, sleeves, nylon wire ties and all the items mentioned/shown in CECE/SER's specification issued vide letter no. CEE/P/56/301/ MAINTENANCE dt.13.07.2022.</li> <li>6) Pin Type Terminal End Lugs: Termination of wires in Switches, Sockets, MCB/MCCB/RCCB etc. shall be done through terminal lugs only for all installations as per CECE/SER's specification issued vide Dy.CESE/GRC's letter under eFile Computer No: 255925 &amp; 98667 dt. 13.09.2024. Cost of all the terminal end lugs has been included in the price and no separate payment shall be made for the same.</li> <li>7) Stainless Steel materials: All hinges, nuts &amp; bolts, screws, washers, locks, cable glands and fasteners etc. used shall be of stainless steel material.</li> <li>8) Concealed/ conduit wiring: Wherever option is given, concealed wiring shall be done along with make good of damaged wall /surface with masonry work &amp; finishing work same as the original condition, the cost of which has also been included in schedule price. In case of non feasibility of concealed wiring, conduit wiring may be done as per advice of consignee.</li> </ol>

Sl. No.	Specification/ Description of Work
	<p>9) FRLSH grade: PVC insulated copper conductor cables supplied for wiring shall be FRLSH type including items or schedule where type of cable has not been mentioned.</p> <p>10) Drawing &amp; Design: Before execution of work, drawing of overhead wire/ UG Cable layout, wiring layout with position of equipment/appliances, light fittings layout as per required lux level in buildings (ABSS standard level for Railway stations), power supply arrangement layout with Panel, DB, feeder pillar box to be prepared by the contractor and got approved by Sr.DEE(G)/CKP or his authorized representative.</p>